

# Highway Safety Information Systems Laboratory (HSIS) Assessment Summary Report

**DATE:** April 2 – 5, 2007

**HOST LABORATORY:** Highway Safety Information Systems Laboratory (HSIS)

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## **EXPERT/PEER REVIEW PANEL MEMBERS:**

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## **Overview of Highway Safety Information System Laboratory**

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## **Overview of Highway Safety Information System Laboratory**

### ***Purpose***

The HSIS Laboratory offers value to FHWA's Research and Development program, to other offices within FHWA and DOT, to the safety research community in general, and to State and local engineers/planners. The purpose of the laboratory is to operate and maintain HSIS, to conduct research to support FHWA's mission and strategic goals, and to

provide data to a wide variety of highway safety researchers. The HSIS laboratory also supports the development and use of data collection and analytical tools for the study of highway safety. Computerized photologs are used to visually verify existing data and collect supplemental data through traditional methods and advanced techniques, such as image recognition algorithms, and GIS-based tools applied to display and analyze safety data.

### **Description**

HSIS is a database for which seven active States (California, Illinois, Maine, Minnesota, North Carolina, Ohio and Washington) provide crash, roadway inventory, traffic, driver, vehicle, and other information that can be linked to analysis files for a wide spectrum of safety studies. Research performed at the HSIS Laboratory is conducted with advanced computer hardware and software. The laboratory contains the HSIS database, consisting of data collected by eight States on more than 5 million crashes, as well as inventory and traffic volume data for approximately 165,000 miles of highway, and videodisc photologs for certain States and Geographical Information System (GIS) applications.

### **Lab Value**

The HSIS is a multi-state database in which crash, roadway inventory, traffic, driver, vehicle, and other information can be linked into analysis files for a wide range of safety studies. HSIS differs significantly from the Fatal Analysis Reporting System (FARS) and General Estimation System (GES), the two other DOT national databases. These systems, based on crash data supplemented by roadway inventory data at the crash site, are by definition records of “failures” (crash sites) in the system. HSIS answers questions regarding the relationships of roadway design and operations with safety where both roadway and traffic information for the “failures” and the “success” (sites with very few or no crashes) must be present in the database. The laboratory is unique in the sense that it contains the only “national” linkable database that contains common identifiers on crashes, roadway inventory, and exposure, which allows one to associate the risk of crashes with roadway and traffic variables. Also, the laboratory has computerized photologs for certain states and Geographical Information System (GIS) applications.

### **Key Strengths and Observations**

- Database fulfills a national need for crash, geometry, and traffic data from multiple jurisdictions. Also, it retains historical data for each of the files.
- FHWA and contractor staff demonstrates enthusiasm for, commitment to, success of HSIS with a demonstrated desire to continue to improve and expand database.
- Significant publications in peer-reviewed journals demonstrate quality of research products.
- The summary reports produced by the HSIS team are of great value to customers.
- Contractors and their consultants are widely regarded as experts in safety evaluation area.
- HSIS has flexibility to capture additional data to support research that wasn't originally part of the system's design.

- A strong history of high-quality research and high-profile publication of results in various venues.
- HSIS continues to be a critical component of national safety research activities.
- Leadership has committed to a multiyear road map with project timeline, which includes stakeholder involvement in the development of such a road map.
- The customers interviewed were very satisfied with the quality and standard of work and cited increased awareness and great appreciation for the HSIS database since it is the only linked crash and road inventory database.
- Convenient on-site facility for quick-response to policy related questions (from the Hill)

### **Key Recommendations and Status of Current Activities**

1. **Panel Recommendation:** Ensure that the next round of Traffic Records Assessments include the HSIS contribution criteria as one of the review items.  
**Action to be taken:** Complete development of Model Minimum Inventory of Roadway Elements (MMIRE). MMIRE elements are those desired in HSIS states/urban centers. Scheduled a meeting w/Bob Pollack to discuss inclusion of MMIRE elements in TRAs.  
**Status as of 8/2/07:** Working with Bob Pollack in HAS to recommend to NHTSA consideration of MMIRE in TRA. *Target Completion Date June 2009.*
2. **Panel Recommendation:** Establish an HSIS advisory group from among key users, potential users, and key data supplies.  
**Action to be taken:** Input is currently acquired annually from donor state/urban center representatives and HSIS end users. HSIS liaisons serve as an advisory group. Establish process for annual input from sample of customers and new AASHTO subcommittee on Safety Management.  
**Status as of 8/2/07:** Feedback at annual HSIS meeting. Will ID key customers and contact Safety Management committee. *Target Completion Date Oct 2007 and March 2008.*
3. **Panel Recommendation:** Pick one or two test states for use of the data collection van and assist them in creation of roadway asset management & photolog systems from the data collected by the van.  
**Action to be taken:** a) Present concept to HSIS state liaisons at annual meeting and ID test state. b) Work w/test State to determine feasibility, including funding and teaming w/TRB SHRP2 Safety project.  
**Status as of 8/2/07:** Placed on annual HSIS meeting agenda. *Target Completion Date a) Oct 2007 b) Oct 2008.*
4. **Panel Recommendation:** Provide the sanitized databases to the states for their own use and analyses.  
**Action to be taken:** States/urban centers typically use their own databases for analysis. HSIS data and data discrepancies are provided to them upon requests.

At next HSIS annual meeting remind States that we can provide them sanitized databases.

