STATE
OF
OREGON

TRAFFIC RECORDS ASSESSMENT

October 4-8, 2010

National Highway Traffic
Safety Administration
Technical Assessment Team

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TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

ACKNOWLEDGEMENTS 10

INTRODUCTION 14

SECTION 1: TRAFFIC RECORDS SYSTEM MANAGEMENT 15

1-A: Traffic Records Coordinating Committee 16

1-B: Strategic Planning 20

1-C: Data Integration 25

1-D: Data Uses and Program Management 29

SECTION 2: TRAFFIC RECORDS SYSTEM COMPONENTS 33

2-A: Crash Data Component 36

2-B: Roadway Data Component 47

2-C: Driver Data Component 53

2-D: Vehicle Data Component 59

2-E: Citation/Adjudication Data Component 64

2-F: Statewide Injury Surveillance System (SWISS) Data Component 73

APPENDIX A: SELECTED REFERENCES 82

APPENDIX B: A BBREVIATIONS AND ACRONYMS 90

TEAM CREDENTIALS 92

EXECUTIVE SUMMARY

The National Highway Traffic Safety Administration (NHTSA), responding to a request by the Transportation Safety Division (TSD) of the Oregon Department of Transportation (ODOT), assembled a team to conduct a traffic records assessment. Concurrently the TSD carried out the necessary logistical and administrative steps in preparation for the onsite assessment. A team of professionals with backgrounds and expertise in the several component areas of traffic records data systems (crash, driver, vehicle, roadway, citation and adjudication, and injury surveillance) conducted the assessment October 3 - 8, 2010.

The scope of this assessment covered all of the components of a traffic records system. The purpose was to determine whether the traffic records system in Oregon is capable of supporting management's needs to identify the State's highway safety problems, to manage the countermeasures applied to reduce or eliminate those problems, and to evaluate those programs for their effectiveness.

Background

The Traffic Records Assessment of 2006 identified deficiencies that were the basis for recommendations contained in that report. During this assessment we have noted progress achieved by the State resulting from implementing some of those suggested remedies, as well as other noteworthy improvements that have been accomplished since the 2006 Assessment including the following:

The proportion of crashes in the database that were reported by law enforcement has increased 50 percent from a baseline of 30 percent to approximately 45 percent. Crash data availability and access to analytic resources have improved dramatically since 2006. The ODOT Crash Analysis and Reporting (CAR) unit provides both data extracts and data analyses upon request in addition to producing a broad range of standard reports, publications and extracts.

The ODOT has aggressively pursued changes and enhancements to the roadway files especially in meeting the data needs of officials responsible for local public road safety. ODOT plans to enhance these systems for efficiency and added functionality and is planning several new initiatives such as the TransInfo Project.

The Division of Motor Vehicles (DMV) has installed and is using facial recognition software in conjunction with stringent identification documentation requirements for driver license applicants. Also, a Customer Information Number has been applied to both vehicle and driver records to provide record access in either system.

E-ticketing is gaining momentum based on the efforts of the ODOT TSD and law enforcement agencies. Currently, there are 28 agencies including the Oregon State Patrol (OSP) which accounts for 800 users of e-ticketing.

Oregon has recently completed a pilot project that has demonstrated the usefulness of a statewide EMS database. The Office of EMS and Trauma Systems is currently partnering with the Office of the Fire Marshal and ImageTrend to continue data collection for the next several years. This

effort will allow Oregon to fill a significant void and make tremendous improvements in the timeliness, completeness, accuracy, and quality of the State's EMS data.

Some issues still remain, however, regarding the ability of the present traffic records system to support Oregon's management of its highway safety programs. These are discussed in the summary below and the full report that follows.

Crash Records System

Crash reports are submitted by motorists as well as law enforcement officers to the Division of Motor Vehicles (DMV), an agency within ODOT. Upon receipt, the reports are processed to meet DMV's operational needs (primarily for financial responsibility verification). Once DMV has completed its processing, which includes matching officer and motorist reports, the reports are forwarded to the Transportation Data Section (TDS), a sister agency within ODOT. Data entry is performed by staff of the Crash Analysis and Reporting (CAR) unit which maintains the statewide Crash Data System (CDS).

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The statutory requirement to *report* crashes applies to motorists; law enforcement officers are only required to report if they *investigate* a crash. However there is no requirement in the statute to investigate a crash. Consequently the majority of crash records in the CDS are based on data supplied by motorists. Estimates of the percentage of records in the CDS that are based on law enforcement reports range from the low- to mid-forties with the remaining fifty-plus percent from motorists. However, this represents a 50 percent increase in the proportion of crash reports in the database from law enforcement since 2006. This increase is attributed to the efforts of the TSD, the Traffic Records Coordinating Committee (TRCC), and State and local law enforcement agency heads who have committed to increased reporting. Although difficult to quantify, the increased use of field data collection automation (e-crash along with e-citation) systems is also credited with the rise in reporting by law enforcement.

The issue of Oregon's reliance on operator reports for the majority of the crash data set has been the perennial issue. There is divided opinion among users in the State – some feel that operator reports are valid and useful, and may be relied upon for (practically) any purpose that police-reported crashes can be, while others are severely critical of the data and find it unreliable for decision making purposes. Further, Oregon's overall crash numbers (the total crashes reported each year) are much lower than those reported by similar states. This under-reporting may be as large as 50 percent missing data by some estimates (a comparison of Oregon to Colorado, for example).

While the true size of the under-reporting and missing data problem in Oregon is unknown, it is worth noting that Oregon does not suffer from geographically systematic missing data. In fact, because of the use of operator reports, Oregon receives data on crashes that it otherwise would have no way to collect, and does not suffer from the problems that many states do when major contributors (such as large municipal law enforcement agencies) fail to turn in crash reports. Here, the crashes not covered by police are, at some level of completeness, covered by operator reports. Thus, in the words of one engineer, the data represent a "level playing field" across the State, allowing Oregon to compare among jurisdictions and among roadways to see where the biggest problems are.

Of particular concern are the possible systematic gaps in the data with respect to certain types of PDO and minor injury crashes. Most worrisome are single-vehicle crashes in remote areas (where it would be unlikely that a witness might notify the police) and multi-vehicle crashes in which both drivers wish to avoid detection or blame and can agree not to report the event to law enforcement.

While there has been progress in increasing the level of police reporting, the State is a long way from weaning itself from reliance on operator reports of crashes. The Transportation Safety Committee, the TSD, the TRCC, and other stakeholders have engaged in multiple efforts in order to achieve the gains made since 2006. There are still other avenues that could be explored. However, it must be recognized that any initiative costing money or requiring increased staffing is likely to fail in the current fiscal climate. The reality is that Oregon is committed to collection and use of operator reports for the foreseeable future. Thus it behooves the State to pursue methods of obtaining these data for as low a cost as possible. To that end, the DMV is assessing the feasibility of an online citizen report that could be used to upload data into the DMV driver record and the CDS without requiring staff time for data entry.

Citation and Adjudication Records

The Oregon Justice Department (OJD) is comprised of three types of courts: Circuit (36), Justice of Peace (38), and Municipal (141). Citations filed in the 36 circuit courts are processed by a standard case management system (CMS), the Oregon Judicial Information Network (OJIN). A central repository of citations processed in the circuit courts is compiled from the OJIN and maintained by the State Court's Administrative Office. However, statistical data and reports are difficult to extract due to the age of the OJIN. The Justice Courts and Municipal courts have no standard CMS thus there is no ability to facilitate the production of data and statistics from those courts either. Consequently, as was the status in 2006, there is no statewide repository for citations, or what is generally known as a Citation Tracking System.

The *Oregon Justice Department Five-Year Strategic Plan for 2009-2013* discusses plans to upgrade the existing circuit court CMS. The resulting system, Oregon eCourt, will be the Court's "primary statewide undertaking for the next five years" and will be "the forefront of the State's court system's strategic plan." By providing a single web portal for access to any court, at any time, from anywhere, for eFiling, eCourt provides an opportunity to move towards a more complete statewide repository with citation records from the other courts. As stated in the *Plan* "Its successful implementation lies at the core of our vision for Oregon's courts."

While the Circuit Courts are presently able to send convictions electronically to the Division of Motor Vehicles (DMV), attempts to establish the necessary connections between OJIN and DMV have failed due to issues related both to the age of the DMV mainframe and other incompatibilities internal to the formatting of the records by OJIN.

As eCourt becomes more mature and as the DMV is able to commit resources, the State needs to prioritize developing the necessary interfaces between the courts and the DMV for electronic transmission of court convictions.

E-ticketing is gaining momentum based on the efforts of the TSD and law enforcement agencies. Currently, there are 28 agencies including the Oregon State Patrol (OSP) which accounts for 800 users of e-ticketing. Many of the agencies are able to send citations electronically to courts for entry into case management systems. This initiative was in response to one of the recommendations of the 2006 Assessment to advance electronic data collection and transfer. An action item in the *Oregon Traffic Safety Performance Plan Fiscal Year 2011 Federal Version* proposes to increase the number of traffic citations that are distributed from law enforcement agencies to local courts electronically per year from approximately 37,000 citations in 2007 to 42,000 by December 31, 2011.

Traffic Records Coordinating Committee

Oregon established a Safety Information *Advisory* Committee in 1999 which became the Traffic Records Coordinating Committee (TRCC) in 2007. It is composed of members who come from upper management within their respective agencies. Oregon's TRCC compares to what is generally considered an Executive Level TRCC in that the members have the authority to make policy decisions and commit funding for TRCC projects.

There is no technical or working-level TRCC as such. When there is a need for a working group of technical experts to manage a specific project, a subcommittee is formed. The State has had good experience with this membership approach. Oregon invited the Washington state TRCC to give a presentation on the success of their two-tiered traffic records coordinating committee; Oregon decided their current TRCC structure was working best for them.

Membership includes representation from a broad range of the major stakeholders. Prosecutors were noted as absent in the previous assessment in 2006, but attempts to seek their participation through the prosecutors association have only been moderately successful. The TRCC's effectiveness is not diminished significantly by the absence of some of the peripheral custodial agencies because the majority of the key stakeholders are housed in agencies within the ODOT.

A Traffic Records Program Manager in the TSD provides administrative support, scheduling meetings, preparing the agenda, scribing meeting minutes, and maintaining the traffic records data contacts/inventory.

The TRCC holds regularly scheduled bi-monthly meetings, but the Program Manager, Chair and Co-Chair meet in the off-months to plan and prepare for the meetings. Subcommittee working/technical group meetings are scheduled as needed.

The TRCC is a well-functioning organization and has served the State's traffic records needs more than adequately. However, one area deserving more attention is data quality monitoring. As recommended in the *Traffic Records Program Advisory:*

> "The TRCC should have oversight responsibility for quality control and quality improvement programs affecting all traffic records data. Regularly scheduled presentations of quality control metrics should be part of the TRCC meeting agenda and the TRCC should promote projects to address the data quality problems that are

presented."

Driver and Vehicle Records

The DMV has achieved modern functionality despite the age of the software platform on which the files are based. The new Customer Information Number enables accesses to the separate systems for drivers and vehicles. However, the DMV currently does not receive electronic submissions of conviction data from those courts with electronic capabilities because their resources are inadequate to undertake the improvement. Driver histories from prior states of licensing are not maintained for non-commercial drivers. That information is needed for identification of problem drivers.

The DMV has obtained a grant from the Department of Justice to enable Oregon to participate in the National Motor Vehicle Title Information System (NMVTIS). Additional funding for operations remains an issue.

Statewide Injury Surveillance System (SWISS) Components

Oregon's Injury Surveillance System consists of data collected under the direction of the following agencies:

Oregon Department of Human Services Division of Public Health	Prehospital/EMS Data Trauma Registry Data Vital Statistics
Oregon Association of Hospitals and Health Systems/Oregon Office of Health Policy and Research	Hospital Discharge/Outpatient Data

Since the previous assessment in 2006, the State has made significant progress toward the development of a statewide EMS database. With funding support from ODOT, the EMS and Trauma Systems Program was able to develop a pilot project which collected data from approximately 70 percent of the State's licensed EMS agencies. This pilot not only demonstrated the feasibility of collecting statewide data but also provided the opportunity to integrate the EMS data system with the crash, hospital, and trauma registry databases. The development of a statewide EMS data collection system, along with the recent release of statewide Emergency Department data will enhance the State's ability to determine the total number of persons injured in a motor vehicle crash in Oregon each year.

Injury surveillance and prevention activities in the State are shared by various divisions within the Department of Human Service's Public Health Division. These activities rely largely on data provided through hospital discharges and vital records. Standardized morbidity and mortality reports are available on the Division's website.

Roadway Information

The passage of the federal legislation SAFETEA-LU, the federal transportation program reauthorization act for 2005, contained a requirement that states develop a Strategic Highway

Safety Plan (SHSP). ODOT was in position to meet the requirements of this act by amending the OTSAP in 2006 and is currently in the process of implementing that plan.

These safety initiatives required a combination of roadway and safety data to effectively carry out these programs. Existing information systems were critical to successfully implementing these programs. Among these are: the Crash Data System, the Integrated Roadway Information System (IRIS), and the Transportation Geographic Information System (TransGIS). ODOT plans to enhance these systems for efficiency and added functionality and is planning several new initiatives including: an example is the TransInfo Project scheduled for a 2011 implementation. This project will merge two major road inventory data systems, improving accessibility to roadway asset data.

Strategic Planning

The Oregon Strategic Plan for Traffic Records Improvement was initially developed in 2006. It was updated annually with the most recent update completed in June 2010. The Plan was based on the 2006 Traffic Records Assessment (TRA), including interviews with users, collectors, and custodians of traffic records in the State, and written documentation provided by State safety stakeholders.

The Strategic Plan for Traffic Records in Oregon is a process that is integrated with several highway safety planning efforts. The Oregon Traffic Safety Action Plan (OTSAP), the Safety Management System (SMS), the Oregon Traffic Safety Performance Plan, and the Motor Carrier Safety Action Plan.

Following are the major recommendations for improvements to the State's traffic records system. The references indicate the sections of the report from which the recommendations are drawn.

MAJOR RECOMMENDATIONS

Crash Records System

- ❑ Conduct the following analyses in order to discover the true nature, extent and potential importance of under-reporting of crashes:

  - Comparison of Oregon to other Western states' (we suggest Washington, Idaho, and Colorado) crash proportions for: single-vehicle run-off-road crashes, alcohol-involved crashes (rural versus urban proportions of total crashes), and two-vehicle crashes in which both drivers have some reason for avoiding reporting the crash (e.g., alcohol-involvement, lack of insurance, or other "factor" that would tend to make a driver reluctant to report). This analysis is aimed at identifying potential systematic gaps in reporting that would have relevance for both engineering (run-off-road) and behavioral (driver factors) safety analysis.

  - Comparison of Emergency Department (ED) visits coded as motor vehicle-related trauma versus crash reports linkable to the same crash event. This will require

cooperation of DHS, DMV and the CAR unit analysts. The analysis holds out the promise of identifying the extent of under-reporting of injury crashes.

- Conduct periodic sweeps of relatively new sections of guardrail and cable barrier installations to identify obvious "hits" to these protective devices. By knowing the date of installation, it should be possible to limit the extent of a subsequent search of the data to identify whether a crash report was submitted. By examining the extent of damage it should be possible to limit the search to those events most likely to meet the reporting threshold. Damage to State property over $1500 would meet the reporting criteria by default and, naturally, one might assume that the vehicle involved was damaged to a similar extent. While this is not necessarily an analysis that could be used to estimate the extent of under-reporting, it could help to determine if the State has a vested interest in the missing crash reports because their equipment is damaged. In addition, this analysis could lead the State to examine whether some roadway segments are chronically under-reported. Maintenance records for guardrail and cable barrier replacement could be used to estimate crash frequencies on segments and to see if the reported crash frequency for run-off-road crashes approaches that frequency. **(Section 2-A)**

- ❑ Implement web-based crash reporting for both operator reports and law enforcement reports. This will help agencies with no automation to submit their reports electronically and reduce the amount of data entry and delay in both DMV and the CAR unit. **(Section 2-A)**

- ❑ Implement electronic data transfer of crash data from law enforcement. This recommendation is critical because failure to accept electronic data is inevitably going to cause resistance among law enforcement agencies and could have a deleterious effect on the ongoing efforts to increase the proportion of crashes they investigate. **(Section 2-A)**

- ❑ Include briefings on the law enforcement crash reporting issue in the annual Silver Springs meeting of the Transportation Safety Committee and in the Public meetings related to the Traffic Safety Action Plan. The purpose of these briefings is to build grass roots support for law enforcement crash reporting as another angle of attack on the problem. Part of the presentation could include the proportion of crash reports for each meeting locale/city/county/region that are reported by law enforcement. **(Section 2-A)**

- ❑ Create a formal data quality measurement program that addresses all of the data quality attributes listed in the *Advisory* and any other federal guideline. In particular, however, the State should expand its data accuracy and completeness measures. The measures should be based on initial submissions by law enforcement, not just the final data file created by the CAR unit staff. **(Section 2-A)**

- ❑ Create an error-tracking system that can report the number and type of errors for each law enforcement agency. Use the information to inform training content at the law enforcement academy and to provide feedback to law enforcement agencies in general and, where errors are most severe, to specific agencies. **(Section 2-A)**

- ❑ Create a public report of percentage of crashes, by jurisdiction, reported by each law enforcement agency. Where geographic jurisdictions overlap or are blurred, develop the report based on combined results for the relevant agencies/areas. **(Section 2-A)**

Driver and Vehicle Records

- ❑ Begin recording histories of serious offenses when licensing drivers from other states for non-commercial drivers as is done for commercial drivers in compliance with CDLIS. **(Section 2-C)**

- ❑ Implement electronic receipt of citation records from courts. **(Section 2-C)**

Statewide Injury Surveillance System (SWISS)

- ❑ Work with the Traffic Records Coordinating Committee (TRCC) to identify the funding necessary to continue the statewide EMS data collection system. **(Section 2-F)**

- ❑ Explore options to incorporate data collected since the initial pilot project in May 2008 to the statewide EMS database. **(Section 2-F)**

- ❑ Encourage use of the EMS, inpatient, and outpatient hospital databases to identify all persons treated as the result of a motor vehicle crash. **(Section 2-F)**

Citation and Adjudication Records

- ❑ Develop a statewide Citation Tracking System to contain data on the life cycle of all citations issued and adjudicated in the State. **(Section 2-E)**

- ❑ Continue the process to replace the Oregon Judicial Information Network (OJIN) with an up-to-date case management system (CMS) and form an outreach group to obtain agreement from all courts in the State in the use of the upgraded CMS to transfer citations electronically to the driver file. **(Section 2-E)**

- ❑ Develop linkage between the Citation/Adjudication Data Component and other components of the State's Traffic Record System. **(Section 2-E)**

Traffic Records Coordinating Committee

- ❑ Insure frequent periodic presentations at the TRCC meetings of data quality metrics for each component of the traffic records system. **(Section 1-A)**

Roadway Information

- ❑ Include local safety engineers on review or implementation committees for the new roadway information system initiatives. (Two local safety engineers are currently serving on the Traffic Records Coordinating Committee.) **(Section 2-B)**

Strategic Planning

- ❑ Charge the TRCC with the development of a new Strategic Plan for Traffic Records Improvement addressing the deficiencies and recommendations in this Traffic Records Assessment. **(Section 1-B)**

- ❑ Document the method for the selection and prioritization of the traffic records projects in the Plan. The "Four Box" analysis method suggested by NHTSA is a method for consideration. **(Section 1-B)**

- ❑ Charge the Traffic Records Coordinator with the maintenance of a project management system and the continual monitoring and reporting of project activities in the Strategic Plan including the 408 grant program. **(Section 1-B)**

- ❑ Develop a formal quality control program addressing all components of the traffic records system. **(Section 1-B)**

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INTRODUCTION

A complete traffic records system is necessary for planning (problem identification), operational management or control, and evaluation of a State's highway safety activities. Each State, in cooperation with its political subdivisions, should establish and implement a complete traffic records system. The statewide program should include, or provide for, information for the entire State. This type of program is basic to the implementation of all highway safety countermeasures and is the key ingredient to their effective and efficient management.

As stated in the *National Agenda for the Improvement of Highway Safety Information Systems*, a product of the National Safety Council's Association of Transportation Safety Information Professionals (formerly the Traffic Records Committee):

> "Highway safety information systems provide the information which is critical to the development of policies and programs that maintain the safety and the operation of the nation's roadway transportation network."

A traffic records system is generally defined as a virtual system of independent real systems which collectively form the information base for the management of the highway and traffic safety activities of a State and its local subdivisions.

Assessment Background

The Traffic Records Assessment is a technical assistance tool that the National Highway Traffic Safety Administration (NHTSA), the Federal Motor Carrier Safety Administration (FMCSA) and the Federal Highway Administration (FHWA) offer to State offices of highway safety to allow management to review the State's traffic records program. NHTSA has published a *Traffic Records Program Assessment Advisory* which establishes criteria to guide State development and use of its highway safety information resources. The Traffic Records Assessment is a process for giving the State a snapshot of its status relative to that *Advisory*.

