Roadway Safety Professional Capacity Building Program

Through engaging peer workshops, the RSPCB Program matches agencies seeking solutions to roadway safety issues with trailblazers who have addressed similar challenges and emerged with a roadmap and noteworthy practices for approaching the issue.

U.S. Department of Transportation
Federal Highway Administration

University Data Partnership Peer Exchange

In March 2012, the Connecticut (CTDOT) and New Mexico (NMDOT) Departments of Transportation met in Baton Rouge, Louisiana for a two-day peer session dedicated to exploring the intricate 12-year safety data partnership between the Louisiana Department of Transportation and Development (LADOTD) and Louisiana State University's (LSU) Highway Safety Research Group (HSRG) (see Appendix A for a complete list of participants). While CTDOT's and NMDOT's goals were slightly different, each wished to advance their electronic crash reporting efforts and develop more comprehensive and collaborative relationships with their respective state universities to collect, store, and analyze crash data.

This report summarizes the key lessons from this dynamic peer exchange and highlights the progress made by each agency in advancing their data partnerships.

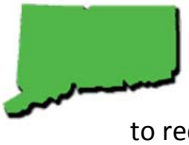
Crash Data: The Key to Better Safety Programs

Because there are no uniform guidelines that dictate how states collect crash data, collecting, storing, analyzing, and accessing accurate and uniform crash data has led to a variety of challenges for the agencies responsible for these tasks, in many cases, state DOTs. States have a variety of models for managing these processes, so finding a successful model that best meets specific state needs can be challenging. Some state DOTs have turned to universities to help manage crash data due to the university expertise, staffing flexibilities, and IT capabilities, but building a successful data partnership is not an easy task. It requires dedicated leadership on both sides, a strategic and prioritized approach, and checks and balances to ensure data integrity and security. By studying the best practices developed during LADOTD's 12-year partnership with LSU, CTDOT and NMDOT hope to avoid pitfalls and advance their university crash data partnerships quickly and effectively.

Some states have turned to universities to manage crash data due to university expertise, staffing flexibilities, and IT capabilities, but building a successful data partnership isn't easy.

The Agencies

At the time of the peer exchange, both Connecticut and New Mexico's data programs were in a state of transition. CTDOT's had a 14-month backlog for entering crash data and the agency was evaluating opportunities to share responsibility for data entry with the University of Connecticut (UCONN). NMDOT, on the other hand, had a minimal backlog but was preparing to transition responsibility for data collection from the New Mexico Corrections Department (NMCD) to the University of New Mexico (UNM). This transition was expected to result in a short-term backlog, but would offer the opportunity for New Mexico to revamp its data program.



Connecticut

Connecticut requested the peer exchange to gather information for implementing recommendations detailed in a Crash Data Improvement Program (CDIP) review, including actions to reduce its data entry backlog. CTDOT also wanted to gather feedback from Louisiana's experience to determine the extent of UCONN's potential role in collecting, managing, and analyzing Connecticut's crash data.

CTDOT's goal for the event was to understand whether Louisiana's model of collaboration would be adaptable to a relationship between CTDOT and the UCONN. In particular, Connecticut wanted to focus on:

1. **Program management,** including business structure, formal agreements, staffing, and costs; and
2. **Technical capability**, including data warehouse structure, electronic reporting, data analysis, and data sharing between LADOTD and LSU.

New Mexico

NMDOT wanted to participate in the event because, at the time, they were planning to transition responsibility for collecting, reporting, and analyzing crash data to UNM. NMDOT planned to use this transition as an opportunity to revamp its crash data program; in particular NMDOT wanted to migrate its paper crash report to an electronic submission system through the Traffic and Criminal Software (TraCS). NMDOT planned to use peer exchange lessons to facilitate the development of a more automated, electronic, and interoperable crash data system to improve the timeliness, accuracy, completeness, and consistency of its data.

Louisiana

Both Connecticut and New Mexico wanted to glean best practices from LADOTD's data partnership with LSU/HSRG, which evolved over a period of more than ten years and included the development of a proprietary electronic crash reporting system, called LACRASH, used across the state. LACRASH helped transition the state from paper reporting to a primarily electronic reporting – by the end of 2012, more than 90% of all crash reports in the State were being filed electronically – saving the agency both time and money and essentially wiping out the problem of report backlogs.

