

Laboratory Assessment Process

# Handbook for Expert/Peer Reviews at the Turner-Fairbank Highway Research Center

Version 1.1

PUBLICATION NO. FHWA-HRT-04-078

DECEMBER 2003



U.S. Department of Transportation  
**Federal Highway Administration**

Research, Development, and Technology  
Turner-Fairbank Highway Research Center  
6300 Georgetown Pike  
McLean, VA 22101-2296

# Table of Contents

|  |    |
|--|----|
| <b>Overview</b> .....  | 1  |
| Purpose of the Handbook .....  | 1  |
| Expert/Peer Review .....   | 1  |
| Assessment Goals .....   | 1  |
| FHWA Vision, Mission, Goals, and Roles .....   | 1  |
| <b>Assessment Criteria</b> .....   | 3  |
| Performance .....  | 3  |
| Quality .....  | 3  |
| Relevance .....  | 3  |
| <b>Focus Areas</b> .....   | 4  |
| <b>Role of the Research and Technology Coordinating Committee (RTCC)<br/>in Laboratory Assessment at TFHRC</b> ..... | 4  |
| RTCC Background .....  | 4  |
| <b>Role of the TFHRC Leadership Council and Program<br/>Management at TFHRC</b> .....                                | 4  |
| <b>Laboratory Assessment Process</b> .....   | 5  |
| Participants .....   | 5  |
| Process Description .....  | 6  |
| Panel Report .....   | 8  |
| Closeout Session .....   | 8  |
| Existing Laboratory Accreditations .....   | 8  |
| Briefing Book .....  | 8  |
| <b>General Information for Expert/Peer Review Panel Members</b> .....  | 9  |
| Conflict of Interest .....   | 9  |
| Panel Diversity and Continuity .....   | 9  |
| Panel Chairperson .....  | 9  |
| Panel Members .....  | 10 |
| Panel Meetings .....   | 11 |
| Pre-Review Telephone Call .....  | 11 |
| <b>General Information for TFHRC Laboratory Participants</b> .....   | 11 |
| Laboratory Personnel .....   | 11 |
| Associate Administrator and TFHRC Leadership .....   | 11 |
| TFHRC Training Opportunities .....   | 11 |
| TFHRC Annual Summary of Laboratory Assessments .....   | 11 |
| <b>Information for Customers, Partners, and Stakeholders</b> .....   | 12 |
| <b>Preparatory Activities for TFHRC Laboratories</b> .....   | 12 |

|  |    |
|--|----|
| <b>Questions for Consideration by the Expert/Peer Review Panel</b> ..... | 13 |
| Objectives and Performance Goals.....                                    | 13 |
| Research Process and Methodology .....                                   | 13 |
| Research Results/Products.....   | 13 |
| Quality of Overall Capabilities.....                                     | 13 |
| <b>Glossary</b> .....  | 15 |
| <b>Appendix—Supporting Materials</b> .....                               | 17 |
| Logistics Fact Sheet .....   | 17 |
| Winning Strategies .....   | 18 |
| Events Timeline.....   | 19 |
| Sample Agenda.....   | 21 |
| Sample Panel Report Format.....  | 22 |
| Program Contacts .....   | 23 |
| <b>Figures</b>   |    |
| 1. Laboratory Assessment Process Diagram.....                            | 7  |

# Overview

## Purpose of the Handbook

The purpose of the *Handbook for Expert/Peer Reviews* is to provide guidance for participants in the Turner-Fairbank Highway Research Center (TFHRC) Laboratory Assessment Process. The handbook is specifically designed to inform TFHRC laboratory managers about the conduct of expert/peer reviews and to assist the managers in their preparations for a review. The handbook also serves to acquaint panel members who will perform the reviews about the process and expectations associated with their involvement. In addition, the handbook provides important background information for customers and stakeholders who may be interviewed during the conduct of the reviews.

## Expert/Peer Review

An expert/peer review is an independent assessment by technical and scientific experts whose knowledge and expertise enable them to make credible and unbiased judgments regarding the conduct of the reviewed research. Assessing TFHRC laboratories through expert/peer reviews will ensure that the research performed at the TFHRC meets established quality and performance standards. Such laboratory assessments provide, through independent evaluation, a means to determine whether the research activities have high potential value and whether they have achieved stated objectives. The laboratory assessment process is continuous, with each laboratory having the benefit of an expert/peer review every 4 years.

## Assessment Goals

The main goals of the TFHRC Laboratory Assessment Process are to:

- ◆ Enhance laboratory and related research program quality, performance, and relevance by providing feedback and suggestions for improvements to laboratory managers.
- ◆ Provide an opportunity for exchange of views among technical experts.
- ◆ Provide increased opportunities for Federal Highway Administration (FHWA) customers and stakeholders to provide input to research and related program activities.
- ◆ Provide a credible, professional, and objective assessment that further improves customer and stakeholder confidence in the conduct of research and the outcomes produced.

## FHWA Vision, Mission, Goals, and Roles

The TFHRC Research and Technology (R&T) Program supports the vision, mission, strategic goals, and primary roles of FHWA, which are defined as follows:

### Vision

Improving Transportation for a Strong America.

### Mission

Enhancing Mobility Through Innovation, Leadership, and Public Service.

## **Goals**

- ◆ Safety.
- ◆ Mobility and Productivity.
- ◆ Environment.
- ◆ National Security.
- ◆ Organizational Excellence.

## **Roles**

- ◆ Leaders for National Mobility.
- ◆ Stewards for National Highway Programs.
- ◆ Innovators for a Better Future.

