

Laboratory Assessment Summary

Crash Analysis & Testing

Laboratories (NCAC / FOIL)

DATE: September 18 - 21, 2006

HOST LABORATORY: Crash Analysis & Testing Laboratories (NCAC/FOIL)

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EXPERT/PEER REVIEW PANEL MEMBERS:

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Overview of Crash Analysis Laboratories

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Overview of Federal Outdoor Impact Laboratory (FOIL)

PURPOSE

The Federal Outdoor Impact Laboratory (FOIL) is a fully equipped outdoor crash testing laboratory and research facility used to support the Federal Highway Administration's (FHWA) Safety Research and Development (R&D) programs and other federally funded security initiatives. Researchers use the facility to extend their understanding of crash events by staging controlled, high-speed motor vehicle collisions. The facility typically is

used to confirm the accuracy of computer-generated crash predictions. This ensures that tested roadside structures-structures that typically are located in close proximity to the Nation's roadways-function as intended when struck by a motor vehicle. Routine certification or compliance testing of roadside safety structures, including testing performed to ensure compliance with existing safety standards is not conducted at the FOIL. In addition to staged motor vehicle collisions, the FOIL is equipped with a large pendulum mass swinging from a support structure. This device enables researchers to conduct low-speed impact testing. Researchers also often use the pendulum to perform dynamic-impact testing of structural components. This type of testing provides researchers with information and data to help improve the accuracy of computer-generated vehicle collisions.

Overview of National Crash Analysis Center (NCAC)

PURPOSE

When safety experts worldwide need to review crash data, look at computer models of vehicles, or analyze roadside hardware designs, they rely on the research and the resources available at the National Crash Analysis Center (NCAC). As a unique storehouse of safety information and safety expertise throughout the world, NCAC supports the Federal Highway Administration's (FHWA) strategic objective to reduce fatalities and injuries by 20 percent in 10 years. NCAC's research goal is to curtail the safety problems of occupants in crashes. NCAC's resources help researchers understand and quantify a vehicle's performance and its components occupants and roadside hardware in crashes, and provide optimum design solutions to minimize crash impact severity.

Key Strengths and Observations

- A local Laboratory is desirable to facilitate test inspection and evaluation.
- Current facility can perform many tests (DOS, NCHRP 350 TL-3 and -4).
- State-of-the-art propulsion system.
- Significant use of pendulum apparatus.
- Staff is qualified and motivated and wants to expand capabilities.
- Testing at the FOIL has produced significant and relevant results.

Key Recommendations and Status of Current Activities

1. **Panel Recommendation:** Update data and document collections in NCAC Library and assess means to increase use and improve access to the information.
Action to be taken: 1) Move Roadside Library to NCAC and integrate with current collection. Update collections with recent materials. 2) Develop NCAC Library Plan to address organization of library, transition to all-digital format, and means to increase use, & improve accessibility. 3) continue Library improvements under new contract; include indexing and accessibility needs.
Status as of 9/30/07: 1) Move completed, cataloging & digitization has begun. 2) Draft library plan under review with GWU and HQ. 3) Library plan outlines

opportunities for improvements to be pursued in new contract. *The Target Completion Dates are 1) June '08, 2) October '07 and 3) April '08.*

2. **Panel Recommendation:** Secure additional crash test materials and convert collection to an electronic format.
Action to be taken: 1) Work (with NHTSA) to convert the Library to all digital format. 2) Secure additional crash test materials to enhance the Library.
Status as of 9/30/07: 1) New equipment for digitization has been obtained and the process of converting films to digital media has begun. 2) NCHRP has agreed to have the NCAC house the detailed roadside crash database from Project 17-22. *The Target Completion Dates are September '08 and Continuous.*
3. **Panel Recommendation:** Become the “go to” organization for such materials and enhance accessibility of the information via the web.
Action to be taken: Contact other organizations (e.g., NCHRP, IIHS) to determine feasibility of merging or linking their collections with the NCAC Library. Publicize the availability of NCAC information.
Status as of 9/30/07: Other NCHRP databases may be housed at NCAC and the offer has been made to house the national in-service evaluations. *The Target Completion Dates are continuous efforts.*
4. **Panel Recommendation:** Continue testing at FOIL but carefully consider upgrade investments given the upcoming contract end and the possibility that GWU will build a new crash test facility locally.
Action to be taken: Continue to make the fullest possible use of the FOIL. Carefully consider upgrade investments.
Status as of 9/30/07: FOIL testing has continued with more tests already this year than in each of the previous two years. Investments have been limited to needs. *The Target Completion Date is September 30, 2008*
5. **Panel Recommendation:** If GWU constructs a new crash facility, evaluate its capabilities in light of FHWA needs; discontinue all or parts of FOIL; develop policy for competitive procurement of crash testing.
Action to be taken: Monitor GWU actions regarding building a new crash test facility & assess the planned capabilities of the facility. Structure the new contract to maintain testing options to support the research program.
Status of 9/30/07: No decision at GWU yet, but planning is advancing. FHWA staff is developing contingency plans. *The Target Completion Date is September 30, 2008*
6. **Panel Recommendation:** If Crash Test Facility Certification requirements are implemented by FHWA, seek certification for the FOIL and only use certified facilities for outside tests.
Action to be taken: Monitor status of certification; develop schedule for seeking certification, if required. Include certification requirement in any new contract.