This assessment report documents the State's traffic records activities as compared to the provisions in the *Advisory*, notes a State's traffic records strengths and accomplishments, and offers suggestions where improvements can be made.

Report Contents

In this report, the text following the "*Advisory*" excerpt heading was drawn from the *Traffic Records Program Assessment Advisory*. The "*Advisory*" excerpt portion is in italics to distinguish it from the "Status and Recommendations" related to that section which immediately follows. The status and recommendations represent the assessment team's understanding of the State's traffic records system and their suggestions for improvement. The findings are based entirely on the documents provided prior to and during the assessment, together with the information gathered through the face-to-face discussions with the listed State officials. Recommendations for improvements in the State's records program are based on the assessment team's judgment.

SECTION 1: TRAFFIC RECORDS SYSTEM MANAGEMENT

Advisory Excerpt: *Management of a State TRS requires coordination and cooperation. The data that make up a TRS reside in a variety of operational systems that are created and maintained to meet primary needs in areas other than highway safety. Ownership of these databases usually resides with multiple agencies, and the collectors and users of the data span the entire State and beyond.*

The development and management of traffic safety programs should be a systematic process with the goal of reducing the number and severity of traffic crashes. This data-driven process should ensure that all opportunities to improve highway safety are identified and considered for implementation. Furthermore, the effectiveness of highway safety programs should be evaluated. These evaluation results should be used to facilitate the implementation of the most effective highway safety strategies and programs. This process should be achieved through the following initiatives.

1-A: Traffic Records Coordinating Committee

Advisory Excerpt: *The National Highway Traffic Safety Administration's (NHTSA) 2004 Initiatives to Address Improving Traffic Safety Data Integrated Project Team report (hereafter referred to as the Data IPT Report) includes guidance on establishing a successful Traffic Records Coordinating Committee (TRCC). The following include recommendations from the Data IPT Report and additional items of an advisory nature:*

- *Establish a two-tiered TRCC.*
  There should be an executive and a working-level TRCC. The executive-level TRCC should be composed of agency directors who set the vision and mission for the working-level TRCC. The Executive TRCC should review and approve actions proposed by the Working TRCC. The Working TRCC should be composed of representatives for all stakeholders and have responsibilities, defined by the Executive TRCC, for oversight and coordination of the TRS. Together, the two tiers of the TRCC should be responsible for developing, maintaining, and tracking accomplishments related to the State's Strategic Plan for Traffic Records Improvement.

- *Ensure Membership is Representative.*
  TRCCs should be representative of all stakeholders, and each stakeholder representative must have support from their top management. When departments are considering changes to their systems, all TRCC members should be notified and departments should consider how to accommodate the needs of all the TRCC agencies.

- *Authorize Members.*
  The Working TRCC should have formal standing, recognition, and support of the administrators of participating agencies. This support will help the TRCC succeed in overcoming the institutional barriers, lack of focus, and lack of resources that prevent collaboration and progress in integrating highway safety data. The exact role and powers of the TRCC should be made explicit in its charter. Legislators, the governor, and top management of participating agencies should give authority to the TRCC members to make policy decisions and commit their agencies' resources to solve problems and approve the State's strategic plan for traffic records. The most important responsibility of the TRCC should be to provide the leadership necessary to ensure that available funds are sufficient to match stated needs. Despite challenges stemming from collective decision making by members from different agencies with competing priorities, TRCC members should speak with "one voice." The TRCC should have guidelines to determine who speaks for the TRCC and how its recommendations should be communicated.

- *Appoint an Administrator/Manager.*
  A single point of contact for managing a data improvement project is necessary to ensure leadership. The TRCC should designate a traffic records administrator or manager and provide sufficient time and resources to do the job. This person should be responsible for coordinating and scheduling the TRCC, in addition to tracking the progress of implementing the State's traffic records strategic plan. Uniform criteria should be established for monitoring progress. NHTSA can facilitate training for the TRCC administrator/manager regarding traffic record systems, program management, and data analysis.
  Schedule Regular Meetings.

  The TRCC should establish a schedule of regular meetings, not only to discuss data coordination issues and make progress on the strategic plan, but also to share success stories to aid in overcoming fears of implementation. The meetings should take place as required to deal with the State's traffic records issues and to provide meaningful coordination among the stakeholders. The TRCC should gain broader support by marketing the benefits of improved highway safety data. An example to provide data and analytical expertise to local government officials, legislators, decision makers, community groups, and all other stakeholders. TRCC meetings should include strategy sessions for such marketing plans.

- *Oversee Quality Control/Improvement.*
  The TRCC should have oversight responsibility for quality control and quality improvement programs affecting all traffic records data. Regularly scheduled presentations of quality control metrics should be part of the TRCC meeting agenda and the TRCC should promote projects to address the data quality problems that are presented.

- *Oversee Training for TRS Data Improvement.*
  The TRCC should have oversight responsibility for encouraging and monitoring the success of training programs implemented specifically to improve TRS data quality. Regularly scheduled presentations of training needs and training participation should be part of the TRCC meeting agenda, and the TRCC should promote projects to conduct training needs assessments and address the identified training needs.

1-A: Traffic Records Coordinating Committee Status

Establish Two-tiered TRCC

Oregon established a Safety Information Advisory Committee in 1999 which became the Traffic Records Coordinating Committee (TRCC) in 2007. It is composed of members who come from upper management within their respective agencies. Oregon's TRCC compares to what is generally considered an Executive Level TRCC in that the members have the authority to make policy decisions and commit funding for TRCC projects.

There is no technical or working-level TRCC as such. When there is a need for a working group of technical experts to manage a specific project, a subcommittee is formed. The Oregon Department of Transportation (ODOT) also uses Community of Interest (COI) committees that can run parallel to the TRCC when looking at subjects of interest concerning traffic records. The State has had good experience with this membership approach. Oregon asked a member of the Washington state TRCC to give a presentation on the success of their two-tiered traffic records coordinating committee but decided their current TRCC structure was working best for them.

The TRCC and the Governor-appointed Transportation Safety Committee share ideas and have joint meetings to discuss issues that concern both.

Representative Membership

The TRCC membership consists of:

- City, county and State police
- City, county and State engineering
- Oregon Department of Human Services (ODHS) Public Health
- Oregon Driver and Motor Vehicle Services (DMV)
- Oregon Department of Transportation (ODOT) Transportation Data Section, Information Systems, Transportation Safety and Motor Carrier
- National Highway Traffic Safety Administration (NHTSA) and Federal Highway Administration (FHWA) are non-voting members of the TRCC
- State prosecutors

The previous assessment recommended that the TRCC "Conduct periodic reviews of the TRCC's membership and mission, and that senior level staff from key stakeholder agencies participate in reviewing the mission and vision of the TRCC." Currently the TRCC membership is reviewed annually during the membership and charter review period. Members are nominated based on their experience within the six data program areas with priority given to selection of a diverse group of members. Some TRCC members indicated that they have not been empowered enough by their agencies or the Governor to be as effective as needed.

The last assessment recommended that the TRCC invite the State prosecutors' association to join the TRCC. Since then prosecutors have been sought to sit on the TRCC, but they have only been able to attend meetings sporadically.

Authorize Membership
The TRCC is governed by a charter which is updated each year. There are no Memoranda of Understanding (MOUs) between members of the TRCC, but the Committee does not see the need for them.

Administrative Manager
There is a Traffic Records Program Manager that is dedicated at 0.5 FTE to manage the program and monitor grant activity. The remaining 0.5 FTE of this position is dedicated toward analyzing traffic records data, traffic safety performance measurement, preparing the Highway Safety Plan (Performance Plan) and Annual Evaluation documents and compiling various program-specific data books to promote traffic safety.

The Traffic Records Program Manager is responsible for scheduling meetings, producing the agenda, scribing meeting minutes, and maintaining traffic records data contacts/inventory. The Chair and Co-Chair positions lead the TRCC and are reviewed annually for replacement. Individuals are selected to leadership positions who will commit to the position for at least two years. Candidates are selected based on their experience and ability to lead the team. Candidates in the past have been chosen from the list of voting TRCC members, although there is no rule that requires promotion from within the TRCC.

Regular Meetings
The TRCC meets every other month at a minimum. In addition, the Traffic Records Program Manager, Chair and Co-Chair meet in the other months to plan and prepare for the meetings. Subcommittee workgroup meetings are scheduled as needed.

Oversee Quality Control/Improvement
The TRCC does not review quality control reports. Two members of the TRCC manage the quality assurance testing for crash data.

Each of the components of the traffic record system has different managers with full authority over their component of the system. The committee has reviewed software and crash analysis tools used by different departments. For example, the Committee reviewed and analyzed the benefit of implementing the use of software for collision diagramming and the use of different equipment and software for electronic citation and crash reporting. In addition, the Committee invited a representative of Portland State University (PSU) to demonstrate PSU's crash data tool in January 2010 and discussed how Oregon could develop a strategic approach to integrate and expand this new tool without a duplication of efforts.

Oversee Training for TRS Data Improvement
Since the 2006 assessment the TRCC has been more active in Oregon to disseminate information about the traffic records system and availability of crash data. There have been more training opportunities, the TRCC website has been created, and the TRCC meetings have welcomed more non-member attendance.

Recommendations:

- ❑ Insure that every active subcommittee reports to every TRCC meeting.
- ❑ Insure frequent periodic presentations at the TRCC meetings of data quality metrics for each component of the traffic records system.

1-B: Strategic Planning

Advisory Excerpt: *The TRS should operate in a fashion that supports the traffic safety planning process. The planning process should be driven by a strategic plan that helps State and local data owners identify and support their overall traffic safety program needs and addresses the changing needs for information over time. Detailed guidance for strategic planning is included in the NHTSA Strategic Planning Guide and the FHWA Strategic Highway Safety Plan documents. The strategic plan should address activities such as:*

- ❑ *Assign Responsibility for the Strategic Plan.*
  The strategic plan should be created and approved under the direction of the TRCC. The TRCC should continuously monitor and update the plan, to address any deficiencies in its highway traffic records system.

- ❑ *Ensure Continuous Planning.*
  The application of new technology in all data operational phases (i.e., data collection, linkage, processing, retrieval, and analysis) should be continuously reviewed and assessed. The strategic plan should address the adoption and integration of new technology as this facilitates improving TRS components.

- ❑ *Move to Sustainable Systems.*
  The strategic plan should include consideration of the budget for lifecycle maintenance and self-sufficiency to ensure that the TRS continues to function even in the absence of grant funds.

- ❑ *Meet Local Needs.*
  The strategic plan should encourage the development of local and statewide data systems that are responsive to the needs of all stakeholders.

- ❑ *Promote Data Sharing.*
  The strategic plan should promote identification of data sharing opportunities and the integration among federal, State, and local data systems. This will help to eliminate duplication of data and data entry, assuring timely, accurate, and complete traffic safety information.

- ❑ *Promote Data Linkage.*
  Data should be integrated to provide linkage between components of the TRS. Examples of valuable linkages for highway and traffic safety decision making include crash data with roadway characteristics, location, and traffic counts; crash data with driver and vehicle data; and crash data with adjudication data, healthcare treatment and outcome data (e.g., Crash Outcome Data Evaluation System [CODES]).

- ❑ *Coordinate with Federal Partners.*
  The strategic plan's budget-related items should include coordination between the State and the various federal programs available to fund system improvements. The data collection, management, and analysis items in the strategic plan should include coordination of the State's systems with various federal systems (e.g., the Fatality Analysis Reporting System [FARS], the Problem Driver Pointer System [PDPS] of the National Driver Registry [NDR], the Motor Carrier Management Information System [MCMIS], and the Commercial Driver License Information System [CDLIS]).

- ❑ *Incorporate Uniform Data Standards.*
  The strategic plan should include elements that recognize and schedule incorporation of uniform data elements, definitions, and design standards in accordance with national standards and guidelines. Current examples of these standards and guidelines include:

  - *Model Minimum Uniform Crash Criteria (MMUCC)*
  - *American National Standards Institute (ANSI) -D20.1 and ANSI-D16.1*
  - *National Governors Association (NGA)*
  - *Global Justice XML Data Model (GJXDM)*

- *National Center for State Courts, Technology Services, Traffic Court Case Management Systems Functional Requirement Standards*

- *Guidelines for Impaired Driving Records Information Systems*

- *National Emergency Medical Service Information System (NEMSIS) Data Dictionary.*

- ❑ *Plan to Meet Changing Requirements.*
  To help the State meet future highway safety challenges, the strategic plan should include a periodic review of data needs at the local, State, and federal levels. It should be updated to include tasks to meet those needs as they are identified.

- ❑ *Support Strategic Highway Safety Planning and Program Management.*
  The strategic plan should include elements designed to ensure that the State captures program baseline, performance, and evaluation data in response to changing traffic safety program initiatives. Additional elements should be present for establishing and updating countermeasure activities (e.g., crash reduction factors used in project selection and evaluation).

- ❑ *Strategic Planning of Training and Quality Control.*
  The strategic plan should incorporate activities for identifying and addressing data quality problems, especially as these relate to training needs assessments and training implementation.

1-B: Strategic Planning Status

The Oregon Strategic Plan for Traffic Records Improvement was initially developed in 2006. It was updated annually with the most recent update completed in June 2010. The Plan was based on the 2006 Traffic Records Assessment (TRA), including interviews with users, collectors, and custodians of traffic records in the State, and written documentation provided by State safety stakeholders.

The Strategic Plan for Traffic Records in Oregon is a process that is integrated with several highway safety planning efforts. The Oregon Traffic Safety Action Plan (OTSAP), the Safety Management System (SMS), the Oregon Traffic Safety Performance Plan, and the Motor Carrier Safety Action Plan.

The Traffic Safety Division of the Oregon Department of Transportation (ODOT) requested this assessment be undertaken to identify potential traffic records deficiencies as a basis for the development of a new Strategic Plan for Traffic Records Improvement. In preparation for the assessment the Traffic Records Coordinating Committee (TRCC) produced a progress report of the recommendation offered in the 2006 TRA.

Assign Responsibility for the Strategic Plan

All members of the TRCC are involved in the strategic planning process. The TRCC voting members prioritize and approve projects and are responsible for updating the document. The TRCC approves the finalized document annually.

Ensure Continuous Planning

The Strategic Plan identifies immediate action items, near term actions, and long term actions. Project budgets are listed at the end of the Strategic Plan when the project grant application has been developed. The Plan is updated each year prior to the June 15 grant application deadline.

Move to Sustainable Systems

The sustainability of projects included in the Strategic Plan is part of the approval process by the TRCC. The TRCC does not typically consider long term maintenance costs for any of the projects; this is a requirement of the applicant to show sustainability in the project proposal. In many cases, the 408 funds provide a jumpstart to a project that would not have been possible otherwise.

Meet Local Needs

The TRCC has been more active in addressing the needs of city and county officials and has been a good sounding board for idea sharing and planning. The Transportation Safety Division (TSD) is the lead agency along with the TRCC to develop and implement the Strategic Plan. The TSD along with the Transportation Data Division of ODOT works with local officials to provide copies of annual crash data database files and has been working to expand the online crash data tool, TransViewer and TransGIS, to include local jurisdiction roads.

Promote Data Sharing
The Plan includes information about sharing crash and road data with State and local safety organizations and training law enforcement agencies on availability and usefulness of data. The Plan also includes an initiative for the development of a statewide road network that will include local roadway inventory data.

Promote Data Linkage
The Plan addresses the data linkage needs for projects brought to their attention. The TRCC relies on the traffic records assessment as a source for identifying linkage issues and uses the findings of the assessment to plan potential improvements in the future.

Coordinate with Federal Partners
The development of the Plan meets this requirement of the *Advisory*.

Incorporate Uniform Data Standards
Model Minimum Uniform Crash Criteria (MMUCC)
The Plan lists a deficiency and performance measure related to increasing the number of MMUCC data elements on the crash form.

National Emergency Medical Services Information System (NEMSIS)
The Plan lists a deficiency and performance measure related to increasing the number of NEMSIS collected data elements present in the Oregon Pre-hospital Database

Highway Performance Monitoring System (HPMS)
In Oregon, the data are contained within several databases and brought together within a system maintained by TDS. The Plan includes deficiency and performance measures related to roadway inventory. HPMS data for State Highways is now part of TransInfo and not being maintained separately. For nonstate public roads, it will eventually be added to TransInfo in the next phase. Asset Management will become the "overseer" of TransInfo and direct the decisions for what new data are added to TransInfo in the future.

Model Inventory of Roadway Elements (MIRE)
The TDS staff is reviewing the data elements suggested in the soon-to-be-released Model Inventory of Road Elements (MIRE) guideline for inclusion in the roadway inventory system that may be required to effectively use the analytic tools recommended in the Highway Safety Manual.

Plan to Meet Changing Requirements
One of the first tasks in updating the Strategic Plan each year is to consider deficiencies and needs within the traffic records system and provide input and recommendations to address the deficiencies. The TRCC spends a considerable amount of time reviewing new software, including electronic citation and crash reporting, crash diagramming software, and pre-hospital run report software. The focus is at the city, county, and State as well as private citizen level.

Support Strategic Highway Safety Planning and Program Management
The Traffic Records Program Manager is responsible for updating both the Traffic Records Strategic Plan and the annual Performance Plan documents. There are deficiencies and performance measures listed in each of the six system components, although there are no baseline measurements established in the Strategic Plan.

Strategic Planning of Training and Quality Control
The Strategic Plan addresses data quality and training plans. The ODOT Crash Analysis Reporting (CAR) Unit has implemented a training program to work with law enforcement officers and both increase the quality of police crash reporting and to encourage problem oriented policing and the use of local crash data as a prevention tool.

Recommendations:

- ❑ Charge the TRCC with the development of a new Strategic Plan for Traffic Records Improvement addressing the deficiencies and recommendations in this Traffic Records Assessment.
- ❑ Document the method for the selection and prioritization of the traffic records projects in the Plan. The "Four Box" analysis method suggested by NHTSA is a method for consideration.
- ❑ Assure representation of custodians or users of each of the component systems of a traffic records system on the TRCC.
- ❑ Charge the Traffic Records Coordinator with the maintenance of a project management system and the continual monitoring and reporting of project activities in the Strategic Plan including the 408 grant program.
- ❑ Develop a formal quality control program addressing all components of the traffic records system.

1-C: Data Integration

Advisory Excerpt: *The Data IPT Report recommends that States integrate data and expand their linkage opportunities to track traffic safety events among data files. Integrated data should enable driver license and vehicle registration files to be updated with current violations, prevent the wrong driver from being licensed, or keep an unsafe vehicle from being registered. Integration should ensure that all administrative actions are available at the time of the driver's sentencing. Data linkage is an efficient strategy for expanding the data available, while avoiding the expense and delay of new data collection.*

State TRCCs should develop working relationships with the health care community to ensure that the causation, crash, emergency medical services, hospital, and other injury-related data linked during the event can be merged statewide. They should also link to other data such as vehicle insurance, death certificates, medical examiner reports, etc., to support analysis of State-specific public health needs.

Linkage with location-based information such as roadway inventory databases and traffic volume databases at the State level can help identify the kinds of roadway features that experience problems, allowing States to better address these needs through their various maintenance and capital improvement programs. Data integration should be addressed through the following:

- *Create and Maintain a Traffic Records System Inventory.*
  The TRS documentation should show the data elements and their definitions and locations within the various component systems. Ancillary documentation should be available that gives details of the data collection methods, edit/error checking related to each data element, and any known problems or limitations with use of a particular data element. The system inventory should be maintained centrally, ideally in a data clearinghouse, and kept up-to-date through periodic reviews with the custodial agencies. Funding for system development and improvement should include a review of existing systems' contents and capabilities.

- *Support Centralized Access to Linked Data.*
  The traffic records user community should be able to access the major component data files of the TRS through a single portal. To support this access, the State should promote an enterprise architecture and database, and develop a traffic records clearinghouse to serve as the gateway for users. The databases in the clearinghouse should be linked in ways that support highway safety analysis. At a minimum, this would include linkage by location, involved persons, and events.

- *Meet Federal Reporting Requirements.*
  The TRS, where possible, should link to or provide electronic upload files to federal data systems such as FARS, MCMIS/SafetyNet, Highway Performance Monitoring System (HPMS), and others.

- *Support Electronic Data Sharing.*
  The TRS should support standard methods for transporting data between systems. At a minimum, these should include a documented file structure and data definitions for information to be transferred to statewide databases. Standard information transfer formats and protocols, such as XML format and FTP, should be supported.

- *Adhere to State and Federal Privacy and Security Standards.*
  The TRS should make linked data as accessible as possible while safeguarding private information in accordance with State and federal laws. This includes security of information transferred via the Internet or other means.

1-C: Data Integration Status

Since the 2006 traffic records assessment, some progress in data integration and linkage has been accomplished. In particular, crash records are now coded with geographic coordinates enabling the data to be linked with geo-coded roadway information. The analytic use of this linked data is still in its infancy especially with respect to local roads (those not maintained by the State). The Oregon Department of Transportation (ODOT) is developing its TransGIS into a full statewide enterprise system for roadway information. As that project progresses, and the analytic capabilities of the system are enhanced, it is anticipated that the value of merged roadway and crash data will become more apparent. In particular, the State will get to the point that it can analyze crash risk associated with particular roadway features, configurations, and levels of service for all public roads.