To support the FHWA role of “Innovators for a Better Future,” TFHRC leadership is committed to:

1. Invest in and conduct transportation research with and on behalf of partners and stakeholders.
2. Create an environment for and deliver innovation in the transportation community through the development of tools, technology transfer, training, and technical assistance.
3. Continually reevaluate and improve the effectiveness and efficiency of our key business process of technology and innovation deployment.

In light of these guiding principles, TFHRC provides FHWA, its customers and stakeholders, and the world highway community with advanced research and development related to new highway technologies—focusing on solutions to complex technical problems by developing economical, environmentally sensitive designs; efficient, quality-controlled construction practices; durable materials; and products that result in a safer, more reliable highway transportation system.

## Assessment Criteria

The TFHRC Laboratory Assessment Criteria are based on three criteria for Federal investment in research established by the Office of Management and Budget. These three criteria are quality, performance, and relevance. The laboratory assessment process at TFHRC particularly highlights the performance and quality criteria, as shown below. The expert/peer reviews are not intended to address *what* research is being conducted, but rather *how* the research in which TFHRC is engaged is being carried out.

### Performance

- ◆ Research activities are managed in a manner that produces high quality, identifiable results, utilizing research procedures and practices that comply with or exceed accepted standards for performance and reproducibility.
- ◆ Research activities are guided by an established set of high-priority, research objectives with performance outputs and milestones that show how the outcomes will be reached.
- ◆ Research activities have well-defined metrics that encourage research project performance and promote broader goals such as implementation of research results, including disseminating knowledge, applications, or tools; transitioning technology to the private sector, if appropriate; and encouraging innovation, cooperation, and education.
- ◆ For major research projects, appropriate termination points and other decision points are adequately defined.

### Quality

- ◆ Research maximizes quality through the use of clearly stated defensible methods for awarding contracts, and Federal managers and contractors are held accountable for cost, schedule, and performance results.
- ◆ Quality assessment of the research is conducted through comparative methods such as best practices identification, expert/peer reviews, and benchmarking.
- ◆ In addition to FHWA reports, research is reported in publications that are peer reviewed.
- ◆ Methods are in place for maintaining the expertise of research personnel and the capabilities of laboratory facilities.
- ◆ Quality guidelines for statistical information are based on structured planning and sound statistical methods.
- ◆ Research demonstrates objectivity in presentation and substance, and integrity, (i.e., protecting information from unauthorized access, corruption, or revision).

### Relevance

- ◆ Research is based on direction as expressed in the FHWA multiyear R&T program plans.
- ◆ The research purpose is clear and addresses a specific interest, problem, or need.
- ◆ The research is designed to make a unique contribution to addressing a specific interest, problem, or need, and is not needlessly redundant of other Federal, State, local, or private efforts.

## **Focus Areas**

The manager of the laboratory being reviewed (the host laboratory) has an option to identify a focus area to be addressed by the expert/peer review panel during the review. The focus area directs the panel's attention to issues of the host laboratory's particular concern and on which the expert peers may provide unique insight. A focus area may deal with program, technical, or administrative issues. The focus area, along with laboratory operations and research conduct, all should be considered within the context of the established assessment criteria.

## **Role of the Research and Technology Coordinating Committee (RTCC) in TFHRC Laboratory Assessment**

### **RTCC Background**

The Transportation Research Board (TRB), with FHWA support, convened the RTCC to provide continuing guidance and advice on the Nation's highway research program. RTCC's mission is to take a broad view of highway research that is not restricted to a particular program, topic area, or agency. RTCC membership includes top-level administrators, researchers, and practitioners from State governments, academia, and industry.

The RTCC advises TFHRC leadership on the laboratory assessment process. Because of the members' knowledge of transportation research and technology, their extensive personal network of contacts, and their independence from the TFHRC management, the RTCC is well-suited to provide an advisory function for the laboratory assessment process. In its advisory role, the RTCC may approve the assessment criteria, as well as the nomination of expert/peer review panel members. The RTCC may also receive periodic updates on laboratory assessment-related activities, and review reports.

## **Role of the TFHRC Leadership Council and Program Management at TFHRC**

The Research, Development, and Technology (RD&T) Leadership Council (LC), headed by the Associate Administrator for Research, Development, and Technology and composed of TFHRC senior staff, provides executive oversight of the laboratory assessment program. The LC monitors laboratory assessment activities and outcomes, and makes decisions regarding implementation of process improvements.

The Office of Program Development and Evaluation at TFHRC is responsible for the general administration and management of the laboratory assessment program. These functions include:

- ◆ Facilitating and coordinating the conduct of expert/peer reviews at TFHRC.
- ◆ Publishing and distributing the *Handbook for Expert/Peer Reviews*.
- ◆ Developing training information for TFHRC personnel for participating in expert/peer reviews.
- ◆ Providing guidance for proper interpretation and application of assessment criteria.
- ◆ Collecting recommendations for nomination to expert/peer review panels, and forward such recommendations to the RTCC.
- ◆ Helping the review manager compile briefing material for the panel and distribute materials in advance of the review.

- ◆ Preparing letters of invitation to the panel members.
- ◆ Providing assistance with travel arrangements for panel members.
- ◆ Helping to make arrangements for meals, including an opening breakfast and panel dinner, as appropriate.
- ◆ Setting up appointments with customers, partners, and/or stakeholders, as necessary.
- ◆ Coordinating with the Office of Resource Management at TFHRC to provide administrative assistance and computer resources for the panel.
- ◆ Providing counsel to laboratory managers regarding the conduct of a review.
- ◆ Receiving expert/peer review panel reports and publishing a summary of laboratory assessment activities in the annual RD&T performance report.
- ◆ Assessing effectiveness of the laboratory assessment process and providing recommendations for improvements and enhancements to the RD&T LC.
- ◆ Managing funding and budget preparation for the laboratory assessment process.
- ◆ Providing current status and program information to the RTCC.

