

# **Part 1 – Deficiency Analysis & Major Strategies**

## **State of Connecticut**

### **Strategic Plan for Traffic Records**

March 2006

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# 2006 Traffic Records Strategic Plan

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# **Executive Summary**

## **Strategic Plan for Traffic Records**

March 2006

Since developing the Strategic Vision in 1996, Connecticut's Traffic Records Coordinating Committee (TRCC) has recognized the need for comprehensive statewide data on injuries and fatalities resulting from motor vehicle crashes to accurately identify highway safety problems and effectively manage highway safety programs.

This Strategic Plan identifies deficiencies in the State's traffic records system and specifies how additional funding could be used, together with estimated timelines, to implement changes in safety data systems that are needed to better support highway safety programs, leading to more lives saved.

### **Goals and Objectives**

The State's TRCC (refer to Appendix E) has accepted the challenge to take a more active role in the improvement of Connecticut's traffic records/safety data system. Highlighting the goal for a more comprehensive and effective traffic records system to accurately identify safety problems, develop countermeasure programs, and evaluate their effectiveness, is an objective to move from paper-laden, labor-intensive traffic records processes to electronic field data capture of motor vehicle crash, traffic citation, emergency medical services, and other information.

In addition to implementing automated roadside data capture, other objectives include improving the quality and completeness of motor vehicle crash and other data, installing data warehouse/decision support capabilities, providing training, promoting standards and guidelines, and strengthening the state Traffic Records Coordinating Committee (TRCC) to oversee and coordinate the implementation of all new system improvements.

### **Priorities**

A top priority for State traffic records improvements is electronic field data capture of motor vehicle crash, traffic citation, and emergency medical services response reporting. Other 'funded' project efforts on the list include the Connecticut Impaired Driving Records Information System (CIDRIS), Commercial Vehicle Analysis Reporting System (CVARS), and Crash Outcome Data Evaluation System (CODES).

### **Progress**

Traffic records improvements have been/are being made in areas related to driver licensing, vehicle registration, base map development, toxicology, commercial motor vehicles, electronic field data capture, impaired driving/citation tracking, fatality analysis, crash outcome evaluation and emergency medical services.

## Methodology

Existing deficiencies in the State's traffic records system and recommendations for improvements are based on an evaluation of the State system as well as ongoing improvement activities. The evaluation follows a "Combined Straw Model" approach based on the Traffic Records Advisory, plus previous traffic records assessment, strategic planning, and systems design efforts. The addition of new projects this past year has resulted in additional criteria for the Straw Model, based on National guidelines for the CIDRIS and CVARS initiatives, in addition to new emphasis areas in crash report training, not contained or documented in the Advisory.

## Recommendations

The following recommendations are presented in *priority order*, determined by a ranking of priorities by a two-thirds representation of the TRCC. Estimates for costs and timeframes for implementation are included in the body of the report, where appropriate.

- ✓ **Program Area 1: Crash – Data Content:** Complete data element capture from the PR-1, for all roadways, including non-injury property damage only crashes on local roads. Conduct MMUCC review and JAD sessions to determine whether PR-1 meets User needs. Adopt an electronic standard (based on definitions, and edit/validity checks); including MMUCC/XML designations to promote standardized reporting of crash data in the state.  
  
**Program Area 2: Location Reference System:** Geospatial Council to coordinate and promote technology, base map development and sharing of geospatial information. ConnDOT also involved in geospatial planning. Base map development effort. Implement electronic incident locator tool(s) with base map integration for locating crash, citation, EMS, and other highway safety events. Continue to implement GIS/GPS technologies where appropriate. Conduct a location identification/linear reference system study for highway traffic safety application and analysis.
- ✓ **Program Area 3: Crash – Electronic Data Capture:** Focus on multiple existing State and local electronic data capture applications by instituting an electronic PR-1/XML standard for agencies to use in submitting their crash data in a standard format. Implement auto-population of the electronic PR-1 through real-time access of licensing and registration files. Realize need to maintain a paper PR-1 for small jurisdictions. Monitor 'best practices' developments in other states, e.g., in MA, where a Web based system accepts xml-formatted data.
- ✓ **Program Area 4: Crash – Data System Design – Communications:** Consider establishing a traffic records system (TRS) data warehouse at the Department of Information Technology (DoIT). Central relational database system; links to driver licensing, vehicle registration, injury, and roadway inventory files. Crash data communications. Project Profile, System requirements definition (SRD), design, program development/testing, and implementation phases.

**Program Area 5: Crash – Report Training – Train the Trainer:** Feedback from user/why data is important. Data to meet User needs. MMUCC, D16, FMCSA supported commercial vehicle crash report training. Improvements in data being captured. Incorporate training for electronic roadside data capture of crash, citation and other incident reporting. Promote a train-the-trainer crash report training workshop, involving accident records, highway safety, research and law enforcement to reinforce the importance of capturing timely and accurate safety event data.

**Program Area 6: Driver/Vehicle Information:** Support for implementing Regulation of Driver Systems Re-Engineering (Re-ROD), and many other DMV initiatives. Providing sanitized downloads of driver and vehicle data for a traffic records/crash data warehouse, and for an impaired driving records information system.

- ✓ **Program Area 7: Citation/Adjudication Information:** Implement recommendations of 2004 Traffic Citation Adjudication System Study, including electronic citations, link between citation and crash data files. Connecticut Impaired Driving Records Information System (CIDRIS) to have big impact on this program area.

**Program Area 8: Traffic Records Coordinating Committee (TRCC):** Leadership – Partnership – Financial Assistance Avenues – Agreements. Expand and reconstitute the TRCC, obtain buy-in from agency heads, publish periodic news updates to the Highway Safety website, and assign strategic plan oversight to the TRCC. Traffic Records Coordinator to head the TRCC.

- ✓ **Program Area 9: Roadway Information:** Importance of linear reference system. Efforts of Geospatial Council. Support for local agency efforts for roadway inventory data. ConnDOT roadway inventory data improvements. ConnDOT's safety improvement program tied to legacy output crash reporting. Location identification interface(s) and State base map development efforts.
- ✓ **Program Area 10: Connecticut Impaired Driving Records Information System (CIDRIS):** Continue implementation of the CIDRIS Project. Electronic citations. Data warehouse/data repository – decision support system. Integration/interface with Judicial and DMV information. Real-time for law enforcement activity log and event messaging. Continue to advance other TCAS Study recommendations, including related improvements within DMV. Project Manager. Project Profile, Request for Proposals (RFP), System requirements definition (SRD).

**Program Area 11: Commercial Vehicle Analysis Reporting System (CVARS):** Crashes involving commercial motor vehicles. Electronic commercial vehicle crash reporting. Minor changes to PR-1. Location identification. Transmitting data to Commercial Vehicle Safety Division (CVSD) within DMV for uploading to SafetyNet. FMCSA training support.

- ✓ **Program Area 12: Fatality Analysis Reporting System (FARS):** Collaborative effort. Address new demands to speed up reporting of fatal crash information (FastFARS), with renewed emphasis on problems facing the state in maintaining current processing of fatal crash information in a timely manner. Continue to focus on complete reporting of alcohol involvement in fatal motor vehicle crashes. New coding changes from NHTSA for fatality analysis reporting.

✓ **Program Area 13: Injury Surveillance System (ISS) CODES/EMS Information:** Grant received from the Centers for Disease Control and Prevention (CDC) for state injury capacity building funds, for a State injury surveillance system. Continue implementation of the CODES Project, generating linked motor vehicle crash and injury outcome data for data analysis/research purposes. Continue efforts to implement an electronic EMS run reporting system.

**Program Area 14: Data Analysis – Problem Identification:** Install CARE, or comparable software for data analysis of traffic records and crash data system. Provide desktop as well as Web-based data access/data analysis tools to all authorized users. Data selection, ad hoc analysis, high hazard location/section analysis, bivariate analysis, form and image printing, data exchange and sharing. Develop a Problem Identification Manual. Conduct a Training Needs Assessment for users of traffic safety program information.

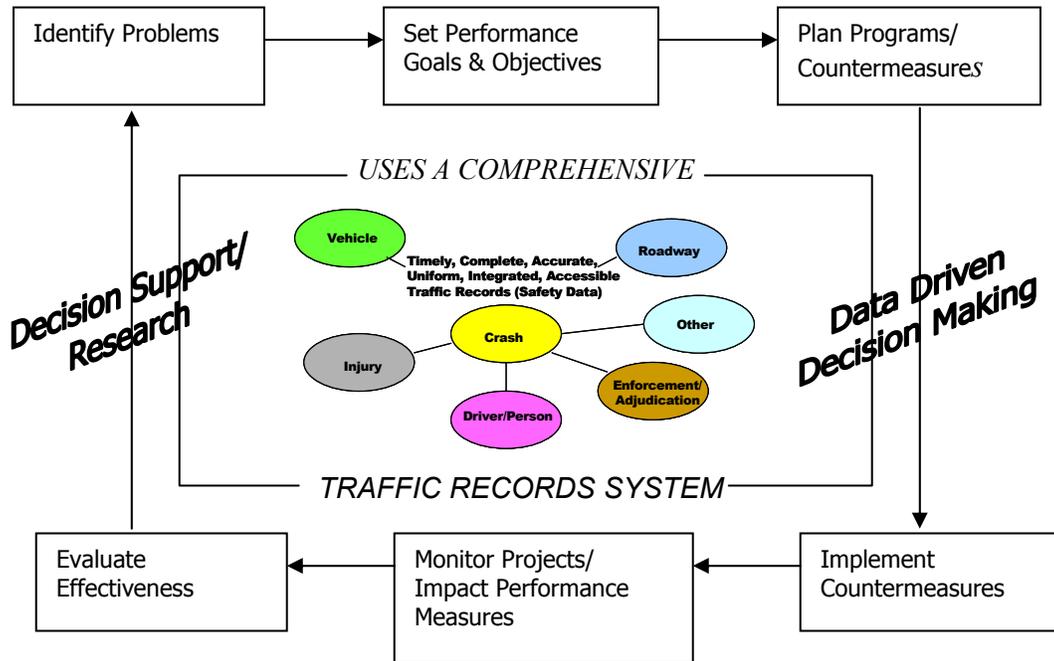
# Strategic Plan for Traffic Records

March 2006

## I. Introduction

The traffic records system should be operated in a fashion that supports the traffic safety planning process. The planning process should be driven by a traffic records system strategic plan that helps State and local data owners identify and support their overall traffic safety program needs.

### Management Approach to Highway Traffic Safety



A traffic records system strategic plan should address all components of a traffic records system, e.g., crash, driver, vehicle and roadway, etc.

To provide an up-to-date program analysis, the Traffic Records Coordinating Committee (TRCC) completed a Traffic Records Assessment in 2004 (refer to Appendix A), which provided a program status summary and outlined more than 250 recommendations for improvement. To view the 2004 Assessment (PDF 'book marked' version), click on the following – <http://www.accident-report.org/community/assessment.pdf>

This 2006 Strategic Plan update of the 1996 Strategic Vision reflects activities undertaken, recommendations for additional improvements, and a timetable for their implementation. The 1996 Vision was also developed under the direction of the TRCC, representing the various members of transportation safety in the state.

Connecticut's TRCC remains active, helping to insure that any changes affecting the crash and other traffic records data systems are beneficial to all highway safety partners and stakeholders. The Committee meets regularly to discuss progress on many ongoing safety data system improvements, such as CAPTAIN/Electronic PR-1, CIDRIS/Impaired Driving, CODES/Crash Outcome, CVARS/Commercial Vehicle, EMS/Emergency Medical, GIS/Geographical Information, GPS/Global Positioning, ISS/Injury Surveillance, RE-ROD/Regulation of Driver Systems, RTOL/Online Vehicle Registration, TCAS/Traffic Citation, and TOX/Toxicology Lab.

To learn more about these and other improvement efforts by stakeholder agencies of Connecticut's TRCC, "clicking-it" is your *ticket* to "learning-it" from one of the following.

Department of Transportation (State) – <http://www.ct.gov/dot>

Contains a link to the Transportation Safety Section

Department of Public Safety – <http://www.state.ct.us/dps>

Department of Motor Vehicles – <http://www.ct.gov/dmv>

Department of Public Health – <http://www.dph.state.ct.us>

Department of Information Technology – <http://www.ct.gov/doi>

Department of Emergency Management and Homeland Security – <http://www.ct.gov/demhs>

Office of Policy and Management – <http://www.opm.state.ct.us>

Judicial Branch – <http://www.jud.ct.gov>

Connecticut Police Chief's Association – <http://www.cpcanet.org>

Capitol Region Council Of Governments – <http://www.crcog.org>

Council of Governments of the Central Naugatuck Valley – <http://www.cogcnv.org>

South Western Regional Planning Agency – <http://www.swrpa.org>

Office of Legislative Research – <http://www.cga.ct.gov/olr>

Office of the Chief State's Attorney – <http://www.ct.gov/csao>

University of Connecticut, Connecticut Transportation Institute – <http://www.cti.uconn.edu>

National Highway Traffic Safety Administration – <http://www.nhtsa.dot.gov>

Federal Highway Administration – <http://www.fhwa.dot.gov>

Federal Motor Carrier Safety Administration – <http://www.fmcsa.dot.gov>

Preusser Research Group – <http://www.preussergroup.com>

Projects proposed in the State's Annual Highway Safety Plan (HSP) and Comprehensive Safety Plan demonstrate a strong commitment to the development of an improved traffic records/safety data collection and reporting system.

## **II. Background – 1996 Strategic Vision**

A brief review of the planning and implementation of the 1996 Strategic Vision is important background information for the 2006 Strategic Plan. Many of the same issues are being addressed, such as mobile computing, traffic safety data warehouse, etc. A significant cost factor was included in the 1996 Vision to cover technology upgrades for law enforcement vehicles. Part of the 2006 effort will be to determine the coverage of "technology equipped" vehicles in the State. Costs to upgrade law enforcement agencies, still needing upgrades, will be determined as the Strategic Plan is implemented.

Implementation of the recommendations contained in the 1996 Strategic Vision required the active support of the Department of Transportation, Department of Motor Vehicles, and Department of Public Safety, referred to as “Enterprise Agencies.”

A modular approach proposed for the Highway and Traffic Safety Management Information System (HTSMIS), started with the implementation of a basic Accident Records System within ConnDOT. The implementation plan was designed to allow existing business processes to be re-engineered, with a view to streamlining workflows, reducing duplication of effort, and improving timeliness, accuracy, and analysis of traffic records data.

Phase 1 of the Implementation Plan (ConnDOT) contained tasks within an HTSMIS Requirements Definition and RFP Document, Detail Design, Databases, Data Warehouse, Hardware and Software Acquisition, Implementation and Production. In subsequent phases for DPS (phase 2), DMV (phase 3), Judicial Branch (phase 4), EMS (phase 5), and Local Political Subdivisions (phase 6), improvements in each agency’s respective computing environment, were to include information extracts for the HTSMIS.

It was also determined that implementation work plans by each state agency would be key to a successful implementation process. Work plans were to define what tasks to be performed, when they would be performed, and who would perform them. Total for this “several year” effort was projected at over \$49 million dollars. For additional information, refer to Appendix B.

### **III. Comprehensive Planning – Emphasis Areas – Objectives**

Since developing the Strategic Vision in 1996, the State has recognized the need for comprehensive statewide data on injuries and fatalities resulting from motor vehicle crashes to accurately identify its highway safety problems and to effectively manage its highways safety programs. It has also recognized that it did not have in place a traffic records and crash data system to meet that need, especially the ability to capture property damage only crash information occurring on local roads, and the capture of all data reported on the State crash report form. The State has been involved in planning for future initiatives to correct these and other shortcomings. Building on the 2004 Assessment, this Strategic Plan documents deficiencies in the State’s traffic records system, focuses on existing needs, states goals, priorities, and measures for assessing future progress, and specifies how additional funding would be used, together with estimated timelines for implementing needed improvements for better traffic safety data, leading to better data-driven decisions and saving more lives.

Many of the estimated timeframes for various proposed system improvements are projected out over the next three years. Due to a number of system requirement/general design, research/study, and technology/training upgrade recommendations, timelines could stretch out further, possibly to the next five-seven years, depending on many factors, such as agency acceptance of the proposed change, technology rollout, and even training of all involved stakeholders. Some of these longer-range projections will become clearer once a program area is addressed and a study, system requirement effort or general design is implemented.

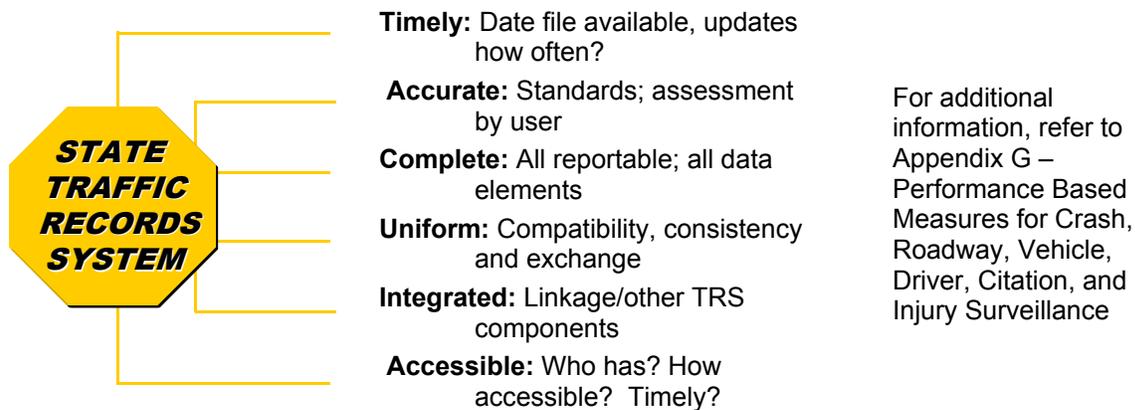
## Comprehensive Safety Plan

In a 2005 Comprehensive Safety Plan, the following stakeholder agencies met to discuss the broad scope of highway safety in Connecticut, focusing specifically on the roadway element and driver behavior: State Department of Transportation, Department of Motor Vehicles, Department of Public Safety, Transportation Safety Section, Capitol Region Council Of Governments, Federal Highway Administration, Federal Motor Carrier Safety Administration, and National Highway Traffic Safety Administration.

Outcome indicators targeted as a measure of the success of this plan include a reduction in the number of fatalities and the number/severity of injuries that occur each year in motor vehicle traffic crashes. As the Comprehensive Safety Plan noted, the planning processes are dependent upon timely, accurate and complete traffic records data. Significant action has taken place to improve traffic records systems in Connecticut, although much remains to be accomplished.

Data improvements in the state have been/are being made in the areas related to motor vehicles, base mapping, toxicology, electronic data capture, citation tracking, fatality analysis and emergency medical services. It remains the goal of the TRCC to develop a delivery system that can provide all users with timely, complete, and accurate traffic records data, to support the necessary comprehensive planning process and to measure the plan's success.