There are few and only limited examples of traffic records data integration other than the roadway/crash linkage. Crash data have been linked to driver history data to support analysis of driver risk. This type of analysis is difficult to accomplish because of the need for IT support in the Division of Motor Vehicle Services (DMV) where the driver data reside. There is a long list of high priority projects that will take precedence over new analytic requests.

A proof of concept analysis was performed to link EMS, trauma, and crash data using probabilistic linkage. In addition, the injury control epidemiologist at the Department of Human Services has successfully linked vital records, hospital discharge and emergency department data to support analysis of the causes and costs of hospitalizations.

Specific Data Integration Components from the Advisory

- ❑ *Create and Maintain a Traffic Records System Inventory*
  The Traffic Records Program Manager in ODOT's Transportation Safety Division (TSD) is responsible for maintaining the traffic records system inventory. This information was reported to be available online on the Traffic Records Program web page http://www.oregon.gov/ODOT/TS/trcc.shtml, but there was no single resource there listing all traffic records components and contacts. Traffic records inventory information on each system component is available to NHTSA and authorized users on the Traffic Records Improvement Program Reporting System (TRIPRS) website.

- ❑ *Support Centralized Access to Linked Data*
  The TransInfo project is envisioned as an Enterprise system for highway safety data including State- and local-roadway, crash, traffic volume, and other data. The system is capable of displaying any geo-located data. It is not a complete central access point for all of traffic records, but it does represent a major improvement in data availability and analytic capability since the previous assessment. A similar project is being pursued independently at the Portland State University (PSU) Department of Civil and Environmental Engineering. That project has been presented to the TRCC and the first steps toward coordination of efforts among ODOT and the PSU have been taken.

- ❑ *Meet Federal Reporting Requirements*

Oregon meets the federal reporting requirements as described in the *Advisory*. At present, the Federal Motor Carrier Safety Administration has advised that completeness of commercial vehicle crashes is in doubt because of the low proportion of property-damage-only crashes entered in SAFETYNET. The State disputes this.

- *Support Electronic Data Sharing*
  An e-citation and e-crash effort is gaining momentum based on the efforts of the ODOT Transportation Safety Division and law enforcement agencies. Many of the agencies are able to send citations electronically to courts for entry into case management systems. Crash data cannot yet be received electronically by ODOT.

  Circuit courts are able to share data through a central Oregon Judicial Information Network (OJIN). Municipal and Justice Courts are independent of the Circuit court system and do not share data via OJIN or any other centralized database. The OJIN data on traffic convictions are not uploaded electronically to the DMV driver database.

  There are examples of electronic data sharing of injury surveillance information. The EMS run reporting system (just now moving out of a limited pilot stage) is designed for electronic data submission, as are the Trauma Registry, the Vital Records database, and the Emergency Department and Hospital Discharge databases. The Department of Human Services has access to these various datasets and can create merged data sets based on unique patient identifiers assigned at the entry points to medical care (ambulance, ED, or hospitals).

- *Adhere to State and Federal Privacy and Security Standards*
  Oregon adheres to the privacy and security standards listed in the *Advisory*.

Recommendations:

- Develop TransInfo into the planned statewide roadway and crash data archive and analysis resource.

- Create a single resource that lists the traffic records system components and contacts for each. Make this resource available on the TSD Traffic Records web page.

- Pursue creation of de-identified merged/linked datasets of crash and multiple injury surveillance datasets. Cooperation among DHS, DMV and the CAR unit will be required. Make the de-identified data available for summary analysis and reporting, with appropriate restrictions on release to ensure compliance with privacy laws.

- Pursue electronic data sharing with local courts. By working with a short list of vendors, it may be possible to create a statewide court records database that is nearly complete.

- Pursue electronic data transfer of convictions from courts to DMV on a high priority basis.

- ❑ Pursue electronic submission of e-crash reports to ODOT.

1-D: Data Uses and Program Management

Advisory Excerpt: *Data availability and quality directly affect the effectiveness of informed decision making about sound research, programs, and policies. Accurate, comprehensive, and standardized data should be provided in a timely manner to allow the agency or decision-making entities at the State or local levels to:*

- *Conduct Problem Identification.*
  Problem identification is the process of determining the locations and causes of crashes and their outcomes and of selecting those sites and issues that represent the best opportunity for highway safety improvements. States should be able to conduct problem identification activities with their traffic records system.

- *Develop Countermeasure Programs and Program Management Procedures.*
  States select and evaluate strategies for preventing crashes and improving crash outcomes. This requires that decision makers can select cost-effective countermeasures and that safety improvement programs and funds should be managed based on data-driven decision making.

- *Perform Program Evaluation.*
  States should be capable of measuring progress in reducing crash frequency and severity. Ideally, the effectiveness of individual programs and countermeasures should be evaluated and the results used to refine development and management processes.

- *Support Safety-Related Policies and Planning.*
  The States are responsible for developing SHSPs. These data should be available to support this and other policy and planning efforts such as development of agency-specific traffic safety policies, traffic records strategic planning, safety conscious planning, and others.

- *Access Analytic Resources.*
  Data users, and decision makers in particular, should have access to resources including skilled analytic personnel and easy to use software tools to support their needs. These tools should be specifically designed to meet needs such as addressing legislative issues (barriers as well as new initiatives), program and countermeasure development, management, and evaluation, as well as meeting all reporting requirements.

- *Provide Public Access to Data.*
  The TRS should be designed to give the public or general non-government user reasonable access to data files, analytic results, and resources, but still meet State and federal privacy and security standards.

- *Promote Data Use and Improvement.*
  The TRS should be viewed as more than just a collection of data repositories, and rather as a set of processes, methods, and component systems. Knowledge of how these data should be collected and managed, along with where the bottlenecks and quality problems arise, is critical to users understanding proper ways to apply the data. This knowledge should also aid in identifying areas where improvement is possible.

1-D: Data Uses and Program Management Status

Conduct Problem Identification

The Transportation Safety Division (TSD) of the Oregon Department of Transportation (ODOT) is responsible for problem identification and the programs that counteract those problems. In Oregon problem identification is essentially a continual process. The TSD staff of more than 20 persons, including five Regional Safety Coordinators, enables the focus on all of the problem priority areas by persons who have become expert in the program areas most of whom also have analytic capabilities.

The TSD staff is extensively supported by the Transportation Development/Transportation Data Section of ODOT and particularly, but not exclusively, the Crash Analysis and Reporting (CAR) unit. CAR is proactive in providing tables, reports, analyses, and data extracts in a variety of user-friendly formats on virtually every aspect of highway safety data. This is in addition to being the custodian and quality assurance manager of the State's crash database. The scope of support from CAR is not to TSD only, and their broad spectrum of services to ODOT helps to integrate or at least correlate with the greater range of concerns and responsibilities of ODOT.

CAR's list of recurring reports, including those for system management, requires two pages in small type. Their capability and preparedness to respond to ad hoc requests from all sources is virtually legendary.

TSD also has access to resources from Portland State University, The University of Portland, and Oregon State University.

Dealing with problem identification in Oregon becomes an issue of determining which of the identified problems to undertake, and the selection process seeks input from the Traffic Records Coordinating Committee.

As impressive as the analytic resource pool is, there are problems with the crash data. There are complaints about the "large number of small errors and inconsistencies" and challenges to the veracity of information on citizen reports when no police report was made. In some instances, data from a locality is obtained. Timeliness (lack of) is the other crash data complaint. The implementation of electronic crash (and citation) reporting should mitigate the timeliness problem and improves data quality.

Develop Countermeasure Programs and Program Management Procedures

As indicated above, TSD has programs in place to address all of the countermeasure programs and has highly qualified persons assigned to manage them. In several instances more than one specialist participates in the administration of the program. Further, the TSD has five seasoned regional coordinators who extend the outreach from the ODOT headquarters and provide support and guidance to the localities conducting the countermeasure activities.

Perform Program Evaluation
Evaluation of highway traffic safety programs seems always to be problematic. One responder has been candid in discussing program evaluation:

"Evaluation is seldom done well…. The best of the lot are Highway Safety grant programs, which require an evaluation which in most cases is an administrative rather than impact evaluation."

What could appear on the surface to be a criticism of the evaluations should be taken as a compliment because the actual circumstance in most states does not rise to the level reflected here.

Support Safety-Related Policies and Planning
The Traffic Records System has enabled timely response to requests from legislators for legislative bill analyses that relate to motor vehicle crashes.

The ODOT provides numerous crash data reports that can be delivered through a series of options or may be accessed directly by users by a web site reporting tool and publication page. Also a web-based interactive GIS mapping tool (TransGIS) is available to meet requester needs.

In addition the CAR unit has four data request analysts who respond to annual, monthly, and daily requests for more specialized data reports.

Access Analytic Resources
The ODOT Transportation Data Section (TDS) has developed the TransGIS database, mapping and analysis tool to provide users with access to crash and roadway analytic capabilities. The current version of the system is somewhat limited but does support joint display and spatial analysis of roadway and crash data. A planned replacement due by the end of 2010 was described as having advanced support for cross-tabulations of roadway features and crash data.

The TDS Crash Analysis and Reporting (CAR) unit produces a wide variety of standard reports and data extracts along with providing support for ad hoc analytic requests. Users of the CAR unit's reports and analytic services were extremely positive with respect to the responsiveness and quality of their work. There were some complaints about data timeliness for crashes, but these concerns did not extend to criticism of the unit or their services in general.

Provide Public Access to Data
Public access to data is available primarily through annual reports provided on each individual agency's website. ODOT maintains an online query system and other tools at https://keiko36.odot.state.or.us, however, these applications are geared more towards engineers than the general public. Ad-hoc queries for additional reports and information can be made directly to ODOT, or the individual health agencies.

Promote Data Use and Improvement
The Oregon Strategic Plan for Traffic Records Improvement includes information about sharing crash data with State and local organizations, training law enforcement agencies on availability

and usefulness of data, and the development of the statewide road network (ORTrans) that will include roadway inventory data. Most of the action items in the Plan are the result of the 2006 Traffic Record Assessment.

Due to an excellent relationship between the Transportation Safety Division (TSD) and the ODOT Crash Analysis and Reporting (CAR) Unit, crash data access has been easy to obtain. They have also been active in training agencies on the importance of crash data and investigation The CAR Unit in conjunction with the TSD does an excellent job of explaining the data available and providing it to program managers within a reasonable timeframe and ensuring data accuracy. The CAR Unit has improved communications with the Oregon DMV and they meet regularly, although they are still working on eliminating some deficiencies and delays in transferring crash records from DMV to the CAR Unit

It was suggested that the Strategic Plan could be improved with more in-depth planning at the project-specific level and establishing realistic performance measures. It has been unmanageable to provide annual updates for the long list of current performance measures, but it would be helpful to include a set list of measures that could be reviewed and updated each year. The current Plan includes many items that are in progress and active, so it will be imperative that the new version contain a fresh look and perspective with many more options to improve the traffic records system and specific steps to accomplish those goals. There are sections of the current Strategic Plan that are not up-to-date, and need to be improved. Some of the long term actions are not feasible or have been addressed (i.e., funding crash reporting or funding more OSP troopers are probably not on the table at this time). The Plan will be much more worthwhile if it contains detailed information about where Oregon needs to improve over the next five years specifically. Stakeholders must commit to adhere to the goals identified in the Plan as long as the Plan is reasonable to accomplish within the given timeframe.

Recommendations:

- ❑ Continue the development of the TransGIS system to support detailed analyses as needed by users.

- ❑ Revise and improve the Strategic Plan for Traffic Records Improvement through more targeted planning and continued cooperation among the data stakeholders.

SECTION 2: TRAFFIC RECORDS SYSTEM COMPONENTS

Advisory Excerpt: *At the time of passage of the Highway Safety Act of 1966, State centralized TRS generally contained basic files on crashes, drivers, vehicles, and roadways. Some States added data on traffic safety-related education, either as a separate file or as a subset of the Driver File. As traffic safety programs matured, many States incorporated EMS and Citation/Conviction Files for use in safety programs. Additionally, some States and localities maintain a Safety Management File that consists of summary data from the central files that can be used for problem identification and safety planning.*

As the capabilities of computer hardware and software systems increased and the availability of powerful systems has expanded to the local level, many States have adopted a more distributed model of data processing. For this reason, the model of a TRS needs to incorporate a view of information and information flow, as opposed to focusing only on the files in which that information resides.

Under this more distributed model, it does not matter whether data for a given system component are housed in a single database on a single computer or spread throughout the State on multiple local systems. What matters is whether the information is available to users, in a form they can use, and that these data are of sufficient quality to support its intended uses. Thus, it is important to look at information sources. These information sources have been grouped to form the major components of a TRS:

- *Crash Information*
- *Roadway Information*
- *Driver Information*
- *Vehicle Information*
- *Citation/Adjudication Information*
- *Statewide Injury Surveillance Information*

Together, these components provide information about places, property, and people involved in crashes and about the factors that may have contributed to the crash or traffic stop. The system should also contain information that may be used to judge the relative magnitude of problems identified through analysis of data in the TRS. This includes demographic data (social statistics about the general population such as geographic area of residence, age, gender, ethnicity, etc.) to account for differences in exposure (normalization) and data for benefit/cost and cost effectiveness determinations. Performance level data should be included to support countermeasure management.

A frequently used overview of the contents of a TRS is the Haddon Matrix, named after its developer, William Haddon, the first NHTSA Administrator. It provides a valuable framework for viewing the primary effects of Human, Vehicle, and Environmental factors and their influence before, during, and after a crash event. Table 1 is based on the Haddon Matrix.

Table 1: Expanded Haddon Matrix
With Example Highway Safety Categories

	Human	***Vehicle***	***Environment***
Pre-Crash	· *Age* · *Gender* · *Experience* · *Alcohol/Drugs* · *Physiological Condition* · *Psychological Condition* · *Familiarity with Road & Vehicle* · *Distraction* · *Conviction & Crash History* · *License Status* · *Speed*	· *Crash Avoidance* · *Vehicle Type* · *Size & Weight* · *Safety Condition, Defects* · *Brakes* · *Tires* · *Vehicle Age* · *Safety Features Installed* · *Registration*	· *Visibility* · *Weather/Season* · *Lighting* · *Divided Highways* · *Signalization* · *Geographic Location* · *Roadway Class, Surface, Cross-Section, Alignment, etc.* · *Structures* · *Traffic Control Devices, Signs, Delineations, and Markings* · *Roadside Appurtenances, Buildups, Driveways, etc.* · *Volume of Traffic* · *Work Zone* ·

			· *Animal Range Land & Seasonal Movements*
Crash	· *Belt Use* · *Human Tolerance* · *Size* · *Seating Position* · *Helmet Use*	· *Crash-Worthiness* · *Passenger Restraints* · *Airbags and Airbag Shutoff*	· *Guardrails* · *Median Barriers* · *Breakaway Posts* · *Rumble Strips and Other Safety Devices* · *Maintenance Status of Roadway and Devices*
Post-Crash	· *Age* · *Physical Condition* · *Insurance Status* · *Access to Health Care* · *Driver Control Actions* · *Court Actions* · *Probation*	· *Post Crash Fires* · *Fuel Leakage* · *Power Cell Securement* · *Hazardous Materials* · *Title*	· *Traffic Management* · *Bystander Care* · *EMS System* · *First Responders* · *Hospital Treatment* · *Long-Term Rehabilitation*

The Haddon Matrix has proven to be a meaningful way to examine primary effects of contributing factors on crash frequency and severity. It helps decision makers to consider countermeasures designed to address specific contributing factors. In recent years, with availability of more detailed data analyses, awareness has grown about the interactions among contributing factors. A good example of such interactions would be weather and drivers' skill or experience levels. To make the contribution of interaction effects more obvious, the matrix in Table 2 can be used to supplement the Haddon Matrix.

Table 1: Examples of the Interactions among Crash Characteristics

	Human	***Vehicle***	***Environment***
Human	· *Road Rage* · *Ped/Bike Behavior & Driver Behavior* · *Driver Age & Passenger Age & Number*	· *Familiarity with Vehicle & Training* · *License Class & Vehicle Type* · *Rollover Propensity & Driver Actions* · *Vehicle Ergonomics & Person Size*	· *Crash Avoidance* · *Vehicle Type* · *Familiarity with Roadway* · *Experience with Weather Conditions*
Vehicle		· *Vehicle Size Weight Mismatch* · *Under-Ride/Over-Ride* · *Shared Roads, No-Zone* · *Tire Inflation & Rollover Propensity*	· *Rollover Propensity & Road Configuration* · *Roadway Debris & Vehicle Size Weight* · *Vehicle Type & Weather Conditions* · *Vehicle Condition & Weather Conditions*
Environment			· *Congestion Interaction with Road Type* · *Congestion & Vehicle Mix & Lane Width* · *Animal Management Policies & Roadway Access & Seasons*

Taken together, these views of traffic safety factors offer a way of thinking about highway safety issues that is both conceptually robust and practical. For the purposes of this Advisory, the most important aspect of the TRS is that it

supports high-quality decision making to improve highway safety. The remainder of this section of the Advisory presents details about the various components of the TRS.

2-A: Crash Data Component

Advisory Excerpt:

- *Description and Contents*

  The Crash Data Component should document the time, location, environment, and characteristics (e.g., sequence of events, rollover, etc.) of a crash. Through links to other TRS components, the Crash Data Component should identify the roadways, vehicles, and people (e.g., drivers, occupants, pedestrians) involved in the crash. These data should help to document the consequences of the crash (e.g., fatalities, injuries, property damage, and violations charged), support the analysis of crashes in general, and the analysis of crashes within specific categories defined by:

  - *person characteristics (e.g., age or gender)*
  - *location characteristics (e.g., roadway type or specific intersections)*
  - *vehicle characteristics (e.g., condition and legal status)*
  - *the interaction of various components (e.g., time of day, day of week, weather, driver actions, pedestrian actions, etc.)*

  The Crash Data Component of the TRS contains basic information about every reportable (as defined by State statute) motor vehicle crash on any public roadway in the State.

- *Applicable Guidelines*

  Details of various data elements to be collected are described in a number of publications. The MMUCC provides a guideline for a suggested minimum set of data elements to be collected for each crash. Additional information should be collected for crashes involving an injury or fatality to meet the tracking and analysis requirements for the State and other systems (e.g., the FARS, SafetyNet).

- *Data Dictionary*

  Crash data should be collected using a uniform crash report form that, where applicable, has been designed and implemented to support electronic field data collection. Law enforcement personnel should receive adequate training at the academy and during periodic refreshers, to ensure that they know the purpose and uses for the data as well as how to complete each field on the form accurately.

  Information from the quality control program should be used to develop and improve the content of training. The training manual on crash reporting should be available to all law enforcement personnel. The instructions in the manual should match the edit checks that are performed on the crash data prior to its being added to the statewide crash database. The edit checks should be documented and sufficient to flag common and serious errors in the data. For example, these errors include missing or out of range values in single fields and logical inconsistencies between the data recorded in multiple fields (e.g., time of day is midnight and the lighting condition is coded as daylight). All data element definitions and all system edits should be shared with collectors, managers, and users in the form of a data dictionary that is consistent with the training manual and the crash report form.

- *Process Flow*

  The steps from initial crash event to final entry into the statewide crash data system should be documented in process flow diagrams. The diagram should be annotated to show the time required to complete each step and to show alternate flows and timelines depending on whether the reports are submitted in hardcopy or electronically to the statewide system. The process flow diagram should include procedures for error correction and error handling (i.e., returning reports to the originating officer/department, correction, resubmission, etc.). Process flow diagrams should show all major steps whether accomplished by staff or automated systems and should clearly distinguish between the two.

- *Interface with Other Components*

  The Crash Data Component has interfaces, using common linking variables shown in Table 3, to other TRS components to support the following functions:

- *Driver and vehicle data should be used to verify and validate the person and vehicle information during data entry and to flag records for possible updating in the driver or vehicle files when a discrepancy is identified. Key variables such as driver license number, vehicle identification number (VIN), license plate number, name, address, and date of birth should be available to support matching of records among the files. The Driver Data Component should also enable access to drivers' histories of crashes and convictions for traffic violations.*

- *Crash data should be linked to roadway inventory and other roadway characteristics based upon location information and other automated and manual coding methods. This linkage supports location-based analysis of crash frequency and severity as well as crash rate calculations based on location-specific traffic counts.*

- *Law enforcement personnel should be able to link crash, contact, incident, citation, and alcohol/drug test results through their own department's records and/or a secure law enforcement information network. For agencies with computer-aided dispatch and/or a records management system, the crash data should be linked to other data through incident, dispatch, and/or crash numbers and by names and locations to support analysis at the local level.*

- *Linkage to injury surveillance data should be possible either directly or through probabilistic linkage in order to support analysis of crash outcomes and overall costs of treatment. Key variables for direct linkage include names of injured persons or EMS run report number. Key variables for probabilistic linkage include the crash date and time, crash location, person characteristics such as date of birth and gender, EMS run report number, and other particulars of the crash.*

Table 3: Common Linking Variables between Crash And Other Data Components of a Traffic Records System

Crash Linkages to Other Law Enforcement and Court Files	- *Incident Number* - *Location (street address, description, coordinates, etc.)* - *Personal ID (name, address, DL number, etc.)*
Crash Linkages to Roadway Information	- *Location Coding (linear referencing system, reference post, coordinates, local street codes)*
Crash Linkages to Driver and Vehicle Information	- *Driver License Number* - *Vehicle Identification Number* - *Personal Identifiers (name, address, date of birth, etc.)*
Crash Linkages to Statewide Injury Surveillance System Information	- *Personal Identifiers (where allowed by law)* - *Crash Date, Time, Location* - *EMS Run Report Number* - *Unique Patient ID Number*

Furthermore, there should be data transfer and sharing linkages between State and local crash databases. The State crash data system should support the electronic transfer of crash data from a variety of law enforcement agencies' (LEAs) records management systems. The State's crash data system management should publish the specifications and editing requirements for generating the outputs from the various agency systems that can be processed into the official State crash data system.