## **Laboratory Assessment Process**

### **Participants**

The main participants in the laboratory assessment process are:

*The Expert/Peer Review Panel:* The experts/peers on the review panel are the central participants in the expert/peer review. These individuals perform the independent review of the laboratory activities. There are three to five visiting expert peers on a review panel, which includes a panel chairperson. The list of panel members is developed based on suggestions from laboratory managers, customers, and stakeholders, and is vetted by an external advisory source, such as the TRB's RTCC.

*Customers, Partners, and Stakeholders:* Other participants in the expert/peer review are customers, partners, and stakeholders of the laboratory(ies) being reviewed. These participants are drawn into the review through interviews and facilitated discussions with the expert/peer review panel.

*TFHRC Management:* TFHRC senior management, including the Associate Administrator for Research, Development, and Technology, participates in the process by attending a review closeout session in which the expert/peer review panel presents its findings. The senior managers also help prepare and deliver the TFHRC response to the review panel's final report.

*The Review Manager:* The review manager is either the laboratory manager from the laboratory being reviewed, or the lead manager from a group of laboratories being reviewed (or his or her designee). The review manager is primarily responsible for organizing the review; however, he or she is not considered part of the expert/peer review panel. The review manager invites and provides arrangements for the panel, is the primary liaison to customers and stakeholders associated with the review, and is responsible for the overall administrative conduct of the review, with assistance from program management in TFHRC's Office of Program Development and Evaluation.

*Review Facilitator:* At TFHRC's discretion, reviews may have an independent, external review facilitator who is an advisor to the review panel and a liaison to FHWA. Such a facilitator is knowledgeable about the conduct of expert/peer reviews at TFHRC and assists the review panel in its duties.

*TFHRC Host Laboratory Personnel:* The host laboratory includes the one or more related laboratories being assessed by the expert/peer review panel. Personnel from the host laboratory participate in the

expert/peer review through presentations, interviews, laboratory tours, and other fact-finding exercises conducted by the expert/peer review panel.

*TFHRC Office of Program Development and Evaluation:* The Office of Program Development and Evaluation is responsible for the general management of the laboratory assessment program at TFHRC.

## **Process Description**

The expert/peer review is accomplished through the collaborative efforts of the Office of Program Development and Evaluation, the expert/peer review panel, the review facilitator, when named, the review manager, other laboratory scientists and managers, and the laboratory's customers and stakeholders. The expert/peer review generally takes 2.5 days, and in cases of a group of laboratories being reviewed, reviews may take 3 days. During the first 2 days, the panel gathers information, including interviewing stakeholders and customers, and synthesizes material. On the last day, the panel prepares its report findings and conducts the closeout session.

The expert/peer review panel obtains information to perform its review from:

- ◆ The briefing book sent to review panel members before the review.
- ◆ Presentations and other materials about the administration and operations of the host laboratory and the conduct of its research.
- ◆ Interviews with host laboratory personnel, customers, and stakeholders.
- ◆ Firsthand observations of laboratory activities.
- ◆ Panel discussions.

The assessment criteria guide the direction of the expert/peer review. The content of the review deals with the administration and operations of the host laboratory and its recently completed research, research in progress, and near-term future activities.

The host laboratory may request that the panel focus on a specific area of interest while performing the review. Details about this focus area, if identified, are provided in the briefing book, which contains materials prepared for the expert/peer review panel by the TFHRC review manager, and is sent to the panel with the *Handbook for Expert/Peer Reviews* in advance of the review. Furthermore, members of the review panel, as well as customers and stakeholders, may identify topics for discussion during the review.

The expert/peer review panel chairperson may choose to have a teleconference before the first meeting. The review itself is held onsite at TFHRC, where information is available about the operations and conduct of research at the laboratory(ies) being reviewed.

The review panel begins work by conducting a session with only the panel members, often at a panel breakfast. During this executive session, the panel chairperson:

- ◆ Outlines the purpose and objectives of the review.
- ◆ Discusses his or her vision for the conduct of the review.
- ◆ Defines assessment criteria and procedures.
- ◆ Assigns activities for individual panel members.
- ◆ Answers any questions from the panel.

Panel member assignments may be to:

- ◆ Interview stakeholders or customers.
- ◆ Lead discussion on a technical or operational topic.

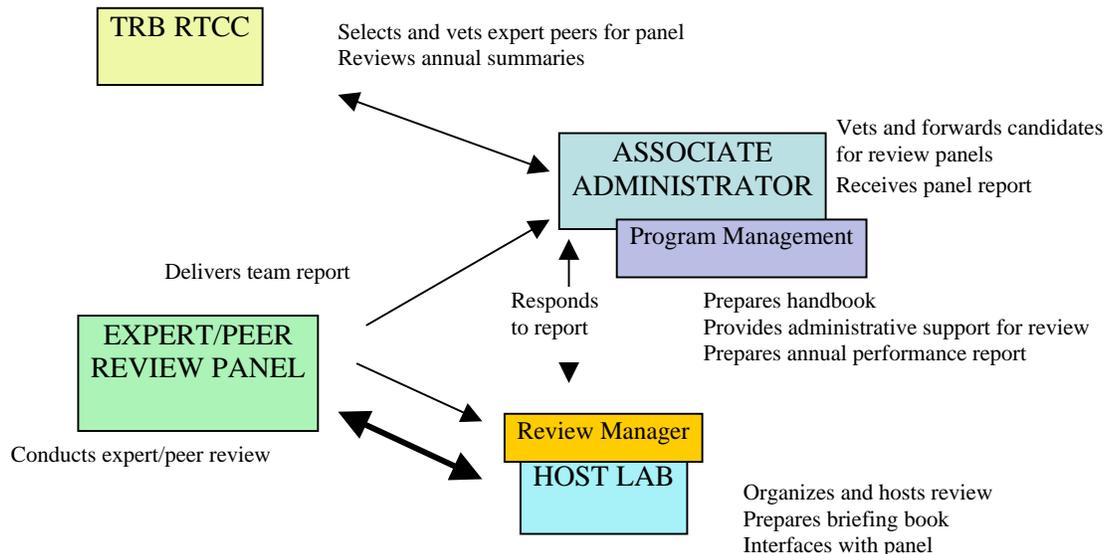
- ◆ Prepare summaries of key areas of the review for the panel report.