Today, LSU's Highway Research Safety Group has become an integral part of LADOTD with 14 full-time employees and 12-20 graduate research students. Responsible for much more than data entry, HSRG is led by a statistician with experience evaluating seatbelt laws, red light cameras, and other legislative issues. This partnership not only offers LADOTD a scalable and robust data program, but also provides the agency with access to cutting-edge technology, through HSRG's research and experiments.

Through a three-year renewable contract, full-time HSRG employees are responsible for:

- Installing, providing support for, and training police officers to use LACRASH;
- Developing business intelligence applications;
- Improving crash geo-location and performing data validation;
- Working with law enforcement agencies to distribute and trouble-shoot GPS units and driver's license scanners;
- Developing and programming websites and applications;
- Conducting GIS research;
- Maintaining HSRG's server and network; and
- Writing and managing grants.

More than **90%** of Louisiana's crash reports are filed electronically.

LADOTD uses data from LACRASH in all aspects of its safety program. LADOTD uses its data to identify needs for both spot improvements and systematic countermeasures through its Highway Safety Improvement Program (HSIP). HSRG has developed a website dedicated to data related to Louisiana's Strategic Highway Safety Plan (SHSP), given the data-driven nature of the plan. Louisiana also shares its data with local governments, Metropolitan Planning Organizations (MPOs), and the Louisiana State Police. These groups can request access to the data repository or can receive a file with all available data.

Louisiana has a goal of zero fatalities and improvements in its data systems are helping the State reach its goal. Fatalities in Louisiana have dropped from 992 in 2007 to 680 in 2011, even though Vehicle Miles Travelled (VMT) has remained relatively stable.

Workshop Design

To make the most of the two-day workshop, the participating agencies met virtually several times prior to the event to share background information about Connecticut and New Mexico's crash data programs, identify common objectives, and develop a list of questions for LADOTD and HSRG to address in their presentations. The workshop was designed to encourage conversations on best practices that support successful roadway safety data partnerships between State DOTs and universities (see Appendix B for the agenda). The workshop discussions focused on staffing, institutional, and funding issues related to university-DOT partnerships; safety data entry, data quality, and warehousing; business intelligence and GIS applications; and the relationship between crash data and the Highway Safety Improvement Program (HSIP) and Strategic Highway Safety Plan (SHSP). The workshop also provided dedicated time for Connecticut and New Mexico to develop action plans. During the action planning portion of the workshop, representatives from Connecticut and New Mexico separated and met independently with staff from LSU, LADOTD, and FHWA to discuss how they might apply the insights from Louisiana to the State's data program. The action planning session ensured that technical and program management staff found agreement on an approach to data program improvement. Following an initial action planning session, technical and program management staff met separately to hold more in-depth conversations about their relevant areas. In addition to the selected representatives who were able to attend in person, key staff from Connecticut and New Mexico participated in conversations via teleconference, video conference, and webinar to involve all critical parties while minimizing travel costs. The technical breakout focused on data entry, data quality, and warehouse structure; crash mapping and other data visualization; and data analysis and accessibility. The program management breakout focused on the details of agreements, contracts, and business processes between LADOTD and HSRG; staffing arrangements; and funding. Louisiana also arranged an onsite tour of the HSRG facilities so that all participants could see the data gathering process in action.

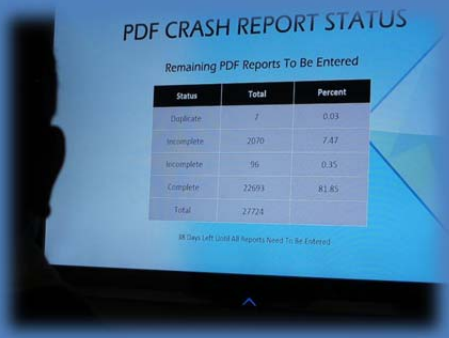
Behind the Scenes at LSU's HSRG

Student data entry and map-spotting stations. Dual monitors increase productivity, allowing data entry staff to simultaneously view a scanned paper crash report and the LACRASH data entry fields. Map-spotters use dual monitors to match the data and narrative description listed on the crash report to a location using mapping services.

An HSRG employee entering data from scanned paper crash report into LACRASH. One screen displays a scanned copy of a paper crash report, while the other displays data entry fields in LACRASH. The data entry fields in LACRASH are designed to resemble the paper crash report form, so that transferring the data is an intuitive process.