- *Quality Control Program*

  The crash data should be timely, accurate, complete, and consistent and these attributes should be tracked based on a set of established quality control metrics. The overall quality of the information in the Crash Data Component should be assured based on a formal program of error/edit checking as the data are entered into the statewide system. In addition, the custodial agency and the TRCC frequently work together to establish and review the sufficiency of the quality control program and to review the results of the quality control measurements. The crash data managers should receive periodic data quality reports. There should be procedures for sharing the information with data collectors through individual and agency-level feedback, as well as training and changes to the crash report instruction manual, edit checks, and data dictionary. Example measurements are presented in Table 4

Table 2: Examples of Quality Control Measurements for Crash Data

Timeliness	- *# days from crash event to receipt for data entry on statewide database* - *# days for manual data entry* - *# days for upload of electronic data* - *Average # of days to enter crashes into the system* - *Average # of days of backlogged crash reports to be entered*
Accuracy	- *% of crashes "locatable" using roadway location coding method* - *% VINs that are valid (e.g., match to vehicle records that are validated with VIN checking software)* - *% of interstate motor carriers "matched" in MCMIS* - *% crash reports with uncorrected errors* - *% crash reports returned to local agency for correction*
Completeness	- *% LEAs with an unexplained drop in reporting one year to the next* - *% LEAs with expected number of crashes each month* - *% FARS/MCMIS match* - *% FARS/State Crash fatality match*
Consistency	- *% time that an unknown code is used in fields with that possible value* - *% logical error checks that fail* - *% compliance with MMUCC guidelines*

The measures in Table 4 are examples of high-level management indicators of quality. The crash file managers should have access to a greater number of measures and be prepared to present a standard set of summary measures to the TRCC on a periodic schedule, such as monthly or quarterly.

2-A: Crash Data Component Status

Since the previous assessment in 2006 the Oregon Department of Transportation (ODOT) has made several improvements in crash reporting, data management, and data access and analysis. The most significant of these are:

- The proportion of crashes in the database that were reported by law enforcement has increased 50 percent from a baseline of 30 percent to approximately 45 percent. This increase is attributed to the efforts of the ODOT Transportation Safety Division (TSD), the Traffic Records Coordinating Committee (TRCC), and State and local law enforcement agency heads who have committed to increased reporting. Although difficult to quantify, the increased use of field data collection automation (e-crash along with e-citation) systems is also credited with the rise in reporting by law enforcement. In particular, the TSD and TRCC made field data collection system grants for law enforcement agencies contingent on their level of crash reporting, in keeping with a recommendation from the 2006 Assessment. The Transportation Safety Committee has ear-marked $500,000 in 2011 for the law enforcement program budget in TSD for expansion of e-crash and e-citation.

- Legislative approval for an increase in Oregon State Police (OSP) staffing levels (also recommended in the previous Assessment), which, though cut short by subsequent fiscal constraints, allowed that agency to field approximately 100 more troopers – an increase of over one third. This in turn provides more coverage on State highways making it more cost-effective for the OSP to send a trooper to the crash scenes to complete a report (more staff means increased shift coverage and thus a reduction in overtime costs for responding to crashes). Numerically, this improvement has not been quantified, but there is a strong sense that the additional staff have helped OSP and the State increase the proportion of crashes investigated by law enforcement. It should also be noted that the Oregon State Police has implemented a policy of budgeting their vehicle replacements to include the cost of all hardware and software to support field operations, including field data collection for e-crash and e-citation applications. This is an encouraging step because, assuming the present replacement cycle of 120,000 miles for OSP vehicles, the agency will move from only 100 field units equipped with MDTs at present to having all units equipped in a few years.

- The designated representative from the Oregon Chiefs of Police Association chairs the TRCC. This individual is committed to crash reporting as an important part of the law enforcement job. While it is impossible to quantify the effect of that leadership throughout the general law enforcement community, it does demonstrate that local police agencies and the TRCC recognize the value of traffic records for safety improvement and thus might encourage additional agencies to adopt similar “full service” policies regarding crashes in their jurisdictions.

- Strong data management and Quality Assurance (QA) functions in the ODOT Transportation Data Section (TDS) Crash Analysis and Reporting (CAR) unit are used to manage the process of creating a satisfactory dataset out of a blend of police-reported and

operator-reported crashes. While these efforts have been ongoing (predating the 2006 Assessment), it is also clear that data management procedures have evolved over time to be state of the practice in the areas of data accuracy. Location coding, in particular, has received increased attention since 2006. Other data quality attributes are discussed later in this section.

- Crash data availability and access to analytic resources have improved dramatically since 2006. The CAR unit provides both data extracts and data analyses upon request in addition to producing a broad range of standard reports, publications and extracts (the list of these standard outputs includes approximately 100 items). Users can request current (preliminary) data throughout the year, and anyone who requests it may have the year-end close-out file. The CAR unit data analysts receive requests for summary data analyses throughout the year and generally meet most requests within days. In addition, the TDS has developed the TransGIS web-based tool for display of mapped data, including crash locations. This system supports some basic cross-tabulation analysis as well. The system is undergoing a major upgrade by the end of 2010 which will improve functionality, including expansion of the available data and more powerful analytic tools. Most of the functionality of TransGIS is available on the public portions of the website. Approved users may also request linked crash and driver history data although the difficulty in manipulating data using the legacy driver file limits the DMV's ability to meet such requests.

- The TSD website includes links to programmatic data summaries. These resources are available to the public.

A Discussion of Operator Reports and Presumed Under-Reporting of Crashes in Oregon
The perennial issue in Oregon has been its reliance on operator reports for the majority of the crash data set. There is divided opinion among users in the State – some feel that operator reports are valid and useful, and may be relied upon for (practically) any purpose that police-reported crashes can be, while others are severely critical of the data and find it unreliable for decision making purposes. Further, Oregon's overall crash numbers (the total crashes reported each year) are much lower than those reported by similar states. This under-reporting may be as large as 50 percent missing data by some estimates (a comparison of Oregon to Colorado, for example). This type of comparison is behind the Federal Motor Carrier Safety Administration (FMCSA) recent downgrading of Oregon's crash data quality to "yellow" status. FMCSA's calculations indicate severe under-reporting of non-fatal crashes based on a comparison of the ratio of fatal, injury and property-damage-only (PDO) crashes in Oregon versus other states.

While the true size of the under-reporting and missing data problem in Oregon is unknown, it is worth noting that Oregon does not suffer from geographically systematic missing data. In fact, because of the use of operator reports, Oregon receives data on crashes that it otherwise would have no way to collect, and does not suffer from the problems that many states do when major contributors (such as large municipal law enforcement agencies) fail to turn in crash reports. Here, the crashes not covered by police are, at some level of completeness, covered by operator reports. Thus, in the words of one engineer, the data represent a "level playing field" across the State, allowing Oregon to compare among jurisdictions and among roadways to see where the

biggest problems are. Again, not all users of the data are convinced, but enough are satisfied with the data, that it is at least conceivable that the crash data are sufficient as they are – composed of a 50:50 mix of police and operator reports. While this possibility is worth exploring, it must be recognized that the burden of proof is on the State. User satisfaction is one criterion by which to judge sufficiency, but in comparison to other states, Oregon's data will continue to be viewed as inferior and suspect from a National perspective unless the State can produce some support for the contention that the data are valid and reliable.

Of particular concern are the possible systematic gaps in the data with respect to certain types of PDO and minor injury crashes. Most worrisome are single-vehicle crashes in remote areas (where it would be unlikely that a witness might notify the police) and multi-vehicle crashes in which both drivers wish to avoid detection or blame and can agree not to report the event to law enforcement. As in all states, the amount of data missing because the involved parties simply decide not to report the crash is "unknown," but the incentives for failing to report are greater in Oregon (where "at fault" crash involvement can lead to suspension) than in other states, and the consequences of not reporting (despite what the laws say) are low or non-existent in practice. In the recommendations, we point to a series of data analyses, well within the State's analytic capabilities, that could help determine if there is a systematic problem with under-reporting, and if so, how large it is. The State could then use the information to decide how best to address the data gaps.

While there has been progress in increasing the level of police reporting, the State is a long way from weaning itself from reliance on operator reports of crashes for highway safety decision-making. The Transportation Safety Committee, the TSD, the TRCC, and other stakeholders have engaged in multiple efforts in order to achieve the gains made since 2006. There are still other avenues that could be explored. However, it must be recognized that any initiative costing money or requiring increased staffing is likely to fail in the current fiscal climate. The reality is that Oregon is committed to collection and use of operator reports for the foreseeable future. Thus it behooves the State to pursue methods of obtaining these data for as low a cost as possible while, at the same time, working toward the ultimate solution of having law enforcement investigate every reportable crash.. To that end, the ODOT Division of Motor Vehicle (DMV) Services is assessing the feasibility of an online citizen report that could be used to upload data into the DMV driver record and the CAR crash database without requiring staff time for data entry. This would not eliminate the need for staff review of the data since a careful blending multiple operator reports and any police report will still be required.

Specific Components from the *Advisory*
Applicable Guidelines
The crash report (Form 735-46A & B, Rev. June 2007) and the Truck/Bus Supplement (Form 735-47, Rev. May 2008) were designed with reference to ANSI D-16.1 and the FMCSA SAFETYNET guidelines, respectively. Preliminary results of a MMUCC compliance review returned the following:

- Attributes: 30 percent

- Elements: 67 percent

A form revision effort is in progress.

The operator report (Form 735-32, Rev. December 2009) and the operator report motor carrier supplement (Form 735-32B, Rev. January 2004) were designed based on the corresponding police accident report forms. Their level of compliance with applicable guidelines was not assessed.

Data Dictionary

The Crash Data System (CDS) maintained by the ODOT TDS CAR unit is well documented. A coding manual (revised 2007) is available online to all potential users. It defines the elements and attributes for every field in the database, including those created during data management (data entry and review). Users of the data file are provided with ample documentation to enable accurate use of the file. The CAR unit is considering developing crash data users training to promote further use of the data and to help ensure that users are given the information they need in order to use the data in a valid manner.

There is a separate *Instruction Manual* for Oregon Police covering the crash and truck/bus supplement reports. It is not as thorough as the coding manual for the CDS in that it does not explain every attribute of every field on the report forms.

Process Flow

Crash reports are sent directly to the DMV in hard copy (paper) originals. There is no electronic submission of crash reports at present, even though there are several law enforcement agencies using e-crash software in the field. Upon receipt of the paper forms, the DMV assigns a unique crash report number to each event, and applies that number to all versions of the report received – potentially there could be one from law enforcement and one for each involved driver. When a driver is incapacitated, the occupants of the vehicle are required to report. All of the reports of a single crash are put together as a package which is then used to record crash involvement on the driver history and initiate financial responsibility checks before the originals are then forwarded to the TDS CAR unit for data entry into CDS. When the TDS completes data entry, the original reports are returned to DMV for filing and long-term storage on site. Reports of fatal crashes are stored and handled directly by the FARS staff within TDS.

The process flow for crash data management is extremely well documented. The CAR unit provided detailed diagrams of every step in the process. Included in process flow documentation were the following:

- The CAR Unit Annual Processes and Data Flow: an overview that shows month-by month the major steps from data input, through QA, generation of standard data extracts (e.g., to support TransGIS), to creation of the final close-out file.

- General Work Flow: a graphic display of the steps from creation of the crash report through coding, QA, distribution of final data, and reporting (analysis).

- Original Data Thru Coding: details the various sources of crash data and how each is handled to create CDS records.

- Fatality Analysis Reporting System (FARS) Data Flow: details the special handling for reports of a fatal crash.

- Motor Carrier Data Flow: details the special handling for reports of commercial motor vehicle and hazardous materials crashes.

These flow diagrams exceed the specifications of the *Advisory* and are detailed enough to show the movement of crash data from recording of the initial event through availability and use for decision making.

Interface with Other Components

There have been, to date, only limited attempts to link crash data with other sources of traffic records information. The longest running and most successful of these efforts relates to use of crash and roadway information on the State-maintained highway system. As this amounts to a small portion of the overall roadway network, the availability of merged roadway and crash data cannot really be judged a success based on past performance. More recently, TDS has applied spatial coordinates to virtually all crashes (local- and State-maintained), enabling them to support GIS-based joint analysis of roadway information and crash experience. The TransGIS online tools, in particular, are on the verge of meeting several of the analytic needs expressed by users.

Because there is no central file containing all crash data elements – the personal identifiers including name, address, DL#, and VIN are captured only on the DMV's driver and vehicle databases – any project requiring linked driver/vehicle and crash data requires special effort. The driver database, in particular, is difficult to work with because of its age and the long list of priority projects such that any request requiring IT support is likely to be turned down or placed at the end of a rather long queue.

Only one attempt to link crash and injury surveillance data was described in the interviews. This was undertaken by the Department of Human Services staff responsible for the EMS and Trauma databases as part of a demonstration of the value of ambulance run reports.

Quality Control Program

The CAR unit staff perform extensive QA on the crash data both during and after data entry. The data entry system in CDS includes 314 edits checking for completeness and logical consistency among the data fields. During the annual file close out process, the CAR staff run multiple checks of the data to identify and correct common errors. These processes are partially documented. The CAR unit plans to develop a manual detailing all the QA steps for use in training their own data entry staff (currently a six-month process) and to help them educate crash data users about the complexity, validity and proper use of the data.

The following data quality metrics were provided by the CAR unit.

	- Annual close out file: six months after year end

Timeliness	- DMV processing: 17 days (down from 39 days in 2006) - CAR data entry: 90-120 days
Completeness	- Not reported
Accuracy	- Percent of crashes NOT locatable: 1.77 percent in 2009, down from 2.75 percent in 2007 - Percent of interstate motor carriers matched in MCMIS carrier list: 86 percent - Percent FARS/MCMIS match: 100 percent
Completeness	- Not reported
Consistency	- MMUCC compliance: attributes 30 percent; elements 67 percent (Oregon considers these not final)
Integration	- Not reported
Accessibility	- Not reported

In the absence of a National standard on crash data timeliness, the criterion generally used in assessments is user satisfaction. Oregon is generally meeting users' needs for timely data, however, there were indications that not all users are satisfied with a close-out file becoming available six months after the end of the calendar year in which the crash occurred. In particular, one user was frustrated by having to wait that long and was not satisfied with preliminary data released by ODOT periodically throughout the year because the data were still subject to major changes. With the spread of field data collection automation, the state of the practice is indeed moving toward day-current data availability with close-out files available much earlier than has been considered "normal" in the past. Oregon's processes are unlikely to be amenable to much improvement with respect to timeliness because of the need to wait for operator reports and reconcile differences among the police and operator reports to settle on a final record of the crash. Two initiatives, now in their infancy, may help to speed things up. The first, and most likely to happen in the next five years, is creation of an online operator report. This would have the potential to eliminate data entry of the reports within DMV and TDS by automatically populating a temporary database of crash data submitted by crash-involved drivers. The online system could also impose some data quality standards by requiring reports to pass a series of edit checks before acceptance. It should be noted that because the operator report is so similar to the full police report, a similar solution offered to law enforcement would seem to be the next logical step. The second initiative is the adoption of digital imaging within DMV driver licensing and vehicle title/registration processes. Scanning of documents into a database will soon replace the failing microfilm systems used by these two areas of DMV. There is some interest within DMV, and much more within the CAR unit, to have the same type of imaging system established for crash reports that are received on paper. The goal would be to create an image database that could be instantly forwarded to the CAR unit, thus shortening the time between crash event and receipt of the report for data entry. This would eliminate the delay inherent in the crash handling processes at DMV by supplying the reports to CAR as soon as they are scanned.

Recommendations:

- ❑ Conduct the following analyses in order to discover the true nature, extent and potential importance of under-reporting of crashes:

- Comparison of Oregon to other Western states' (we suggest Washington, Idaho, and Colorado) crash proportions for: single-vehicle run-off-road crashes, alcohol-involved crashes (rural versus urban proportions of total crashes), and two-vehicle crashes in which both drivers have some reason for avoiding reporting the crash (e.g., alcohol-involvement, lack of insurance, or other "factor" that would tend to make a driver reluctant to report). This analysis is aimed at identifying potential systematic gaps in reporting that would have relevance for both engineering (run-off-road) and behavioral (driver factors) safety analysis.

- Comparison of Emergency Department (ED) visits coded as motor vehicle-related trauma versus crash reports linkable to the same crash event. This will require cooperation of DHS, DMV and the CAR unit analysts. The analysis holds out the promise of identifying the extent of under-reporting of injury crashes.

- Conduct periodic sweeps of relatively new sections of guardrail and cable barrier installations to identify obvious "hits" to these protective devices. By knowing the date of installation, it should be possible to limit the extent of a subsequent search of the data to identify whether a crash report was submitted. By examining the extent of damage it should be possible to limit the search to those events most likely to meet the reporting threshold. Damage to State property over $1500 would meet the reporting criteria by default and, naturally, one might assume that the vehicle involved was damaged to a similar extent. While this is not necessarily an analysis that could be used to estimate the extent of under-reporting, it could help to determine if the State has a vested interest in the missing crash reports because their equipment is damaged. In addition, this analysis could lead the State to examine whether some roadway segments are chronically under-reported. Maintenance records for guardrail and cable barrier replacement could be used to estimate crash frequencies on segments and to see if the reported crash frequency for run-off-road crashes approaches that frequency.

- ❑ Implement electronic data transfer of crash data from law enforcement. This recommendation is critical because failure to accept electronic data is inevitably going to cause resistance among law enforcement agencies and could have a deleterious effect on the ongoing efforts to increase the proportion of crashes they investigate.

- ❑ Implement web-based crash reporting for both operator reports and law enforcement reports. This will help agencies with no automation to submit their reports electronically and reduce the amount of data entry and delay in both DMV and the CAR unit.

- ❑ Create a formal data quality measurement program that addresses all of the data quality attributes listed in the *Advisory* and any other federal guideline. In particular, however, the State should expand its data accuracy and completeness measures. The measures should be based on initial submissions by law enforcement, not just the final data file created by the CAR unit staff.

- ❑ Create an error-tracking system that can report the number and type of errors for each law enforcement agency. Use the information to inform training content at the law

enforcement academy and to provide feedback to law enforcement agencies in general and, where errors are most severe, to specific agencies.

- ❑ Create a public report of percentage of crashes, by jurisdiction, reported by each law enforcement agency. Where geographic jurisdictions overlap or are blurred, develop the report based on combined results for the relevant agencies/areas.

- ❑ Include briefings on the law enforcement crash reporting issue in the annual Silver Springs meeting of the Transportation Safety Committee and in the Public meetings related to the Traffic Safety Action Plan. The purpose of these briefings is to build grass roots support for law enforcement crash reporting as another angle of attack on the problem. Part of the presentation could include the proportion of crash reports for each meeting locale/city/county/region that are reported by law enforcement.

- ❑ Continue to prioritize the subsidies for law enforcement field data collection equipment and software based on the proportion of crash reports submitted by that agency in their jurisdiction.

- ❑ Encourage all law enforcement agencies in the State to budget for the cost of vehicle replacements including field data collection hardware and software, as is now done in the Oregon State Police.

- ❑ Improve the Police Officer's Instruction Manual as part of the next crash report form revision.

- ❑ Develop a long-range plan (20 years plus) for gradual elimination of the operator report. This should include alternate means of verifying financial responsibility so that the reports are no longer required for any purpose. Seek endorsement of this plan from key stakeholders including the Transportation Safety Committee.

2-B: Roadway Data Component

Advisory Excerpt:

- *Description and Contents.*
  Roadway information includes roadway location, identification, and classification, as well as a description of a road's total physical characteristics and usage. These attributes should be tied to a location reference system. Linked safety and roadway information are valuable components that support a State's construction and maintenance program development. This roadway information should be available for all public roadways, including local roads.