The first general session of the review includes introductions and a welcome by TFHRC management; goals and description of review procedures; presentations about the operations of the host laboratory and the research it accomplishes; and a tour of the host laboratory and other facilities, if appropriate. As the review continues, the expert/peer review panel gathers more information through interviews with laboratory staff, customers, and stakeholders.

The expert/peer review panel has a meeting room at TFHRC and computer resources available for its use during the entire review process. Time is reserved in the daily schedule to allow the expert/peer review panel to confer among itself, as necessary. Working dinners also may be scheduled for the expert peers to discuss the day's topics and to synthesize what they have observed.

After finalizing its business with laboratory representatives, stakeholders, and customers, the review panel prepares a written report of its findings. The panel report then is discussed with the host laboratory managers and the review manager. At that time, the panel has the opportunity to receive feedback on its findings and to correct any misinterpretations or errors in its assessment conclusions.

The review panel finalizes its report and prepares a brief presentation for the closeout session, which is the last formal activity of the review. The closeout session is a meeting of the review panel, the Associate Administrator, selected TFHRC managers, including the Laboratory Assessment Program Manager, and the review facilitator. During this meeting the Expert/review panel presents its findings and transmits its report to the Associate Administrator. The panel's report is distributed to the TFHRC managers, including the laboratory assessment program manager who attended the closeout session, the laboratory manager, the expert/peer review panel and the review facilitator.



**Figure 1. Laboratory Assessment Process Diagram**

## **Panel Report**

After completing interviews and discussions with laboratory representatives, stakeholders, and customers, the review panel prepares a written report of its findings. The report synthesizes the considered opinions and thoughts of the entire panel. The report provides review objectives, the process followed by the review panel, a detailed discussion of strengths, key issues, and opportunities for the host laboratory, and panel recommendations. If required, minority opinions are included in the report. The panel report is written during the review and completed before the panel's departure. During the closeout session, the last activity of the review, the panel presents this report to the TFHRC Associate Administrator.

## **Closeout Session**

The closeout session is a meeting of the review panel, the Associate Administrator and selected TFHRC managers (including the laboratory assessment program manager), and the review facilitator. During this meeting, the expert/peer review panel briefly presents its findings and may discuss the findings and the review with TFHRC management. At this time, the expert/peer review panel chairperson officially transmits the panel's written report of findings to the Associate Administrator. The closeout session is the last formal activity of the review.

## **Existing Laboratory Accreditations**

Some laboratories at the TFHRC accredited by respected organizations within their area of science. The expert/peer reviews will consider such laboratory accreditation processes and requirements and avoid duplicating assessment activities, when possible.

## **Briefing Book**

The briefing book is a collection of materials prepared for and distributed to each of the expert peers before his or her arrival at TFHRC for the review.

The briefing book typically contains:

- ◆ Agenda, logistics information, and process improvement survey.
- ◆ Review panel biographical information.
- ◆ Assessment criteria, goals of the review, and the review panel's task instructions.
- ◆ Highlights from past reviews, if applicable.
- ◆ Existing laboratory accreditation information.
- ◆ FHWA and TFHRC overview material.
- ◆ Detailed information about the research conducted by and resources available to the host laboratory, including funding and staff resources.
- ◆ Information about the focus area, if identified.
- ◆ Customer and stakeholder involvement.
- ◆ Technology transfer and deployment activities.

## **General Information for Expert/Peer Review Panel Members**

The expert/peer review panel is comprised of approximately three to five experts/peers who are external to the Agency. The panel members should be qualified to perform an independent, competent review of the technical and scientific merit and quality of the research.

Nomination of an expert/peer as a qualified reviewer is a distinguished recognition of the individual's professional accomplishments in his or her field of endeavor. The expert/peer's participation in the review process is broadly acknowledged within the transportation and scientific community.

Panel members may be:

- ◆ Scientists from similar laboratories.
- ◆ Scientists in allied or other disciplines performing similar types of work.
- ◆ Managerial or technical mentors from the private sector, academia, or other public agencies.
- ◆ Scientists that have conducted successful/productive laboratory assessments (for example, from the National Institute of Standards and Technology or other such groups).
- ◆ Recently retired scientists/researchers who, before retirement, would have qualified in one of the above categories.
- ◆ Engineers and other professionals in disciplines performing similar types of work.

Panel members (laboratory managers and/or senior scientists) may come from:

- ◆ Federal laboratories.
- ◆ State departments of transportation (DOT).
- ◆ Academia.
- ◆ Private sector.
- ◆ Customers or stakeholders.

### **Conflict of Interest**

Panel members must not be under contract to the FHWA laboratory in any way. Individuals asked to serve on expert review panels may be asked to complete a disclosure statement to identify any possible conflicts of interest.