### Reauthorization – Data Quality Components



Federal, State and local agencies will be better equipped to identify local, State and National transportation safety problems and to evaluate their programs and countermeasures.

In addition to calling for safety data that is more timely, complete and accurate, other strategies noted in the plan, pertain to motor vehicle traffic crash reporting (data warehouse), timely citation/adjudication data, and a database environment for motor vehicle initiatives.

### Outcome Emphasis Areas

The following are additional outcome/emphasis areas, noted in the Comprehensive Safety Plan, which would require traffic records or safety data systems to measure their success.

- **Roadway Departure** – Reduce the number of severe injury and fatal fixed-object accidents,
- **Pedestrians and Bicycles** – Reduce the number of pedestrian and cycling fatalities and personal injuries in Connecticut by at least 10 percent by 2008,
- **Work Zone Safety** – Ensure maintenance and protection of work zones, enhanced training, web-based motorists’ awareness, and partnership to promote and reinforce safety efforts,
- **Driver Behavior** – Reduce alcohol-related fatalities, the average BAC, the percentage of alcohol-related fatalities in the 21 through 39-year old age group, the percentage of alcohol-related fatalities in the <21-year-old age group, and work to diminish teen access to alcohol,
- **Occupant Protection** – Reduce the percentage of serious injuries, moderate injuries, and injuries to children resulting from motor vehicle crashes, by increasing safety belt usage rate, and correct child safety seat usage,
- **Speeding** – Reduce speed related fatal crashes,
- **Motorcycle Safety** – Reduce injuries per 10,000 registrations, the percentage of fatally injured motorcycle operators with BACs greater than 0,
- **Commercial Vehicle Safety** – Reduce fatal crashes, and
- **Traffic Incident Management** – Reduce delays in normal traffic flow associated with highway crashes, reduce secondary crashes, improve response time by first responders, and educate the motoring public on incident management and how it affects their daily commute.

### **New Federal Transportation Act**

The new federal transportation act – Safe, Accountable, Flexible, Efficient Transportation Equity Act, A Legacy for Users (SAFETEA-LU), requires timely, accurate, complete data systems so that highway safety programs can be data driven (refer to Appendix G). Grants to eligible states are being provided to support the development and implementation of effective programs to:

1. Improve the timeliness, accuracy, completeness, uniformity, integration, and accessibility of safety data that is needed to identify priorities for national, State, and local highway and traffic safety programs,
2. Evaluate the effectiveness of efforts to make such improvements,
3. Link the State data systems, including traffic records, with other data systems within the State, such as systems that contain medical, roadway, and economic data, and
4. Improve the compatibility and interoperability of the data systems of the State with national data systems and data systems of other States and enhance the ability of the U.S.DOT to observe and analyze national trends in crash occurrences, rates, outcomes, and circumstances.

To be eligible for a first-year grant, a State must demonstrate that:

1. A highway safety data and traffic records coordinating committee has been established, with a multidisciplinary membership that includes, among others, managers, collectors, and users of traffic records and public health and injury control data systems, and
2. A multiyear highway safety data and traffic records system strategic plan has been developed, that:
  - a. Is approved by the highway safety data and traffic records coordinating committee,
  - b. Addresses existing deficiencies in the State's highway safety data and traffic records system,
  - c. Specifies how existing deficiencies in the State's highway safety data and traffic records system were identified,
  - d. Prioritizes, on the basis of the identified highway safety data and traffic records system deficiencies of the State, the highway safety data and traffic records system needs and goals of the State,
  - e. Identifies performance-based measures by which progress toward those goals will be determined, and
  - f. Specifies how the grant funds and any other funds of the State are to be used to address needs and goals identified in the multiyear plan.

### **Performance Goals and Objectives**

The State TRCC has accepted the challenge to take a more active role in the improvement of Connecticut's traffic records/safety data system. Its goal for a more comprehensive and effective traffic records system to accurately identify safety problems, develop countermeasure programs, and evaluate their effectiveness and measure progress, includes moving from paper-laden, labor-intensive traffic records processes to electronic capture and processing, including, but not limited to:

- Implementing electronic field data capture of motor vehicle crash, traffic citation, EMS, and other information,
- Improving the quality and completeness of crash and other data, such as the location of crashes, demographics of persons involved, contributing factors, selective enforcement, occupant restraint use, emergency medical response and injury outcome,
- Providing training for the importance of complete, accurate, and timely data as well as the mechanics of roadside data capture,
- Promoting standards and guidelines, such as MMUCC and XML for electronic roadside data capture<sup>1</sup>, and
- Installation of data warehouse/decision support capabilities to access and analyze data from the statewide system (software, training, guidelines, etc.).

The TRCC also realizes the importance of maintaining awareness/coordinating with other related public safety development, such as increasing the effectiveness and the safety of law enforcement and other traffic safety professionals in the field, including objectives that are related to those for safety data improvements:

- Increasing the communication between patrol vehicles as well as other emergency responders,
- Increasing the functionality of the patrol vehicle by integrating the operation of all of the equipment within the vehicle, and
- Improving the ability of the officer to collect, interpret, and exchange data between mobile patrol units on the road and between different agencies.

## IV. Prioritization of Objectives

The following table presents an overview of identified traffic records system deficiencies, system needs/goals, proposed lead agencies and timelines for making system improvements, measures by which progress can be determined, cost estimates for system improvements, and other factors for each of the (14) Traffic Records Component/Program Areas addressed in the Strategic Plan. They have been listed in *priority order* according to the TRCC.

The comprehensive nature of a statewide plan assures stakeholders that any changes being considered in one component of the traffic records system will take into account impacts, either positive or negative, on other programs or systems. New technology applications that may benefit one component may also benefit other traffic records system components.

Program Area -- in Priority Order	Deficiencies Identified	Needs/Goals	Lead Agency /Timelines	Measure(s) of Progress	Cost(s) for Improvements
<b>#1 Crash Data Content</b> (page 22 in plan)	-Incomplete reports -Data doesn't meet needs of Local and other users -Location data inconsistent -Alcohol, contributing circumstances, other data often not recorded -Data not compatible/comparable with other states	1) Working group to determine whether content of the PR-1 meets needs of all authorized users. 2) Compare current data content with recommended MMUCC guideline and additional determination of data needs by agency stakeholders. 3) Special focus on location identification 4) Determine whether PR-1 needs to be updated	TRCC/ State and Local Law Enforcement/ ConnDOT  "Short term" less than 2 years	Tracking the progress of the working group as it addresses 1-4.  Progress to be measured by the degree to which deficiencies are addressed and needs met.	Initial cost would be for time spent by various stakeholders participating on the working group.  - <i>NHTSA</i> providing in-depth comparison of the PR-1 with the MMUCC Guideline.  If determination is made to update the PR-1, this would feed the electronic data capture (software) solution. Many jurisdictions have already developed applications to do this.  Need for paper PR-1 would be for those jurisdictions without software solution and for instances where a computer may be down and a backup (paper) PR-1 is needed.
Determine PR-1 User Needs			2006-2007		\$5K
Update/Revise PR-1	Link to program area #3		2007-2008		\$150K
Electronic PR-1 Standard	Link to program area #3		2007-2008		\$5K
Revise Paper PR-1	Link to program area #3		2007-2008		\$10K

<sup>1</sup>Cost(s) are estimated amounts for each system improvement – they do not imply funding source, i.e., 408. Any funding could apply.

<b>Program Area -- in Priority Order</b>	<b>Deficiencies Identified</b>	<b>Needs/Goals</b>	<b>Lead Agency /Timelines</b>	<b>Measure(s) of Progress</b>	<b>Cost(s) for Improvements</b>
<b>#2 Location Reference System</b> (page 25 in plan)	-Identifying crash location on a State reference map from field information is time consuming -Location data inconsistent	1) Working group to meet with Geospatial Council to introduce TRCC, strategic plan and question of standard location identification methodologies 2) Research location identification – various ongoing approaches 3) Promote need for standard methodologies	TRCC/ ConnDOT  “Medium term” 2 to 5 years	Tracking the progress of the working group as it addresses 1-3.  Progress to be measured by the degree to which deficiencies are addressed and needs met.	Initial cost would be for time spent by various stakeholders participating on the working group.  If Geospatial Council concurs with idea to research location identification for highway safety related events, funding will be pursued for a TRCC working group to proceed.
Locator Tool for E-Data Capture	Link to program area #3		2006-2007		\$75K
Research Location Identification	Link to program areas #1, #3, #5, #7, and #9 - #14		2006-2008		\$400K
Integrate with LRS			2006-2009		\$5K
Integrate with Base Map			2006-2009		\$5K

<b>#3 Crash Electronic Data Capture</b> (page 30 in plan)	-Handwritten reports sometimes hard to read -Copying errors -Incomplete reports -Local road PDO reports not entered into the State system -2/3 <sup>rd</sup> data from all other crashes not entered into the State system -Duplication in data entry of reports at State and Local levels -Transposition errors made preparing finished copy -Delays in obtaining data	1) Reports that are legible, timely, complete 2) 100% of data from PR-1 captured into the State crash file, including data from Local road PDO crashes 3) Elimination of duplication 4) Linkage between other TR files, i.e., Driver/Vehicle files	TRCC  “Medium term” 2 to 5 years	1) Assessing the implementation of data capture technology in the field, link to driver/vehicle files, radio communications, etc.) 2) Degree to which component (locator, diagram, wireless, etc.) recommendations are implemented.  Progress to be measured by the degree to which deficiencies are addressed and needs met.	Currently, many local agencies are funding their own technology upgrades.  Cost (time spent) for working group to address program area.
Existing E-Crash Efforts			2006-2007		
Auto Populate Driver/Vehicle Info	Link to program area #6		2007-2009		
Integrate Locator Tool	Link to program area #2		2006-2007		\$75K
Electronic PR-1 Standard	Link to program area #1		2007-2008		\$5K
Police Vehicle Hardware/Software			2006-2008		
Diagram Tool			2007-2008		\$50K
Paper PR-1	Link to program area #1		2007-2008		

<b>Program Area -- in Priority Order</b>	<b>Deficiencies Identified</b>	<b>Needs/Goals</b>	<b>Lead Agency /Timelines</b>	<b>Measure(s) of Progress</b>	<b>Cost(s) for Improvements</b>
<b>#4 Crash Data System Design</b> (page 34 in plan)	<ul style="list-style-type: none"> <li>-Legacy crash data system can't accommodate electronic transmission of crash reports</li> <li>-Legacy system can't support other new input/output capabilities</li> <li>-Legacy system poor user access</li> <li>-Legacy system no capabilities to link to other systems</li> </ul>	<ol style="list-style-type: none"> <li>1) Crash data warehouse (DW) that can accommodate electronic transmission of crash reports from the field</li> <li>2) Improved access to DW for all authorized users</li> <li>3) DW that links to other TR files</li> </ol>	TRCC/ DoIT/ ConnDOT  "Medium term" 2 to 5 years	<ol style="list-style-type: none"> <li>1) Project profile completion</li> <li>2) Status of implementing DW</li> <li>3) Status of user access to DW</li> <li>4) Status of other files linking to the DW</li> </ol> Progress to be measured by the degree to which deficiencies are addressed and needs met.	With the first five program areas related to crash reporting improvements, that will benefit several agencies, this statewide initiative will be a major focus for funding support.
DoIT Project Profile			2006-2007		\$5K
SRD/General Design			2006-2007		\$240K
Detail Design			2007-2008		\$160K
Develop/Testing/Implementation			2007-2008		\$500K
Data Warehouse Hardware/Software			2008-2009		\$75K
User Access/Analysis	Link to program area #14		2008-2009		\$80K

<b>#5 Crash Report Training</b> (page 39 in plan)	<ul style="list-style-type: none"> <li>-Feeling by law enforcement that reporting is only done for insurance and for use in court</li> <li>-Reporting of CMV crashes incomplete and inconsistent</li> <li>-Sometimes officers don't know how to classify motor vehicle crashes</li> <li>-Officers tend not to indicate contributing circumstances or other factors if driver is not cited</li> <li>-Officers don't hear enough of the value of and how data is used for highway traffic safety planning</li> <li>-Officers think they're being forced to become data entry operators</li> </ul>	<ol style="list-style-type: none"> <li>1) Comprehensive train-the-trainer program</li> <li>2) Instilling in law enforcement that good crash reporting, including the circumstances, cause(s), etc., is important for highway traffic safety.</li> </ol>	TRCC/ CSP/ ConnDOT  "Medium term" 2 to 5 years	Assessment of current level of training, followed by tracking for next 2-5 years of the percentage (statewide) of traffic officers who have been trained.  Progress to be measured by the degree to which deficiencies are addressed and needs met.	In relation to the program areas #1, #3, and #4 crash reporting initiatives, this will be another high emphasis funding support request area.
CVARS Training	Link to program area #11		2006-2007		\$10K - FMCSA funding
Comprehensive Train-the-Trainer			2006-2008		\$200K

<b>Program Area -- in Priority Order</b>	<b>Deficiencies Identified</b>	<b>Needs/Goals</b>	<b>Lead Agency /Timelines</b>	<b>Measure(s) of Progress</b>	<b>Cost(s) for Improvements</b>
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<b>#6 Driver/ Vehicle Information</b> (page 42 in plan)	-Lack of a customer account number to tie related driver and vehicle information together -DMV files more stand alone, not linked files -Data on DL, such as driver address can be outdated -Some processed DMV data not timely enough	DMV initiatives: 1) Customer account Number (CA#) 2) Re-ROD (driver systems) 3) Relational DB, plus linkage to other systems using the CA# 4) RTOL (vehicle registration) 5) Other initiatives	DMV  "Medium term" 2 to 5 years  - Ongoing	DMV's progress addressing its own initiatives.  Progress to be measured by the degree to which deficiencies are addressed and needs met.	- <i>DMV funding</i> system improvements. Outside funding received for CIDRIS, as well as traffic records data warehouse, and other initiatives may be used if those initiatives are dependent on DMV system improvements.
Data for TR Data Warehouse	Link to program areas #3, #4		2007-2009		
Data for CIDRIS	Link to program areas #7, #10		2006-2007		
DMV Initiatives:					
Customer #, Re-ROD			Ongoing		
Relational Database			"		
DMV File Linkage			"		
Real-Time Online Veh Registration			"		
Real-Time Imaging Processing			"		

<b>#7 Citation Adjudication Information</b> (page 44 in plan)	-Too much radio time between dispatch and officer in the field conducting an enforcement stop -Officers think they're being forced to become data entry operators -Quality of driver, vehicle, citation, other data lacking (refer to 2004 TCAS study)	1) Electronic roadside data capture of citation information 2) Electronically populate the citation with Driver/Vehicle data 3) Link citation with crash file	DMV  "Medium term" 2 to 5 years  - Ongoing	Degree to which component recommendations are implemented.  Progress to be measured by the degree to which deficiencies are addressed and needs met.	E-citation ranks as a fairly high emphasis funding support request area.  Ideally, efforts to address E-crash can be combined with E-citation to maximize the use of transportation funding, but most importantly to give law enforcement a more integrated/ seamless application leading to efficiency and interoperability.
Existing E-Citation Efforts			2006-2008		
Auto Populate Driver/Vehicle Info	Link to program area #6		2006-2008		
Electronic Citation Standard	Link to program area #10		2006-2008		
Link Citation with Crash Info/File	Link to program area #4		2007-2009		
Hardware/Software			2007-2009		

<b>Program Area -- in Priority Order</b>	<b>Deficiencies Identified</b>	<b>Needs/Goals</b>	<b>Lead Agency /Timelines</b>	<b>Measure(s) of Progress</b>	<b>Cost(s) for Improvements</b>
Paper Citation	Link to program area #10		2006-2008		
<b>#8 Traffic Records Coordinating Committee (TRCC)</b> (page 46 in plan)	-Most agency heads probably not even aware of the TRCC and its role -Agencies lack appreciation of each others roles -Stovepipe planning still exists among agencies -Spending monies on agency system improvements not coordinated -TSS which has long supported TRCC, lacks a traffic records coordinator	1) TR Coordinator position, similar to CIDRIS management position to champion TR improvements/ strategic plan, etc. 2) Organize executive level meeting in 2006 to update them on TRCC efforts, strategic plan, etc. 3) Make TRCC membership more formal, if executives should decide to designate representatives for the TRCC.	TRCC/ ConnDOT  "Short term" less than 2 years  - Ongoing	Measured by 1) Establishing/ hiring TR Coordinator 2) Obtaining Executive level awareness and support for TRCC 3) MOU establishing TRCC 4) Accomplishing financial survey of TRCC stakeholders to encourage collaboration and coordination of efforts	- <b>ConnDOT</b> may continue to support TRCC through its Transportation Safety Section.  As a program area to drive the other system improvements through a strategic plan, this program area is also a fairly high emphasis funding support request area.
<b>Traffic Records Project Manager</b>			2006-2007		\$100K/yr
Reconstitute TRCC			2006-2007		\$5K
Provide TRCC Training			2006-2007		\$5K
Reaffirm Management Support			2006-2007		
Survey TRCC Stakeholders			2006-2007		

<b>#9 Roadway Information</b> (page 49 in plan)	-State lacks a standardized location reference system -Roadway inventory data not standardized or automated for data gathering, analysis and dissemination -Roadway inventory for Local roadways more deficient/lacking than State's system -State safety improvement programs tied to outdated legacy reporting system	1) Promote efforts of Geospatial Council to develop a new State base map 2) Encourage Local agencies to provide roadway inventory data to the State 3) Address safety improvement programs tied to outdated legacy system.	ConnDOT/ Local Engineering  "Medium term" to "Long term"  2 to 5 years, plus  - Ongoing	1) ConnDOT's progress addressing it's own initiatives 2) Assessment of Local agencies to determine already existing roadway inventories 3) Progress incorporating Local road information into State roadway inventory 4) Progress addressing ConnDOT legacy output challenges	- <b>ConnDOT</b> funding own initiatives.  Roadway inventory and reprogramming legacy output reporting – large funding requirements for ConnDOT.  Local agencies responsible for providing roadway inventory data to the State.
Promote Geospatial Efforts	Link to program area #2		2006-2007		
New Technology/ Roadway Inventory			2006-2008		
Local Effort/ Roadway Inventory			2006-2008		
Safety Program/ Legacy Output			2006-2009		