  The State Department of Transportation (DOT) typically has custodial responsibility for the Roadway Data Component. This component should include various enterprise-related files such as:

  - *Roadway Inventories*
    - *Pavement*
    - *Bridges*
    - *Intersections*
  - *Roadside Appurtenances*
    - *Traffic Control Devices (TCD)*
    - *Guard Rails*
    - *Barriers*
  - *Traffic*
    - *Vehicle Miles Traveled (VMT)*
    - *Travel by Vehicle Type*
  - *Other*
    - *Geographic Information Systems (GIS)*
    - *Location Reference System (LRS)*
    - *Project Inventories*

- *Applicable Guidelines*
  The major guideline that pertains to the Roadway Data Component is the HPMS. This provides guidance to the States on standards for sample data collection and reporting for traffic volume counts, inventory, capacity, delay, and pavement management data elements. Guidelines and tools that address roadway data, as well as identifying which of these are expected to have the greatest correlation with crash incidences, should be considered part of this advisory. Examples of these resources are the Highway Safety Manual, Safety Analyst, and the Interactive Highway Safety Design Model. In addition, the American Association of State Highway and Transportation Officials (AASHTO) is developing a series of guides for its Strategic Highway Safety Plan. This multi-year cooperative effort includes guidelines relevant to several TRS components.

- *Data Dictionary*
  Roadway information should be available for all public roads in the State whether under State or local jurisdiction. The contents of the Roadway Data Component should be well documented, including data definitions for each field, edit checks, and data collection guidelines that match the data definitions. Procedures for collection of traffic data and calculation of vehicle miles traveled (VMT) should be documented as well.

- *Process Flow*
  The steps from initial event to final entry onto the statewide roadway data system should be documented in process flow diagrams for each file that are part of the Roadway Data Component. The diagrams should be annotated to show the time required to complete each step and to show alternate flows and timelines depending on whether data are submitted in hardcopy or electronically to the statewide system. The process flow diagram should include processes for error correction and error handling (i.e., returning reports to the original source for correction, resubmission, etc.). Process flow diagrams should show all major steps whether accomplished by staff or with automated systems and clearly distinguish between the two.

- *Interface with Other Traffic Records System Components*
  A location reference system should be used to link the various components of roadway information as well as other TRS information sources, especially crash information, for analytical purposes. Compatible location coding methodologies should apply to all roadways, whether State or locally maintained. When using a GIS, translations should be automatic between legacy location codes and geographic coordinates. This process should be well established and documented. Compatible levels of resolution for location coding for crashes and various roadway characteristics should support meaningful analysis of these data.

- *Quality Control Program*
  The roadway data should be timely, accurate, complete, and consistent and these attributes should be tracked based on a set of established quality control metrics. The overall quality of the roadway data should be assured based on a formal program of error and edit checking as the data are entered into the statewide system and procedures should be in place for addressing the detected errors. In addition, the custodial agency and the TRCC should frequently work together to establish and review the sufficiency of the quality control program and to review the results of the quality control measurements. The roadway data managers should receive periodic data quality reports. There should be procedures in place for sharing the information with data collectors through individual and agency-level feedback, as well as training and changes to the applicable instruction manuals, edit checks, and roadway data dictionary. Audits and validation checks should be conducted as part of the quality control program to assure the accuracy of specific critical data elements. Example measurements are shown in Table 5.

Table 3: Examples of Quality Control Measurements for Roadway Data

Timeliness	- *% of traffic counts conducted each year* - *# days from crash event to location coding of crashes* - *# days from construction completion to roadway file update*
Accuracy	- *% of crashes locatable using roadway location coding method* - *% errors found during data audits of critical data elements*
Completeness	- *% traffic data based on actual counts no more than 3 years old* - *% public roadways listed in the inventory*

The measures in Table 5 are examples of high-level management indicators of quality. The managers of individual roadway files should have access to a greater number of measures. The custodial agency should be prepared to present a standard set of summary measures to the TRCC monthly or quarterly.

2-B: Roadway Data Component Status

Description and Content

Roadway information systems are used by managers at all levels of government to manage highway infrastructure assets. In Oregon these assets are valued in multi-billions of dollars. They include the State public road system comprising approximately 85,000 miles of streets and highways and over 6,600 bridges (2500 of which are on the State system).

The State highway system consists of about 8,000 miles of State highways (roadways owned and maintained by the Oregon Department of Transportation (ODOT)). This is about nine percent of the total road mileage in the State, and includes Oregon's portion of the Interstate Highway System (730 miles).

An example of the use of roadway information for asset management decision-making relates to ODOT's goal to maintain the highway infrastructure under its jurisdiction in good condition. The data suggest that it is the most cost-effective way to do business in the long run. This is because deterioration and repair costs accelerate rapidly over time. On average, for every dollar spent treating pavement in "fair or better" condition, four dollars are required to repair that same pavement once it has reached "poor" condition.

ODOT's goal is also to provide an efficient highway system at a high level of mobility and safety. Using road and traffic crash data, the safety program focuses on investments which address priority hazardous highway locations and corridors in order to reduce the number of fatal and serious injury crashes. Projects funded through this program meet strict benefit/cost criteria. Safety projects may include access management features, guardrails, illumination, signing, rumble strips and railroad crossing improvements.

ODOT established a Safety Management System (SMS) in response to the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. In conjunction with the establishment of the SMS, ODOT developed a tool, the Safety Priority Index System (SPIS), for identifying potential safety problems on State highways. The SPIS has been modified several times over the past two decades and is recognized as an effective problem identification tool for evaluating segments of highway with crash histories that have a high potential for crash and severity reduction remedies.

The mission of ODOT is "to provide leadership and vision in the development and management of a statewide transportation network" and "ensure the safety of transportation system users." As early as 1995, ODOT developed *The Oregon Transportation Safety Action Plan (*OTSAP*)* that identified a safety agenda to guide the department and the State of Oregon for a 20 year period.

The OTSAP reinforced the safety goals, policies, and actions of the ODOT by identifying 70 actions to be implemented over 20 years and identifying specific implementation strategies for eleven key actions that were to be in place by the year 2000. Implementation of the OTSAP resulted in a continued significant decline in the rate of deaths, injuries, and economic loss resulting from transportation-related crashes.

The Safety Management System provided the methods to measure and evaluate the need for safety improvements such as those called for in the OTSAP, and performance measures to monitor results.

The passage of the federal legislation SAFETEA-LU, the federal transportation program reauthorization act for 2005, contained a requirement that states develop a Strategic Highway Safety Plan (SHSP). ODOT was in position to meet the requirements of this Act by amending the OTSAP in 2006 and is currently in the process of implementing that Plan.

These safety initiatives required a combination of roadway and safety data to effectively carry out these programs. Existing information systems were critical to successfully implementing these programs. Among these are: the Crash Analysis and Reporting (CAR) unit's Crash Data System (CDS), the Integrated Roadway Information System (IRIS), and the Transportation Geographic Information System (TransGIS). ODOT plans to enhance these systems for efficiency and added functionality and is planning several new initiatives including:

- TransViewer Crash Data Portal – will provide on-line queries for local road crash data.

- Crash Magic On-line – this project is in progress and will provide collision diagrams for selected locations.

- TransInfo Project – scheduled for a 2011 implementation. This project will merge two major road inventory data systems, improving accessibility to roadway asset data.

These initiatives will also help achieve another objective of ODOT in meeting the data needs of officials responsible for local public road safety. Several local traffic and safety engineers voiced a concern about the timeliness of receiving data from ODOT. Accessibility was also an issue. The above initiatives should address both of these concerns.

Several recommendations in the 2006 Traffic Records Assessment have been addressed by the TRCC and are described in the following table:

Change State highway referencing to eliminate multiple occurrences of the same milepoint on a single route.	Project was started in 2006-07 and continued in 2008-09.
Create necessary translation mechanisms between coordinate-based and other location coding methods used by ODOT to support ongoing analyses and to support spatial analysis of routes and areas in addition to specific points on the roadway.	Prior to 2007, only State highway crashes had an LRS value making them geo-locatable. The map based location coding project in 2007-08 enabled non-State highway crashes to be assigned an LRS value. As a result, more data is accessible using TransGIS.
Develop user-friendly analytic tools that support GIS mapping and non-spatial (e.g., cross-tabulated data aggregation) analyses through a single point of access.	TransGIS and TransViewer project in 2008-09. Collision Diagram Tool project also in 2008-09.

Applicable Guidelines
Specifically the Highway Performance Monitoring System, the Pavement Management System, and the Bridge Management System are adopted by ODOT. The Transportation Data Section staff is also looking into the suite of analytic tools suggested in the recently published Highway Safety Manual. Additionally, in conjunction with the use of these tools, they are reviewing the data elements suggested in the soon to be released Model Inventory of Road Elements (MIRE) guideline for inclusion of data elements in the roadway inventory system that may be required to effectively use these analytic tools.

Data Dictionary
There are a variety of systems that make up the ODOT roadway information system. Most of these systems have a high level data dictionary. The data dictionaries do include data definitions and to some degree data collection guidelines and edit checks.

Process Flow
Some of the newer systems have process flow diagrams showing manual and automated processes.

Interface with Other Traffic Records System Components
Most files can be linked using GIS. Some do not have sufficient location information to be mapped (e.g., Pavement Marking). Files can also be linked by road number and milepoint, and can be displayed through GIS.

Quality Control Program
ODOT provided the following quality control metrics for Roadway Data:

Timeliness	- ***30%*** *of traffic counts conducted each year*
Consistency	- *Not reported*
Completeness	- ***100%*** *traffic data based on actual counts no more than 3 years old* - ***100%*** *public roadways listed in the inventory*
Accuracy	- ***98%*** *of crashes locatable using roadway location coding method*
Accessibility	- *Not reported*
Data Integration	- *Not reported*

Recommendation:

- ❑ Include local safety engineers on review or implementation committees for the new roadway information system initiatives. (Two local safety engineers are currently serving on the Traffic Records Coordinating Committee.)

2-C: Driver Data Component

Advisory Excerpt:

- *Description and Contents*
  Driver information should include data about the State's population of licensed drivers, as well as data about convicted traffic violators who are not licensed in that State. Information about persons licensed by the State should include: personal identification, driver license number, type of license, license status, driver restrictions, convictions for traffic violations in this State and the history of convictions for critical violations in prior States, crash history whether or not cited for a violation, driver improvement or control actions, and driver education data.

  Custodial responsibility for the Driver Data Component usually resides in a State Department or Division of Motor Vehicles. Some commercial vehicle operator-related functions may be handled separately from the primary custodial responsibility for driver data. The structure of driver databases should be typically oriented to individual customers.

- *Applicable Guidelines*
  The ANSI D-20 standard should be used to develop data definitions for traffic records-related information in the driver and vehicle files. Driver information should be maintained to accommodate information obtained through interaction with the NDR via the PDPS and the CDLIS. This enables the State to maintain complete driving histories and prevent drivers from circumventing driver control actions and obtaining multiple licenses. Data exchange for PDPS and CDLIS should be accomplished using the American Association of Motor Vehicle Administrators (AAMVA) Code Dictionary. Security and personal information verification should be in accordance with the provisions of the Real ID act.

- *Data Dictionary*
  At a minimum, driver information should be available for all licensed drivers in the State and for all drivers convicted of a serious traffic violation (regardless of where or whether the person is licensed). The contents of the driver data files should be well documented with data definitions for each field, and where applicable, edit checks and data collection guidelines that match the data definitions. Procedures for collecting, reporting and posting of license, conviction, and license sanction information should be documented.

- *Process Flow*
  The steps, from initial event (licensure, traffic violation, etc.) to final entry onto the statewide driver and vehicle data files, should be documented in process flow diagrams for each file that is part of the Driver Data Component. The diagram should be annotated to show the time required to complete each step and to show alternate flows and timelines depending on whether the data are submitted in hardcopy or electronically to the statewide system. The process flow diagram should include processes for error correction and error handling (i.e., returning reports to the original source for correction, resubmission, etc.). The process flow should also document the timing, conditions, and procedures for purging records from the driver files. Process flow diagrams should show all major steps whether accomplished by staff or automated systems and clearly distinguish between the two. The steps also should be documented in those States that have administrative authority to suspend licenses based on a DUI arrest independent of the judicial processing of those cases.

- *Interface with Other Traffic Records System Components*
  The Driver Data Component should have interfaces (using common linking variables shown in Table 6) to other TRS components such that the following functions can be supported:

  - *Driver component data should be used to verify/validate the person information during data entry in the crash data system and to flag records for possible updating in the driver or vehicle files when a discrepancy is identified. Key variables such as driver license number, name, address, and date of birth should be available to support matching of records among the files. Social Security Numbers should be validated for interstate records exchange.*

  - *Driver and vehicle owner addresses are useful for geographic analyses in conjunction with crash and roadway data components. Linkage in these cases should be based on conversions of addresses to location codes and/or geographic coordinates in order to match the location coding method used in the roadway data component and in the GIS.*

  - *Links between driver convictions and citation/adjudication histories are useful in citation tracking, as well as in systems for tracking specific types of violators (DUI [Driving Under the Influence] tracking systems, for example). Even if a citation tracking system is lacking, there is value in being able to link to data from enforcement or court*

records on the initial charges in traffic cases. These linkages should be based usually on driver name and driver license number but other identifiers may be used as well. The National Center for State Courts (NCSC) is looking for these identifiers in addition to methods to improve data sharing. "NCSC offers solutions that enhance court operations with the latest technology; collects and interprets the latest data on court operations nationwide; and provides information on proven best practices for improving court operations." (http://www.ncsconline.org/)

- *Linkage to injury surveillance data should be possible either directly or through probabilistic linkage in order to support analysis of crash outcomes and crash risk associated with specific driver characteristics (e.g., the driver's history of violations or crash involvement). Key variables should include names, date of birth, dates, times, and locations of crashes and citations.*

Table 6: Common Linking Variables between Driver And Other Data Components of a Traffic Records System

Driver Linkages to Other Law Enforcement & Court Files	- *Citation Number & Case Number* - *Location (street address, description, coordinates, etc.)* - *Personal ID (name, address, DL number, date of birth, etc.)*
Driver Linkages to Roadway Information	- *Driver Addresses (location code, coordinates)*
Driver Linkages to Crash Information	- *Driver License Number* - *Personal Identifiers (name, address, date of birth, etc.)*
Driver Linkages to Statewide Injury Surveillance System Information	- *Personal Identifiers (where allowed by law)* - *Crash Date, Time, Location*

- *Quality Control Program*

The driver data should be timely, accurate, complete, and consistent and these attributes should be tracked based on a set of established quality control metrics. The overall quality of the information in the Driver Data Component should be assured based on a formal program of error/edit checking as data are entered into the statewide system and procedures should be in place for addressing the detected errors. In addition, the custodial agency (or agencies) and the TRCC should work together frequently to establish and review the sufficiency of the quality control program and to review the results of the quality control measurements. The driver data managers should receive periodic data quality reports. There should be procedures in place for sharing the information with data collectors through individual and agency-level feedback, as well as through training and changes to the applicable instruction manuals, edit checks, and the driver and vehicle data dictionaries. Audits and validation checks to assure the accuracy of specific critical data elements should be conducted as part of the formal quality control program. Example measurements are presented in Table 7.

Table 3: Examples of Quality Control Measurements for Driver Data

Timeliness	- *Average time to post driver licenses* - *Average time to post convictions after receipt at DMV* - *Average time to forward dispositions from court to DMV*
Accuracy	- *% of duplicate records for individuals* - *% "errors" found during data audits of critical data elements*
Completeness	- *% drivers records checked for drivers moving into the State* - *% of driver records transferred from prior State*
Consistency	- *% of SSN verified online* - *% of immigration documents verified online* - *% violations reported from other States added to driver history*

The measures in Table 7 are examples of high-level management indicators of quality. The managers of individual driver files should have access to a greater number of measures. The custodial agency should be prepared to present a standard set of summary measures to the TRCC monthly or quarterly.

2-C: Driver Data Component Status

Description and Contents

Basic Characteristics

The Driver and Motor Vehicles (DMV) Division of the Oregon Department of Transportation (ODOT) maintains the licensing and driver history records on just under three million persons. The records on commercial drivers are in the same file as those for non-commercial drivers, the latter being almost five percent of the total.

The DMV is also responsible for vehicle titling and registration. The driver and vehicle records are not integrated, but records for both systems apply a seven-digit numeric Customer Information Number that becomes the key to record access in either system. Though driver and vehicle records are not integrated, the DMV can associate drivers with vehicles they own. Other identifiers can be used to search the file when necessary.

The data system that maintains the records is antiquated compared with contemporary databases; its origins date back to at least early 1986, and it operates under CICS. However, the DMV has managed to achieve contemporary functionality for the services needed by the public, law enforcement, the courts, and the needs of the highway safety user and research communities. Oregon pioneered flexible options to serve the public: service hours outside the normal business hours, placement of Express offices in shopping malls, and accommodating the special needs of the working public.

Obtaining Licenses

"All applicants for driver licenses, instruction permits and ID cards - including renewals and replacements - must provide proof that they are citizens of the United States or are in the country legally, proof of Social Security number and proof of full legal name." This information, prominent on the DMV's Internet Home Page, links to all of the information any applicant may need to apply for a license: acceptable documents, the nature and history of upgraded identification requirements, the DMV use of facial recognition, and the status of the Real ID Act in Oregon. All driver licensing transactions are performed by DMV employees instead of agents or contractors. The Problem Driver Pointer System is checked, and licenses are refused to those under suspension or revocation in another state. CDLIS transactions are completed as required.

Social Security Numbers are verified, and the SAVE system is checked for aliens. Some non-working aliens ineligible for a SSN could verify their ineligibility and obtain a license (if satisfying the legal presence requirement). Homeland Security is checked if necessary.

Field offices processing license applications perform an initial one-to-one facial recognition scan, and a one-to-many scan is performed that night at the DMV headquarters. Using this capability, the DMV has detected instances of fraud committed years earlier.

Oregon has a graduated driver license law, and an evaluation of its effects showed a decline in crash rates for those under the constraints of the program.

Driver History Information

Adverse driver information from a prior State of record is obtained and maintained for commercial drivers as is required by CDLIS. Such information on non-commercial drivers is not maintained or used.

Convictions are sent to the DMV on paper irrespective of the abilities of those courts operating with electronic records. At present, the DMV does not foresee the option to take advantage of electronic citation/conviction records because of limited resources already burdened with other mandated priorities. Even so, the DMV records the original citation charge and the charge on which the driver was convicted. It is unfortunate that this rich mine of information goes mostly untapped to identify the extent of reductions in charges, plea bargaining, and patterns of preferential treatment of some offenders in some courts.

There is no citation monitoring or tracking system, and there is no accounting for citations that are voided, destroyed, or mishandled—either for individual citations or books of citations. Thus there is no way for the DMV or the courts to exercise any control over the misuse of citations, and no way for the DMV even to detect improper handling of citations by a court. Judges, court clerks, and Violations Bureaus can reduce charges, dismiss a case, or destroy a record.

The DMV has the administrative authority to suspend licenses based on a DUI arrest independent of the judicial processing of those cases. Officers are required to confiscate the driver license for per se violators. BAC information is not entered in a driver's record.

The various problems described above diminish the State's ability to identify problem drivers.

Although the DMV does not record driver education information on a person's driver record, there is a file at the DMV that identifies driver education course completion. It is the basis for reimbursing approved driver schools for their services. A youthful driver must complete 50 hours of supervised driving and show attendance at an approved program or complete 100 hours of supervised driving.

Driver history information is available to law enforcement, the judicial community, and to authorized users in compliance with the DPPA.

Driver Improvement

Oregon does not use a point system to bring a driver's accumulating convictions to the attention of the Division. There is, however, an automated process that identifies convictions (by specific classes of offense) accrued within a defined time period to alert the Driver Improvement section that a driver qualifies for a suspension within one of several tiers. A sanction is then applied and becomes the basis for further tracking of possible future offenses. The offense types are listed in detail on the DMV Internet site. The DMV cannot issue a warning letter, so the lowest level of sanction restricts a driver for 30 days to no driving between midnight and 5:00 AM. Thus the light suspension serves as a warning. Subsequent offenses cause more significant suspensions or ultimately revocation when the accumulation of offenses reaches the Habitual Offender status. Among the offense types are involvement in a crash that is deemed by the DMV to have been avoidable. The basis for that determination is also documented.

Applicable Guidelines
Oregon records all convictions received from another jurisdiction using the AAMVA Code Dictionary. Another reference Oregon uses is the AAMVA Equivalency Tables.

Data Dictionary
The DD11 Inquiry Program Manual is available for use by ODOT personnel who access driving records. The DD11 Inquiry Program Manual is not available to the public. The Guide to Oregon Driving Record is available for non-ODOT.

Each data field is defined, and values for each field are specified. Edits are defined in the work procedures (and not in the Data Dictionary).

Reference materials available for the examiners who issue driver licenses are the following:

"Oregon Transportation Service Representatives have access to the CDL Examiner Manual, DD11 Inquiry Program Manual, DRIVE, Customer Information Control Systems (CICS) and Customer Information Systems Procedure Manuals, Driver License Procedure Manual, Driver and Motor Vehicle Policy Manual, Vehicle Registration and Title Manual, US Identification Manual, Digest of Motor Laws, I.D. Checking Guide, Fraud Emergency Warning Systems and Docutector. DMV's system checks the Problem Driver Pointer System (PDPS) and the Commercial Driver License Information System for all issuances and for most reinstatements."