### **Panel Diversity and Continuity**

Because of the varying perspectives each panel member can bring to panel deliberations, it is advantageous to have diverse backgrounds represented on a review panel. Likewise, it is desirable to have a degree of continuity from one review of a laboratory to the next review of the same laboratory. When possible, one or two panel members from the previous review should serve on the current review panel.

### **Panel Chairperson**

The expert/peer panel chairperson is invited, in writing, to chair the review. He or she can be included in the planning of the review's technical content, as requested. The panel chairperson is in contact with the TFHRC laboratory manager and/or review manager to prepare for this leadership role. The panel chairperson receives a briefing book to become acquainted with the TFHRC laboratory, the assessment

criteria, the goals of the review, the focus area to be considered (if identified), and other items, as needed. The panel chairperson may lead any pre-review activities, such as a panel telephone conference call.

### **General Characteristics of the Panel Chairperson**

The panel chairperson must be a highly credible individual from outside FHWA. He or she may be a laboratory manager or an expert in a discipline of importance to the host laboratory. He or she must be a good communicator and be able to synthesize, elicit constructive discussion, and keep discussions on-topic and within reasonable time allowances. Most importantly, he or she must have time to commit to the review, and must be trusted by the host laboratory managers and scientists.

### **General Responsibilities of the Panel Chairperson**

The main responsibilities of the panel chairperson are to:

- ◆ Facilitate the review sessions with the panel, stakeholders, and customers.
- ◆ Direct organization and content of the panel's report.
- ◆ Incorporate input from all members of the panel into the panel's deliberations.
- ◆ Help plan the technical aspects of the review.
- ◆ Act independently in the external expert peer role.
- ◆ Relate personal experience and offer considered opinion on the topics under discussion.
- ◆ Be available for a minimum amount of followup discussions with the host laboratory personnel based on the nature of the findings of the review panel.
- ◆ Meet the items listed under panel member responsibilities.

## **Panel Members**

The expert/peer review panel members are invited, in writing, to be part of the panel. They are provided with a briefing book that provides information about the operations of and research conducted by the TFHRC laboratory. The review panel members, like the panel chairperson, receive an agenda, logistics fact sheet, and other administrative and technical information necessary for participating in the review. Review panel members also attend the closeout session.

### **General Characteristics of Panel Members**

Review panel members must be able to encourage, criticize constructively, and provide positive feedback on laboratory accomplishments. Panel members must be trustworthy, able to understand the laboratory's operations and research quickly, contribute cogently to and synthesize discussion, communicate well, have time to commit to the review, and possess expertise that contributes to the review. All panel members must be motivated to participate and contribute their expertise to enhancing the host laboratory's business.

### **General Responsibilities of Panel Members**

Main responsibilities of panel members are to:

- ◆ Act independently in the external expert peer role.
- ◆ Relate personal experience and offer considered opinions on the topics under discussion.
- ◆ Be fully engaged in all the review sessions.
- ◆ Conduct interviews with customers and stakeholders.
- ◆ Synthesize facts gathered during the review and contribute to the expert/peer review panel's report.
- ◆ Discuss focus area issues cogently and concisely.
- ◆ Seek the best courses of action for the host laboratory.
- ◆ Present some portion of the panel's report during the closeout session with the TFHRC senior managers, as requested.

## **Panel Meetings**

Review panel meetings are held at TFHRC. General sessions consist of presentations from host laboratory staff, interviews with customers and stakeholders, and panel deliberations. In addition, the review panel tours the host laboratory's facilities and visits any other facilities and operations relevant to the review proceedings. The panel also meets in executive or closed sessions. These meetings allow the panel to discuss and synthesize the information gathered from the tours, presentations, literature, and interviews, and to prepare its report of findings.

## **Pre-Review Telephone Conference Call**

The expert/peer review chairperson may conduct a pre-review telephone conference call to discuss the purpose of the review and clarify any issues the panel may have about the review. This call is conducted approximately 2 weeks before the review and after all the panel members have received their briefing books. The review manager and the host laboratory manager (if different from the review manager) are included in this conference call. This call also helps to form a working team from the individual peer experts invited to be panel members.

## **General Information for TFHRC Laboratory Participants**

The laboratory assessment process requires specific information distribution and excellent communications among the participants in the expert/peer review and among those who will be affected by its conduct. The review manager is responsible for facilitating proactive communication among all participants in the review, including customers, partners, and stakeholders.

## **Laboratory Personnel**

The TFHRC laboratory manager and senior scientists are responsible for providing information about the laboratory to the expert/peer review panel as requested. In addition, laboratory personnel may be interviewed by the expert/peer review panel. All laboratory participants will receive information regarding their role in the conduct of the review before the actual review, and may be included in pre-review communications with the review panel, such as a telephone conference call.

## **Associate Administrator for RD&T and TFHRC Leadership**

Ongoing, open communication with the Associate Administrator for RD&T and other TFHRC leaders is a critical element of the review. Regular status meetings with these managers are encouraged during review planning. The availability of the Associate Administrator and management is an important aspect for scheduling the review's closeout session.

## **TFHRC Training Opportunities**

A short training seminar is available to familiarize TFHRC laboratory managers and personnel with the conduct of an expert/peer review. The seminar explains review benefits to the TFHRC laboratories, clarifies review process expectations, educates participants about their roles and contributions to the

review, and provides mentors (people who have participated in a past review) for newcomers to the process.

## **TFHRC Annual Summary of Laboratory Assessments**

The TFHRC Office of Program Development and Evaluation prepares an annual summary of the laboratory assessments conducted during the year to include in the annual RD&T performance report. This summary synthesizes information contained in the individual review panel reports presented during the year.