<b>Program Area -- in Priority Order</b>	<b>Deficiencies Identified</b>	<b>Needs/Goals</b>	<b>Lead Agency /Timelines</b>	<b>Measure(s) of Progress</b>	<b>Cost(s) for Improvements</b>
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<b>#10 Impaired Driving Records Information System (CIDRIS)</b> (page 52 in plan)	<ul style="list-style-type: none"> <li>-Paper based citation issuance process</li> <li>-Lack of real time access to critical data "24x7"</li> <li>-Lack of standards to permit better sharing of justice information</li> <li>-Handwritten reports sometimes hard to read</li> <li>-Copying errors</li> <li>-Incomplete reports</li> <li>-Duplication in data entry of reports at State and Local levels</li> <li>-Transposition errors made preparing finished copy</li> <li>-Delays in obtaining data</li> </ul> <p>Link to program areas #6, #7</p>	<ol style="list-style-type: none"> <li>1) Electronic roadside data capture of citation information</li> <li>2) Electronically populate the citation with Driver/Vehicle data</li> <li>3) More timely and accurate (impaired) driver, vehicle and enforcement adjudication information and records management and tracking system to support:               <ol style="list-style-type: none"> <li>a) Enforcement, adjudication and imposing of sanctions against impaired driving offenders</li> <li>b) Eliminating duplication of effort</li> </ol> </li> </ol>	<p>OPM "Medium term" 2 to 5 years</p> <p>- Ongoing</p>	<ol style="list-style-type: none"> <li>1) Successful tracking of project profile</li> <li>2) Project Manager on board</li> <li>3) RFP</li> <li>4) SRD</li> <li>5) Design</li> <li>6) Implementation</li> </ol> <p>Progress to be measured by the degree to which deficiencies are addressed and needs met.</p>	<p>\$1.6Million - <i>NHTSA funding</i></p> <p>\$300K <i>ConnDOT funding</i> for project manager position</p>
Project Manager			2006-2008		\$300K
DoIT Project Profile/RFP			2006-2007		\$1.6Million
SRD/General Design			2006-2007		
Detail Design			2006-2007		
Testing & Implementation			2006-2007		
Hardware/Software			2007-2008		

<b>#11 Commercial Vehicle Analysis Reporting System (CVARS)</b> (page 57 in plan)	<ul style="list-style-type: none"> <li>-Deficiencies related to crash reporting previously mentioned</li> <li>-Current process for capturing/uploading CMV crash data for SafetyNet not automated</li> </ul>	<ol style="list-style-type: none"> <li>1) Small changes required in current PR-1</li> <li>2) Need to coordinate with other electronic roadside data capture efforts</li> </ol>	<p>CSP</p> <p>"Short term" to "Medium term" 2 to 5 years</p>	<ol style="list-style-type: none"> <li>1) Success of changes to PR-1</li> <li>2) Success of Pilot</li> <li>3) Percent of CMV crashes impacted</li> <li>4) Percent of law enforcement trained</li> </ol>	<p>\$250K - <i>FMCSA funding</i></p> <p>CSP providing manpower support to implement CVARS</p>
CVARS Pilot			2006-2007		- <i>FMCSA</i>
E-Crash/CSP RMS	Link to program area #3		2006-2007		"
Police Vehicle Hardware/Software			2006-2007		"
Training (FMCSA)	Link to program area #5		2006-2007		"
File Server			2006-2007		"
Upload CVSD/SafetyNet			2006-2007		"

<b>Program Area -- in Priority Order</b>	<b>Deficiencies Identified</b>	<b>Needs/Goals</b>	<b>Lead Agency /Timelines</b>	<b>Measure(s) of Progress</b>	<b>Cost(s) for Improvements</b>
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<b>#12 Fatality Analysis Reporting System (FARS)</b> (page 59 in plan)	-Information regarding alcohol or drugs (crash related) can be delayed -Delay in submitting entire fatal crash cases if there are extenuating circumstances  Link to program areas #1, #3 - #5	1) Establish good rapport with law enforcement to ensure submission of fatal crash reports on a timely basis 2) Build on current FARS reporting to create a basis for advancing to FastFARS	NHTSA/ TRCC support  "Short term" less than 2 years	1) Resolution of problems with delayed reporting of fatalities 2) Progress in developing the capability to meet requirements of FastFARS	- <i>NHTSA funding</i>
FARS Coding Changes			2006		
Delayed Fatal Reporting			2006		
FastFARS Implementation			2006-2007		
Other FARS Support			2006-2007		

<b>#13 Health/ Injury Control Information</b> (page 62 in plan)	-Limited resources (in past) for injury surveillance and data analysis -Dependencies on crash, location identification and other program areas needing improvements themselves -Lack of manpower	1) Implement ISS 2) Continue to expand CODES research applications 3) Implement electronic roadside data capture of EMS run report information	DPH  "Medium term" to "Long term"  2 to 5 years, plus	1) Percentage of electronic EMS run reporting implemented by 2007 2) Progress of ISS development 3) Measure of CODES research conducted	- <i>DPH</i> providing manpower support with funding by <i>NHTSA</i> for CODES and <i>CDC</i> for ISS.  DPH seeking funding for Epidemiologist position.
Data for TR Data Warehouse	Link to program area #4		2006-2008		\$10K
Injury Surveillance System (ISS)			2006-2010		\$120K/yr
Injury Planning Group			2006-2007		
Injury Prevention Plan			2006-2007		
Provide ISS Data to Users	Link to program area #14		2007-2008		
CODES - Research			2006-2009		\$50K/yr
CODES Epidemiologist			2006		\$86K/yr
Electronic EMS Run Reporting	Link to program areas #2, #3		2007-2008		Assess existing electronic capabilities

<b>Program Area -- in Priority Order</b>	<b>Deficiencies Identified</b>	<b>Needs/Goals</b>	<b>Lead Agency /Timelines</b>	<b>Measure(s) of Progress</b>	<b>Cost(s) for Improvements</b>
<b>#14 Data Analysis/ Problem ID</b> (page 67 in plan)	-Crash data for Local roads lacking -Crash data for PDO crashes lacking -Complete crash data for all crashes lacking -State lacks a Problem ID manual/w. training -State lacks data access, data analysis tools and appropriate training for authorized users  Link to program areas #2, #4, and #13	1) Seek improvements in crash data reporting (related to #1, #3 - #5, above) 2) Install data analysis software. Desktop option versus web-based option. 3) Implement Problem ID manual with training.	ConnDOT Transportation Safety Section (TSS)  "Short term" less than 2 years	1) Data analysis software installed 2) Training implemented 3) Problem ID manual developed/implemented  Progress to be measured by the degree to which deficiencies are addressed and needs met.	\$120K  While not high on the priority list, this program area is important to the actual use of traffic records data by authorized users.  Positive factors include relatively low cost, and fairly quick implementation time period for an initiative which would benefit many stakeholder agencies.
Data Analysis Software			2006-2007		\$60K
Training Needs Analysis			2006-2007		\$5K
Problem ID Manual			2007-2008		\$50K
Promote Existing Training			2007-2008		\$5K

## V. Progress to Date

As previously noted, improvements in the State safety data system have been/are being made in areas related to driver licensing, vehicle registration, base map development, toxicology, commercial motor vehicles, electronic field data capture, impaired driving/citation tracking, fatality analysis, crash outcome evaluation and emergency medical services.

Major recommendations from the 1996 Strategic Vision, which are coming to fruition, include mobile computer terminals for law enforcement, the use of global positioning and geographic information systems, field access to the Connecticut On-Line Law Enforcement Communication Teleprocessing (COLLECT) system, and electronic data exchanges between safety agencies.

The State now has an active Traffic Records Coordinating Committee (TRCC), an essential step in insuring that any changes affecting the crash and other traffic records data systems are beneficial to all highway safety partners and stakeholders.

The recent Traffic Records Assessment in 2004, and Strategic Plan of 2006 both identify deficiencies and recommended actions for improvement, to address needed changes in the State's traffic records/safety data system.

## **VI. Methodology**

This document has been prepared as an update to the 1996 Strategic Vision. It builds on that plan by reflecting activities begun since that time and new technologies and new concepts that have become available. The existing deficiencies in the State's traffic records system and recommendations for improvements contained in this Strategic Plan are based on an evaluation of the State's current traffic records system as well as the ongoing improvement activities.

### **Straw Model**

The evaluation follows a "Combined Straw Model" approach based on the <sup>2</sup>NHTSA Traffic Records Highway Safety Program Advisory (refer to Appendix D), plus previous traffic records assessment, strategic planning, and system design efforts. The "Straw Model" describes the features and characteristics ("Attributes") of a model system. Deficiencies noted are those areas where the State does not conform to the "Attributes" in the "Straw Model." Recommendations for improvements represent those steps needed to meet or exceed the functionality represented by the "Straw Model." The recommendations presented below, grouped according to the various "Program Areas," also include estimated costs and timeframes (where appropriate).

The addition of new projects this past year has resulted in additional criteria for the "Straw Model", based on National guidelines for the CIDRIS, and CVARS initiatives. In addition, new emphasis areas in crash report training have emerged that were not contained or documented in the NHTSA Advisory.

The "Straw Model" also includes proven solutions used by other states and new technology tools on how traffic records/information system components may be better organized and integrated to record, maintain, and process information to improve the capabilities for analysis, planning and management of traffic records data for highway safety.

### **NHTSA Traffic Records Advisory – Strategic Planning**

The traffic safety planning process should be driven by a traffic records system strategic plan that helps State and local data owners identify and support their overall traffic safety program needs. This plan should address activities such as:

- Continuous review and assessment of the application of new technology in all data operational phases (i.e., data collection, linkage, processing, retrieval, and analysis). The strategic plan should address the adoption and integration of new technology as this facilitates improving traffic records system components,
- Promotion of local data systems that are responsive to the needs of local stakeholders,
- Identification and promotion of integration among State and local data systems to eliminate duplication of data and help assure timely, accurate and complete traffic safety information,
- Data integration to provide linked data between components of the traffic records system (e.g., CODES),
- Coordination of federal systems (e.g., FARS, NDR, CDLIS) with State records systems,

- Recognition and incorporation, where feasible, of uniform data elements and definitions and design standards in accordance with national standards and guidelines (e.g., MMUCC, ANSI-D20.1, ANSI-D16.1, NGA, EMS Data Dictionary, etc.),
- Changing State and federal data requirements (e.g., those associated with the commercial driver's license program),
- Capture of program baseline, performance, and evaluation data in response to changing traffic safety program initiatives, and
- Establishing and updating countermeasure activities (e.g., crash reduction factors used in project selection and evaluation).

The strategic plan should be endorsed by, and continually updated through the activities of the statewide traffic records coordinating committee.

## **VII. Major Findings and Strategies Recommendations**

### **Program Area 1: Crash – Data Content**

#### **Attributes:**

The primary mission of highway safety is to reduce the number and severity of motor vehicle traffic crashes. Crash data collected and reported by law enforcement personnel are vital for carrying out safety mandates of various highway safety stakeholder agencies. To improve the quality and comprehensiveness of motor vehicle traffic crash data collection and reporting, states are migrating to electronic roadside data capture coupled with a renewed emphasis on training to assure uniformity in reporting and to reinforce for law enforcement that their dedication to capturing timely, complete and accurate data is vital.

The Crash component documents the time, location, environment, and characteristics (sequence of events, rollover, etc.) of a crash. Through links to the crash-involved segments of Roadway, Vehicle, and Driver information, the Crash component identifies the roadways, vehicles, and people (drivers, occupants, pedestrians) involved in the crash and documents the consequences of the crash (fatalities, injuries, property damage, and violations charged). In addition to providing information on a particular crash, the Crash component supports analysis of crashes in general and 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), and the interaction of various components (e.g., time of day, day of week, weather, driver actions, pedestrian actions, etc.).

The Crash component of the Traffic Records System should contain some basic information about every reportable motor vehicle crash on any public roadway in the State. Details of various data elements to be collected are described in a number of publications. The Model Minimum Uniform Crash Criteria (MMUCC) guideline provides a suggested minimum set of data elements to be collected for each crash. Additional information should be collected (as necessary) for crashes involving an injury or fatality to meet the requirements for tracking and analysis for the State and other systems, e.g., the Fatality Analysis Reporting System (FARS), and the General Estimates System (GES).

#### **Data Standards – Achieving Uniformity**

Adoption of existing standards and guidelines contributes significantly to achieving uniformity among the states in terms of the data elements collected to record the crash experience of the various states. Standards include: ANSI D16.1, Manual on Classification of Motor Vehicle Traffic Accidents; and ANSI D20.1, Data Element Dictionary for State Traffic Records Systems.

The ANSI D16.1, and ANSI D20.1 standards, and the MMUCC guideline all promote uniformity; however, they approach it from different perspectives. It is important that the use

and application of these standards/guideline compliment each other. They all exist for different reasons.

The D16.1 Classification Manual is a standard used for classifying traffic accidents.

The D20.1 Data Element Dictionary is also a standard that is used for exchanging data, but which touches on many more areas in traffic records, in addition to traffic accidents.

The MMUCC Guideline (not a standard) represents a minimum set of crash data elements that states are encouraged to adopt as they revise their state crash report forms. MMUCC includes 77 data elements that law enforcement should collect at the crash scene and an additional 34 data elements that can be derived from those that are collected at the scene or obtained by linking to other data files, e.g., driver history, injury, and roadway inventory data. MMUCC was originally developed in response to requests by states interested in improving and standardizing their state crash data, leading to more complete reporting with uniform data element attributes.

The MMUCC Guideline recommends the voluntary implementation of the 111 data elements as described in the Guideline, and a reporting threshold that includes all persons (injured or uninjured) in crashes statewide involving the death, personal injury, or property damage of \$1,000 or more. The MMUCC Guideline is a tool to strengthen existing state crash data systems and facilitate the implementation of new systems. For information – <http://www.mmucc.us>.

### **Findings – Connecticut:**

The location identification of crash reports is a primary concern. Crash location is either handwritten or typed on the PR-1. The location identification consists of the roadway where the crash occurred, with a given distance (in feet or tenths of a mile) from a specific reference point (preferably the nearest intersecting street). If a crash occurs at an intersection, all appropriate roadways are listed. For both State and local roadways, ConnDOT converts the given information into an actual mileage. For fatal crashes, the State FARS analyst also uses a GPS software program to determine the latitude and longitude measures for the specific location. For additional information pertaining to location identification, refer to Program Area #2.

Approximately 110,000 crashes occur in each year in the State. Of this total, approximately 81,000 police reported crashes are added to the Crash file. The reporting threshold includes crashes involving an injury, fatality, or at least \$1,000 damage to any one individual's property. Complete 2004 data should be available in early 2006.

### **Incomplete Crash File**

The PR-1 crash report (last revised in 1994), is used statewide by all jurisdictions; however, a complete State crash file has not existed for a number of years mainly due to the following:

- Approximately one third of the information on the PR-1 crash report is actually coded/added to the State Crash file,

- No information from <sup>3</sup>property damage only (PDO) crashes on local roads is added to the file (estimated average of 29,000 reportable crashes per year),
- Incomplete PR-1 reports submitted to ConnDOT are returned to the submitting agency for completion; however, with the exception of crashes involving state property damage, crashes where personnel are needed for post crash scene management, or fatal crashes, there is no follow-up to determine if those reports are completed and returned to ConnDOT, and
- Law enforcement training on the use of the PR-1 was provided when it was updated in 1994; however, generally, there has been no systematic follow-up or in-service training undertaken since.

The following are examples of information that is completed on PR-1 reports by police officers, but is not coded or added to the State Crash file:

- Driver name, address, license class, driver license number, vehicle owner name/address,
- Vehicle registration number, year, make, vehicle identification number, and
- Diagram, narrative, enforcement action.

**Local Road PDO Crashes** – These additional examples represent crash factors and other information that is completed on PR-1 reports, but is not coded or added to the State file for PDO crashes occurring on local roads. Estimates, based on 29,000 PDO crashes each year on local roads, represent the number of cases of this type lost (not added to the State crash file) each year.

- Speed Too Fast for Conditions – 2,980 crashes per year,
- Driver Lost Control – 2,270 crashes per year,
- Driver Failure to Yield Right of Way – 4,970 crashes per year,
- Driver Violated Traffic Control – 1,020 crashes per year,
- Improper Lane Change – 2,420 crashes per year, and
- Following Too Close – 10,120 crashes per year.

Other information that is not coded or added to the State Crash file for PDO crashes on local roads includes occupant restraint usage for drivers and passengers. In measuring the success of seat belts or air bags in preventing injuries, possibly serious injuries in crashes occurring on local roads, this information is lost (not captured) for an estimated 29,000 PDO crashes each year in the State file.

<b>Data Quality</b>	<b>81,000 Reportable Traffic Crashes – per Year in Connecticut</b>
<b>Timeliness</b>	There is a one-year delay for users to have access to information that is coded and added to the State Crash file
<b>Accuracy</b>	Most accurate for crashes on State highway system
<b>Completeness</b>	1/3 <sup>rd</sup> data for all crashes data entered; No data for local road PDO crashes

<b>Consistency</b>	Most consistent for crashes on State highway system
<b>Integration</b>	Very little file linkage with other traffic records system components
<b>Accessibility</b>	Tailored to planning, engineering and other offices of ConnDOT, who are the primary users of the data

**Strategies Recommendations:**

**Revise/Update the PR-1 Crash Report Form**

Request a detailed comparison from NHTSA of the MMUCC Guideline with the PR-1 and with the State Crash File that is created from the PR-1. This will provide the TRCC stakeholders a better picture of where the State stands in terms of the content of its Crash Reporting System.

Conduct joint application development (JAD) sessions involving members of Connecticut’s highway safety community. Using/comparing the MMUCC Guideline, ANSI D16 and D20 standards, determine whether the PR-1 meets user needs.

Focus of JAD sessions, (1) Justify which data elements to collect (who needs them); (2) Determine how the data should best be collected. Auto-populating of the PR-1 at the scene by real-time access to license and registration files, linkage to other traffic records system (TRS) files, such as injury or roadway inventory files, derived or calculated from other data elements or sources; (3) Discuss electronic roadside data capture vs. continued need for paper PR-1 forms for smaller jurisdictions. Pending the outcome of the JAD sessions, draft a revised crash report form (PR-1), if called for. This program area (Crash – Data Content) has dependencies with most of the other program areas. Pursue program area recommendations in conjunction with other identified targeted program area improvements.

**Implementation costs and timeframes – Program Area #1:**

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated Cost</u>
Determine User Needs for the PR-1	2006-2007	\$5K
Conduct JAD Sessions		
Compare MMUCC data elem recomm		
Update/Revise PR-1	2007-2008	\$150K
Develop an electronic PR-1 Standard (Appendix J)	2007-2008	\$5K
Revise Paper PR-1	2007-2008	\$10K

**Program Area 2: Location Reference System**

**Attributes:**

Transportation, public safety, health care, emergency management and other professionals rely on geographic information system (GIS) technology as a decision support tool and to further understand relationships between drivers, vehicles, and roadways (geographic locations). With

better understanding of spatial characteristics, professionals can understand problems and formulate a response, improving both their ability to increase their presence in areas of greatest need and their ability to improve services they already have in place.

Geospatial data is geographical data used to precisely identify a certain location or area and is often used to create maps and informational profiles about that specific location or area. Geospatial data and GIS technology are essential for a coordinated, swift and effective response by municipalities and State agencies in the event of a homeland security emergency. The coordination of information between the State and various emergency preparedness and public service agencies will require that geospatial technology and data be shared by State agencies.