Process Flow
Flow diagrams are available; however, error and correction information is part of the procedure manuals and is not documented in the flow diagram.

Routine and ad hoc reports are produced extensively from the driver file for management information and control, public information, research uses, and responses to legislative inquiries.

Interface With Other Traffic Records System Components
As explained initially, the driver database is antiquated. It has no dynamic interaction with other components of the traffic records system other than the fact that there is a customer information number applied to the records in the driver and vehicle separate systems.

Quality Control Program
The following explanation was given to describe the quality control program:

"There are edits built into the data entry programs and every entry is proofread by a different employee the following day. Corrections to the data are performed as needed.

"Each day, registers are produced for proofreading purposes, but there is no system-generated report that indicates errors made by employees. Error information is tracked manually for the manager to use for performance evaluation purposes and to provide feedback to the employee."

Quality Control Measurements for Driver Data

Timeliness	– Average time from accepted application to create driver record = **NA - Processing does not create an original record based on an application for a DL or ID Card, only Field Services does this.** – Average time to mail license to driver from time of application = **No record of this. Check with production facility, or maybe the DP Coordinators or Field Services gets a report indicating this.** – Average time to post convictions after receipt at DMV = **12 days** – Average time from court disposition to receipt at the DMV = **We do not track this information. I would suggest an ad hoc report to calculate the number of days between the conviction date and the entered date. Since they are entered an average of 12 days after receipt, you could then subtract 12 days from that average for this answer.**
Accuracy	– % of duplicate records for individuals requiring correction = **We do not track this information.** – Frequency of audits to assure data validity = **Daily proofreading, but no set schedule for a system audit. Every now and then, we get a message from a DP Coordinator that something is wrong with a record, but it more often occurs with issuance transactions related to combining driving records.** – % of errors found during audits of critical data elements = **We do not track this.**
Completeness	– % of records checked for drivers moving into the State = **Not sure what this means. PDPS and CDLIS are checked for every driver moving into the State at the time of issuance.** – % of driver records requested from prior State = **None, until the implementation of 10 Year History Check in October 2010.** – % of driver records received from prior state = **We do not track this.**
Consistency	– % of SSN verified online = **Unkown** – % of immigration documents verified online = **Unknown** – % non-CDL violations reported from other states added to driver history = **Not tracked in Processing**.

Recommendations:

- ❑ Begin recording histories of serious offenses when licensing drivers from other states for non-commercial drivers as is done for commercial drivers in compliance with CDLIS.
- ❑ Implement electronic receipt of citation records from courts.
- ❑ Support the development and use of a citation tracking system.

2-D: Vehicle Data Component

Advisory Excerpt:

- *Description and Contents*
  Vehicle information includes information on the identification and ownership of vehicles registered in the State. Data should be available regarding vehicle make, model, year of manufacture, body type, and vehicle history (including odometer readings) in order to produce the information needed to support analysis of vehicle-related factors that may contribute to a State's crash experience. Such analyses would be necessarily restricted to crashes involving in-State registered vehicles only.

  Custodial responsibility for the vehicle data usually resides in a State Department or Division of Motor Vehicles. Some commercial vehicle -related functions may be handled separately from the primary custodial responsibility for all other vehicle data. The structure of vehicle databases is typically oriented to individual "customers."

- *Applicable Guidelines*
  Title and registration information, including stolen and salvage indicators, should be available and shared with other States. The National Motor Vehicle Title Information System (NMVTIS) facilitates such exchanges. In addition, some States empower auto dealers to transact vehicle registrations and title applications following the Business Partner Electronic Vehicle Registration (BPEVR) guidelines from AAMVA. The International Registration Plan (IRP), a reciprocity agreement among U.S States and Canadian provinces, administers the registration processes for interstate commercial vehicles.

- *Data Dictionary*
  Vehicle information should be available for all vehicles registered in the State. The contents of the Vehicle Data Component's files should be well documented, including data definitions for each field, and where applicable, edit checks and data collection guidelines that match the data definitions. Procedures for collection, reporting and posting of registration, title, and title brand information should be documented.

- *Process Flow*
  The steps from initial event (registration, title, etc.) to final entry onto the statewide vehicle data files should be documented in process flow diagrams for each file that is part of this component. The diagram should be annotated to show the time required to complete each step and to show alternate flows and timelines depending on whether the data are submitted in hardcopy or electronically to the statewide system. The process flow diagram should include processes for error correction and error handling (i.e., returning reports to the original source for correction, resubmission, etc.). The process flow should also document the timing, conditions, and procedures for purging records from the vehicle files. Process flow diagrams should show all major steps whether accomplished by staff or automated systems and should clearly distinguish between the two.

- *Interface with Other Traffic Records System Components*
  The Vehicle Data Component has interfaces (using common linking variables shown in Table 8) to other TRS components such that the following functions should be supported:

  - *Vehicle data should be used to verify/validate the vehicle information during data entry in the crash data system, and to flag records for possible updating in the vehicle files when a discrepancy is identified. Key variables such as VIN, license plate number, names, and addresses should be available to support matching of records among the files.*

  - *Vehicle owner addresses are useful in geographic analyses in conjunction with crash and roadway data. Linkage in these cases should be based on conversions of addresses to location codes and/or geographic coordinates in order to match the location coding method used in the Roadway Data Component and in the GIS.*

  - *As with crash data, linkage to injury surveillance data should be possible either directly or through probabilistic linkage in order to support analysis of crash outcomes and crash risk associated with specific driver characteristics (e.g., the driver's history of violations or crash involvement). Key variables should include names and dates, date of birth, times, and locations of crashes.*

Table 8: Common Linking Variables between Vehicle And Other Data Components of a Traffic Records System

Vehicle Linkages to Other Law Enforcement & Court Files	- *Location (street address, description, coordinates, etc.)* - *Personal ID (name, address, DL number, etc.)*
Vehicle Linkages to Roadway Information	- *Owner Addresses (location code, coordinates)*
Vehicle Linkages to Crash Information	- *Vehicle Identification Number* - *Personal Identifiers (name, address, date of birth, etc.)*
Vehicle Linkages to Statewide Injury Surveillance System Information	- *Personal Identifiers (where allowed by law)* - *Crash Date, Time, Location*

- *Quality Control Program*
  The vehicle data should be timely, accurate, complete, and consistent and these attributes should be tracked based on a set of established quality control metrics. The overall quality of the vehicle data should be assured based on a formal program of error/edit checking as the data are entered into the statewide system and procedures should be in place for addressing the detected errors. In addition, the custodial agency (or agencies) and the TRCC should work together frequently to establish and review the sufficiency of the quality control program and to review the results of the quality control measurements. The vehicle data managers should receive periodic data quality reports. There should be procedures in place for sharing the information with data collectors through individual and agency-level feedback, as well as training and changes to the applicable instruction manuals, edit checks, and the driver and vehicle data dictionaries. Audits and validation checks should be conducted to assure the accuracy of specific critical data elements as part of the formal Quality Control Program. Example measurements are presented in Table 9.

Table 9: Examples of Quality Control Measurements for Vehicle Data

Timeliness	- *Average time for DMV to post title transactions* - *% title transactions posted within a day of receipt*
Accuracy	- *% of duplicate records for individuals* - *% errors found during data audits of critical data elements* - *% VINs successfully validated with VIN checking software*
Completeness	- *% of records with complete owner name and address*

The measures in Table 9 are examples of high-level management indicators of quality. The managers of individual vehicle files should have access to a greater number of measures. The custodial agency should be prepared to present a standard set of summary measures to the TRCC monthly or quarterly.

2-D: Vehicle Data Component Status

Description and Contents

Basic Characteristics

The Driver and Motor Vehicles (DMV) Division of the Oregon Department of Transportation (ODOT) maintains the vehicle title and registration records on commercial and non-commercial vehicles. Vehicles that weigh over 26,000 lbs. are required to be registered with Oregon's Motor Carrier Transportation Division.

The DMV is also responsible for the driver database. The vehicle and driver records are not integrated, but records for both systems apply a seven-digit numeric Customer Information Number that becomes the key to record access in either system. Though these records are not integrated, the DMV can associate vehicles with drivers who own them. Other identifiers can be used to search the file when necessary.

The data system that maintains the records is antiquated compared with contemporary databases; its origins date back to at least early 1986, and it operates under CICS. However, the DMV has managed to achieve contemporary functionality for the services needed by the public, law enforcement, the courts, and the needs of the highway safety user and research communities.

Obtaining Titles and Registrations

A vehicle must be titled before it can be registered. The application for a title and registration is a single document. Processing is done primarily in DMV field offices, but where an emissions inspection is required, the title and registration application can be processed through a Department of Environmental Quality facility in the Portland area or in the Rogue Valley.

Also, authorized auto dealers are able to transact title and registration applications using the Business Partner Electronic Vehicle Registration (BPEVR) program. Oregon DMV has a contract with a third-party integrator, CVR, to provide an electronic vehicle registration service to Oregon vehicle dealers. Some locations are able to use the R. L. Polk Company VINA software to populate the vehicle record information, but customarily the VINA program is applied at DMV headquarters. The DMV standard for vehicle make and model descriptions are those in the NCIC tables. Those will be used when any discrepancy results from the VINA extracts. Information on older and special vehicles must be entered manually.

Vehicle classifications were described as follows: “Vehicle types are primarily classified according to the vehicle weight or length. Such as, a passenger vehicle is a passenger car, van or pickup up to 10,000 pounds combined weight. There are several vehicle classifications: passenger, truck, motor home, motorcycle, moped, camper, travel trailer, heavy trailer, etc. The type of registration plate issued is based on the classification type and can be used to determine the class or type of vehicle. The only vehicle related classifications used in crash reporting are VIN, plate, year, make and model.”

Odometer readings are recorded at initial titling or when titles are transferred. The registration document does not have a bar code. The file is accessed directly by law enforcement using the e-crash and e-citation applications.

Stolen vehicles are not flagged, and the status of stolen vehicles is determined by checking NCIC or other law enforcement resources. Flags are used for administrative notations. Title brands are applied using Oregon's own descriptive terms. When brands from another State are applied to a new Oregon title, the text of the incoming brand is perpetuated, and the other state is named in case any clarification of the meaning is required. These processes were explained as follows:

"DMV does not maintain records on stolen vehicles, but our title process includes a check on transactions against NCIC (National Crime Information Center) or LEDS (Oregon's Law Enforcement Data System's) database for stolen status.

"DMV has several different types of flag notations that are added to vehicle records. There are also several types of title brands that are include on the vehicle record when applicable. These are entered based on information received from a customer's application for title/registration, or notification from an insurance company, etc. They are only withdrawn when DMV is satisfied that the flag or brand can be removed. DMV may request additional certifications, documentation, etc., to remove a flag notation or brand.

"Information on salvage vehicles is obtained from the ownership document, notification from a registered owner, a wrecker's notification, notation on an application for title or notice from an insurance company. DMV will receive an indication that an Oregon titled vehicle is wrecked or totaled. The vehicle record is flagged to note that the vehicle is wrecked or totaled and will also indicate if the ownership document has or has not been received. When the regular title is surrendered, a salvage title is issued with the appropriate brand."

Applicable Guidelines

The DMV would participate in the National Motor Vehicle Title Information System (NMVTIS) but has not had the financial or human resources necessary. They have obtained a grant from the U.S. Department of Justice for the development but will be unable to proceed unless the operating fees are also provided—an issue currently pending.

As noted above, NCIC nomenclature is used for make and model descriptors, and the other descriptors extracted by VINA constitute a *de facto* standard.

Data Dictionary

There are a number of data dictionary documents for the vehicle file; each of them focused on a separate part of the file, and each data field is defined within the documents. Values are assigned for each field; otherwise the field would not be recognized for use in entry/production.

Reference materials in use include the following: DMV's Registration and Title Manual (three volumes), DMV's Title and Registration Handbook (primarily for dealers), national

Polk/Peck/NADA handbooks, which provide title and registration information for all U.S. jurisdictions, and various other training materials produced by DMV. There are training units in DMV for all DMV functions. Dealers receive training through dealer associations.

Process Flow
Process flow diagrams and documentation are available.

Interface With Other Traffic Records System Components
As explained initially, the vehicle database is antiquated. It has no dynamic interaction with other components of the traffic records system other than the fact that there is a customer information number applied to the records in the driver and vehicle separate systems.

Quality Control Program
The following explanation was given to describe the quality control program: "Vehicle files are updated nightly with whatever information was entered into the system using the data provided by the customer. If two competing transactions for the same vehicle are sent through the same night, both are stopped and placed on an error report to be manually checked the next day. There are edits to catch certain data entry errors immediately and all titles are manually proofread before leaving the building."

Quality Control Measurements for Vehicle Data

Timeliness	– Average time to post registrations = **Our Service Level Goal for Mail-In Registration is 5 days, we are currently at 4 days.** – Average time to process title documents = **Our Service Level Goal is 19 days, we are currently at 16 days.** – Average time to produce completed titles = **Our Service Level Goal is 19 days, we are currently at 16 days.** – % title brands posted with 24 hours of receipt = **0% (See above)** – % registrations and title brands posted within 24 hours = **21% registrations, 0% title brands (See above)**
Accuracy	– % of duplicate records for individuals = **0% for individual (sometimes we have duplicate vehicles records when a vehicle leaves the State and comes back which is often referred to an in and out vehicle, but the system recognizes these and they are entered correctly to avoid duplicate vehicle record).** – % "errors" found during data audits of critical data elements = **% unknown (we have a manual process to check for errors based on daily error reports).** – % VINs successfully validated with VIN checking software = **99.9%**
Completeness	– % of records with complete owner name and address = **100%**

Recommendations:

❑ None

2-E: Citation/Adjudication Data Component

Advisory Excerpt:

- ❑ *Description and Contents*
  Information, which identifies arrest and adjudication activity of the State, should be available, including information that tracks a citation from the time of its distribution to a law enforcement officer, through its issuance to an offender, its disposition, and the posting of conviction in the driver history database. Case management systems, law enforcement records systems, and DMV driver history systems should share information to support:

  - *citation tracking*
  - *case tracking*
  - *disposition reporting*
  - *specialized tracking systems for specific types of violators (e.g., DUI tracking systems)*

  Information should be available to identify the type of violation, location, date and time, the enforcement agency, court of jurisdiction, and final disposition. Similar information for warnings and other motor vehicle incidents that would reflect enforcement activity are also useful for highway safety purposes and should be available at the local level.

  The information should be used in determining the level of enforcement activity in the State, for accounting and controlling of citation forms, and for detailed monitoring of court activity regarding the disposition of traffic cases.

  Custodial responsibility for the multiple systems that make up the Citation/ Adjudication Data Component should be shared among local and State agencies, with law enforcement, courts, and the Department of Motor Vehicles (DMV) sharing responsibility for some files (e.g., portions of the citation tracking system). State-level agencies should have responsibility for managing the law enforcement information network (e.g., a criminal justice information agency), for coordinating and promoting court case management technology (e.g., an administrative arm of the State Supreme Court), and for assuring that convictions are forwarded to the DMV and actually posted to the drivers' histories (e.g., the court records custodian and the DMV).

- ❑ *Applicable Guidelines*
  Data definitions should meet the standards for national law enforcement and court systems. Applicable guidelines are defined for law enforcement data in:

  - *National Crime Information Center (NCIC)*
  - *Uniform Crime Reporting (UCR)*
  - *National Incident-Based Reporting System (NIBRS)*
  - *National Law Enforcement Telecommunication System (NLETS)*
  - *Law Enforcement Information Network (LEIN)*
  - *Traffic Court Case Management Systems Functional Requirement Standards*

  Applicable guidelines should be defined for court records in the National Center for State Courts (NCSC), and jointly for courts and law enforcement in the GJXDM (with specific Traffic Processing Standards created through a national committee). Tracking systems for citations (i.e., a citation tracking system) and for specific classes of violators (e.g., a DUI tracking system) should meet the specifications for such systems published by NHTSA.

- ❑ *Data Dictionary*
  The citation/adjudication data files should be well documented, including data definitions for each field and where applicable, edit checks and data collection guidelines that match the data definitions. Procedures for collection, reporting and posting of license, registration, conviction, and title brand information should be documented.

Law enforcement personnel should receive adequate training at the academy and during periodic refreshers to ensure they know the purpose and uses for the data. Training also should ensure that officers know how to access information on violators and process citations and arrests properly. The training manual should be available to all law enforcement personnel and the instructions should match, as appropriate, the edit checks that are performed on the data prior to its being added to the local records management system and statewide databases. The edit checks should be documented and both common and serious errors in the data should be flagged, including missing or out-of-range values and logical inconsistencies. The data element definitions and system edits should be shared with all collectors, managers, and users in the form of a data dictionary that is consistent with the training manual and the crash report form. Court case management systems and tracking systems (citation tracking and DUI tracking) should be well documented to include definitions of all data elements and corresponding edit checks to ensure accuracy.

- *Process Flow*
  The processing of traffic violations, citations, arrests, and court cases should be documented in a series of flow diagrams showing the typical procedures and their average time to completion for each step. The administrative handling of payment in lieu of court appearance should be shown separately from those violations that are not handled administratively. The processes for detecting drugs or collecting blood alcohol concentration (BAC) values through various methods (breath test, blood or urine tests) should also be documented. The processes for tracking DUI cases in a DUI tracking system should also be included in the set of process flow diagrams. Processes for paper and electronic filing and reporting should be shown separately. Process flow diagrams should show all major steps whether accomplished by staff or automated systems and clearly distinguish between the two.

- *Interface with other traffic records system components*
  NCIC, GJXDM, NIBRS, LEIN, and NLETS guidelines all define methods and data standards for information transfer and sharing at the State and national level. Typically, there are State-level equivalents of the various networks and standards governing the sharing of law enforcement and court-related data. For the purposes of safety analysis at a State and local level, linkage between the Citation/Adjudication Data Component and other components of the TRS is important because it is useful for analyzing the geographic distribution of traffic violations and incidents, as well as monitoring the effectiveness of countermeasures that involve enforcement or court processes. It also enables the creation and updating of adverse driver histories for the purpose of driver control. Key linkages within the TRS for citation/adjudication information are listed in Table 10.

Table 10: Common Linking Variables between Citation/Adjudication and Other Data Components of a Traffic Records System

Citation/Adjudication Linkages to Other Law Enforcement Files and Tracking Systems	- *Computer Aided Dispatch (CAD) Record Number* - *Citation/Arrest/Incident Number, Court Case Number* - *Location (street address, description, coordinates, etc.)* - *Personal ID (name, address, DL number, etc.)*
Citation/Adjudication Linkages to Driver/Vehicle Files	- *Driver and Owner Names, Driver License Number* - *Driver & Owner Addresses (location code, coordinates)* - *Vehicle Plate Number, VIN*
Citation/Adjudication Linkages to Statewide Injury Surveillance System Information	- *Personal Identifiers (where allowed by law)* - *Crash-Related Citation/Arrest Date, Time, Location*

- *Quality Control Program*
  The citation/adjudication data should be timely, accurate, complete, and consistent and these attributes should be tracked based on a set of established quality control metrics. The overall quality of the citation/adjudication data should be assured based on a formal program of error/edit checking as the data are entered into the statewide system, and procedures should be in place for addressing the detected errors. In addition, the custodial agency (agencies) and the TRCC should frequently work together to establish and review the sufficiency of the quality control program and to review the results of the quality control measurements. The data managers receive regular, periodic data quality reports. There should be procedures in place for sharing the information with data collectors through individual and agency-level feedback as well as training and changes to the applicable instruction manuals, edit checks, and the driver and vehicle data dictionaries. Audits and validation checks should be conducted to assure the accuracy of specific critical data elements as part of the formal Quality Control Program. Example measurements are presented in Table 11.

Table 11: Examples of Quality Control Measurements for Citation/Adjudication Data

Timeliness	- *Average time for citations to be sent from LEAs to courts* - *Average time for convictions to be sent to DMV*
Accuracy	- *% errors found during data audits of critical data elements* - *% violations narratives that match the proper State statute*
Completeness	- *% of cases with both original charges and dispositions in citation tracking system*
Consistency	- *% traffic citations statewide written on a single uniform citation*

The measures in Table 11 are examples of high-level management indicators of quality. The managers of individual citation/adjudication files should have access to a greater number of measures. The custodial agency should be prepared to present a standard set of summary measures to the TRCC monthly or quarterly.

2-E: Citation/Adjudication Data Component Status

Description and Contents

Oregon does not have a statewide unified court system, but there is a judicial oversight function vested in the Oregon Judicial Department (OJD).

The State level court, the Circuit Court, is the court of general jurisdiction in Oregon. There are 36 circuit courts, one in each county. Judicial oversight of Circuit Courts is the responsibility of the OJD.

The Office of the State Court Administrator oversees a statewide, State-funded Circuit Court system. It promotes efficient, statewide improvement and supports local courts in responding to community and statewide needs.