Status as of 9/30/07: The Crash Labs Certification rule has been finalized. NCAC and FHWA staff have begun discussions on how to implement them at the FOIL. *The Target Completion Date is September 30, 2009*

7. **Panel Recommendation:** Prioritize projects and allocate funds, including advanced research funds, based on priorities.
Action to be taken: Pursue projects reflected by the priorities in the NCAC Annual Work Plan, Road Departure Roadmap, and Safety R&D Spending Plan.
Status as of 9/30/07: Spending plans have been updated to reflect Roadmap priorities. *The Target Completion Date is continuous.*
8. **Panel Recommendation:** Consider use of Transportation Pooled Fund Projects to extend funding.
Action to be taken: Develop and solicit supplement to deliver FY 08' and beyond.
Status as of 9/30/07: A PFS proposal Advanced Crash Analysis has been drafted for advertisement. *The Target Completion Date is November 30, 2007.*
9. **Panel Recommendation:** Add staff (both full time and temporary) by various means to focus on agency mission, road departure goals, project management, and the technical review and publication process.
Action to be taken: Expedite HR request to fill the staff vacancy and consider options for temporary staff.
Status as of 9/30/07: Staff recruitment papers have been prepared. An OST Transportation Career Residency Program person spent four months undertaking an analysis with NCAC. *The Target Completion Date is October 30, 2007.*
10. **Panel Recommendation:** Continue the development and application of finite element and simulation models for crash analysis.
Action to be taken: Incorporate modeling and crash simulation efforts into Road Departure Roadmap & promote broader applications in the safety field.
Status as of 9/30/07: Model of the Ford F250 and cable median barrier were completed, validated and posted. The Geo Metro model was updated to provide an active suspension and work begun to model a Chevy Silverado pick-up. *The Target Completion Date is October 31, 2007.*
11. **Panel Recommendation:** Improve the report publication process: include publication requirements into project/researcher responsibility; initiate early involvement by the publications unit; conduct technical review of reports; make materials available via the web site.
Action to be taken: 1) Establish new procedures to define products, effectively produce materials, improve the review process with involvement by HQ, RC, and others, and work to expedite publication of results. 2) Eliminate the current backlog of report production (including documentation of past efforts) & promote a broader range of products.
Status as of 9/30/07: 1) Several reports & presentations provided to HQ for review. Several reports are scheduled for release by the end of 2007. 2) Draft technical

summaries and presentations for eight past efforts have been prepared. *The Target Completion Dates are 1) October 30, 2007 and 2) December 31, 2007.*

- 12. Panel Recommendation:** Develop and maintain a strategic plan for the NCAC that clearly defines its mission and associate goals & objectives.
Action to be taken: 1) FHWA maintains a Road Departure Roadmap which outlines plans and priorities to achieve its mission. Future contract will support the Roadmap. 2) GWU is reviewing its future plans, including construction of crash test facility and continually pursues related opportunities.
Status as of 9/30/07: 1) Roadmap and spending plan updates have been made. A draft RFP for the new contract provides flexibility to pursue the activities outlined in the Roadmap. 2) FHWA is monitoring GWU plans. *The Target Completion Dates are 1) September 30, 2008 and 2) September 30, 2008.*
- 13. Panel Recommendation:** Assess the effectiveness of the NCAC's efforts to promote the use of FEA and the NCAC products with partners and stakeholders. Enhance the visibility of the NCAC and FOIL efforts through a more converted outreach effort. Expand and enhance interactions in coordinating and engaging research with States, universities, government agencies, and others.
Action to taken: The Technology Facilitation Action Plan will guide the timely transfer products and technologies to partners and stakeholders. Feedback from AASHTO, TRB, universities, industry, and others will be used to assure that appropriate products are delivered.
Status as of 9/30/07: NCAC updates have been provided at several TRB, AASHTO, TF13, and other meetings and NCAC materials provided upon request. *The Target Completion Dates will be December 2007.*
- 14. Panel Recommendation:** Involve universities in the transfer of technologies (i.e., FEA modeling process) through IPA's, visiting students, and co-PI's from external organizations. Increase interactions with universities using new schemes to support efforts and work cooperatively with the states
Action to be taken: The FHWA will continue FEA Center of Excellence Workshops; workings with universities on specific topics, & will continually assess opportunities for collaboration with others.
Status as of 9/30/07: COE workshop held in Livermore, CA in August 2007 received rave reviews. Materials from that workshop will be posted for the benefit of others. New projects were initiated with Virginia Tech, GWU, and University of Nebraska. *The Target Completion Date will be continuous.*
- 15. Panel Recommendation:** Create an External Advisory Board (EAB) at GWU for NCAC Oversight.
Action to be taken: Consider as part on new contract.
Status as of 9/30/07: FHWA is monitoring GWU efforts. *The Target Completion Date will be September 30, 2008.*