### **Geographic Location**

The geographic location of a crash, citation, emergency medical services (EMS) response or other highway safety related event is posted automatically to each electronic record, directly from the latitude and longitude, with an on-scene computer utilizing the global positioning system (GPS), hand entered at the roadside from an unconnected GPS device, or with location hand entered as comments, such as 1/10<sup>th</sup> mile South of Seneca Highway. Incidents with location entered as comments are automatically routed to location identification experts who use those comments to determine and add the geographic locations to the event record. The roadway system GIS plots the location of the highway safety related event, directly from the recorded latitude and longitude.

Location reference subsystem should support accurate identification of a crash location by:

- Using standard location reference system to establish preliminary location on a GIS-based display,
- Supporting multiple roadway synonyms,
- Detecting incorrect locations, and
- Allowing manual operator correction.

### **GIS Analysis**

GIS analysis is used by state and local highway planners to assist in making effective decisions on signage, lane control, repair and construction investment, construction area planning, and numerous other facets of highway management.

GIS analysis begins with the display of the highway system map. User selections allow sub-division display, for any county or municipality. Roadway points and features are plotted on the map from their geographic location data in the highway database. The user selects each overlay database they wish to see plotted on top of the map. Most data in all databases now have a GIS location or coordinate set that allow automatic locating on the base map. Roadway points and features that do not have GIS location data in their database record display a location characteristics text box, and are positioned manually by the user.

In motor vehicle crash analysis, for example, layers of plot points display the location of the first or most harmful event, and the crash location(s). Additional layers for the same map area may

be displayed with in-area roadway features, in-area construction or detour in-progress, in-area planned/funded improvements, in-area needed/unfunded improvements, or in-area previous crashes, etc.

## **GIS Display**

Collision, citation or other highway safety event diagram output utility displays plots based on selections made on the displayed GIS map. Data captured for the event is used for output selections, such as: all crashes, citations, etc., between two dates, events involving impaired drivers, or events involving at least one commercial vehicle.

Highway safety events are selected prior to displaying single or composite diagram(s). Selections are made for crashes or other events at a specified or selected intersection or roadway section, events with a location (latitude/longitude) within a closed line figure drawn with the mouse or stylus on the screen, etc.

The GIS display plots different types of points with their own set of plot attributes (such as color, shape, shading, etc.) that distinguish it from other types of points. When any “point” is clicked, or when a selection is circled or blocked on the screen, the summary of motor vehicle crash or other events that comprise the point, or that are within the circle or block are displayed by category, with a selection form containing buttons to change the presentation, or summarization, or to drill down into highway safety event report details.

## **Findings - Connecticut:**

### **Geospatial Council**

By Executive Order a Governor’s Interim Geospatial Council was created to coordinate and promote technology and sharing of geospatial information. The focus of the Council is to:

- Develop policies and guidelines to implement a statewide geospatial data-sharing network,
- Prepare and submit a report to the Governor containing its legislative recommendations to establish a permanent council within the State to manage the network on geospatial data and technology, and
- Have the authority to apply for federal funding grants and accept and expend such grants on behalf of the State.

The Connecticut Department of Transportation (ConnDOT) has a geospatial planning effort of its own. ConnDOT’s primary linear reference system used for the State database is route and cumulative mileage. A GIS based reference system is currently in use, however, latitude and longitude is usually present only at the beginning of a route, end of a route, bridge location and signal location.

## **Identifying Crash Locations**

The location identification of crash reports is of primary concern. Currently, crash location is either handwritten or typed on the PR-1 crash report. The location identification consists of the roadway where the crash occurred, with a given distance (in feet or tenths of a mile) from a specific reference point (preferably the nearest intersecting street). If a crash occurs at an intersection, all appropriate roadways are listed. For both State and local roadways, ConnDOT converts the given information into an actual mileage. For fatal crashes, the State Fatality Analysis Reporting System (FARS) analyst also uses a GPS software program to determine the latitude and longitude measures for the specific location.

Identifying a crash location on a State reference map from field information provided on the PR-1 crash report by a police officer consumes the single greatest amount of time for each ConnDOT coder when processing a crash for data entry.

From the 2004 Traffic Records Assessment, the following relates to the location identification of motor vehicle crashes employed by select local police departments.

Waterford – Crash location is listed by identifying the name of the roadway. If at an intersection, the second road name is entered. If away from an intersection, the distance and direction from the nearest intersecting street is entered on the PR-1.

Farmington – Distance and direction from the nearest intersecting street or landmark is used.

Woodbridge – Proper street names or in some cases the route number is used. Accidents on major highways in Woodbridge fall within the purview of the Connecticut State Police (CSP).

Glastonbury – Street name is used unless it occurs on a State road. Hebron Avenue (a State road) is listed as Route 94 on the PR-1.

Crashes on the State highway system are location coded by route and cumulative mileage allowing them to be used in conjunction with ConnDOT's roadway files. Route and cumulative mileage information for the crash file is used with the location and average daily traffic (ADT) files to generate the traffic accident surveillance report (TASR) and suggested list of surveillance study sites (SLOSSS) reports (refer to Program Area #13).

### **Strategies:**

Continue to research the use of data capture/mapping software – locator tool with base map integration for more accurate identification of location on crash reports, citations, etc. With GPS positioning of a crash scene, and GIS base mapping of the roadway, aggregate information and reports can be generated by selecting a point, or circling the area of interest (on the computer screen), and with drill-down into detailed crash information available for every crash in the selected circle, the traffic or roadway planners and engineers can have better quality data upon which to make decisions.

Use crash reporting location methods for other applications as the State expands capabilities for electronic data capture, e.g., electronic citation reporting. Explore the application of the event locator tool/technology in emergency vehicles. This and other measures will greatly enhance the ability to compare field incidents such as crashes with citations, crashes with EMS, roadway files, etc. All State Police vehicles and ultimately most local police vehicles will have GPS technology to pinpoint the vehicle's location on a State base map in relation to the highway safety event, crash, citation, EMS response, etc.

Combine State base map development with the event locator tool. The data capture software integrated GIS/GPS locator tool will utilize GPS coordinates, in addition to providing other location identification options. An officer in the field will be able to place a cursor to locate a crash and the electronic PR-1 will record the latitude and longitude location. This will provide a key element for ConnDOT in the way that they record location in their various roadway files. This procedure will permit the State to use a common location system for all of the databases that compare data based on location, such as crashes, citations, and roadway files.

Conduct research into/study of a Standard Location Identification/Linear Reference System (LRS) for locating highway traffic safety events on State and local roadways. Establish an LRS Subcommittee of the TRCC with a highway safety focus to plan the research/study. Adopt a standard location identification system for highway safety related events. Include standards, and procedures, for example; how would an electronic data capture locator tool interface with an established base map to relate the measurement taken in the field back to a specific location. Crashes, citations, EMS, and other highway safety related events should utilize comparable methods for determining location identification. This program area (Location Reference System) has dependencies with most of the other program areas.

**Implementation costs and timeframes – Program Area #2:**

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated Cost</u>
Implement Locator Tool for E-Data Capture Applications	2006-2007	\$75K
Conduct research into/study of a Standard Location Identification System for Highway Safety	2006-2008	\$400K
Integrate with existing State and local agency LRS dev efforts	2006-2009	Minimal
Integrate with Geospatial Initiative to Develop State Base Map Geospatial Information System	2006-2009	Minimal

### **Program Area 3: Crash – Electronic Data Capture**

#### **Attributes:**

The capabilities of the State's traffic crash records system to provide for electronic field data capture and transmission to the State database will determine the quality of the data that resides in the State's Crash file, ultimately improving data-driven decision making by federal, state and local highway safety managers.

**Auto populating the PR-1:** The ability to access and download driver license and vehicle registration information from the Department of Motor Vehicles (DMV) directly to the scene of a crash, will mean a reduction in the actual data capture required of an officer to complete the PR-1. Recommended MMUCC Guideline data that could be obtained by auto populating the PR-1 includes (7) motor vehicle, and (9) driver related data elements, or 17% of the MMUCC data elements, not counting 18 roadway data elements, to be obtained by linking to roadway files.

**Laptop computer:** Personal computer (PC) data capture by laptop operates essentially the same as a typical data entry application on a Windows PC. The application accepts crash data and saves the data on the PC local hard disk storage device. A modern laptop PC may have numerous automated data capture devices attached. Devices include large capacity hard disks, diskettes, bar code readers, magnetic stripe readers, radio frequency communications modems, wireless cell phone modems, GPS receivers, hand-held scanners, and printers.

**Pen-based computer:** Pen-based computers are sophisticated, nearly full computers, with options such as large capacity hard disks, diskettes, bar code readers, magnetic stripe readers, radio frequency communications modems, wireless cell phone modems, GPS receivers, hand-held scanners, printers, etc., all available utilizing a PCMCIA interface card. These interchangeable devices allow the pen computer user to change its configuration in an instant.

**Hand-held computer:** The hand-held computer alternative to a large keyboard is a stylus, or pen, that is touched to the touch sensitive screen for character data entry. These hand-held computers run the Microsoft Windows CE operating system software, which assures that future updates to the crash records program will remain relatively simple, since Windows CE is the system of choice for small system software development.

The Crash Reports application for Windows CE is essentially the same as the PC Crash Reports application described above. It also does not require a network connection to operate, and uses the same forms and entry rules used for data entry of hand-written crash reports.

The hand-held computer user chooses to transmit a crash report simply by marking it completed. The hand-held computer may be network connected through RF (radio frequency) communications or wireless communications. All communications and local mode operations are essentially the same as described above.

A hand-held computer offers alternative functionality over an in-car computer: it can be quickly disconnected from communications, printing, or other connections, and hand-carried by the investigating officer when they are outside the vehicle.

**Data Transmission:** Once captured in the field by the officer the data should then be transmitted to the State crash records system via Network Mode or Local Mode.

**Network Mode:** The officer transmits directly to the State crash records system. The application operates in Network mode, ready to link to the network. Network mode currently has two different connection methods, RF Communications, and Wireless Communications. Most police units have one or the other network connections (some have both). Radio frequency (RF) communications requires a mobile RF modem connected to the computer and to a police RF radio. Wireless communications requires a cell phone modem connected to the computer.

**Local Mode:** The PC Crash Reports application does not require a network connection to operate. The same forms and entry rules are used for data entry of hand-written crash reports. The crash data application monitors and displays on the PC screen the number of crash cases on file, and the number not successfully transmitted. At the end of the officers' shift, the officer copies all untransmitted local data to diskette, and hand delivers the diskettes to a police facility. There, the communications officer copies the diskette data to the 'upload' folder on a local storage device and recycles the diskettes. The crash data in the 'upload' folder is uploaded to the state crash database via the state communications network.

Other features of the electronic data capture and reporting system may include:

**Scanned Image Data Capture:** An officer or investigator in the field uses a scanner to copy hand-written operator, occupant, and witness notes, accident reports, citations, etc. A hand-held or compact roller scanner is best suited for this. When the scanner is needed, it is connected as an input device to the in-car or hand-held computer. The scanned images are saved to the PCs' 'open' case folder, and moved to the Crash Records system with the associated crash record.

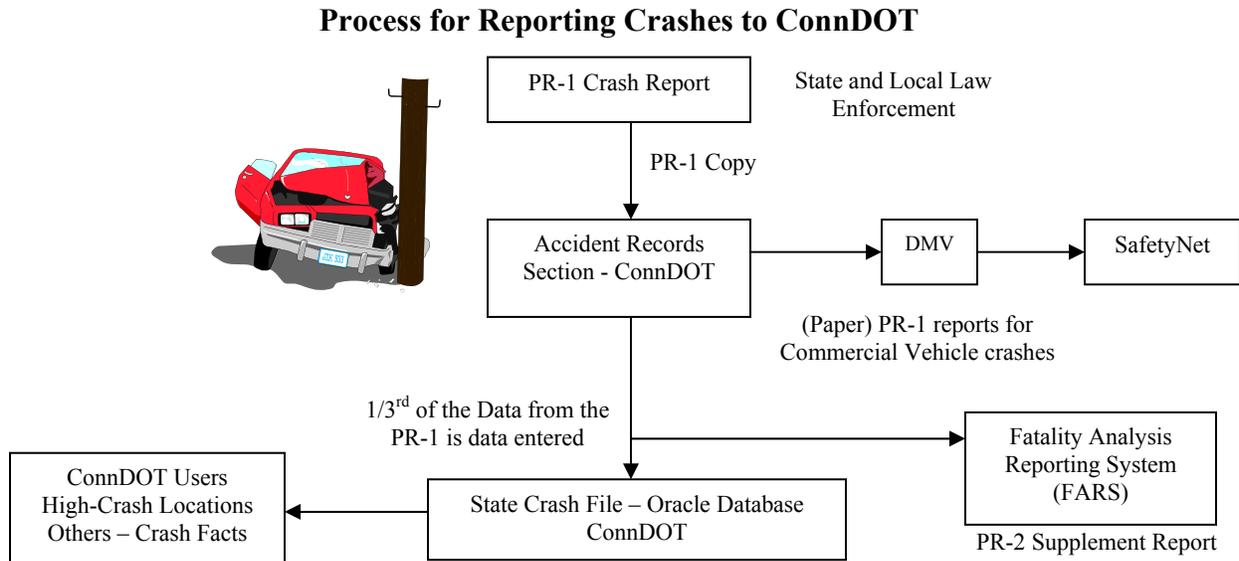
**Bar Code or Magnetic Stripe Data Capture:** In the field, the officer uses the bar code reader to scan their own nametag, and to scan VIN numbers (Vehicle Identification Number) on the front window of most vehicles. The officer uses the magnetic stripe reader to scan driver licenses for all operators involved in the crash. A scan of license plate year validation sticker number is usually not done, since simple entry of the vehicle tag number is much more efficient. The high degree of scanned data accuracy, and the amount of officer on-scene time saved, make the investment in scanning equipment both a cost saving measure (data accuracy), and a time saving measure (increase in officer availability).

**GPS Position Data Capture:** A hand-held GPS receiver may be connected to the computer, or the officer may take it when he or she is outside the vehicle. When connected to the computer, the officer 'marks' the location by clicking the GPS send on the GPS device. The latitude and longitude are sent to the application, and displayed in the latitude and longitude

form fields. GPS readings obtained when the GPS is not connected to the computer are hand entered to the latitude and longitude form fields (refer to Appendix M: Related Technology).

**Findings - Connecticut:**

The State is dependent on data from the current crash system that is based on paper reports filed by investigating officers and key entered into the Crash file at ConnDOT. The chart below reflects the process used by all State and local law enforcement for reporting crashes to the ConnDOT Accident Records Section.



**Crash Reporting** – As indicated in the Investigator’s Guide For Completing The Uniform Police Accident Report Form, in accordance with section 14-108a of the Connecticut General Statutes, the division of state police and each police department and officer and other suitable agencies or individuals are required to submit a uniform investigation of accident report, in such form as the commissioner of transportation shall prescribe.

In each motor vehicle accident in which any person is killed or injured or in which damage to the property of any one individual, including the operator, in excess of one thousand dollars is sustained, the investigating officer or individual, shall, within five days after completing such investigation, complete and forward one copy of the report to the commissioner of transportation. Such report shall call for and contain all available detailed information to disclose the location and cause of the accident; the conditions then existing, the persons and vehicles involved and the names of the insurance companies issuing their automobile liability policies, as well as the enforcement action taken.

Reports are coded onto a data entry system in ConnDOT and later transferred to a mainframe computer. Copies of the PR-1 crash reports involving commercial motor vehicles are provided to the DMV’s Commercial Vehicle Safety Division (CVSD). Copies of the PR-1 are discarded after coding and data entry has been completed.

The State presently is working towards implementing an electronic crash data collection and reporting capability that meets the intent of the attributes described above. The Capitol Region Council Of Governments (CRCOG) has already developed an electronic PR-1 component, and is considering enhancing the CAPTAIN suite of software tools by utilizing the National Model TraCS<sup>4</sup> software (refer to Appendix N). The CSP is preparing for a pilot test of an electronic PR-1 to capture motor vehicle crash data, involving commercial motor vehicles (refer to Program Area #11).

The following represents a sampling of local police agencies, which have implemented electronic crash reporting/data entry.

In Waterford, patrol vehicles are equipped with mobile data terminals (MDT) with software that allows an officer to complete a traffic crash report in the vehicle. Cellular digital packet data (CDPD) capability exists to transmit data from the vehicle to a host computer at the Waterford police department.

In Farmington, a standard PR-1 is completed on an MDT using the CAPTAIN system. After supervisor approval, data is transferred from the CAPTAIN switch to an in-house mobile server, then to a records management system (RMS). Information regarding the EMS agency responding to a crash is also captured by the RMS through a CAD system.

In New Milford, the entry of crash report information consists of manual entry into a PC based RMS. Detailed information regarding the EMS agency responding to the crash, run number, agency identifier, medical facility, etc., is logged into an in-house computer.

In Woodbridge, a CAD system is used to collect crash locations by intersection. Information is manually entered. EMS information is also captured in the CAD system.

In Glastonbury, a computerized crash file is maintained, using data entry into a PC workstation. The crash file can be electronically linked to a citation file.

In addition to the Commercial Vehicle Analysis Reporting System (CVARS), another initiative in the State, which involves an electronic roadside data capture component – traffic citations, is the Connecticut Impaired Driving Records Information System (CIDRIS – refer to Program Area #10). Adding to motor vehicle crashes and traffic citations, other possible applications for roadside data capture by law enforcement include vehicle safety inspections, complaints, tow slips, incidents, GIS location tools, and other types of roadside E-incident reports. Ideally, it would be best for the officer in the field for all future roadside data capture/incident reporting that he or she is required to do, to be resident in the same computing environment.

As electronic roadside data capture for motor vehicle traffic crashes becomes more prevalent, and as the ability to receive electronic crash reporting at the State level is realized, a phase-in period will ensue, in which paper crash reports received will continue to be entered into the State Crash file, while electronic reports will be entered as well. The State's crash data could reside partially in each of two files during this transition period. However, the amount of data in the

existing crash file (based on hard copy reports) would be expected to decrease as the volume of electronic reports are received and stored.

**Strategies:**

Implement E-Crash reporting for All Reportable Crashes. This program area has dependencies with most of the other program areas. Continue to implement program area recommendations in conjunction with other targeted program area improvements.