The Chief Justice of the Supreme Court is the administrative head of the Oregon Judicial Department, which is a statewide court system. The Chief Justice appoints a chief administrative officer whose title is State Court Administrator, a position created by statute.

The State Court Administrator (SCA) is responsible for making the Judicial Department work day-to-day. The SCA oversees all administrative and executive operations of the State trial and appellate courts, the indigence verification program, and the foster care review program. These responsibilities are carried out through ten divisions and programs.

At the county level, there are Justice Courts presided over by a Justice of the Peace. Not all counties have Justice Courts, and some counties may have more than one Justice Court. Justice Courts have limited subject matter jurisdiction which includes traffic citations. Justice Courts have limited geographic jurisdiction which is defined by the Board of County Commissioners, but which may not exceed the geographic boundaries of the county. A county may have up to six Justice Court districts, each with a sitting Justice of the Peace with geographic jurisdiction limited to the boundaries of the district. There are 38 Justice Courts.

Incorporated cities may have municipal courts. Not all cities have municipal courts. Municipal courts have limited subject matter jurisdiction which includes traffic citations. Municipal courts have limited geographic jurisdiction which is defined by the geographic boundaries of the city. There are 141 municipal courts.

There is no single Case Management System (CMS) in use by all courts in the State. The circuit courts plus Multnomah County (Portland) are supported by a standardized CMS on the Oregon Judicial Information Network (OJIN) that includes a central database. The OJIN system is at least 20 years old and was reported to be "horrible." Currently, the OJD has a request for proposal (RFP) to develop an entirely new system to replace/upgrade OJIN.

The *Oregon Justice Department Five-Year Strategic Plan for 2009-2013* discusses a project to upgrade the existing circuit court CMS. The resulting system, Oregon eCourt, will be the Court's "primary statewide undertaking for the next five years" and will be "the forefront of the State's court system's strategic plan." By providing a single web portal for access to any court,

at any time, from anywhere, for eFiling, eCourt provides an opportunity to move towards a more complete statewide repository with citation records from the other courts.

The Justice Courts and the Municipal Courts have no standard CMS and there is a variety of systems in use including; Magic, Chaves Consulting, Caselle, and Full Court. As stated in the *Plan,"* Its successful implementation lies at the core of our vision for Oregon's courts."

Circuit Courts and approved Municipal and Justice Courts can query the CMS on OJIN for an offender by name and obtain all pending and adjudicated cases in all Circuit Courts. This capability does not exist in the CMSs for Justice Courts or Municipal Courts.

Circuit, Justice and Municipal Courts all hear traffic violation cases. There is no citation or Driving Under the Influence (DUI) tracking system to follow cases through the court system. The State can use conviction abstracts to identify the original charge and final adjudication. Convictions only are sent to the Division of Motor Vehicles (DMV) to be added to the driver history.

The previous assessment recommended that the State "Work with the State Office of the Court Administrator to transfer electronically both court charges and convictions from that agency to the DMV." With OJIN the Circuit Courts are ready to send notices of conviction electronically to the DMV. However the DMV driver file is operating on a 1965 era mainframe computer application and requires all reports of convictions to be submitted to them on paper for hand entry.

Some convictions are withheld through discretionary powers of the court. Judges may enter a conditional sentence and change the disposition from conviction to dismissal if the court's conditions are met. These successful conditional sentence cases are never reported to the DMV. This practice has decreased in the Circuit Courts through in-service training.

Recently, a new traffic violation fine structure was approved by the State. Some judges have found this structure too restrictive and severe and have found methods to circumvent it such as automatic violation reduction. It was also reported that some municipal courts add extensive surcharges to these fines making them even more severe. Some law enforcement officers are reluctant to issue citations for violations that have severe monetary penalties.

Court clerks may query driving history records on-line, or may have batch print-outs of driving records run as citations are processed. Judges, normally, do not have the capability to run driver history reports due to their understanding of State mandated training requirements needed for access to the electronic files. DMV reported that judges could access the driver history by contacting DMV directly.

Citation and/or conviction data used for statistical or analytical use can be obtained from the Office of the State Court Administrator for Circuit Courts and from each county or city for Justice and Municipal Courts. There is no comprehensive statewide data available. Some police agencies have a record of issued and court-filed citations. This record could be used to audit the court system for citation processing, but no such audit has been done in the recent past.

Prosecutors reported that they would like a system such as OJIN that provided statistics on sentencing for all courts and statistics to identify the driving under the influence of drugs problem in the State.

The State does have an approved uniform citation that is used by all agencies. Required data including the type of violation, location, date and time, the enforcement agency, court of jurisdiction, and final disposition is collected. Each individual law enforcement agency manages its own citations but, as stated earlier, there is no statewide citation tracking or accountability.

The Transportation Safety Division (TSD) has an approved ECitation/ECrash System supported by Report Beam software. The OTS funded selected departments that agreed to a fifty-fifty grant match. Currently, there are 28 agencies including the Oregon State Patrol (OSP) which accounts for 800 users of the new system. Interest has been expressed by agencies around the State. This system was in response to one of the recommendations of the 2006 Assessment regarding electronic data collection and transfer.

With ECitation the officer, upon stopping a motorist, uses a personal digital assistant (PDA) or notebook computer to scan the driver's license data, clicks on an application to complete a citation, then sends it to a small mobile printer. The officer presents the printed citation to the alleged violator.

The Keizer Police Department estimated the ECitation system it is deploying will reduce the amount of time spent issuing and processing tickets by 87 percent. Other law enforcement reported that the error rate on citations has gone down significantly using ECitation.

The TSD held a meeting in august of 2010 at the Keiser Police Department. The purpose of the meeting was to promote best practices in electronic citations and crash reports. Some of the areas discussed were upfront costs, ongoing costs, potential savings, revenue and other intangibles. It is hoped that the meeting would generate interest in law enforcement and courts to replace paper reporting with electronic reporting.

State and local law enforcement indicated that they would like to see warnings for traffic violations collected by ECitation for storage in Records Management Systems (RMS). The TSD reported that they plan to include the warning function in the next ECitation upgrade.

The Governor's Transportation Safety Committee, a committee created within the Oregon Department of Transportation to advise the department and the Oregon Transportation Commission concerning the functions described under ORS 802.310, was so impressed with the ECitation/ECrash System that they recently earmarked $500,000.00 to continue implementation of the program.

Some local law enforcement agencies have RMSs that contain data that allows them to sort citations by violation type, location, etc. Citation data in the RMS allows them the opportunity to measure the success of their countermeasures. Unfortunately, adjudication data is seldom received from the courts.

The Oregon State Police (OSP) also had a RMS, but the vendor went out of business and OSP is no longer able to support or use the system.

Applicable Guidelines
Reportedly, data definitions meet the standards for national law enforcement and court systems including: National Crime Information Center (NCIC), Uniform Crime Reporting (UCR), National Incident-Based Reporting System (NIBRS), National Law Enforcement Telecommunication System (NLETS), Law Enforcement Information Network (LEIN), Traffic Court Case Management Systems Functional Requirement Standards, and National Center for State Courts (NCSC).

Data Dictionary
The citation/adjudication data files are well documented, including data definitions for each field. Law enforcement personnel receive adequate training at the academy and at State-sponsored refresher classes to ensure they know the purpose and uses for the data. There are no training manuals that address completion of the State approved citation.

Process Flow
It was reported that there are no documents in the State that describe the processing of traffic violations, citations, arrests, and court cases in a series of flow diagrams showing the typical procedures and their average time of completion for each step. There are also no flow chart that depict law enforcement procedures in ticket issuance and DUI arrests, including how long each step takes.

Interface With Other Traffic Record System Components
Law enforcement reported that the ECitation can be automatically downloaded into local RMSs but there is no linkage capability with other files.

Quality Control Programs
The following is the State's pre-assessment response to quality control measures for citation/adjudication data.

Quality Control Measurements for Citation/Adjudication Data

Timeliness	– Average time citations sent from LEA to courts = **N/A** – Average time convictions sent to DMV from courts = **N/A**
Accuracy	– % "errors" found during data audits of critical data elements = **N/A** – % violations narratives that match the proper State statute = **N/A**
Completeness	– % of cases with both original charges and dispositions in citation tracking system = **N/A**
Consistency	– % traffic citations statewide written on a uniform citation = **N/A**

During the assessment quality control measures were reported as:

- Timeliness – Transfer of electronic citations from the field to the courts is instantaneous. Hand written citations to the courts take varying amount of time depending on the department.

- Accuracy and Completeness – Has improved markedly for electronic citation users.

- Consistency – 100 percent of citations are on an approved uniform citation.

There are no formal data quality control programs at the court level or assurances that citations are acceptable within the adjudication system. Also, there is no training manual on the completion of citations. There is training on completion of the citation at training academies and at local functions. Local law enforcement reported that quality has been improved significantly with ECitation and ECrash.

Recommendations:

- ❑ Develop a statewide Citation Tracking System to contain data on the life cycle of all citations issued and adjudicated in the State.

- ❑ Work with the DMV to build an interface to receive electronic convictions.

- ❑ Develop a quality control program for citation/adjudication data with measurable attributes.

    - Track these attributes based on a set of established quality control metrics.

    - Develop a program of error/edit checking as the data are entered into a statewide system, and procedures should be in place for addressing the detected errors.

- ❑ Develop linkage between the Citation/Adjudication Data Component and other components of the State's Traffic Record System.

- ❑ Educate judges on how to access the State's Driver File.

- ❑ Continue the process to replace the Oregon Judicial Information Network (OJIN) with an up-to-date case management system (CMS) and form an outreach group to obtain agreement from all courts in the State in the use of the upgraded CMS to transfer citations electronically to the driver file.

2-F: Statewide Injury Surveillance System (SWISS) Data Component

Advisory Excerpt:

- *Description and Contents*

  With the growing interest in injury control programs within the traffic safety, public health, and enforcement communities, there are a number of local, State, and federal initiatives that drive the development of a SWISS. These systems typically incorporate pre-hospital (EMS), trauma, emergency department (ED), hospital in-patient/discharge, rehabilitation and morbidity databases to track injury causes, magnitude, costs, and outcomes. Often, these systems rely upon other components of the TRS to provide information on injury mechanisms or events (e.g., traffic crash reports). The custodial responsibility for various files within the SWISS typically is distributed among several agencies and/or offices within a State Department of Health.

  This system should allow the documentation of information that tracks magnitude, severity, and types of injuries sustained by persons in motor vehicle related crashes. Although traffic crashes cause only a portion of the injuries within any population, they often represent one of the more significant causes of injuries in terms of frequency and cost to the community. The SWISS should support integration of the injury data with police reported traffic crashes and make this information available for analysis to support research, public policy, and decision making.

  The use of these data should be supported through the provision of technical resources to analyze and interpret these data in terms of both the traditional traffic safety data relationships and the specific data relationships unique to the health care community. In turn, the use of the SWISS should be integrated into the injury control programs within traffic safety, and other safety-related programs at the State and local levels.

- *Applicable Guidelines*

  NHTSA has produced the National Emergency Medical Service Information System (NEMSIS) to serve as a guideline for a uniform pre-hospital dataset. It applies to all EMS runs, not just those related to traffic crashes. The American College of Surgeons (ACS) certifies trauma centers and provides guidelines for trauma registry databases and for a National Trauma Databank. Emergency Department and in-patient data guidelines (UB-92) are available from the US Department of Health and Human Services. The National Center for Health Statistics, within the Centers for Disease Control (CDC), sets ICD-9 codes and E-codes for injury morbidity/mortality. These codes are updated as needed and the ICD-10 codes are expected by the fall of 2007. The CDC also sets standards for reporting to their injury database and for use of the Public Health Information Network for data sharing.

- *Data Dictionary*

  The contents of the SWISS Data Component's files should be well documented to include data definitions for each field, and where applicable, edit checks and data collection guidelines that match the data definitions. Procedures should be documented in instruction manuals for collection, reporting, and posting of EMS run data on a uniform run report, uniform data in various hospital and trauma databases, and for tracking morbidity and mortality for each system.

  Training should include (where applicable) data collection, data entry, use of various injury coding systems (ICD and E-codes) as well as injury and trauma severity scoring systems such as the Injury Severity Score (ISS), Revised Trauma Score (RTS), and Abbreviated Injury Score (AIS) scales.

- *Process Flow*

  The information and processes involved in transport and treatment of victims of crash-related injuries should be documented in a series of flow diagrams showing the typical data collection and management processes and their average time to completion for each step in the data flow process. Processes for paper and electronic filing and reporting should be shown separately. Process flow diagrams should show all major steps whether accomplished by staff or automated systems and clearly distinguish between the two.

- *Interface with other Traffic Records System Components*

  Data transfer and sharing between local systems and the SWISS should be governed by data definitions, quality control requirements, and data transfer protocols defined by the custodial agencies. Transfer and sharing between SWISS files and the relevant national databases are governed by the data definitions, quality control requirements, and data transfer protocols for those systems (e.g., National Trauma Database).

The CODES project is the primary example of data sharing and integration between SWISS and the other components of a TRS. It can take the form of direct linkage using personal identifiers or probabilistic linkage using other data elements such as incident time, date, date of birth, and locations, responding officer/agency, and others. Key linkages within the TRS for SWISS information are listed in Table 12.

Table 12: Common Linking Variables between SWISS And Other Data Components of a Traffic Records System

Linkages Internal to the SWISS data on injury and healthcare treatments/outcomes	- *Patient name* - *Patient ID number* - *EMS run report number* - *Social Security Number*
Linkages between SWISS data and Crash Data	- *Personal Identifiers: Name, address, date of birth (direct linkage)* - *CODES linking variables (probabilistic linkage)* - *EMS run report number* - *Crash Report Number*
Linkages between SWISS data and other (non-Crash) components of the traffic records system	- *Name & SSN linked to driver file (direct linkage)* - *Location/address* - *Event & treatment date and time*

- *Quality Control Program*

  The SWISS data should be timely, accurate, complete, and consistent and these attributes should be tracked based on a set of established quality control metrics. The overall quality of the information in the SWISS Data Component should be assured based on a formal program of error/edit checking as the data are entered into the statewide system and procedures should be in place for addressing the detected errors. In addition, the custodial agency (or agencies) and the TRCC should work together frequently to establish and review the sufficiency of the quality control program and to review the results of the quality control measurements. The data managers should receive periodic data quality reports. There should be procedures in place for sharing the information with data collectors through individual and agency-level feedback, as well as to provide modifications to applicable training and instruction manuals, edit checks, and the SWISS data dictionaries. Audits and validation checks to assure the accuracy of specific critical data elements should be conducted as part of the formal Quality Control Program. Example measurements are presented in Table 13.

Table 13: Examples of Quality Control Measurements for the Statewide Injury Surveillance System

Timeliness	- *Average time for EMS run reports to be sent to governing agency* - *% EMS run repots sent to governing agency in the prescribed time* - *Average time from treatment & discharge from ED to record availability in the ED discharge database* - *Average time from patient discharge to record availability in the hospital discharge database* - *Average time from date of incident to record appearing in the trauma registry* - *# days from death to appearance of record on mortality database*
Accuracy	- *% EMS run locations that match statewide location coding* - *% correct ICD-9 and E-codes* - *% "errors" found during data audits of critical data elements in EMS, ED, trauma registry, hospital discharge, & mortality databases*
Completeness	- *% of traffic crash-related EMS runs in the EMS database* - *% of ED visits for crash-related injuries recorded in ED discharge database.* - *% of trauma cases represented in the trauma registry* - *% of SCI/TBI cases represented in the SCI/TBI registries*
Consistency	- *% correct ICD-9 and E-codes (see also accuracy)* - *CODES match rate (where applicable)* - *% crash-related deaths with motor vehicle crash in cause of death field on death certificate*

The measures in Table 13 are examples of high-level management indicators of quality. The managers of individual medical data files should have access to a greater number of measures. The custodial agencies should be prepared to present standard sets of summary measures to the TRCC monthly or quarterly.

2-F: Statewide Injury Surveillance System (SWISS) Data Component Status

A successful statewide injury surveillance system uses several key components to monitor the incidence of, risk factors for, and costs of fatal and non-fatal injuries to individuals in their State. These components are: emergency medical services, acute care, trauma and rehabilitation facilities, and vital records. Oversight for these entities' activities may be governed by local, State, and regional authorities. Data collected by these agencies provides a wealth of patient care, injury surveillance, and prevention information that can be used for problem identification and program evaluation within highway safety programs. A comprehensive surveillance system can provide valuable healthcare and injury prevention information to local, State, and regional health agencies, providers, and planners.

Integration of injury surveillance data with other State traffic records system components benefits all agencies involved. Motor vehicle crash data supply much of the pre-event and event information used by the Haddon Matrix for injury prevention program planning activities. In a comprehensive traffic records system, data related to all EMS, outpatient care, and hospital admissions resulting from a motor vehicle crash may be used to quantify the severity and cost of traffic crashes as well as the long-term outcomes associated with the various types of crashes. Providing traffic safety program coordinators and engineers with medical outcomes of motor vehicle crashes enables them to augment their understanding of crash severity beyond the typical five-point scale utilized by most crash reports.

Current Status

In 2006, the State underwent an assessment process of both their traffic records and emergency medical systems. Each report noted that Oregon did not have a statewide EMS database and would be unable to provide data necessary for quality assurance, education, public health, systems development and patient care improvement efforts. Early in 2008, the State's new EMS Director and Medical Director partnered with the Oregon Department of Transportation (ODOT) and ImageTrend to initiate a pilot project which had the potential to significantly improve the quality, timelines, and integration of EMS data in Oregon. The pilot project, which took place in May 2008, collected prehospital patient care data using Washington state's EMS data collection system as a model. In addition to using the one-month pilot data to describe the types of patients and EMS practices in Oregon, the pilot program also provided the opportunity to catalogue and describe all EMS agencies and to assess the feasibility of capturing standardized data from all licensed EMS agencies in the State.

Over three-quarters of the licensed EMS agencies in the State participated and provided data on an estimated 70 percent of all EMS calls. The data was used to generate county reports and provide information back to local agencies on such subjects as procedures performed, medications given, and patient outcomes. While the initial pilot ended after one month, data collected since the conclusion of the initial pilot program remains with its individual agency waiting for data entry or upload into the State's database. Manpower shortages and funding issues have prevented this process from proceeding. Recently, plans have been established for the pilot project to be continued for the next several years through a partnership with the Oregon State Fire Marshal to combine the ImageTrend EMS data collection with the data collected for the National Fire Incident Reporting System. The data collected will be used to improve the

quality of EMS care, for disaster management planning, and for research. Based on the initial success of the pilot program, it is anticipated that the data will be integrated with the Oregon Trauma Registry, Oregon Discharge Database, and the ODOT Crash Data System.

Oregon's Trauma System, which has been operational for the last 20 years, replaced their trauma registry vendor in late 2006. The new registry system, TraumaOne, was initially beset with technical problems. These problems, along with the departure of the State's Trauma Coordinator resulted in the discontinuation of the Trauma System's biennial report. With the technical problems now overcome, it is hoped the personnel will be available to re-establish report's compilation.

With the trauma registry online and the second phase of the pilot project in place, many of the components of a statewide injury surveillance system will now be available within the State. The Department of Human Services, Public Health Division contains the Emergency Medical and Trauma Systems Program which oversees the collection of prehospital and trauma registry data. In addition, the Division's Center for Health Statistics manages the State's vital statistics data. The Center for Health Policy and Research maintains hospital discharge and outpatient databases collected through the Oregon Association of Hospitals and Health Systems. Information collected through these programs is used by Division staff to provide annual reports on injury morbidity and mortality trends and for other injury surveillance activities.

Details of each system component are outlined below.

Emergency Medical Services

Applicable Guidelines

Under Oregon Administrative Rules (OAR) 333-250-0044 the Prehospital Care Report Form must be provided, in electronic or paper format, to the designated hospital at the time of (paper) or within 12 hours of (electronic) the patient transport. There is no current requirement for the data to be reported to the State's EMS agency.

Data Dictionary

The pilot project is based on a NEMSIS compliant database used by the state of Washington. Eighty-three data points are included for collection. The data dictionary is available from the EMS office.

Quality Control

The ImageTrend product used in the pilot project has quality control and data consistency checks built into the system. As the second phase of the pilot project is implemented, additional quality control measures will be developed to ensure accurate and complete data collection. A State EMS *Advisory* Committee has been established to oversee the process.

Process Flow
Under Oregon Administrative Rules, all licensed EMS agencies must complete a Prehospital Care Report Form (PCRF) for each instance where an ambulance arrives on the scene and patient contact is initiated. A completed PCRF (manual or electronic) must be prepared by ambulance personnel and delivered to appropriate hospital staff at the time patient care is transferred. There are 136 licensed EMS transport agencies in Oregon and approximately 77 percent participated in the 2008 pilot. For those agencies, data could be entered directly into the ImageTrend system through State Bridge or by entering data into a laptop computer for subsequent transmission (Field Bridge). Using either system, reports can be generated for local EMS agencies. These reports show call volumes, response times, success rates for invasive procedures, and other measures of agency activities. These reports can then be used to improve training and support equipment decisions for the individual companies. During the initial pilot month, just over 27,000 patient care reports were collected. From this, it is conservatively estimated that there are 380,000 annual EMS calls in Oregon.