**Status as of 8/2/07:** Placed on annual HSIS meeting agenda. *Target Completion Date Oct 2007.*

5. **Panel Recommendation:** Promote the awareness of and potential application of HSIS data for local agency use.  
**Action to be taken:** Develop marketing plan. Include local agency outreach in marketing plan.  
**Status as of 8/2/07:** Begin to develop marketing plan March 08. *Target Completion Date Oct 2008.*
6. **Panel Recommendation:** Link the safety data to non-safety data.  
**Action to be taken:** Need clarification from panel on what is meant by “non-safety data”  
**Status as of 8/2/07:**
7. **Panel Recommendation:** Develop knowledge-base of best practices.  
**Action to be taken:** Need clarification from panel on what is meant by “best practices”  
**Status as of 8/2/07:**
8. **Panel Recommendation:** Ensure that this HSIS products each year include some portion that are directly relevant and important to the state and local personnel who have control over the core data sets that HSIS needs from them. This will help to show them the value of participating in HSIS.  
**Action to be taken:** Solicit input from HSIS liaisons and other staff within the HSIS states/urban center on needed research. These ideas and research topics will be specifically considered for funding within the HSIS annual work plan.  
**Status as of 8/2/07:** Prepare solicitation for annual HSIS meeting in Oct 2007. *Target Completion Date Nov 2007.*
9. **Panel Recommendation:** Consider changing focus of lab to “research findings” as the primary product. Especially, those findings that can be used by agencies and are likely to have direct impact on practice.  
**Action to be taken:** Address in annual work plan and marketing plan.  
**Status as of 8/2/07:** Begin to develop marketing plan March 2008. *Target Completion Date Oct 2008.*
10. **Panel Recommendation:** Moving Toward GIS – “Just do it”. The lab should mobilize now to be ready.  
**Action to be taken:** Develop a process to handle data received in GIS formats and production of extraction files from these systems.  
**Status as of 8/2/07:** Will begin developing implementation plan Sept 2007. *Completion Date June 30, 2008.*

- 11. Panel Recommendation:** Implement an annual process of recognizing accomplishments and contributions of on-site contractors.  
**Action to be taken:** Determine, with HRRM, whether and, if so, how on-site contractor's accomplishments and contributions may be recognized.  
**Status as of 8/2/07:** Discuss with McCarthy and Chase as part of TFHRC Science Day. *Completion Date Oct 2007.*
- 12. Panel Recommendation:** Include the State Traffic Records Coordinator in the HSIS process.  
**Action to be taken:** a) Add all Coordinators to the HSIS email list to receive summaries and updates. b) Explore with HSIS Liaisons about more involvement with State TRCCs.  
**Status as of 8/2/07:** Gathering contact information. *Completion Date a) Sept 2007, b) Dec 2007*
- 13. Panel Recommendation:** Develop a strategic plan that leads to defined, measurable objectives and goals as well as time frame for its implementation.  
**Action to be taken:** a) Develop issues and questions appropriate for data analysis strategic plan; present & discuss at annual HSIS meeting. b) Develop strategic plan.  
**Status as of 8/2/07:** On agenda for annual HSIS meeting. *Completion Date a) Dec 2007, b) Dec 2008*
- 14. Panel Recommendation:** Research findings that are responsive to stakeholder request should be highlighted as a key component of HSIS product development (de-emphasize database as a product) and emphasize "agency" as customer (de-emphasize university researchers as customer).  
**Action to be taken:** Development of a) strategic plan and marketing plan that will b) respond to recommendation to emphasize "research findings."  
**Status as of 8/2/07:** On agenda for annual HSIS meeting. *Completion Date a) Dec 2008, b) June 2009*
- 15. Panel Recommendation:** Improve communication with HSIS states and FHWA Division Offices in HSIS states.  
**Action to be taken:** a) HSIS States will be involved in development of Strategic Plan, HSIS Marketing Plan, and in annual research solicitation. b) Continue to invite Division Office staff from the HSIS states to the annual Liaison meeting. Establish HSIS Liaisons within the Resource Centers.  
**Status as of 8/2/07:** Potential Resource Center liaison identified. *Completion Date a) Dec 2008, b) Dec 2007*
- 16. Panel Recommendation:** Develop teaching modules for university based instructions.  
**Action to be taken:** Assess the availability of funding to pursue this task. If funding is available. 1) survey need for training & type of training; 2) document existing training and 3) develop needed training

**Status as of 8/2/07:** Begin assessment February 2008. *Completion Date June 2008*

17. **Panel Recommendation:** Provide on-site and off-site training for the federal and state professionals who don't have adequate training in research and analysis. Through the training they will be able to conduct basic and descriptive analysis they need.

**Action to taken:** Beyond scope of HSIS. Consider incorporation into SAS roadmap. Schedule meeting with office of Safety.

**Status as of 8/2/07:** Scheduled meeting w/ SAS team to discuss Lab Action Matrix action items. *Completion Date Sept 2007*

18. **Panel Recommendation:** FHWA will need to enhance its efforts to encourage agencies to conduct safety evaluations.

**Action to be taken:** Beyond scope of HSIS. Discuss w/ Office of Safety for consideration in SAS roadmap. This task may be better pursued within the FHWA Office of Safety.

**Status as of 8/2/07:** Scheduled meeting w/ SAS team to discuss Lab Action Matrix action items. *Completion Date Sept 2007*