**Implementation costs and timeframes – Program Area #3:**

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated Cost</u>
Implement E-Crash Data Capture CSP – RMS Approach CRCOG – TraCS/CAPTAIN Other E-Crash approaches Autopopulate PR-1 with Driver And Vehicle Data Implement Locator Tool Develop an Electronic PR-1 Standard MMUCC, XML (refer to Appendices J and K) Police Vehicle Hardware & Software Implement Diagramming tool Revise Paper PR-1 to match Data Fields for E-Crash Reporting	2006-2009	Assess various efforts: <ul style="list-style-type: none"> <li>• CSP’s RMS – application for CVARS; # of vehicles equipped; pilot effort, etc.</li> <li>• Locals already producing electronic PR-1; # of vehicles equipped</li> <li>• Determine existing use of locator/diagramming tools</li> <li>• Refer to Appendix L – Cost(s) to Equip a Law Enforcement Vehicle for Electronic Data Capture</li> </ul>

**Program Area 4: Crash – Data System Design – Communications**

**Attributes:**

**Relational Database System**

The State crash records database system is a full function relational database management system (RDBMS) that meets the requirements for crash records. The relational database system has features such as:

- A Data Dictionary that describes each data element of each data table within the crash RDBMS, with each data element classified with the type of data stored in the element,
- A database schema that follows the relational hierarchy suggested by National guidelines and data standards, including MMUCC, ANSI D16.1, and ANSI D20,
- A record conversion capability to populate the crash RDBMS with crash file data from the State legacy data file(s),

- A record conversion capability to populate the ‘related’ tables (described below) in the RDBMS with data from the State legacy roadway, driver, vehicle, and EMS data files,
- A central security management system that provides/denies logon and record read/write access to crash records data systems,
- A records archive capability that copies PDF versions of crash records to a large capacity optical storage device, and
- A crash records archive access capability with select, download and print features.

### **Links to Roadway, Driver, Vehicle, and EMS Data**

The logical State traffic crash sub-system contains ‘real’ data for the crash report, plus related data from the:

- Vehicle table (for each vehicle involved in the crash) for registration and inspection information,
- Driver table (for each driver involved in the crash) for driver license, personal information, restrictions, financial responsibility, and parental authorization information,
- Roadway table (for the roadways where the crash occurred) for roadway features, intersection, construction, maintenance, and traffic information,
- Citation table (for citations issued to each driver involved in the crash),
- EMS table (for EMS run reports for drivers, passengers and pedestrians involved in the crash) for EMS on-scene and in-transit care provided, trauma registry, and medical examiner information,
- Incident table (for police and EMS incident reports and follow-up actions for the crash) for 911, police and EMS dispatch emergency call information, and
- Driver History table (for Drivers involved in the crash and cited) for violations record, accident history, corrective actions.

### **Data Warehouse/Decision Support System**

Examples of information/forms (by subject area) contained in the crash data warehouse:

<u>Crash</u>	crash record form(s), crash data, graphics (photos, scanned attachments),
<u>Driver</u>	driver license, personal information, restrictions, financial responsibility,
<u>Vehicle</u>	registration, inspection, type, branding,
<u>Roadway</u>	roadway features, construction, maintenance, traffic information,
<u>Citation</u>	date, location, violation,
<u>EMS</u>	run reports, hospital, medical evaluation

### **Crash Data Mining**

Traffic analysts use data mining software to expose patterns and consistencies in crash data that are contained within data entered text fields of the crash records. Data Mining software represents a 4<sup>th</sup> generation version of what began as ‘Key Word in Context’, or KWIC analysis. Specified words or word roots are located within selected text areas of the crash records, and a statistical summary is generated on matches found, close matches found, context of finds, etc.

The analyst may scan through source crash data records for a matched word or word root. The crash data warehouse is used as the crash records source.

### **Crash Database with Same Capabilities to Function on Local PCs**

The Crash Records database system with forms, reports, and analysis capabilities is available to state, regional planning organizations, and municipalities as a Windows 2000 server based application. The system can be installed as a client/server application, or as an Internet web application.

### **Communications – State Telecommunications Network**

The State operated telecommunications network is used to move crash data between the central site and state, regional planning and municipal traffic records users.

### **State Internet Web Site**

The web site allows authorized and public users to access the State motor vehicle crash records Internet site (authorized users must log on to access crash records). Authorized users are provided with a selection form, where the user has three ways to enter crash records selections to the form.

Authorized users of the web site use the Internet to upload crash records generated in their State, regional planning organization or municipal jurisdiction, to the crash records database (optical images ‘attached’ to a crash record are uploaded with the crash records). Public users (those not logged on) may view safety data news, blank (printable) crash report forms, crash records statistical summaries by region, accident type, or vehicle type.

### **Findings - Connecticut:**

The current legacy crash data system maintained by ConnDOT cannot support the new capabilities to be available with implementation of “data capture software” and the other system improvements recommended in this Strategic Plan.

The current legacy system cannot provide users with access to available data, nor can it supply the full range of data, in order to effectively manage the State’s highway safety programs.

There are no capabilities within the current system to link the legacy crash file with data from other traffic records files such as roadway, driver, vehicle, citation, or EMS. Such merging of data from various safety related data files is essential to provide the optimum range of information to support problem identification, program evaluation, and general in-depth analyses of highway safety issues.

The current legacy system does not provide for easy access to download needed files or subsets of the file thus forcing some duplication of data entry processes.

The legacy system as currently structured cannot accommodate the electronic transmission of crash reports at present. Consequently, many local jurisdictions have developed and maintain their own systems.

**Strategies:**

Conduct a system requirements definition (SRD) in conjunction with a general design for a new data warehouse for traffic records/motor vehicle traffic crash reporting. The SRD would include, but not be limited to the current systems; improving current systems (transition) to be able to meet user demands; data warehousing; dual reporting (legacy systems vs. new systems); data modeling (mapping old formats to new); data access, and reporting, as well as other issues.

With successful completion of the CVARS pilot (refer to Program Area #11), expand efforts to include a capability for all law enforcement officers to transmit/upload crash reports to a State Crash file. Continue efforts to create a data warehouse to be populated by all law enforcement.

Continue efforts to provide authorized as well as public user access of crash data from the data warehouse. Public users should have access to general statistical summaries, safety data updates, blank crash report forms and other information as provided and agreed to by the state. This program area (Crash – Data System Design) has dependencies with most of the other program areas. Implement program area recommendations in conjunction with other targeted program area improvements.

**Implementation costs and timeframes – Program Area #4:**

**Strategies:**

Consider establishing a Traffic Records/Crash Data Warehouse at the Department of Information Technology (DoIT). DoIT requires project profiles for initiating new projects, which must follow the endorsed project management methodology. A second alternative for locating a data warehouse could be a University sponsor. Other states have chosen this alternative. Interest was expressed, including discussion during the TRCC meeting in February 2006.

The data warehouse is to become the repository of not only crash data but of all other highway safety related data, including:

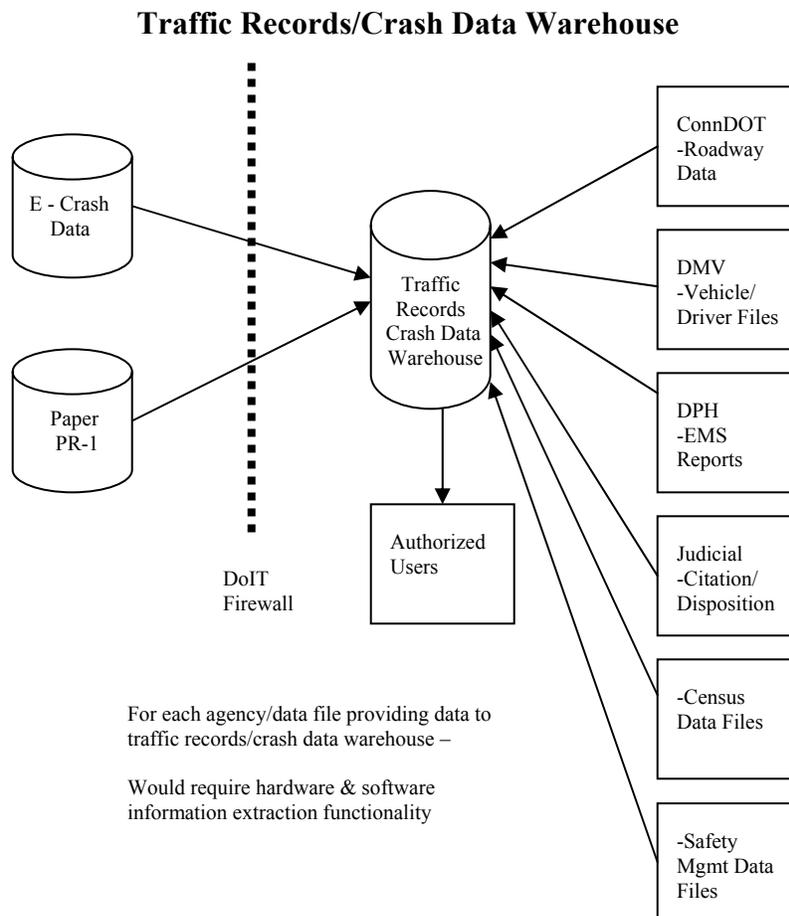
- a. Crash file – the crash file from electronic roadside data capture,
- b. Citation/disposition file – an extract of pertinent information maintained by the Judicial Branch, excluding personal identifying information,
- c. EMS file – a copy of the file of automated EMS run reports containing those data elements furnished by the State Department of Public Health (DPH),
- d. Roadway file – a copy of those files with data pertaining to roadway locations as furnished by ConnDOT,
- e. Driver and Vehicle files – copies of the driver and vehicle files maintained by DMV, excluding personal identifying information,

- f. Safety Management Data Files – a file containing data needed to supplement crash and safety data such as analysis reports, and
- g. Census data – a file containing population counts by age and sex for the State and political subdivisions.

**Implementation costs and timeframes:**

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated Cost</u>
DoIT Project Profile/System Req Defn		
General Design (Data Warehouse)	2006-2007	\$240K
Detail Design	2007-2008	\$160K
Program Dev. Testing & Implementation	2007-2008	\$500K
Data Warehouse Hardware and Software	2008-2009	\$75K
<u>Communications Recommendation</u>	<u>Timeframe</u>	<u>Estimated Cost</u>
Technical Assistance – Access/analysis for Authorized Users and the Public	2008-2009	\$80K

The following is a proposed chart for a Traffic Records/Crash Data Warehouse.



## **Program Area 5: Crash – Report Training – Train the Trainer**

### **Attributes:**

The current edition of the Traffic Records Advisory does not contain recommendations for training officers to collect crash information or to focus on data quality issues. Training is referenced in Section 4-C; training highway safety professionals involved in program development, management, and evaluation; and users in what data are available and how that data can be used.

As described earlier under Methodology, this Strategic Plan utilizes a “Combined Straw Model” approach, enhancing/expanding on the guidance provided in the Traffic Records Advisory.

The following are references to training – which impact crash report data capture as well as other roadside incident reporting. For additional resource information, click on the following link.

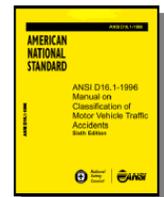
[http://www.nhtsa.dot.gov/people/perform/training\\_resources.htm](http://www.nhtsa.dot.gov/people/perform/training_resources.htm)



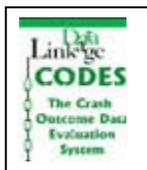
### **MMUCC - Model Minimum Uniform Crash Criteria**

MMUCC provides a voluntary set of guidelines that help states collect consistent, reliable crash data that are more effective for identifying traffic safety problems, establishing goals and performance measures, and monitoring the progress of programs. Some of America's leading traffic safety experts worked together to develop the MMUCC guidelines, including representatives from groups in safety, engineering, emergency medical services, law enforcement, public health, and motor carriers.

### **ANSI D16.1-1996 Manual on Classification of Motor Vehicle Traffic Accidents**



NHTSA supports the use of uniform crash report form data elements and encourages the use of ANSI D-16 and D-20 standards. The purpose of the **ANSI-16, Manual On Classification Of Motor Vehicle Traffic Accidents**, is to provide a common language for classifying motor vehicle traffic accidents. The purpose of **ANSI D-20, Data Element Dictionary For Traffic Records Systems**, is to promote uniformity in the transmission of records, relating to traffic safety, law enforcement, emergency medical services, driver licensing and vehicle registration.



### **CODES - Crash Outcome Data Evaluation System**

Crashes can be prevented, or reduced, but only if we understand their type, severity and cost in relation to the characteristics of the crash, vehicles, and persons involved. Crash data alone do not indicate the injury problem in terms of the medical and financial consequences. By linking crash, vehicle, and behavior characteristics to their specific medical and financial outcomes, we can identify prevention factors. For other examples of crash reporting-related training materials, refer to the following appendices.

- Appendix H Standards and Guidelines
- Appendix I Differences in Definitions for Reportable Commercial Motor Vehicle Crashes
- Appendix P Sources of Training Impacting Crash Reporting
- Appendix Q Crash Data Collection for Commercial Motor Vehicles
- Appendix R Model Minimum Crash Reporting (MMUCC) Guideline Training
- Appendix S ANSI D16.1 Accident Classification Training Course

### **Findings - Connecticut:**

Identified in the 2004 Traffic Records Assessment, the following relate to opportunities for crash report training for local law enforcement.

Waterford – New recruit police officers receive basic traffic crash investigation and reporting in a block of instruction while in the training academy; training is reinforced during the recruit’s field training period. Few officers see the crash reporting system in terms of a tool for highway safety.

Farmington – Common problems in reporting are addressed in monthly training bulletins; remedial training is initiated when necessary on an individual basis.

New Milford – Problems are emphasized during recertification training as well as in advanced training in accident investigation.

Woodbridge – Officers are taught to review their work during basic Police Academy training and during Field training. Some officers have additional crash investigation training and serve as the Department’s major accident investigators.

Stratford – Other than a new officer’s investigation and report training at a State Police training facility, there is no other crash report training unless an officer shows interest in investigating serious/fatal crashes. Most officers view the collection of crash data – solely for the benefit of the parties involved for insurance purposes.

Glastonbury – The only type of crash investigation or report training is what the officers receive in the police academy. Officers wishing to receive additional accident investigation training are sent to specialized training classes. Officers tend to see the reporting process as something done for insurance purposes only.

## Strategies:

**Implement Commercial Vehicle Crash Report Training** for State Police as well as local law enforcement who become a part of the Commercial Vehicle Analysis Reporting System (CVARS) initiative (Program Area #11). The Federal Motor Carrier Safety Administration (FMCSA) sponsored one-day workshop includes the following five lessons.

- Reportable Commercial Motor Vehicle Crashes,
- Configuration, Cargo Body and GVWR,
- Motor Carrier Identification,
- Crash Events, and
- Recording Hazardous Materials.

**Implement a Comprehensive Train-the-Trainer** program for all law enforcement which reinforces the importance of complete, timely and accurate crash report data, how crash data is used, the importance of minimum standards for crash reporting to be comparable among jurisdictions, and the electronic data capture aspect, which includes locator, diagram, and other software tools, such as ‘auto populating’ the PR-1 with Driver and Vehicle data to enhance officer effectiveness in the field and their safety. Suggested training components include:

- CVARS – Commercial Vehicle Crash Report Training,
- ANSI D16 Accident Classification Training,
- MMUCC Crash Report Training,
- E-Crash Report Training/Roadside Data Capture,
- Importance of Crash Data/How it is Used/Data Quality,
- E-Crash Standards Training – Understanding Edit/Validity Checks Made in the Field, and
- Incorporate/Recruit Train-the-Trainers within Law Enforcement.

This program area (Crash Report Training) has dependencies with many of the program areas, including Location Identification, all of the Crash-related program areas, the Citation, CIDRIS, CVARS, and FARS program areas.

### **Implementation costs and timeframes – Program Area #5:**

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated Cost</u>
Implement CVARS Training	2006-2007	Funding support from FMCSA
Implement Comprehensive Train-the-Trainer Program	2006-2008	\$200K

## **Program Area 6: Driver/Vehicle Information**

### **Attributes:**

The Driver file includes information about the State's population of licensed drivers. It should include personal identification, driver license number, type of license, license status, driver classifications, endorsements, restrictions, convictions for traffic violations, driver improvement or control actions, and driver education data.

Driver information should also be maintained to accommodate information obtained through interaction with the National Driver Register (NDR), the Commercial Driver License Information System (CDLIS), and the Social Security On Line Verification System (SSOLV) to enable the State to assist in the verification of license and identification card applicants, to maintain complete operator related driving history records, and to prevent operators from circumventing driver control actions and obtaining multiple licenses.

The Vehicle file 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 miles traveled in order to produce the information needed to support analysis of vehicle-related factors which may contribute to a State's crash experience. This information should also be available for commercial vehicles and carriers which may be registered in other states, but which are licensed to use the public roadways in the state.

### **Driver Information Quality**

Routine license issuance information should be updated daily. Adverse actions (license suspensions, traffic convictions) should be posted daily. Information should be complete in terms of data elements (e.g., unique personal identifiers and descriptive data) and complete in terms of all prior driving history, especially adverse actions received from other states either while licensed elsewhere or while driving in other states.

Information should be readily accessible to the principal users of these databases, including driver licensing personnel, law enforcement officers, the courts, and for general use in highway safety analysis (refer to Program Areas #4 and #10, relating to data warehouse(s)). Driver information should be capable of linkage with other information sources and use common identifiers (e.g., driver license number, citation number, customer account number) where possible and permitted by law. Updates of driver information from courts should be accomplished through electronic linkages to the driver history data.

### **Vehicle Information Quality**

Information should be complete in terms of the vehicle ownership, registration, type, VIN, etc. Information on vehicle miles traveled (VMT) by type or class of vehicle should be available. For commercial vehicles, completeness also involves collection and availability of standard data elements, such as National Governor's Association (NGA) recommended data elements. The

State should employ technologies, such as the use of bar-coded vehicle registration forms that allow scanning of vehicle registration information directly onto appropriate forms (citation, crash, other forms). Vehicle information should be capable of linkage with other information sources and use common identifiers (e.g., VIN, crash report number, etc.) where possible and permitted by law.

## **Findings - Connecticut:**

### **Driver Data System**

Connecticut's Driver License file includes records for 2.3 million licensed drivers. The electronic Driver History file contains ten (10) years of information for certain statutory violations, and three (3) years for most others. The DMV accepts electronic driver license actions from the courts. The timeliness of driver license status being added to the driver record is current to real-time. The database that is used for both the master and analysis data files is VSAM.

Driver license information can be linked with driver history information using the driver license number. The State has a bar code on the driver's license, which meets AAMVA standards. The driver license file is updated with information from field offices in real-time. The court transmits conviction information to DMV on a nightly basis. DMV in turn, batches the conviction information on a weekly basis. The State lists out-of-state infractions, for those Driver License Compact convictions or Non-Resident Violator Compact reports, on the agency's Driver History file.

DMV data can be accessed by internal agency staff (DMV), other State agencies, local agencies, public sector, and certain private sector entities that have a permissible use. Automated audit controls and callable verifications are used to assess the accuracy of the database.

Driver licensing activity is shared between ten full service branch offices, four satellite offices, five photo license centers, three mobile bus units, and fifteen American Automobile Association (AAA) license renewal centers.

### **Vehicle Data System**

Connecticut's Vehicle Registration file includes records for 3,025,500 registered motor vehicles. There is approximately a 6-week delay in processing vehicle registration information. The State is required to keep four (4) years of automated vehicle registration information on the State system.

The database that is used for both the master and analysis data files is keyed Sequential (KSDS) VSAM. The Vehicle file is not directly linked with any other files, but can be cross-referenced.

Access to vehicle data is provided to internal agency staff, as well as other State agencies. Verifying the accuracy of the database is conducted by verifying internal samplings of data.