A monitor in the HSRG lobby displays data entry productivity metrics for student employees. HSRG sets expected standards for timeliness, pace, and accuracy of data entry and rewards students who meet or exceed these standards with pay increases.

A monitor in the HSRG lobby displays the status of data entry from scanned PDF files of paper crash reports. HSRG typically enters data from paper crash reports into LACRASH within 90 days of the crash occurring.



- **Maintain Good Working Relationships**. HSRG and LADOTD maintain a collaborative, trusting relationship. HSRG has a cooperative relationship with its IT staff, which helps in communicating needs to the business analytics staff. A good relationship with the Traffic Records Coordinating Committee (TRCC) helps the development of new systems, because business requirements can be communicated from the TRCC directly to the IT staff. LADOTD and HSRG hold joint meetings with both groups' IT staff to inform work plans and avoid duplication of effort. HSRG has dedicated IT staff but relies on the central LSU IT department for campus-wide networking, firewall, and equipment issues.
- **Assign Dedicated IT Staff**. University IT departments must focus on maintaining or regaining core university functions in the event of a crisis. When Hurricane Gustav hit Baton Rouge in 2008, LSU's central IT had to focus on the campus-wide electricity and network outage before they could address HSRG's needs. In this situation, HSRG's dedicated IT staff effectively minimized disruption to the crash data system.
- **Review Currently Available Electronic Reporting Options**. Prior to developing its proprietary LACRASH system, LADOTD invited representatives for TraCS to demonstrate the system but realized it would require customization. Customization to existing systems can be costly and difficult to maintain, particularly if further changes are required in the future. HSRG can easily implement changes to the crash form for the agencies using LACRASH, but changes are significantly more difficult to implement for the agencies using third party vendors.
- **Ease the Transition to Electronic Reporting with Incentives**. HSRG has promoted the use of LACRASH by offering it at no charge to local law enforcement agencies and funding equipment purchases for agencies that cannot afford the computer equipment needed to install and run LACRASH. HSRG established a scaled approach to funding the purchase of equipment based on the number of reports an agency submits annually. These funds are provided through Louisiana's TRCC, while funding to provide GPS and card swipe units (to automatically read driver's licenses) is provided through LADOTD's contract with HSRG. The TRCC uses Section 408 funding and will only offer financial support to an agency once, regardless of whether they are installing laptops for the first time or upgrading existing equipment. If agencies receive support to purchase equipment, HSRG believes they are more likely to be interested in using LACRASH. The actual LACRASH software is free for agencies and software development, support, and maintenance is funded by LADOTD's contract with HSRG. Agencies that receive funding are required to attend data quality training provided by LADOTD.
- **Develop Validation Rules and Training Options**. LACRASH only allows officers to enter a valid code for each field, which helps with completeness, though not necessarily with accuracy. HSRG can check for completeness with a software program; graduate assistants also check reports for accuracy. In order to help with both measures, HSRG developed a training section for its website. The training section contains short videos describing various parts of the crash report form. It also offers an Interactive Crash Manual, which allows a user to click on specific sections of the LACRASH report form to view descriptions. HSRG also developed an app for the iPad called "LaTCRM" which is available for free on Apple's App Store to provide similar assistance. Every year, HSRG holds a users' conference for LACRASH, during which it asks agencies to provide feedback on the program. HSRG develops enhancements to LACRASH based on this feedback.
- **Define Ownership of Data**. The contract between LADOTD and LSU identifies LADOTD as the owner of the data, but the ownership of the police reports lie with the reporting agency. HSRG will add information to the police reports in order to ensure accurate and complete data, but it does not consider the police reports it receives to be the official version of the crash report. HSRG shreds the paper copies of crash reports it receives once they are scanned and entered into LACRASH.
- **Maintain Source Data**. LADOTD maintains two databases. Every other week, it transfers data from HSRG's database and maintains this original data at LADOTD. In a separate database, LADOTD strips away unnecessary data elements and merges the remaining data with roadway inventory files.
- **Process Data Requests According to Users' Needs**. LADOTD processes data requests in a variety of ways. For routine requests, it directs the requestor to HSRG's website, which contains a wealth of general data. HSRG responds directly to special requests from government and law enforcement agencies. Requests for location-specific data are directed to LADOTD, who makes a determination on a case-by-case basis.
- **Restrict Data Usage as Necessary**. LADOTD does not place any restrictions on using the data for research, academic papers, theses, or dissertations, as long as there is no monetary gain for the students or LSU.