### **Information for Customers, Partners, and Stakeholders**

Customers, partners, and stakeholders represent the offices and organizations that rely on the results produced by the TFHRC laboratory or that have a share in the success or failure of the activities the laboratory performs. Customers, partners, and stakeholders may be interviewed by the expert/peer review panel. Before the review, the review manager initiates a request for such interviews. After a time is arranged, a written confirmation is sent to the customer, partner, or stakeholder. Information about the TFHRC laboratory that is relevant to the review should accompany the interview request. Meeting time and place should be confirmed with all participants.

### **Preparatory Activities for TFHRC Laboratories**

- ◆ Designate a review manager.
- ◆ Review specific goals of the laboratory assessment process. Consider identifying a focus area for the review panel to address. (Consideration should be given to issues of particular concern on which the expert/peer review panel may be able to provide unique insight).
- ◆ Prepare a briefing book for the review panel. The material sent to the panel should help them understand the basics of the laboratory's research and administrative activities. All materials should be clear and easy to understand for individuals not familiar with the laboratory.
- ◆ Arrange/develop presentations that explain research activities at the laboratory. Determine who should make the presentations.
- ◆ Arrange a tour of the laboratory.
- ◆ Define roles of laboratory staff who will be involved with the review.
- ◆ Recommend stakeholders and customers who should participate in the review.
- ◆ Identify activities and outcomes that best demonstrate the laboratory's commitment to quality.
- ◆ Identify activities and outcomes that best demonstrate the laboratory's adherence to high research performance standards.

## Questions for Consideration by the Expert/Peer Review Panel

### Objectives and Performance Goals

- ◆ Are appropriate scientific and technical objectives being posed, taking into consideration stakeholder and customer needs, laboratory strengths, and time horizon for the research being accomplished?
- ◆ Is the research based on direction specified in FHWA program plans?
- ◆ Does the research support the Agency's strategic goals?
- ◆ Do performance metrics exist that explain how outcomes will be reached?
- ◆ Does the research conducted satisfy the identified performance assessment criteria?
- ◆ Are termination procedures and appropriate exit strategies clearly defined for research projects?

### Research Process and Methodology

- ◆ How are the projects and researchers selected (is it a merit based, peer-reviewed, competitive process)?
- ◆ Does the research build on work already done or being conducted elsewhere?
- ◆ Have the investigators leveraged the work of leaders in the field?
- ◆ Are partnerships, if any, well-chosen and managed?
- ◆ How well-crafted are the project plans/designs?
- ◆ Is the use of the laboratory experiment, modeling, simulation, and/or field tests appropriate, and how well are these integrated?
- ◆ Is the choice and use of the equipment appropriate?
- ◆ Is data collection and analysis rigorous and robust?
- ◆ Are the research conclusions supported by the results?
- ◆ Are the ideas for further study reasonable?
- ◆ Are there established processes to assure and improve quality in the conduct of research?

### Research Results/Products

- ◆ Does the work being examined appear to be considered significant?
- ◆ Where have the results of the research generated by the laboratory been published?
- ◆ What patents, licensing agreements, and software, have been produced, what technology transfer activities have been accomplished, and how have the results been deployed?

### Quality of Overall Capabilities

- ◆ Is the scientific or engineering quality of the work comparable to similar efforts at similar institutions (e.g. other Federal laboratories and research facilities)?
- ◆ What are the qualifications of the scientific and engineering staff?
- ◆ How is staff morale?
- ◆ What are the qualifications and capabilities of the laboratory managers?
- ◆ What is the state of the equipment and facilities, and are these sufficient to conduct research that meets objectives?
- ◆ Is the funding appropriate for the objectives?
- ◆ Is there a fully documented process that maintains quality for distribution of funds for noncompetitive research performance?

- ◆ Are administrative processes effective and efficient?
- ◆ What process exists to incorporate needs of stakeholders and customers, and are their needs being met?
- ◆ Is there an appropriate balance between meeting customer needs and long-term vision?
- ◆ Are there quality improvement mechanisms to assure continued excellence?
- ◆ Are other items described in the quality assessment criteria met?

## Glossary

**Assessment Criteria:** The standards by which laboratories are measured by expert peers during expert/peer reviews. The assessment criteria are quality, performance, and relevance. Particular emphasis is placed on quality and performance.

**Briefing Book:** A collection of materials prepared for and distributed to each of the expert peers before his or her arrival for the review at the TFHRC.

**Closeout Session:** A meeting of the expert/peer review panel with the Associate Administrator, selected managers of TFHRC, including the laboratory assessment program manager, and the review facilitator. The session is an opportunity for the review panel to present its findings, discuss them with TFHRC managers, and transmit its written report to the Associate Administrator. This is the last formal session of the review.

**Customers, Partners, and Stakeholders:** The offices and organizations that rely on the results produced by the host laboratory or that have a stake in the success or failure of the activities performed by the host laboratory.

**Existing Laboratory Accreditations:** Accreditations within its field of science received by a laboratory; these accreditations may have similar assessment requirements to those of the expert/peer review.

**Expert/Peers:** Technically qualified independent professionals who are invited to review the research activities of a TFHRC laboratory.

**Expert/Peer Review:** An independent assessment of the quality, performance, and relevance of a TFHRC laboratory. Reviews are conducted through 2.5- to 3-day meetings of 3–5 expert peers. These expert peers visit the laboratory, discuss the research activities with the scientists and technical personnel, and formulate their opinions, which are documented in a report to TFHRC senior management.