**Strategies:**

This program area (Driver/Vehicle Information) has dependencies with most of the other program areas. Continue to implement improvement in conjunction with other related program area improvements.

**DMV Initiatives**

- Customer Account Number (CA#)
- Re-engineering Regulation of Driver Systems (Re-ROD)
- Relational Database – Linkage to Other Systems Using the CA#
- DMV File Linkage – All Pertinent Information on a Customer
- Real-time Online (RTOL) Registration System
- Document Imaging Retrieval and Storage – Supporting Customer Documentation

**Implementation costs and timeframes – Program Area #6:**

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated cost</u>
Provide appropriate (sanitized) Driver/Vehicle Data for TR Crash Data Warehouse	2007-2009	Efforts to write software; provide means to download/transfer data to data warehouse(s) – to be determined during SRD phase, Program Areas #4 and #10
Provide appropriate (sanitized) Driver/Vehicle Data for CIDRIS	2006-2007	
Provide support for Implementing DMV Initiatives (listed above)	Ongoing	

**Program Area 7: Citation/Adjudication Information**

**Attributes:**

Information should be available which identifies arrest and conviction activity of the State, including information which tracks a citation from the time of its distribution to an enforcement jurisdiction, through its issuance to an offender, and its disposition by a court. 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.

This information is useful in determining the level of enforcement activity in the State, for accounting and controlling for citation forms, and for monitoring court activity regarding the disposition of traffic cases.

## **Findings - Connecticut:**

Whenever a police officer conducts a motor vehicle enforcement stop a number of activities occur:

1. The dispatcher makes an entry into the CAD/RMS,
2. The dispatcher queries a motor vehicle data base to determine license and registration status and transmits that data to the officer on the road,
3. The dispatcher enters the offender's (violator's) information into the CAD/RMS,
4. The dispatcher enters the enforcement action taken by the officer into the CAD/RMS

This process generates a significant amount of radio time back and forth between the dispatcher and the officer. Depending on the call volume, often times there are data entry errors made in the process. By having the capability to make these queries and enter data into the CAD/RMS directly by the officer in the cruiser, police operations would be significantly more effective and efficient – increasing officer safety and effectiveness.

A study of the State's citation/conviction tracking system was published in January 2004. It was used as a basis for the successful response to NHTSA for an impaired driving records information system for the state.

Approximately 400,000-500,000 traffic citations are added to the State system each year, utilizing a uniform Traffic Citation form. The State has an automated court information system for traffic citations.

To assess the accuracy of the citation/conviction data, users were asked to rate the database. Refer to data quality components presented in the 2004 Traffic Records Assessment (timeliness, consistency, completeness, accuracy, accessibility, and data integration).

Planned revisions for the current citation form and/or database: Initial components receiving attention, include electronic roadside data capture, integration/interface with Judicial and DMV information, integration/interface with offender-based data, and data warehouse decision support system (refer to Program Area #10).

## **Strategies:**

Promote TCAS study recommendations for creating and automating a citation/conviction file including, but not limited to, the type of violation, location, date and time, enforcement agency, court of jurisdiction, and final disposition. This program area (Citation/Adjudication Information) has dependencies with most of the other program areas. Continue to consider these other program areas as improvements are sought in citation/adjudication information quality, processing and integration into a more complete traffic records system.

## Citation/Adjudication Information – Program Area #7

### Implementation costs and timeframes:

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated cost</u>
E-Citation Data Capture (refer to Program Area #10)	2006-2008	Assess various efforts:
Promote TCAS study recommendations: Electronically populate the citation with Driver/Vehicle data	2006-2008	<ul style="list-style-type: none"> <li>• CSP's RMS – application; # of vehicles equipped</li> <li>• Locals already producing electronic citation; # of vehicles equipped</li> <li>• Determine existing use of locator tool</li> <li>• Refer to Appendix M – Cost(s) to Equip a Law Enforcement Vehicle for Electronic Data Capture</li> </ul>
Develop linkage between Citation and Crash data files	2007-2009 Refer to SRD Prog Area #4	
Promote other TCAS study recommendations	Ongoing	

## Program Area 8: Traffic Records Coordinating Committee (TRCC)

### Attributes:

The State should have a Traffic Records Coordinating Committee (TRCC) to manage, coordinate and provide direction for the State's traffic records and crash data system activities.

### NHTSA Traffic Records Advisory – TRCC

Coordination. The State TRCC should be formed within State policy and legal guidelines and institutionalized and empowered (refer to Vision, Mission, and Memorandum of Understanding - Appendix F) to recommend traffic records system policy and procedures. A correctly constituted and empowered TRCC should be responsible for oversight and completion of a number of tasks.

- Establishing file structure and data integration (traffic safety information),
- Assessing system capabilities and resources,
- Establishing goals for improving the traffic records system,
- Evaluating traffic records system components on a periodic basis,
- Developing cooperation and support from stakeholders, and
- Ensuring that timely, accurate, and complete data are available to all appropriate users.

## **Safety Data Project Manager**

A Safety Data Project Manager should be designated as the lead person for the Section 408 Safety Data Improvement Projects. The duties and responsibilities of the Project Manager include oversight, and coordination of safety data projects. A single point of contact, as well as responsibility and coordination should be provided for safety data project issues. This office is required to perform an annual review and report to the citizens of the State, on the current status of implementing various safety data improvements.

The Safety Data Project Manager maintains liaison with all agencies or operations involved in 408 Safety Data projects, including the department of transportation, State Police, local police, office of emergency medical services, and software vendors.

The office in which the Project Manager is assigned should be the single point of contact for all 408 Safety Data projects, to assure that efforts are coordinated with all providers and users, but does not necessarily control the budget or resources required to improve the various systems.

## **Highway Safety Information System Leadership Workshop**

This course was designed by GHSA and NHTSA to help stakeholders assess the strengths and weaknesses of their State's traffic records or safety data system, and to exert a leadership role in the development or improvement of that system to support highway safety related decision-making, leading to reductions in deaths, injuries, injury severity and costs.

### **Workshop Topics**

#### **Module 1: Purpose**

Presentation of current highway safety requirements and how data supports them.  
Justification of a stakeholders leadership role is discussed.

#### **Module II: The Model Traffic Records System (TRS)**

Description of the need for comprehensive highway safety information. The scope and characteristics of the TRS are presented along with the importance of a collaborative approach to obtaining the necessary resources for implementation.

#### **Module III: Significance**

Demonstration of the significance of the TRS to the highway safety process.

#### **Module IV: Implementation Strategies**

Module uses group process techniques to compare a State's TRS with the model. Implementation obstacles and potential solutions are discussed. Participants create plans of action and learn about the role of the TRCC.

## Module V: Resources and Direction

Module includes available resources including standards/guidelines, tools, private and public organizations, funding sources, and contacts that will help stakeholders implement or improve their State's TRS.

### **Findings - Connecticut:**

As this Strategic Plan shows, and from the ongoing activities described in fourteen (14) Program Areas, Connecticut has an active Traffic Records Coordinating Committee (TRCC) that is supported by the Transportation Safety Section.

Traffic Records System component managers represented on the TRCC, include Crash, Road Inventory, Traffic Volumes, Citation/Conviction, EMS Run, Public Health/Injury Prevention, GIS, Driver License, and Vehicle Registration. Stakeholders represent data collectors, users and managers.

Professional disciplines represented on the TRCC include Traffic Engineering, Traffic Enforcement, Safety Planning, Emergency Medical Services, Education, Judicial, and Injury Prevention (Health).

The TRCC normally meets quarterly to discuss progress on recent Assessments and Strategic Plan. More recently the agenda has consisted largely of a review of progress on the TCAS Study, CIDRIS, CVARS, CODES, EMS Run Report, Toxicology Lab, Geospatial Council and other efforts. Progress has also been achieved in other areas under the oversight and coordination of the TRCC.

Recent Assessment/Action Plans include a Traffic Records System Action Plan in 2001, and Traffic Records Assessment in 2004. The 2006 Multi-Year Strategic Plan builds on those as well as other planning efforts.

A copy of the 2004 Traffic Records Assessment is available at the following Web-link.  
<http://www.accident-report.org/community/assessment.pdf>

### **Strategies:**

#### **Reaffirm Buy-in from Agency Heads**

Send a letter to agency heads with updated newsletter of accomplishments of the TRCC, with follow-up/reminder as to the roles and responsibilities of the TRCC. Obtain signatures for MOU (refer to Appendix F).

#### **Emphasize Importance of a Safety Data Project Manager**

Support efforts for a Traffic Records Project Manager to help provide oversight, and to promote ongoing communication and collaboration among 408 safety data projects.

## **Highway Safety Information System Leadership Workshop**

To further strengthen the TRCC, provide training materials to TRCC stakeholders, especially newer members to reaffirm their role on the TRCC and the importance of improved safety data systems in helping to save lives. Refer to Appendix C – Connecticut Traffic Records System Web Inventory, which contains information for each of the component areas in Connecticut’s Traffic Records System.

### **Assign oversight responsibility to the TRCC**

The TRCC should be responsible for maintaining continuing oversight over the implementation of the recommendations in this Strategic Plan.

### **Survey TRCC Stakeholders**

Survey TRCC members to determine financial assistance avenues (who is doing what in safety data systems development, monies that are committed), and how stakeholders can maximize their efforts. Provide members with NHTSA/GHSA TRCC Training Brochure/Materials for their review.

### **Implementation costs and timeframes – Program Area #8:**

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated cost</u>
Support Efforts for a TR Project Manager	2006-2007	\$100K/yr
Reconstitute TRCC	2006-2007	Minimal
Provide TRCC Training Materials	2006-2007	Minimal
Reaffirm Management Support	2006-2007	“
Survey TRCC Stakeholders	2006-2007	“

### **Program Area 9: Roadway Information**

#### **Attributes:**

Roadway information includes roadway location, identification, and classification, as well as a description of a road’s total physical characteristics and usage, which are tied to a location reference system. Linked safety and roadway information are valuable components in support of a State’s construction and maintenance program development.

Roadway information should be available for all public roads in the State whether under State or local jurisdiction. A location reference system should be used to link the various components of roadway information as well as other information sources (e.g., Crash/ Environment information, EMS records) for analytical purposes.

Roadway information should be updated as required to produce valid analysis. This implies that changes on the roadway (e.g., construction, sign improvements) should be available for analysis as soon as the project is completed.

In order to develop viable traffic safety policies and programs, roadway information must be linked to other information files through common identifiers such as location reference points. Integration should also be supported between State and local systems.

Location reference subsystem should support accurate identification of a crash location (refer to Program Area #1).

### **Findings - Connecticut:**

ConnDOT's primary linear reference system used for the State database is route and cumulative mileage. A GIS based reference system is currently in use, however, latitude and longitude is usually present only at the beginning of a route, end of a route, bridge location and signal location. Roadway mileage in the State that is reflected in the State roadway database includes a total of 21,089 roadway miles, including 4,065 miles of State/US/IR Roads, and 17,024 miles of City Streets.

Roadway inventory files, linked by route and milepost include, 1) Sign Inventory, 2) Traffic Signals, 3) Illumination, 4) Ramps, 5) Town Road Inventory, and 6) State Road Inventory, which includes road type, functional class, access control, average daily traffic, pavement information, improvement information, maintenance, bridge numbers, RR xing numbers, and many other details of information.

ConnDOT has a safety improvement program that is tied to its statewide accident reporting system. ConnDOT uses Oracle with MS Access for its master database file, while the database that is used for analysis is in ASCII, which is used to query, manipulate and report data. Information in the Roadway Inventory file is linked with other databases via ASCII files only.

The agency maintains over 400 reports/programs, which utilize both 512-column and 80-column formats for reported motor vehicle traffic crash data. The accident reporting system is used to add, delete, and update cases, reading and writing files in ASCII format.

Crashes on the State highway system are location coded by route and cumulative mileage allowing them to be used in conjunction with roadway files. Route and cumulative mileage information for the crash file is used with the location and average daily traffic (ADT) files to generate reports such as:

- TASR – an analysis of crashes at particular intersections or on particular road segments on the State highway system
- SLOSSS – which contains a listing of intersections and other locations that have experienced abnormally high crash rates.

Standard reports for the crash data that is contained in the State crash file include the Connecticut accident summary tables, which contain information on user groups or individuals, such as bicycle crashes, motorcycle crashes, occupant protection use, and other commonly requested information.

**Strategies:**

Promote the efforts of the Geospatial Council to develop a new State base map, and a statewide GIS. Help to coordinate efforts between the TRCC, the ConnDOT Geospatial working group and the Geospatial Council.

Continue to assess and adopt new technologies as appropriate, to improve data gathering, analysis, and dissemination capability.

Encourage local agencies to provide roadway inventory data by making these files easily available to the State in a user-friendly manner.

ConnDOT officials should address safety improvement program routines that are tied to the legacy output reporting system.

ConnDOT officials should serve as the lead in the proposed study in Program Area #2 for a Location Identification/Location Reference System for Highway Safety. This effort could function as a subcommittee to the TRCC with strong liaison to the Geospatial Council. Continue to implement program area recommendations in conjunction with other roadway/location related program area improvements.

**Implementation costs and timeframes – Program Area #9:**

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated cost</u>
Promote efforts of the Geospatial Council	2006-2007	Minimal cost to TRCC
ConnDOT to Assess/Adopt New Technologies/Roadway Inventory	2006-2008	Geospatial effort ongoing
Support Local Agency Efforts for Roadway Inventory Data	2006-2008	Road Inventory big cost item for ConnDOT
Address Safety Improvement Program Routines, tied to the Legacy Output Reporting System	2006-2009	Assess locals who have existing road inventories  Cost to re-program output reporting – ConnDOT

## **Program Area 10: Connecticut Impaired Driving Records Information System (CIDRIS)**

### **Attributes:**

The highway safety mission of the National Highway Traffic Safety Administration (NHTSA), as well as the State of Connecticut and other states is to reduce deaths, injuries, and economic loss resulting from motor vehicle crashes. Each year, more than 1.4 million drivers are arrested for alcohol-impaired driving, the number one cause of fatal crashes in the U.S. States bear the primary responsibility for enacting impaired driving laws and enforcing, adjudicating, and sanctioning those driving offenses.

A major concern of NHTSA has been the lack of current and accurate driver record information at the State level, making it difficult for law enforcement agencies, licensing agencies and others in the criminal justice system to make sound decisions on how to respond and take appropriate actions for these unsafe drivers.

In response, NHTSA developed a model for an Impaired Driving Records Information System and an implementation guide that allows for accurate, reliable, and timely exchange and transmission of data between the law enforcement agencies, the courts, and the DMVs. NHTSA's effort encompasses the totality of a State's efforts to generate, transmit, store, update, link, manage, report, and retrieve information on impaired driving offenders and citations.

### **Findings - Connecticut:**

Connecticut became the fifth state to receive funding to implement an impaired driving records information system, now referred to as CIDRIS. Previous states include Iowa, Wisconsin, Alabama, and Nebraska (refer to Appendix T).

Components of CIDRIS include:

- Electronic roadside data capture of traffic citations,
- Integration/interface of Judicial and DMV information,
- Integration/interface with Offender-based data, and
- Data warehouse/data repository – decision support system.

The CIDRIS project will lead to more timely and accurate driver, vehicle, and enforcement-adjudication information, and a records management and tracking system, enabling law enforcement, licensing, and criminal justice agencies, and others to better enforce, adjudicate, and impose sanctions against impaired driving offenders.

A CIDRIS <sup>5</sup>Project Manager (PM) will be assigned to the Office of Policy and Management (OPM), the managing agency for the State for CIDRIS. Responsibilities include:

- PM must drive the CIDRIS development effort,
- OPM must guide/oversee the PM, and

- TRCC/key stakeholders, including Motor Vehicles, Police Chiefs Association, State Police, Judicial, Highway Safety, and others must provide CIDRIS development oversight and guidance support.

Expected results of implementing CIDRIS:

#### Improvements

- Electronically automate the citation process, and
- Develop a centrally located decision support environment through the creation of a traffic citation adjudication tracking system.

#### Environment

- Real-time or near real-time transmittal from a citation's issuance to its disposition,
- Real-time or near real-time for law enforcement activity log and event messaging, and
- Just-in-time data access (standard data warehouse) for global and data mart uses.

#### Functionality

- Appropriately identify, charge and sanction impaired driving offenders, based on their driving history,
- Manage impaired driving cases from arrest through the completion of court and administrative sanctions,
- Identify target populations and trends, evaluate countermeasures, and identify problematic components of the overall impaired driving control system,
- Provide stakeholders with adequate and timely information necessary to fulfill their responsibilities, and
- Reduce administrative costs for system stakeholders and increase system efficiencies.

#### **Progress to Date:**

Work has focused on the refinement of the system development plans. Issues were identified that could have affected the successful implementation of CIDRIS, which were addressed and mitigated. To facilitate the refinement of CIDRIS, a CIDRIS Committee was formed, which included as applicable representatives from the following agencies:

Court Operations, Judicial Branch  
 Judicial Information Systems Division, Judicial Branch  
 Department of Motor Vehicles, Executive Branch  
 Department of Public Safety, Executive Branch  
 Connecticut Police Chiefs Association  
 Department of Information Technology, Executive Branch  
 Office of Policy and Management, Executive Branch  
 Department of Transportation, Executive Branch

Functions associated with highway safety, information technology, users at both the state and local levels, as well as planning, project management, and administration were brought together.

Coordination with the TRCC was facilitated through updates and reports at TRCC meetings. The following significant issues were addressed and tactical responses were developed.

Data Warehousing/Data Repository --- Further technical review of the proposal to expand the Offender Based Tracking System (OBTS) for the CIDRIS yielded concerns associated with users' intent relating to data access or data query functions. A re-engineering of the CIDRIS approach for data access and data query functions was completed. It was determined that a data repository approach be taken, to be further refined as part of the development of the request for proposal.

Hosting and Organization --- The capabilities and operational parameters of the Department of Information Technology (DoIT) and the Judicial Information System (JIS) were reviewed. Significant is the need to recognize the "24x7" characteristic of CIDRIS and law enforcement need for real time data. The Judicial Information System does not operate on a "24x7" basis; the Department of Information Technology does.

The need for real time access was affirmed and the Department of Information Technology would be the host for the CIDRIS. DoIT requires project profiles for initiating new projects. All IT projects must follow the project management methodology endorsed by DoIT.

Operational Locations --- Two different citation processes were reviewed. A DWI (driving while intoxicated) roadside situation generally involved a custody citation that would be initiated at a roadside location and would lead to a booking and a court appearance. Other citations generally involved paperwork being issued on the ticket at the roadside location, with the offender being on their way. Data for the form utilized to document the DWI circumstances is mostly captured as part of the roadside stop; it is important to collect the data elements as they occurred at the time of the stop and be tracked immediately at they are time sensitive. As a result, the electronic citation system needed to be applicable in both roadside settings and in law enforcement agency settings.

The developed application for the electronic citation system will need to be applicable in both a mobile or roadside environment and the police facility environment.