Interface with other Traffic Records System Components
As part of the one-month pilot project, EMS data were successfully integrated with other components of the traffic records system including crash, hospital and trauma registry. Oregon uses a Trauma Band system which assigns each person a unique patient and incident ID. This band number can be used to track an individual from the scene of injury through the course of their hospital stay.

Hospital Discharge and Outpatient Databases

Applicable Guidelines
The Oregon Hospital Discharge Database contains administrative data on all patients admitted to any of the 58 Oregon acute care hospitals and is maintained by the Oregon Association of Hospitals and Health Systems. As of early 2010, the hospital association is mandated by Oregon law to provide these data annually to the Oregon Department of Human Services for quality assurance purposes. There are approximately 350,000-400,000 discharges per year. Outpatient data was reportedly available beginning in 2009.

Data Dictionary
A data dictionary and reporting manual for hospital discharge data are available online at the Office of Health Policy and Research web site. Data fields contain general demographics (age, sex, race, ethnicity), primary diagnosis and up to 20 ICD-9 diagnosis codes, procedure codes, hospital disposition, length of hospital stay, and total charges. Approximately 90 percent of the records contain a valid E-code.

Quality Control
Multiple error checks are performed on the data as they are submitted. These include identification of missing or invalid data. Such cases are sent back to the originating hospital for correction.

Timeliness	- Number of days from hospital discharge until data is entered into database	30 days
	- Number of days from end of quarter/year until data is available for analysis on a State level.	180 days
Completeness	- % of discharges containing a valid E-Code	87-89%

Process Flow
Hospitals provide data to the Oregon Association of Hospitals and Health Systems who then provide a database to the Department of Human Services. Annual public use datasets for hospital discharges from each Oregon hospital and two Washington hospitals are available for purchase from the Office for Health Policy and Research.

Interface with other Traffic Records System Components
Through the 2008 EMS pilot project, hospital discharge data were probabilistically linked to EMS, vital records and crash data.

Trauma Registry

Applicable Guidelines
Oregon Administrative Rules 333-200-0090 requires hospitals to report all required data set forth in the Oregon Trauma Registry manual to the Division of Public Health for every patient that meets the trauma inclusion criteria. Data must be submitted within 90 days of death or discharge.

Data Dictionary
Data elements in the Oregon Trauma Registry are based on the National Trauma Data Standard. The data dictionary is available from the EMS and Trauma Systems office.

Quality Control
Hospitals are using TraumaOne trauma registry software. Data validation and consistency checks are implemented within TraumaOne. The following metrics were submitted in response to the assessment.

Timeliness	- Number of days from trauma center discharge until data is entered into database	90 days
	- Number of days from end of quarter/year until data is available for analysis on a State level.	90 days
Accuracy	- % ”missing” found during data audits of critical data elements	0%
Completeness	- % of discharges containing a valid E-Code	100%

Process Flow
Oregon does not require certification by the American College of Surgeons (ACS) for trauma center designation but, based on ACS standards has designated 44 of the State's 60 hospitals as trauma centers ranging from Level I to Level IV. Data are also collected from six trauma centers in the neighboring states. The Oregon Trauma Registry contains data on all patients meeting statewide trauma triage criteria. There is no minimum level of injury severity or length of stay required for entry in the registry system. The registry collects comprehensive data including prehospital information, disposition, injury severity, and total charges. Patients are tracked through the system, including inter-hospital transfers, using the Oregon Trauma Band, a bracelet containing a person- and event-specific identifier that is applied in the field by EMS to all trauma patients. Patients suffering traumatic injury who do not meet inclusion criteria, who are treated at non-trauma hospitals, or declared dead at the scene are not included. Approximately 7,000 to 8,000 patients are entered into the trauma registry each year.

Interface with other Traffic Records System Components
Eighteen variables have been identified for use in probabilistic linkage between the trauma registry and EMS databases. Feasibility and match rates were demonstrated using the May 2008 pilot project.

Office of Vital Records and Statistics

Limited information regarding the vital statistics system and death certificate database was available during the assessment. The following statement is extracted from the Center for Health Statistics website: "The Vital Records office is responsible for certifying, amending, and issuing these vital event records, compiling and analyzing data from the records, and maintaining the adult and youth risk behavior surveys."

The Center for Health Statistics also has a number of injury and mortality related reports available on its website. Death certificate data are also supplied to the Injury and Violence Prevention Program for incorporation in statewide reports. In addition, the Center has developed the Oregon Vital Events Registration System (OVERS) which provides a secure web-based environment that supports convenient, stable and flexible operations from the creation of certificates to the production of certified copies and statistical reporting. The use of the OVERS system requires a personal account and training is available.

Applicable Guidelines
The State's Vital Records Office within Oregon's Department of Human Services gathers information about each birth and death that occurs in Oregon and on all deaths to residents of the State that occur in other states or countries.

Data Dictionary
Death certificate data are coded according to national guidelines set by the National Centers for Health Statistics (NCHS) for collecting death data. Cause-of-death information is classified in accordance with the ICD-10 standard.

Interface with other Traffic Records System Components
Vital records data was integrated with other components of the traffic records system through the EMS pilot project. Vital records data can also be integrated with other data systems on a project-specific basis.

Crash Outcome Data Evaluation System
Oregon has not previously been eligible for participation in the CODES project due to the lack of statewide EMS or Emergency Department data. With the initiation of the EMS pilot program and the recent introduction of Emergency Department data there is an opportunity to integrate this information with hospital and crash data to provide a more complete picture of the number and effect of motor vehicle collisions within the State.

Recommendations:

- ❑ Work with the Traffic Records Coordinating Committee (TRCC) to identify the funding necessary to continue the statewide EMS data collection system.
- ❑ Expand the use of the Trauma Band for use in all motor vehicle crashes to help facilitate subsequent data linkage.
- ❑ Encourage use of the EMS, inpatient, and outpatient hospital databases to identify all persons treated as the result of a motor vehicle crash.
- ❑ Invite a member of the Injury and Violence Prevention Program to join the TRCC.
- ❑ Encourage the use of data linkage between crash and hospital data for ad-hoc analysis.
- ❑ Explore options to incorporate data collected since the initial pilot project in May 2008 to the statewide EMS database.
- ❑ Resume production of the biennial trauma registry report.

APPENDFIX A

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APPENDIX B

Abbreviations and Acronyms

AAAM	Association for the Advancement of Automotive Medicine
AAMVA	American Association of Motor Vehicle Administrators
AASHTO	American Association of State Highway and Transportation Officials
ACS	American College of Surgeons
AIS	Abbreviated Injury Score
ANSI	American National Standards Institute
ATSIP	Association of Transportation Safety Information Professionals
BAC	Blood Alcohol Concentration
BPEVR	Business Partner Electronic Vehicle Registration
CDC	Center for Disease Control
CDLIS	Commercial Driver License Information System
CODES	Crash Outcome Data Evaluation System
DMV	Department of Motor Vehicles
DOT	Department of Transportation
DUI	Driving Under the Influence
ED	Emergency Department
EMS	Emergency Medical Service
FARS	Fatality Analysis Reporting System
FHWA	Federal Highway Administration
GES	General Estimates System
GIS	Geographic Information System
GJXDM	Global Justice XML Data Model
GPS	Global Positioning System
HPMS	Highway Performance Monitoring System
ICD	Injury Coding System
IRP	International Registration Plan
ISS	Injury Surveillance Score
LEIN	Law Enforcement Information Network

MCMIS	Motor Carrier Management Information System
MMUCC	Model Minimum Uniform Crash Criteria
NCIC	National Crime Information Center
NCSC	National Center for State Courts
NDR	National Driver Registry
NEMSIS	National Emergency Medical Service Information System
NGA	National Governor's Association
NHTSA	National Highway Traffic Safety Administration
NIBRS	National Incident-Based Reporting System
NLETS	National Law Enforcement Telecommunication System
NMVTIS	National Motor Vehicle Title Information System
PDPS	Problem Driver Pointer System
RTS	Revised Trauma Score
SHSP	Strategic Highway Safety Plan
SWISS	Statewide Injury Surveillance System
TCD	Traffic Control Devices
TRCC	Traffic Records Coordinating Committee
TRS	Traffic Records System
UCR	Uniform Crime Reporting
VIN	Vehicle Identification Number
VMT	Vehicle Miles Traveled

TEAM CREDENTIALS

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Professional Experience

- Law Enforcement Liaison, NHTSA Region VIII
- Commander, District III Colorado State Patrol, Retired
- Director of Public Safety Services, Data Nexus, Inc.
- Coordinator/Instructor, Colorado Law Enforcement Training Academy and Colorado State Patrol Academy
- Instructor, Colorado Institute of Law Enforcement Training, Colorado State University
- Law Enforcement Experience - 30 years

Organizations/Affiliations

- Member, Transportation Research Board, National Academy of Sciences, Law Enforcement Committee
- Chair, Association of Transportation Safety Information Professionals, National Safety Council
- Member, ANSI D-16 Committee on Motor Vehicle Accident Classification
- Member, MMUCC Committee on Motor Vehicle Accident Crash Criteria
- Steering Committee and Chair of Law Enforcement Section, Colorado Safety Management System
- Member, Colorado State Traffic Records *Advisory* Committee
- Member, National Agenda Committee for Highway Information Systems
- USDOT, NHTSA, Traffic Records Assessment Team Member, Iowa, Nebraska, Louisiana, Kansas, Arizona, South Carolina, New Mexico, Wisconsin, North Dakota, Idaho, Connecticut, Illinois, Oregon, Delaware, New Jersey, Mississippi, Montana, Wyoming, Tennessee, Kentucky, Massachusetts, South Dakota, Massachusetts, Mississippi, Missouri, Oregon, Tennessee, Ohio, Nevada, San Carlos Indian Nation and the Menominee Indian Nation.
- USDOT, NHTSA, Impaired Driving Assessment Team Member, Vermont, Nevada, California, Alaska, Louisiana, Florida, Oregon, Indiana, and Massachusetts, Maine and Tennessee.

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Professional Experience
Mr. Kerns has been a database engineer at the University of Maryland's National Study Center for Trauma and EMS since 1990. During this time he has gained considerable experience in the manipulation and use of large datasets relating to motor vehicle crashes and injury. He has co-authored a number of journal articles on highway safety and has presented results from independent research projects at local and national health and injury conferences. He is currently the project director for the Crash Outcome Data Evaluation System (CODES) and the Crash Injury Research and Engineering Network (CIREN) projects funded by the National Highway Traffic Safety Administration (NHTSA).

Organizations
American Trauma Society – Maryland Division
Association of Traffic Safety Information Professionals

ROBERT A. SCOPATZ, PH.D.
Data Nexus, Inc.

Dr. Bob Scopatz is the Director of Research and Government Services for DNI. He has over 20 years of experience in performance monitoring and improvement using psychological, statistical, and operations research techniques. He directed numerous states= traffic records system audit and strategic planning efforts has been instrumental in developing subject matter content for both Instructor-based and Internet-based courses about using transportation data for decision-making. While with New York City DOT, he designed and conducted field and acceptance testing for automated data collection systems and enhanced software to collect roadway condition surveys and traffic volume/classification counts. Working with the Georgia Tech research team, he adapted standards for the physical layout and design of the human/ computer interface for an advanced traffic management center environment. He developed chapters on these topics for the Advanced Traffic Management Center Human Factors Design Guide. He also conducted research with the U.S. Navy about factors of the human/computer interface for instructor stations in pilot training and fleet coordination simulators, including review of existing interfaces and human-computer interface standards for graphical user interfaces, embedded help, and training/wizard-based task completion. Dr. Scopatz has served as a media expert on issues related to safety impact of unlicensed drivers and other traffic safety issues.

Traffic Records Data Improvements

Facilitated the original and follow-up projects to revise the NHTSA Traffic Records Program *Advisory* and Traffic Records Assessment procedures

Participated in numerous state traffic records assessments, many including multiple assessments

Provided planning and technical support to the multi-agency USDOT TRCC

Developed and evaluated a model court records system to meet the traffic safety needs of judges and prosecutors

Designed a statewide OVI Tracking System and a Citation Tracking System for Ohio

Conducted state crash data process audits to identify current practices and make recommendations for improvement

Evaluated options for using technologies for data collection for all USDOT modal agencies

Evaluated the state of the art for state data collection for long commercial vehicle crashes

Training and Workshops

Developed Instructor-based and Internet-based training for highway safety programs and use of traffic records data

Developed guidelines for user interface and data presentation chapters of Advanced Traffic Management System control center handbook

Facilitated strategic planning for Safety Management Systems in several states

Analysis and Evaluation using Local, State, and National Data

Developed the standard operating procedures for field data collection of transportation data in New York City

Implemented annual condition assessments for local surface streets

Researched and established policies for comparing bridge infrastructure spending strategies' effects on traffic flow, air quality, and economic vitality; a simulation study of parking enforcement's effect on midtown traffic speeds in support of congestion pricing initiatives

Conducted field video study of intersection traffic control effects on traffic flow

Used NASS CDS and GES datasets and various state motor vehicle crash files to conduct analyses to compare the rollover propensity of various makes/models of sports utility vehicles and light trucks and to identify the differential outcomes of occupants using various seatbelt design “generations” in cars

Conducted a methodological study of between-states comparisons in terms of the .08% BAC law evaluation

Evaluated the Long-Term Truck Crash Causation Study database to determine patterns of prior inspection violations that predict violations associated with crashes; analyzed indicators of driver contributions to the critical reason for a crash and the post-crash inspection of vehicles and drivers

Analyzed national and state data for safety risks posed by those who drive without a valid license

Education

Ph.D.	Experimental Psychology	Columbia University	1992
M.A.	Experimental Psychology	Columbia University	1982
B.S.	Psychobiology	University of Southern California	1980

Affiliations/Memberships

National Safety Council - Traffic Records Committee; Association of Transportation Information Professionals (ATSIP) (Executive Board and President 2005-2006)

AASHTO/TRB – Highway Safety Manual content review panel

TRB/USDOT – Data Needs for SAFETEA-LU ad-hoc outreach panel

TRB Committee on Statistical Methodologies, Statistical Computer Software in Transportation Research (A5011 past member), Committee on Safety Data, Analysis and Evaluation (ANB20 – current member)

State of Florida Safety Management System Committee (past member) and co-developer of the SMS Truck/Bus Subcommittee's Research Agenda

NCHRP Panel Member: Project 20-05, Synthesis Topic 31-02 "Statistical Methods for Highway Safety Analysis"

Selected Publications and Presentations

Research and evaluation reports on the projects listed above and numerous presentations at local, state, and national conferences and workshops

LANGSTON A. (LANG) SPELL

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Lake Wales, FL 33859-4807
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Independent Consultant

Professional Experience

Mr. Spell entered his professional career in traffic records systems and data exchange over 50 years ago. He is nationally recognized for his work in development of traffic records systems, especially interchange (NDR and CDL) of information amongst various users and the development and promulgation of data standards in information processing.

He served as a member of D16.1 committee. He developed the AAMVA Violations Exchange Code or "ANSI" code (predecessor of the AAMVAnet Code Dictionary or ACD which he also co-developed) while employed with AAMVA and later served as the Accident (Crash) Subcommittee Chairman for the ANSI D-20 Standard, A States Model Motorist Data Base, while employed with the National Highway Traffic Safety Administration.

While employed with NHTSA he created the original reporting forms and file structure for the Fatality Analysis File which was renamed in 1975 as the Fatal Accident Reporting System (FARS) and later renamed again, the Fatality Analysis Reporting System (FARS). He and his staff conducted the training for all of the original analysts.

As an independent consultant, he conducted the NHTSA Uniform Traffic Ticket Study to determine the extent and details of emerging Citation Tracking Systems. He conducted all aspects of the study including on-site State visits and assessments to determine the extent of control being exercised in citation issuance, processing of conviction information through the courts, and recording conviction dispositions in driver history files.

In the private sector, he developed numerous Crash Report forms, instruction manuals for crash reporting, data input procedures, all edits to assure data quality, and reporting and analysis procedures for problem identification. He also developed the EMS Run Report for Kentucky.

He designed the graphical user interface for the Highway Traffic Records Information System for the Virginia Department of Transportation (VDOT) and provided training in the use of the system to the district offices of VDOT.

He was involved in the design and developmental efforts for the Commercial Driver Licensing Information System (CDLIS) and its AAMVAnet environment and was a member of the AAMVAnet "Tiger Team" that made the assessments of selected states to become pilots and eventual founding states in the National Motor Vehicle Title Information System. His background, experience and interested cover the entire spectrum of traffic records systems.

History

1992 – "present"	Independent Consultant (now essentially retired)
1977 – 1992	Senior Traffic Records Analyst National ConServ, Inc. (but 1980 to 1983: Independent Consultant)
1974 – 1977	Vice President GENASYS (Systems Division) (now Keane, Inc.)
1968 – 1974	Chief, Information Systems, NHTSA, US Department of Transportation
1966 – 1968	Director of Data Systems for the AAMVA
1958 – 1966	Staff Specialist in MVRs (driver histories) for Retail Credit Co. (now Equifax) Atlanta, GA

Memberships in Professional Associations (former)

- ❑ Traffic Records Committee, Transportation Research Board
- ❑ American National Standards Institute, D-16, D-20, and X3L8 Committees
- ❑ Executive Board, Traffic Records Committee, National Safety Council
- ❑ Society of Automotive Engineers Committee on Standardization of Vehicle Identification Numbers

Education

Boston University ..... S.T.B., 1956
Duke University ..... A.B., 1953

JOHN J. ZOGBY, PRESIDENT

Transportation Safety Management Systems
1227 North High Street
Duncannon, PA 17020
Voice: (717) 834-5363
Email: jzogby@centurylink.net

Summary of Experience
Mr. Zogby has over 40 years experience in highway safety engineering and management and motor vehicle and driver licensing administration.

Mr. Zogby's transportation career began in the Bureau of Traffic Engineering in the Pennsylvania Department of Highways, where he was responsible for statewide application of highway signs and markings. He was instrumental in developing the State's first automated accident record system in 1966. In the late 1960's, he helped initiate and was project director for the statewide safety improvement program and the State's in-depth accident investigation function.
Mr. Zogby worked in the private sector in traffic safety research for several years before returning to public service as the Director of the Bureau of Accident Analysis in the Pennsylvania Department of Transportation. He was appointed Deputy Secretary of Transportation for Safety Administration in February of 1979, a position he held for 13 years, until his retirement from public service in December 1991.

Since his retirement from State government, Mr. Zogby has been engaged as a consultant on management and policy issues for federal, State and local government agencies in the area of transportation safety and motor vehicle/driver licensing services.

Professional and Business Experience
Subcontract with GeoDecisions Consulting on a Safety Analysis Management System (SAMS) for the state of Mississippi.

Subcontract with iTRANS Consulting Inc. on NCHRP project 17-18 (05), Integrated Management Process to Reduce Highway Injuries and Fatalities Statewide for the Transportation Research Board.

Contract with the National Academy of Sciences (NAS) to provide AASHTO Strategic Highway Safety Plan - Case Studies (17-18(06)) for the Transportation Research Board.

Subcontractor with ISG, a systems integration consulting company, conducting a reengineering contract with the Pennsylvania Department of Transportation in the area of motor vehicle processes.

Subcontractor with the Pennsylvania State University to research the impact of an education provision in State law governing novice drivers.

Conducted a three-week course on safety management for the Ministry of Communications in the Kingdom of Saudi Arabia.

Subcontractor with a Moroccan Engineering firm to develop a national highway safety plan for the Country of Morocco.

Completed a study for the State of Mississippi, Department of Public Safety, to develop a Strategic Plan for Highway Safety Information.

Contracted by the Federal Highway Administration, Office of Motor Carrier Safety, to help in the final implementation phase of the Commercial Driver License (CDL) program.

Consulted with several States in assessing their Traffic Records capabilities to address highway safety program management needs. In addition, completed Traffic Records Assessments for three Indian Nations in Arizona.

Project director and principal instructor for a Federal Highway Administration (FHWA) contract to develop, implement, and instruct a training program for the Highway Safety Management System.

Professional Societies and National Committees
Member Institute of Transportation Engineers (ITE).

Member Emeritus of the Transportation Research Board (TRB) Committee on Transportation Safety Management.

Chair TRB task force on Safety Management status.

Member of the National Safety Council's Association of Transportation Safety Information Professionals.

Past President of the Mid-Atlantic Section of ITE.

Past Chair of the National Safety Council's Traffic Records Committee.

Past President of Region 1 of the American Association of Motor Vehicle Administrators.

Chaired the Governing Board of the International Registration Plan.

Chaired a subcommittee of the NGA Working Group on State Motor Carrier Taxation and Regulation.

Completed six-year tenure as Chair of the TRB committee on Planning and Administration for Transportation Safety.

Community
President, Duncannon Area Revitalization, Inc.

Pastoral Associate, St. Bernadette Church, Duncannon, PA

Education
B.S., Economics, Villanova University
MPA, Penn State University