**Expert/Peer Review Advisory Group:** The RTCC is responsible for providing advice regarding the laboratory assessments at TFHRC.

**Expert/Peer Review Panel:** A group of three to five independent expert peers who are external to the Agency; these peers perform the laboratory review.

**Expert/Peer Review Panel Chairperson:** The leader of the expert/peer review. This person is an independent expert peer who is external to the Agency.

**Expert/Peer Review Panel Report:** The report of findings from the expert/peer review panel, which includes the considered thoughts and opinions of the entire panel.

**Focus Area:** An area that will receive particular attention by the expert/peer review panel during the conduct of the review and which may be identified by the TFHRC laboratory under review.

**Host Laboratory:** The TFHRC laboratory or a group of related laboratories being reviewed by the expert/peer review panel.

**Laboratory Assessment Program Management:** The TFHRC Office of Program Development and Evaluation manages the program. In its capacity as program manager, the office coordinates and facilitates all aspects of the program.

**Laboratory Assessment Process:** The method used to facilitate enhanced performance and quality in the research activities conducted at the TFHRC. Assessments are accomplished through periodic laboratory reviews by expert/peers.

**Review Facilitator:** At TFHRC's discretion, reviews may have a review facilitator who is independent and external to the Agency advise the review panel and act a liaison to FHWA. Such a facilitator knows about the conduct of expert/peer reviews at TFHRC and assists the review panel in its duties.

**Review Manager:** The TFHRC laboratory manager or lead manager, if a group of related laboratories are being reviewed, who organizes the review.

## Appendix—Supporting Materials

### Logistics Fact Sheet

The following information is provided to the expert/peer review panel members when they agree to participate in the review. It is also included in the briefing book.

**Panel:** The names and information about panel members and the panel chairperson of the expert/peer review are provided.

**Location and Facilities:** Directions to TFHRC and the security admittance process are detailed. In addition, a meeting room, computer resources, and other materials or tools to facilitate discussions are available.

**Lodging:** Panel members are responsible for making their own hotel reservations. A block of rooms at a local hotel may be held for panel members by TFHRC staff. Panel members should arrange to arrive the evening before the review begins.

**Transportation:** Panel members also are responsible for making their own air or rail transportation reservations and obtaining tickets. TFHRC will reimburse travel costs and/or the use of personal automobiles at the standard Federal rate.

**Ground Transportation:** Arrangements for local transportation between the airport or train station and TFHRC will be provided. Expert/peers should not require a car during the review.

**Meals:** Breakfast is included in the cost of the room. Lunches are provided each day during the review. Dinners may be arranged and are designed to allow time for panel deliberations. Special dietary arrangements can be accommodated.

**Dress:** Dress for the entire review is business casual.

**Expenses:** TFHRC will reimburse all meal and lodging expenses. Other expenses, such as meals during travel, also will be reimbursed, subject to limits. Expert/peers must submit vouchers and receipts to FHWA for reimbursement of all covered expenses.

## Winning Strategies

Successful strategies to assist in the conduct an expert/peer review:

**Timing:** Schedule the review around the Associate Administrator's schedule; such senior management participation is essential at the closeout session. Begin early.

**Team-Building:** Conduct a conference call before the review to help the expert/peers to 1) get to know each other and begin forming a team and 2) ask any questions that they may have about the conduct of the review. A pre-review dinner also allows the experts/peers to get acquainted with each other as well as the leaders from the host laboratory.

**Panel Members:** Recruit the very best possible panel members. Include a diverse membership from academia and the private and public sectors. Include representatives from allied disciplines and those knowledgeable in management practices.

**Keep Presentations about Laboratory Activities to a Minimum:** Make presentations short to allow more time for in-depth discussions among panel members, stakeholders/customers, and laboratory managers and personnel. Include substantive information about laboratory activities in the briefing book.

**Interviews:** Limit interviews to a reasonable amount of time, then have an unstructured time for discussion.

**Customers, Partners, and Stakeholders:** Provide a good representation of customers, partners, and stakeholders as participants in the review. Their input is critical to measuring the quality and performance of the laboratory's efforts.

**Panel Executive Sessions:** Provide sufficient time for the review panel to discuss issues and synthesize material.

**Informal Interaction:** Build in time during the review for informal interaction among the laboratory personnel and the experts/peers.

**Meals with Stakeholders/Customers or Laboratory Personnel:** Provide an appropriate room setup to facilitate discussion if breakfast or lunch is scheduled with stakeholders/customers or laboratory personnel. Avoid long conference tables.

**Respect Positions:** Be sensitive to the presence of the host laboratory managers in discussions with stakeholders, customers, or laboratory personnel. Responses of those interviewed may vary, depending on the presence or absence of the host laboratory managers.

## Events Timeline

This events timeline contains a list for the review manager of what to do and when, from the initiation of the review through its completion.

### **Estimated 4 Months Before the Review:**

- ◆ Contact Associate Administrator's administrative assistant to agree upon date for closeout session.
- ◆ Set specific review date.
- ◆ Determine review goals and focus area, if any.
- ◆ Determine which customers and stakeholders should participate and the extent of their contribution to the review.
- ◆ Determine whether a review facilitator will be used.
- ◆ Begin considering agenda.

### **As Soon as Possible Thereafter:**

- ◆ Meet with Associate Administrator to review goals and potential agenda.
- ◆ Send invitation letter to expert/peers.
- ◆ Send invitation letter to customers and stakeholders.
- ◆ Arrange for review facilitator to be available.
- ◆ Make hotel room reservations.
- ◆ Make dinner reservations.
- ◆ Make ground transportation arrangements.