Electronic Citations/Data Elements --- The array of data elements currently associated with relevant other databases that could be included in CIDRIS was introduced. The use of identifiers also introduced, with the court processing occurring under a case number, which includes offender identification. The DWI processing in the Department of Motor Vehicles (DMV) identifies offenders by name and date of birth; operator license numbers are used for matching purposes.

It was determined that the focus associated with data elements for a citation data base, at this time, should be on the variety and types of data needed. Various data modules associated with the TraCS (Traffic and Criminal Software) system or similar systems would also be considered.

"Per Se" Reporting --- In reviewing the reporting of findings from the "Per Se" administrative process carried out by the Department of Motor Vehicles (DMV), it was explained that a hearing

officer indicates an “affirmation of suspension” in the driver history record, if the finding of the operation of a vehicle by a person with a blood alcohol content (BAC) is above the legally defined threshold. Concern centered on situations of what might be considered an open record, if no finding is indicated on the driver history record.

The use of a term, “suspension not affirmed”, or some similar term was determined to be important. It was recognized that this initiative would need to be included in the re-engineering of the driver or operator information system in the DMV.

Global XML --- The use of the Global JXDM, a comprehensive initiative within the justice community providing data models, data dictionaries, and XML (eXtensible Markup Language) schemas, was reviewed. The latest release, Version 3.0, increases the ability of justice and public safety communities to share justice information at all levels, laying the foundation for local, state, and national justice interoperability.

The development of CIDRIS is to utilize the latest applicable Global JXDM version. The applicability to the National Information Exchange Model (NIEM) will also be considered.

Commercial Vehicle Analysis Reporting System (CVARS) Project --- The relationship of CVARS and CIDRIS was reviewed, especially for the common capture of roadside data. Efforts in each project should be coordinated/integrated where it is feasible and to the extent possible.

Project Management --- In initiating the CIDRIS, project management for the development of the CIDRIS technology application was found to be required. In reviewing approaches for the preparation of the request for proposal, assistance in vendor selection, and managing the vendor work, an interfacing with the user community, a determination became evident that separate project management support was necessary. State agency resources were not available to provide for this function. Project participants, including the CIDRIS Committee, were concerned for having a successfully implemented impaired driver information system that could provide real time information from roadside locations.

To respond to this determination and need, the Highway Safety Office, in the Connecticut Department of Transportation (DOT) determined that project management could be funded from grant funding administered by DOT. An application for the assistance, for a two-year period in the amount of just less than \$300,000, was developed. Meetings with the Highway Safety Office to develop application for project management assistance provided an opportunity to assure consistency with other traffic records initiatives in DOT. CIDRIS and the associated project management will be together managed by the project officer.

Self-Sustaining --- Separately and in response to state guidelines for the operation of implemented systems, the project participants with the CIDRIS Committee explored mechanisms under which the CIDRIS operating costs could be self sustaining. The continued and sustaining operation of CIDRIS was determined to be significant in assuring ongoing support and the availability to users. Sustainability, in light of state resource allocations in times of reduced budgeting, is an item, which is reviewed in developing project profiles associated with information technology projects. Similarly, continuation and cost assumption are concerns

associated with the projects funded through the Highway Safety Office, in the Connecticut Department of Transportation (DOT).

Revenue resources to support the ongoing operations of CIDRIS have focused on fees and surcharges involving issued citations. The identified resource areas are:

- A surcharge for each issued citation,
- A processing fee (or surcharge) for each “per se” hearing,
- A fee (or surcharge/penalty) for impaired driving repeat offenders, and
- Financial support from the insurance industry or insurance industry institutes for information systems associated with impaired driving, provided there is no conflict with State or Federal ethics procedures or concerns.

Resources involving surcharges or fees will require legislative approval. Proposals for surcharges or fees will be developed in the next quarter to be submitted into an established procedure for legislative consideration of state agency requests. The proposals are for consideration in the 2006 legislative session. The parameters of the fees would be developed as a result of the RFP review process.

**Strategies:**

This program area (CIDRIS) has dependencies with other program areas, such as Location Identification, Electronic Data Capture, Traffic Records/Crash Data Warehouse, Driver/Vehicle Information, Citation/Adjudication Information, CVARS, and FARS. Continue to implement CIDRIS in conjunction with other identified targeted program area improvements.

**Implementation costs and timeframes – Program Area #10:**

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated cost</u>
Implement CIDRIS, including: E-Citation Data Capture Police Vehicle Hardware & Software	2006-2008	\$1.6 million
DoIT Project Profile, RFP	2006-2007	Included
SRD/General Design (CIDRIS)	“	“
Detail Design	“	“
Program Development Testing and Implementation	“	“
Hardware & Software	2007-2008	“
Project Management	2006-2008	\$300K

## **Program Area 11: Commercial Vehicle Analysis Reporting System (CVARS)**

### **Attributes:**

The Motor Carrier Safety Improvement Act of 1999 established the Federal Motor Carrier Safety Administration (FMCSA) and provided funding to improve data collection and analysis of traffic crashes involving large trucks. The focus of the Act was for States to address deficiencies in the reporting or recording of commercial motor vehicle crashes, by developing new or revised systems or procedures and/or policies to improve their reporting and recording procedures.

The goal of CVARS (Commercial Vehicle Analysis Reporting System), a joint development effort between FMCSA and NHTSA, is to improve the quality, completeness, timeliness and quantity of commercial motor vehicle crash data collected by the States. It is also the intent of CVARS to encourage states to explore and test new and proven methodologies and protocols, allowing for the rapid electronic exchange of crash data. Capturing more complete and accurate data leads to better identification of problem drivers and carriers, and provides a solid foundation of data on which safety analyses and program evaluation can be based.

### **Findings - Connecticut:**

The Connecticut State Police (CSP) received a <sup>6</sup>Federal Grant to electronically capture crash report data involving commercial motor vehicles (CMV).

To facilitate planning for CVARS, a Planning Committee was formed, which included as applicable representatives from the following agencies:

- Department of Motor Vehicles, Commercial Vehicle Safety Division
- Department of Public Safety, Division of State Police
- Connecticut Police Chiefs Association
- Department of Transportation, Transportation Safety Section
- Department of Transportation, Accident Records Section

Discussions were held regarding the current PR-1 Crash Reporting Form, and changes that would be required to meet the data requirements for CVARS. Discussion also centered on the need to coordinate electronic roadside data capture efforts with the CIDRIS project, so that any law enforcement officer, engaged in electronic crash reporting as well as electronic citation issuance from the roadside, could use the same data capture tools, without having to switch between different computing platforms.

Coordination with the TRCC was facilitated through updates and reports at TRCC meetings.

A pilot test of an electronic PR-1, capturing the required CVARS data is being planned by the Division of State Police, in conjunction with the ConnDOT Accident Records Section, and the Commercial Vehicle Safety Division, within DMV. The CSP's CAD/RMS vendor is expected to participate in the development of the electronic PR-1 for the CVARS pilot test.

Electronic cases will flow into a server at the CSP and could be transmitted directly to the DMV's Commercial Vehicle Safety Division (CVSD) for upload to SafetyNet. The choice of a crash data server (still to be determined) could also include the Department of Information Technology (DoIT), and/or ConnDOT. State agencies, such as ConnDOT would have access to the server to perform needed functions, such as detailed location identification to determine the route and cumulative mileage of crashes occurring on the State highway system.

The CSP, CVSD, ConnDOT, and DoIT continue to work in cooperation with plans to make crash reports involving commercial motor vehicles available in electronic format. Ultimately, this should eliminate numerous and repetitive data entry tasks and allow SafetyNet to be populated electronically.

Currently, the CVSD manually reviews all crash and field safety inspection reports prior to editing and data entry into the SafetyNet System. Data, which are entered into SafetyNet, are not recorded electronically on the State's main crash reporting system at ConnDOT.

In a recent evaluation by FMCSA of State-reported commercial motor vehicle crash and roadside inspection records for January 1, 2004 through December 31, 2004, Connecticut rated a score of **good**, using a scale of "poor", "fair", and "good." Connecticut has had a record of producing good commercial vehicle crash data, based in large part on the efforts of the CVSD.

FMCSA is currently sponsoring a one-day training course to demonstrate how the use of nationally-accepted terminology for commercial vehicle crash data reporting can be beneficial in the preparation of the State's crash report and in supporting the State's reporting guidelines. For additional training regarding all crash reporting, E-crash reporting, etc., refer to the program area for Crash Report Training.

One area that will merit further attention during CVARS implementation and training will be to eliminate differences in definitions for reporting commercial motor vehicle crashes (refer to Appendix I). Though minor, differences between a CVSD brochure, 1994 and 2001 versions of the PR-1, and recommendations by FMCSA need to be coordinated so officers, reporting under CVARS, are working from the same set of guidelines. Ultimately, CVARS will lead to commercial motor vehicle crash data that is even more timely, complete, and accurate. For additional information on the FMCSA evaluation, go to:

<http://ai.volpe.dot.gov/SafeStat/staterating.asp>

### **Strategies:**

Continue to implement CVARS recommendations in conjunction with Location Identification, Crash, Training, Citation, CIDRIS, FARS, and other related targeted program area improvements.

Implement E-Crash Reporting for Commercial Motor Vehicle Crashes

- CVARS Pilot
- Utilize CSP – RMS
- Training (FMCSA)

- CSP or DoIT Server

Implement Uploading of Commercial Vehicle Crash Data to SafetyNet

- CSP or DoIT Server
- Transmit Data to DMV/CVSD
- Upload crash data to SafetyNet

**Implementation costs and timeframes – Program Area #11:**

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated cost</u>
CSP Pilot	2006-2007	CSP effort:
E-Crash Data Capture/CSP-RMS	2006-2007	• RMS – application for CVARS; # of vehicles equipped; pilot effort, etc.
Police Vehicle Hardware & Software	2006-2007	• Determine existing use of locator/diagramming tools
CSP Server/DoIT Server	2006-2007	
Upload to CVSD/SafetyNet	2006-2007	
Crash Report Training	2006-2007	
Total		\$250K

**Program Area 12: Fatality Analysis Reporting System (FARS)**

<http://www-fars.nhtsa.dot.gov> Web-Based Encyclopedia

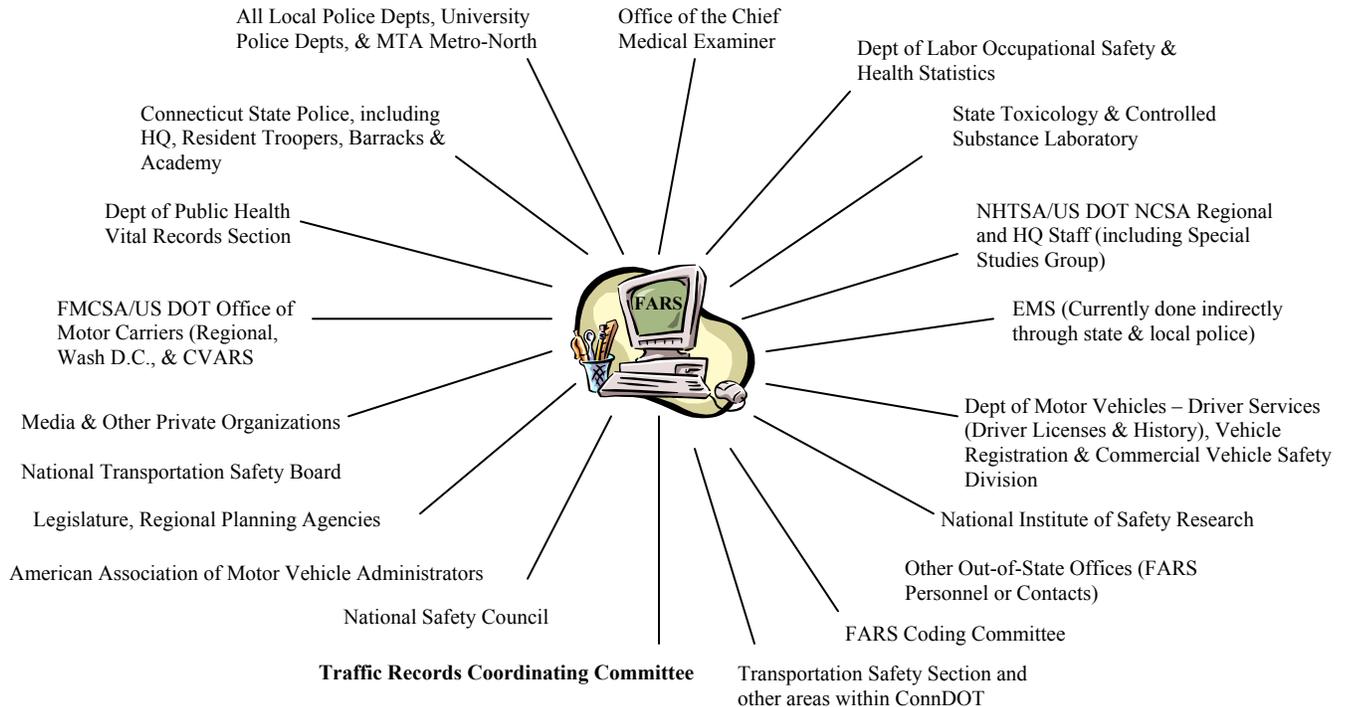
**Attributes:**

The Fatality Analysis Reporting System (FARS) contains data on a census of fatal traffic crashes within the 50 States, the District of Columbia, and Puerto Rico. To be included in FARS, a crash must involve a motor vehicle traveling on a traffic way customarily open to the public and result in the death of a person (occupant of a vehicle or a non-occupant) within 30 days of the crash. FARS has been operational since 1975 and has collected information on over 989,451 motor vehicle fatalities and collects information on over 100 different coded data elements that characterize the crash, the vehicle, and the people involved.

It is the mission of NHTSA to reduce the number of motor vehicle crashes and deaths on our nation's highways, and subsequently, reduce the associated economic loss to society resulting from those motor vehicle crashes and fatalities. FARS data are critical to understanding the characteristics of the environment, trafficway, vehicles, and persons involved in the crash.

NHTSA has a cooperative agreement with an agency in each state government to provide information in a standard format on fatal crashes in the state. Data are collected, coded and submitted into a micro-computer data system and transmitted to Washington, D.C. Quarterly files are produced for analytical purposes to study trends and evaluate the effectiveness highway safety programs.

## Fatality Analysis Reporting System



### Findings - Connecticut:

Within the State of Connecticut, the FARS Analyst is located in the Accident Records Section in ConnDOT. As the above diagram illustrates, the FARS Analyst cultivates the involvement of many stakeholders in order to compile the most comprehensive picture of each fatal motor vehicle traffic crash that occurs. EMS dispatch, arrival on scene and arrival at hospital times are collected and entered into the FARS database. A Fatal Accident Supplement (PR-2) is used to obtain this information for FARS.

Approximately 275-300 motor vehicle crashes are added to the FARS database each year. There is usually a 3-4 month delay in adding reports to the file. The FARS database is compared with the State database for accuracy. There are always a few exceptions due to the classification “criteria.” Information regarding alcohol or drugs suspected can be delayed if officers do not have the additional paperwork to back it up. In reporting fatal motor vehicle crashes, officers are sometimes hesitant to record certain information on the PR-1 crash report, or even submit the PR-1 to the Accident Records Section if there happens to be uncertainty, extenuating circumstances, and/or an investigation is still open. This year has seen a rise in outstanding fatalities with a dozen fatal crashes for calendar year 2004, some of which have still not been reported.

Persons with access to the FARS data for on-line queries and analysis include ConnDOT as well as other State and local agency staff, and the public/private sector.

## Strategies:

There are several changes expected in the way certain cases will be coded for the year 2006 (i.e., Parked vehicles). FARS has not included these vehicles in the past, but with growing interest in vehicles striking commercial motor vehicles parked on the shoulder, as well as issues with select makes of vehicles, FARS will be entering information regarding these vehicles in 2006.

FARS is also looking to get all states on-board with FastFARS (a real-time data linking system) in the near future. This improvement may be problematic, given the fact that the State has had a tough time this year completing the previous calendar year's worth of fatals.

The purpose of FastFARS is to provide basic crash information to agency managers in near "real-time" on qualifying crashes, provide near "real-time" notification of fatal crashes to NHTSA, and reduce the reporting time of crashes during holiday periods.

The success of FastFARS depends on reliable and timely fatal crash notification within each State, timely and accurate reporting of fatal crashes by each State to NHTSA, and compilation of State reported fatality counts into a National total.

This program area (FARS) has dependencies with most of the other program areas. Continue to implement FARS program area recommendations in conjunction with other targeted program area improvements.

## Implementation costs and timeframes – Program Area #12:

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated cost</u>
Provide Support to the State's FARS Function, Seeking Improvements:	2005-2006	Minimal cost to State
Coding Changes for 2005	2005-2006	"
Support FastFARS Implementation by Promoting Interagency Collaboration of FARS Data Providers	2006-2007	Cost to provide support to FARS to obtain 'fast' reporting of fatal crashes

## **Program Area 13: Injury Surveillance System – ISS/CODES/EMS Information**

### **Crash Outcome Data Evaluation System (CODES)**

#### **Attributes:**

The Crash Outcome Data Evaluation System (CODES) Project generates linked motor vehicle crash and injury outcome data. This linkage is important because each data system lacks sufficient information to completely describe both crash characteristics and injury outcomes, particularly related to the use of safety countermeasures such as safety belts, bicycle and motorcycle helmets, and child restraints.

Police crash data includes information that describes the injured and uninjured occupants in terms of their utilization of safety countermeasures, but not their medical outcomes or the financial consequences of their injuries. Injury data provide information about types and severity of injuries and total hospital charges but lacks important information about the crash.

Given the limitations of the individual data sets, data linkage combines the benefits of both types of data and generates population-based outcome information to better characterize crashes and their associated costs. Differences in injuries, injury severity, required hospital admission, and total charges can be compared for those using safety countermeasures and those who do not. Thus, the full impact of the effectiveness of highway safety and injury control initiatives directed at specific crash, vehicle, and person characteristics can be accurately determined.

Use of linked crash and injury data will guide the initiatives surrounding motor vehicle and pedestrian safety that are conducted by the Department of Public Health, its partners, and other agencies and organizations concerned with traffic safety. In the future, the outcomes of this project will reap better traffic safety, and less injuries and deaths from crashes in Connecticut.

#### **Findings - Connecticut:**

Connecticut was originally funded in 1997 to conduct the CODES project. Since that time, changes in personnel, agency priorities, and funding have impacted the project. Connecticut did not receive funding in response to its first application to become a Data Network state. Therefore, CODES activities were reprioritized.

The Department of Public Health (DPH) was recently awarded funding for a period of five (5) years from NHTSA to support the CODES project in Connecticut. DPH received Data Network funding in September 2004 and resumed project activities. CODES transitioned to a new division within the DPH, and the new project staff person is currently linking 1999 data.