Developing Action Plans for Connecticut and New Mexico

Connecticut and New Mexico absorbed a wealth of information from Louisiana, which they incorporated into action plans. With assistance from LADOTD and HSRG, Connecticut and New Mexico each identified their top challenges, program strengths, opportunities for improvement, and characteristics of their desired data program and system. Participants also indicated how input from Louisiana altered their views. Finally, each state identified their top actions and associated champions, stakeholders, and resources, as summarized below.

Connecticut

1. Develop a statewide base map.
2. Reduce the 14-month backlog in entering crash data (includes establishing a pilot project at UCONN for scanning paper crash reports).
3. Develop a data repository.
4. Develop a MMUCC-compliant crash report form and reach 100 percent electronic crash report submission.

New Mexico

1. Transition data entry to UNM and catch up with backlog.
2. Transition to new crash data system (replace ARCS with SQL Server).
3. Update crash report form.
4. Develop a data warehouse.

Following the peer exchange, FHWA arranged follow-up meetings with representatives from both Connecticut and New Mexico to continue their action-planning.

Putting Plans into Action

In the twelve months since the peer exchange, both New Mexico and Connecticut have made impressive strides in advancing their action plans.

Connecticut

- CTDOT established a Memorandum of Understanding with the Connecticut Transportation Institute at UCONN and committed funding to support the newly created Transportation Safety Research Center.
- The Transportation Safety Research Center is building a new electronic crash data repository and plans to develop an electronic crash reporting system.
- CTDOT and UCONN have piloted one crash report scanning approach to reduce the backlog of paper reports and are also piloting an electronic crash reporting tool.

New Mexico

- NMDOT has transferred all responsibility for entering crash data to UNM.
- UNM is currently developing a new crash data repository and establishing new processes for entering crash data.

All participants have continued their discussions following the event, with both New Mexico and Connecticut commenting that the peer workshop helped them more efficiently and confidently advance their university data partnerships plans. “Connecticut has a long way to go,” suggested the director of UCONN’s Transportation Safety Research Center, “but now we have a road map in the LSU history.”

While serving as the “teacher” of the workshop, Louisiana benefited from telling its story and hearing the challenges of its peers, in particular how other agencies approached data dissemination and sharing responsibilities

with the public and other agencies. One participant from LSU suggested that he gained a "clearer understanding of where states currently are in the process [of collecting crash data] and the challenges they face."

By continually monitoring the progress of Connecticut and New Mexico, FHWA hopes to collect additional noteworthy practices that can be used to help other states improve their crash data programs. The University Data Partnership peer exchange is just one example of how agencies can effectively work together to address shared challenges more efficiently and effectively, which is essential in today's financial environment. **To learn more about the University Data Partnership Workshop, please contact the Roadway Safety Professional Capacity Building Program (http://rspcb.safety.fhwa.dot.gov/contacts.aspx), or request a topic for your own peer exchange by filling out an application online (http://rspcb.safety.fhwa.dot.gov/p2p/p2p_app.aspx).**

KEYS TO SUCCESSFUL PARTNERSHIPS

Representatives from Connecticut and New Mexico accomplished their goals for the peer exchange, which were to understand the contributing factors to the successful partnership between LADOTD and HSRG and identify elements to replicate in expanding the relationships with their respective universities.

Key findings from the event included the following:

- **Universities are good resources for processing crash data.**
  The skill set needed to create and maintain data systems requires an extensive knowledge of information technology, which many engineers and planners do not have. Moreover, many State agencies face constraints in hiring new staff. Universities may offer a flexible alternative means of accessing specialized expertise in data, information technology, and business intelligence.

- **Building a successful DOT-university partnership takes time.**
  Participants in the peer exchange were generally impressed with the sophistication and extent of LADOTD's partnership with HSRG. However, staff from both groups reminded Connecticut and New Mexico that their relationship had developed over a period of twelve years. During this time, the partnership expanded iteratively, as LADOTD and HSRG prioritized critical improvements and enhancements.

- **Strong champions are needed on both sides of the partnership.**
  The success of LADOTD and HSRG's partnership was attributed to many factors, not the least of which was strong leadership in both organizations. Key employees continually push the partnership in new and innovative directions and ensure that joint processes and responsibilities function well.