### **Estimated 3 Months Before the Review:**

Make transportation arrangements after acceptance is received from expert/peers.

- ◆ Arrange for any special demonstrations and tours.
- ◆ Begin collecting information to be included in the briefing book.
- ◆ Prepare preliminary agenda.
- ◆ Schedule and invite staff who will make presentations, and determine the content.
- ◆ Hold a status meeting with the Associate Administrator.

### **Estimated 2 Months Before the Review:**

- ◆ Finalize agenda.
- ◆ Finalize laboratory personnel roles and content of presentations.
- ◆ Finalize travel arrangements, including ground transportation.
- ◆ Finalize briefing book materials.

### **Estimated 1 Month Before the Review:**

- ◆ Distribute briefing book.
- ◆ Hold a status meeting with the Associate Administrator.
- ◆ Finalize hotel and meal arrangements.
- ◆ Conduct expert/peer review training seminar for the laboratory personnel.

## **Events Timeline (continued)**

### **Estimated 2 Weeks Before the Review:**

- ◆ Conduct team-building telephone conference call, if desired.
- ◆ Make any adjustments to agenda.
- ◆ Review laboratory personnel roles and responsibilities.

### **As Soon After the Review as Possible:**

- ◆ Distribute panel report to appropriate recipients.
- ◆ Send thank-you letters to all participants: expert/peers, customers, and stakeholders, and others.
- ◆ Conduct post-review session to discuss what went well with the review and what could be improved.

## Sample Agenda

### Evening Before Opening Session

6:30–7:00 p.m. Reception  
7 p.m. Dinner with TFHRC Laboratory Staff

### Day 1

7–8 a.m. Panel Breakfast at Hotel—Panel Orientation, Panel Members Only  
8 a.m. Depart for TFHRC  
8:30–9 a.m. Welcome and Introductions  
9–9:45 a.m. Goals of Review, Assessment Criteria, Process Description, TFHRC Overview  
9:45–10:15 a.m. Break  
10:15 a.m.–12 p.m. 12:00 p.m. Overview of the TFHRC Laboratory and Laboratory Tour  
12–1 p.m. Lunch  
1–2:30 p.m. Technical Discussions  
2:30–3 p.m. Break  
3–4 p.m. Technical Discussions  
4–4:30 p.m. Panel Meeting—Executive Session  
4:30–5 p.m. End-of-Day Wrap-Up—Panel, TFHRC laboratory managers, and Laboratory Assessment Program Staff  
6 p.m. Panel Dinner—Working Session, Panel Only

### Day 2

7:30–8:30 a.m. Panel Breakfast at Hotel with TFHRC Laboratory Personnel and Selected Stakeholders and Customers  
8:30 a.m. Depart for TFHRC  
9–10:15 a.m. Stakeholder and Customer Discussions  
10:15–10:45 a.m. Break  
10:45 a.m.–12:00 p.m. Stakeholder and Customer Discussions  
12–1 p.m. Lunch  
1–2:30 p.m. Technical Discussions or Interviews  
2:30–3 p.m. Break  
3–4 p.m. Technical Discussions  
4–4:30 p.m. Panel Meeting—Executive Session  
4:30–5 p.m. Panel Meets with Laboratory Assessment Program Staff, Associate Administrator, and Office Director for a General Status Check  
6 p.m. Panel Dinner and Working Session—Report Writing, Panel Only

## Sample Agenda (continued)

### Day 3

|                   |   |
|-------------------|---|
| 7–7:30 a.m.       | Panel Breakfast at Hotel  |
| 7:30 a.m.         | Depart for TFHRC  |
| 8–11 a.m.         | Panel Report Writing and Presentation Preparation                   |
| 11–11:30 a.m.     | Review Findings with Host Laboratory Managers                       |
| 11:30 a.m. –12 pm | Finalize Report   |
| 12–12:30 p.m.     | Closeout Session with Associate Administrator and Selected Managers |
| 12:30 p.m.        | Adjourn   |

## Sample Panel Report Format

- ◆ Brief Overview of the Laboratory.
- ◆ Goals.
- ◆ Discussion of Application of Assessment Criteria.
- ◆ Focus Area, If Identified.
- ◆ Participants.
- ◆ Review Process Discussion.
- ◆ Strengths of the Host Laboratory.
- ◆ Key Issues and Opportunities To Be Considered by the TFHRC Laboratory.
- ◆ Minority Opinion, If Necessary.

The report is a cogent description of the expert/peer review panel's understanding of the host laboratory's activities and the panel's findings and recommendations regarding the host laboratory. Bullet points, short descriptive paragraphs, and other methods to express information clearly and concisely are encouraged. A template showing a proposed, optional format for the final report is provided to the review panel.

## **Program Contacts**

Marci Kenney, Director, Office of Program Development and Evaluation  
Office of Research, Development, and Technology  
Federal Highway Administration  
Turner-Fairbank Highway Research Center  
6300 Georgetown Pike  
McLean, VA 22101-2296  
202-493-3317  
E-mail: [Marci.Kenney@fhwa.dot.gov](mailto:Marci.Kenney@fhwa.dot.gov)

Donna McEnrue, Research and Technology Program Specialist  
Office of Program Development and Evaluation  
Office of Research, Development, and Technology  
Federal Highway Administration  
Turner-Fairbank Highway Research Center  
6300 Georgetown Pike  
McLean, VA 22101-2296  
202-493-3172  
E-mail: [Donna.McEnrue@fhwa.dot.gov](mailto:Donna.McEnrue@fhwa.dot.gov)

**Handbook Revision Date: December 14, 2003**



*HRDI-01/01-04(Web)E*