As a Data Network state, Connecticut provides data to NHTSA in order to support its research efforts at the national level. Topics of interest to NHTSA typically encompass the following areas:

- 1) Health care charges (e.g., pre-hospital, emergency department, inpatient, rehabilitation) by payer source (e.g., private, Medicare, Medicaid) associated with the consequences of motor vehicle crashes, and
- 2) Crash injury patterns by type and severity, and charges, analyzed by use of safety countermeasures and person, crash, and geographical characteristics.

Research projects will be one of the top priorities for CODES as well as NHTSA.

Lack of adequate staff has significantly impacted the progress of the CODES Project. Due to agency reorganization, several personnel initially assigned to the project were reassigned to other projects. Since September 2004, one staff person has been responsible for all technical and administrative pieces of the project. However, this staff person also has responsibility for several other public health surveillance and data analysis projects. If capacity was increased to provide for additional technical support, the project could be expanded greatly. At least one full-time, dedicated staff person would greatly enhance the capability of the program to operate at an optimal level.

Considerable delays have been faced in obtaining more recent hospital inpatient and emergency department data (2000-2004). Use of the most current data is critical for meeting health and safety needs by assessing present risks, which will help guide efforts to improve traffic safety. Linkage of the most recent data will begin immediately upon its receipt.

### **Emergency Medical Services (EMS) Run Data**

#### **Attributes:**

EMS run reports, along with crash reports are the first critical steps in the identification of a community's injury problem, and in turn, the identification of cost-effective countermeasures which can positively impact both the traffic safety and health communities. The use of the 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.

#### **Findings - Connecticut:**

The Office of Emergency Medical Services, Department of Public Health (OEMS/DPH) is in the process of Beta testing a new EMS Data Collection System (EMS DCS). The system uses Tablet PC based data entry. The Data will be transmitted electronically to the Emergency Department (ED) where it can be printed and added to the Receiving hospital database. When the ambulance returns to the EMS service base, the electronic run form will be uploaded to the EMS service computer where the data will be sent to the sponsor hospital if different from the receiving hospital, the EMS service-billing agent (if they bill) and to OEMS/DPH.

Beta testing is scheduled for completion in the fall of 2006, and statewide use is expected to begin on January 1, 2007. No service is mandated to use the provided system, but all services are required to submit electronic run reports in the National Emergency Medical Services Information System (NEMSIS) format.

The EMS DCS data will be linked to ED and Inpatient Discharge data in order to obtain a definitive diagnosis to allow proper data analysis. In addition, the EMS DCS data can be used in the CODES system.

For additional information regarding EMS activity reports, and EMS run forms, go to:

[http://www.dph.state.ct.us/OHCPHHO/EMS\\_Office/pages/data\\_main.htm](http://www.dph.state.ct.us/OHCPHHO/EMS_Office/pages/data_main.htm)

### **Injury Surveillance System (ISS)**

#### **Attributes:**

Injury Surveillance is the ongoing process of tracking and monitoring incidence rates, causes, and circumstances resulting in fatal and non-fatal injuries and dissemination of this data for injury prevention.<sup>7</sup> Injury surveillance enables state health departments and other organizations to assess need for specific prevention programs and policies and evaluate their effectiveness.

The Association of State and Territorial Injury Prevention Directors Association (STIPDA) and the Centers for Disease Control (CDC) have developed recommendations for injury surveillance for state health departments. These include 14 specific types of injuries and injury risk factors, including motor vehicle crash injuries. Recognizing that no single data set provides sufficient information for planning and evaluating injury prevention initiatives, 11 core data sets have been identified. These include vital records (death certificates), hospital discharge (inpatient hospitalizations), emergency department (ED), EMS/Ambulance run reports, motor vehicle crash reports, FARS reports, Behavioral Risk Factor Surveillance System (BRFSS), Youth Risk Behavior Surveillance System (YRBS), occupant protection use surveys, uniform crime reports, and medical examiner. The STIPDA report notes that most state health departments do not yet have the recommended injury surveillance capacities.<sup>8</sup>

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 Injury Surveillance System (ISS) should allow the documentation of information which tracks magnitude, severity, and types of injuries sustained by persons in motor vehicle related crashes. The ISS should support integration of the ISS data with police reported traffic crashes. The EMS run reports, crash reports, and roadway attributes are the first critical steps in the identification of a community's motor vehicle injury problem, and in turn, the identification of cost-effective countermeasures which can positively impact both the traffic safety and health communities.

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 ISS should be integrated into the injury control programs within traffic safety, and other safety-related programs at the State and local levels.

### **Injury Surveillance Systems Information Quality**

Ideally, the medical data on an injury should be available within an ISS in the same time frame as data about the crash is available. However, the medical record on the individual may be incomplete initially because local protocols dictate that the medical record is only placed in the ISS when the patient leaves the health care system. Every effort should be made to integrate the ISS record with the crash data as soon as the medical records become available. The CT Department of Public Health does not own two major sources of medical data; the hospital discharge and ED data sets. The process of purchasing these data sets can add additional delays in accessing timely data.

The reporting of EMS run data, hospital ED and inpatient data, and trauma registry data, should be consistent with statewide formats that follow national standards such as ICD-9-CM, ICD-10-CM, Injury Severity Scale standards, etc.

Recognizing the issues of patient and institutional confidentiality, there should be mechanisms in place to balance the demands for data accessibility from end users and the requirements of State and local privacy rules. At a minimum, the traffic safety and injury control communities should be able to access these data in summarized reports designed to address specific needs, including injury type and severity cost data. Ideally, the system should support the creation of “sanitized” extracts of the ISS data for use in research, problem identification, and program evaluation efforts.

The true power of the ISS is recognized when the ISS data are integrated with other traffic records system data such as traffic crash, roadway and crime data, as well as internally between EMS runs, hospital inpatient, and ED data. The ISS should be implemented in a fashion that supports this integration as efficiently as possible. The use of common identifiers whenever possible within the traditional traffic records system and ISS data systems will facilitate such an integration effort. Often GIS systems provide the ideal platform for interpretation of the ISS and traditional traffic records system data.

### **Findings - Connecticut:**

In August 2005, the CT Department of Public Health (DPH) received an Integrated Core Injury Prevention Program Grant from the Centers for Disease Prevention and Control (CDC). The purpose of this funding is to build Injury Prevention capacity in the state health department and to integrate injury surveillance with planning and prevention activities. Year One objectives will include 1) analysis of injury related data sets including mortality; hospital discharge and emergency department and development of an injury data report, 2) development of a multidisciplinary injury planning group, 3) development of a comprehensive data driven state injury prevention plan, and 4) an injury symposium to promote implementation of specific plan

recommendations. Over the course of the 5-year grant, the Injury Program will work with partners including the traffic safety community to implement state plan recommendations.

Prior to this grant the DPH Injury Prevention Program had very limited resources for injury surveillance and data analysis to meet its own needs, or fulfill requests from communities, state agencies, and injury related collaboratives. This grant should increase the Program's capacity to meet the CDC/STIPDA recommendations for state injury surveillance, including analyzing multiple injury data sets, linking data sets where feasible and providing injury surveillance data on an ongoing basis. The Injury surveillance system will benefit DPH injury prevention initiatives and other agencies and organizations concerned with injuries.

### **Strategies:**

This program area (ISS/CODES/EMS) has dependencies on program areas related to Location Identification, Crash Reporting, Driver/Vehicle Information and FARS. Continue to implement program area improvements in conjunction with other targeted program area improvements.

Continue to develop injury surveillance capacity and to integrate injury surveillance with prevention programs

Continue to implement CODES

Continue to implement electronic EMS run reporting

In the future, there are several ways in which the CODES project can be greatly enhanced. Such opportunities include:

- Increasing program capacity through additional staffing,
- Enhancement of data systems. As the crash data are improved through electronic data capture efforts, information currently lacking in the electronic data set such as names and addresses of involved persons and VIN numbers for involved vehicles will improve linkage results and expand opportunities for data analysis,
- Expansion of the PR-1 to include information such as gender for passengers and pedestrians, whether injured persons were transported to a medical facility, and increased detail on the type of occupant protection used, particularly for the type of child restraint used,
- Linkage of crash and hospital data sources to EMS data. Once available, the EMS data will include all emergency medical service runs in Connecticut. This data will be an important addition to the data sets used for linkages, providing valuable information about the transport of injured persons from the crash location to a given hospital,
- Expanding linkage efforts to include other data sources such as mortality, trauma registry, and medical examiner data,
- Linkage to ancillary data sources (e.g., DMV driver and vehicle data) to provide additional data for linkage and/or analysis. Currently, linkage of the crash file to ancillary data sources (if available) would be limited because identifying information (names, addresses) is not recorded electronically, and

- Development of a CODES Advisory Committee Advisory Committee consisting of agencies and organizations with an interest in using the data. The Committee will provide input for potential analysis and uses of the linked data.

**Implementation costs and timeframes – Program Area #13:**

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated cost</u>
Provide appropriate (sanitized) EMS Data for TR Crash Data Warehouse	2006-2008	Provide EMS data to data warehouse, SRD, Prog Area #4
Continue development of ISS/ Develop/maintain Injury Planning Group Develop data driven Comprehensive State Injury Prevention Plan Provide ISS data to users for assessment and evaluation	2006-2010	CDC funded Integrated Core State Injury Prevention Prog Grant
Implement CODES Conduct Research Study Increase Research Support	2006-2009	\$50K/year
Increase Capacity Hire Edipemiologist (salary + fringe)	2006	\$86K/year
Implement electronic EMS run reporting	2007-2008	Assess current experience; Number of vehicles equipped, etc.

**Program Area 14: Data Analysis – Problem Identification**

The purpose of a State's traffic records system is to establish a base of information and data that is available and useful to its customers. This includes operational personnel, program managers, program analysts, researchers, policy makers, and the public. To be of optimal value, the system should provide for the efficient flow of data to support a broad range of traffic safety and other activities. The traffic records system should support the data needs of users at all levels of government (State and local), as well as the private and the public sectors. The information requirements of this broad and diverse group are driven by both the need for operational data, as well as the need for data for planning and evaluation purposes.

## **Attributes:**

State and local offices have a need to analyze traffic records for numerous purposes. The State's traffic records system should be available to authorized users, beginning, at a minimum with the stakeholder agencies included on the Traffic Records Coordinating Committee (TRCC).

Fiscal limitations make it imperative that existing resources be used as efficiently as possible. Traffic safety programs should be accountable for demonstrating their impact. This places demands on the traffic records system for information to monitor progress and to evaluate the impact (e.g., changes in alcohol-related injuries as a result of an enforcement effort, monitoring the number of crashes during a construction zone project, etc.)

Data-driven planning decisions within the highway and traffic safety communities necessitates identification of trends and baseline measures. In order to identify safety problems and trends, the traffic records system should provide comparable data, over time, that can be easily linked and analyzed, and that allows for easy access of the data by a wide range of users (e.g., State Traffic Safety Offices for development of the highway safety plan, local law enforcement agencies for force deployment purposes, etc.).

## **Reporting/Data Analysis**

Through a combination of information sources, technical staff, and public record access policies, the traffic records system should be capable of producing scheduled and ad hoc reports. The media, advocacy groups, safety organizations, the general public and internal (State and local) users have requirements for regular reporting as well as for unanticipated ad hoc reports and data extracts. There should be a procedure in place for establishing what data can be made available to public and private sector users consistent with the laws protecting individual privacy and proprietary information. Examples of data analysis capabilities/software that should be available include:

### **Data Selection**

The ability for an authorized user to log on to the State's Internet site to submit queries to the State crash records data files. Query results may be returned to meet the import requirements of a data analysis software package (so statistical analysis of the data records may be performed).

### **Ad Hoc Analysis**

As mentioned earlier, State, county, and municipal highway safety practitioners at times have a need to analyze crash records for purposes not supported by programmed functions provided in the state crash records system. These stakeholders should be able to select and download crash records to their respective systems to provide the raw data for such analysis. Tools are currently available to allow users to produce such downloaded sub-sets of data, re-sort records, generate (or find) useful data, and summarize specified fields based on values in another field.

## **High Hazard Location/Section Analysis**

High-Hazard analysis functions should be available to all authorized users through the State's Internet site. Data analysis should be performed regularly to identify new high hazard locations, and to assess the value of previously applied safety improvements. Analysis is invaluable when previous high hazard locations have been improved, providing proof to the citizens and visitors of the state and municipalities of the value that safety improvements make to on-the-road safety.

## **Bi-variate Analysis**

Data selection, high hazard, and bi-variate analysis utilize the entry of crash records selection criteria that match data fields stored in any number of source data tables (using a form of data-mining) to cross-match data records.

## **Form and Image Printing**

A standard motor vehicle crash form can be printed for any crash record in the database, selected via any of the data selection software, mentioned above. The format is essentially the same as the field entered crash report with all data computer printed. All images (drawings, photos, etc.) attached to the original crash report should be available for display and printing.

## **Data Exchange and Sharing**

Crash records and images may be saved as a data file for FTP (file transfer protocol) transmittal or for CD (compact disk) burning, using the Data Exchange Utility. The data records or images output may also be output as PDF (Portable Document Format) or HTML (Hypertext Markup Language), ready for printing on a local or network printer, or posted to a web site, or e-mailed. Authorized users sign on via the Internet to make their record selection. Public access via Internet accepts requests for individual crash records, with output as PDF.

## **Training Needs Analysis**

Throughout the data gathering, interpretation, and dissemination process, there is a continuing need for training and technical support. A training needs analysis should be conducted for those highway safety professionals involved in program development, management, and evaluation. Training should be provided to fulfill the needs identified in this analysis. There should also be an ongoing outreach program for users of traffic safety program information to assure that all users are aware of what data are available and how the data can be used for their traffic safety information requirements.

## **Findings - Connecticut:**

Within ConnDOT, standard reports for the State crash file include the Connecticut Accident Summary Tables, which contain information on user groups or individuals, such as bicycle crashes, motorcycle crashes, occupant protection use, and other commonly requested information. The annual Connecticut Traffic Accident Facts book is also produced.

The Transportation Safety Section (TSS) accesses data from various traffic records files. Breath test machine results from the State Toxicology Lab are sent to TSS. Crash data is obtained from the Accident Records Section in ConnDOT, Inventory/Planning and FARS.

Output available from the State crash file includes annual crash summary reports, and print outs from special requests. ConnDOT has a safety improvement program that is tied directly to its statewide accident reporting system. Accident data is good on State owned roadways compared to local roads. Crash data for local roads is only added to the State database for crashes involving injuries. Information pertaining to property damage only crashes is not captured.

To meet the information needs for crashes occurring on local roads, many local law enforcement agencies maintain their own crash files for analysis. They utilize these data primarily for enforcement programs, identification of high crash locations, to answer questions from their local governing bodies and engineering staff, and to respond to insurance requests and for court appearances.

## **Strategies:**

A data warehouse for Traffic Records/Crash Records is presented in Program Area #4, and a data warehouse/data repository for Citation/Impaired Driving Records is presented in Program Area #10. It is possible that these different traffic records files could ultimately reside in the same data warehouse along with other safety data files. This type of traffic records system design and realignment will greatly enhance users' access to a variety of safety data files for conducting analysis.

Recommended steps include ready access for highway safety planning (ability to log on to a Web site and be able to initiate queries for various scenarios -- i.e., motorcycle DUI crashes in Hartford County, January-June, by BAC, severity of injuries, etc.).

It is recommended that the State install public domain software tools, such as CARE, or other comparable system to enable users with powerful and easy to use data query and data analysis tools.

## **Install CARE Software for Data Analysis <http://care.cs.ua.edu>**

This would require that State acquire the services of the University of Alabama to convert any new electronic crash files as well as legacy crash files into the Critical Analysis Reporting Environment (CARE) format (refer to Appendix O). CARE should be installed for access to new data warehouses mentioned earlier.

In addition to the installation of CARE for the crash and citation/impaired driving record files, other files should be considered for future conversion into the CARE analysis format, i.e., driver, vehicle, injury prevention, etc. CARE could have special application for data systems, such as the Crash Outcome Data Evaluation System (CODES), which is somewhat limited to detailed statistical analysis software users. This could be beneficial at a time when NHTSA is looking for additional non-traditional state and local highway traffic safety practitioners, who might benefit from use of CODES.

Options contained in the CARE data analysis tool set are incorporated into Windows that guide the user to their desired output. By following the directions provided, users obtain information on the screen or at the printer. CARE exists in two platforms: desktop and Web. The CARE desktop is designed to operate on PC-compatible microcomputers under all recent versions of Windows (e.g., 95, 98, NT, 2000, ME). CARE provides several major advances that facilitate problem identification. By producing information in a matter of seconds directly to the decision-maker, queries can be modified immediately, giving users the ability to hone in on exactly what they want.

**Develop a Problem Identification Manual**

The Problem Identification Manual contains a step-by-step process for analyzing crash data to identify highway safety problems. It contains a section on the various problem areas such as pedestrian, alcohol, youth, etc., describing these problems and how to use the crash file to describe the specific problem. It also contains a chapter on how to use the CARE software package to analyze crash data. Sample performance measures are also provided in the Manual.

**Provide Access to Additional Users**

As part of the Traffic Records/Crash Data Warehouse (Program Area #4), it is recommended that additional users (State and local) have access to the crash and other data via the Internet or the warehouse server for data selection, analysis, etc., as defined in the Straw Model Attribute above.

This program area (Data Analysis/Problem ID) has dependencies with most of the other program areas.

**Implementation costs and timeframes – Program Area #14:**

<u>Recommendation</u>	<u>Timeframe</u>	<u>Estimated Cost</u>
Install CARE Software	12 months 2006-2007	\$60K
Training Needs Analysis	2006-2007	Minimal
Develop Problem Identification Manual	2007-2008	\$50K
Promote Existing Training	2007-2008	Minimal

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NOTE: The actual content for the appendices is contained in a separate document

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<sup>1</sup> MMUCC is the Model Minimum Uniform Crash Criteria; XML is extensible Markup language.

<sup>2</sup> NHTSA “working document” designed to provide a basis for State Traffic Records System development/improvements.

<sup>3</sup> Estimate of 29,000 Local Road PDO crashes not included in state crash file; based on PDO to Injury crash ratio (2.3925) for State Highways (X) local road Injury crashes for 2002 (12,114) = approx. 29,000.

<sup>4</sup> For more information on TraCS, sponsored by NHTSA, FHWA, and FMCSA, visit [www.dot.state.ia.us/natmodel/tracs.htm](http://www.dot.state.ia.us/natmodel/tracs.htm)

<sup>5</sup> CIDRIS project management support provided by the Transportation Safety Section, ConnDOT.

<sup>6</sup> Commercial Vehicle Analysis Reporting System (CVARS) – [www.fmcsa.dot.gov](http://www.fmcsa.dot.gov).

<sup>7</sup> State and Territorial Injury Prevention Directors Association. “Consensus Recommendations for Injury Surveillance in State Health Departments.”

<sup>8</sup> State and Territorial Injury Prevention Directors Association. “Consensus Recommendations for Injury Surveillance in State Health Departments.”