> "The peer exchange telescoped time to learn and find out on our own how to best design our data entry system and data dissemination process."
> *—Dely Alcántara*
> *University of New Mexico*

> "The workshop was very well planned and the folks from Louisiana did an excellent job of presenting and answering our questions."
> *—Robert Ramirez*
> *FHWA Connecticut Division Office*

APPENDIX A: EVENT ATTENDEES

Attendees	
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APPENDIX B: AGENDA

DATA PEER EXCHANGE

Agenda - March 20-21, 2012

Transportation Training and Education Center
4099 Gourrier Avenue
Baton Rouge, Louisiana

Times printed in red will include an option for video conferencing.

Tuesday, March 20, 2012

Room 175(unless otherwise indicated)

8:00 AM	**Welcoming Remarks, Overview, Introductions, and Expected Outcomes** - Dan Magri – Louisiana Department of Transportation and Development (DOTD) - Maribeth Wojenski – Connecticut Department of Transportation (CTDOT) - Yolanda Duran – New Mexico Department of Transportation (NMDOT)
8:30 AM	**Peer-to-Peer Program Background** - Tamiko Burnell – Federal Highway Administration (FHWA) Office of Safety (HSA)
8:40 AM	**FHWA Data Programs Overview – Roadway Safety Data Partnership Program and Crash Data Improvement Program** - Bob Pollack – FHWA HSA
9:00 AM	**Peer Presentation – Connecticut** - CTDOT and University of Connecticut (UCONN) - Q&A
9:30 AM	**Break**
9:40 AM	**Peer Presentation – New Mexico** - NMDOT and University of New Mexico (UNM) - Q&A
10:10 AM	**Peer Presentation – Louisiana** - LA DOTD and Louisiana State University (LSU) - Q&A
11:10 AM	**Lunch**
12:15 PM	**Group Discussion – University Partnerships** - Processes: Relationship to Highway Safety Improvement Program (HSIP)/Strategic Highway Safety Plan (SHSP), Business Intelligence Processes, Process Flow Charts, Data Entry, Data Quality, Geographic Information Systems (GIS), Warehouse Structure - Staffing - Institutional Issues - Funding
2:15 PM	**Break** -Participants may decide to break during the university partnerships discussion, in which case this break will be shorter or omitted
2:30 PM	**Action Planning (Part 1)** ***Connecticut – Room 175; New Mexico – Executive Conference Room*** - Representatives from Connecticut and New Mexico will separate; representatives from Louisiana will split and join CT and NM. - Groups will discuss strengths and weaknesses of Connecticut's and New Mexico's current data programs as well as opportunities to build on lessons learned from Louisiana.
4:00 PM	**Wrap-Up (*Room 175)*** - FHWA will provide a brief summary of Day 1 and an overview of Day 2
4:15 PM	**Adjourn**

Wednesday, March 21, 2012

8:00 AM **Tour of LSU Facilities (*Meet at TTEC*)**

Following the recap of Day 1, the group will split into program managers and data/technical staff.

Program Managers (*Exec. Conference Room*)

9:00 AM **Group Discussion – Processes**
- Agreements/Business Relationships
- Memoranda of Agreement/Contracts

9:45 AM **Group Discussion – Staffing**
- Agreements
- Student employment
- In-house staff

10:30 AM **Break**

10:45 AM **Group Discussion – Funding**
- Cost Trends
- In-house issues that led to DOTD/LSU Partnership
- Direct/Indirect benefits
- Time Savings
- Improvements in Accuracy

11:30 AM **Lunch**

Data/Technical Staff (*Room 175*)

9:00 AM – 11:30 AM **Data Discussion**

Topics to Include:
- Data Warehouse Structure
- Data Entry
- Data Flows
- Mapping: GIS, Base Map, Data Visualization
- Data Analysis
- Data Interchange Between Partners
- Data Integration
- Data Quality
- MMUCC/MIRE
- Web-Portal
- Query/Analysis Tools

Program managers and data/technical staff will reconvene as one group for the remainder of Day 2.

12:30 PM **Next Steps for Louisiana's Crash Data Systems (*Room 175*)**

1:30 PM **Action Planning (Part 2)**

Connecticut – Room 175; New Mexico – Executive Conference Room
- Representatives from Connecticut and New Mexico will separate again with representatives from Louisiana and continue the action planning from Day 1.
- *This session will include a 10 minute break in the middle*

3:45 PM **Wrap-Up and Next Steps (*Room 175*)**

4:30 PM **Adjourn**