



TRANSPORTATION RESEARCH BOARD

OF THE NATIONAL ACADEMIES

September 27, 2006

Ronald Hynes
Deputy Associate Administrator
Office of Research, Demonstration, and Innovation
Federal Transit Administration
U.S. Department of Transportation
400 Seventh Street, S.W.
Washington, D.C. 20590

Dear Mr. Hynes:

We are pleased to transmit this third letter report of the Transit Research Analysis Committee (TRAC). The committee was convened by the Transportation Research Board (TRB) in response to a request from the Federal Transit Administration (FTA). The members are listed in Enclosure A. The committee is charged with advising FTA as the agency develops a strategic agenda for transit research and with identifying roles that FTA and industry should play in carrying out that agenda. The committee also advises FTA with regard to (a) the federal role in research, relative to the roles and activities of others involved in transit research; (b) high-priority opportunities proposed by the agency; and (c) processes that should be in place to ensure that FTA receives the input and cooperation of transit research stakeholders in developing the federal research program.

The purpose of this brief, out-of-cycle letter report is to share with you in a timely manner the committee's suggestions for helping FTA to develop a compelling research agenda.¹ At the fifth TRAC meeting, held on July 6–7, 2006, in Woods Hole, Massachusetts, FTA presented work under way in developing its 3- to 5-year program plan for research. This program plan will identify the priority research topics to be undertaken to serve the goals of the agency's strategic research plan.² While the work presented is not without merit in providing an inventory of ongoing and recently completed transit research conducted by selected organizations, the committee questions whether the path FTA's contractor is pursuing will lead to the "compelling research agenda" TRAC recommended in its second letter report to you dated March 10, 2006. In the committee's view, a modified approach to identifying specific research activities in support of FTA's strategic research plan would result in a more robust research program offering the potential for more effective use of the agency's limited research budget.

¹ As discussed at the July 2006 meeting, the next major letter report from the committee will follow after the next meeting.

² Other useful and important topics were also presented and discussed at the recent TRAC meeting, but this brief letter report addresses only the development of the program plan. The other topics may be items for the committee's planned letter report following the next meeting. This letter was developed on the basis of deliberations that began at the meeting and was completed on the basis of subsequent correspondence.

BACKGROUND

At the fourth TRAC meeting in December 2005, FTA staff indicated their intention to develop a 3- to 5-year program plan. This plan would lay out the specific research activities that FTA would pursue to meet the objectives established in the September 2005 strategic research plan.

In its March 2006 letter report, TRAC endorsed FTA's proposed development of a multiyear program plan and offered the following observations:

FTA proposes creating a 3- to 5-year research program plan that identifies priority research topics and links the strategic research plan with FTA's annual program of research. The committee considers it important for FTA to identify compelling research topics that FTA can invest in to meet its objectives. Doing so will round out and complete the strategic research plan and make clear the lost opportunities when FTA does not have sufficient discretion over its research funding. . . . The strategic research plan sets forth good objectives and research strategies to meet those objectives but has yet to develop a compelling list of specific research topics. Developing these topics is not a trivial exercise and requires considerable intellectual effort. . . . [T]here is . . . a considerable body of literature to review and analyze. Moreover, defining researchable topics that could contribute to the attainment of FTA's high-level goals requires careful thought and insight.

The committee also made the following recommendation:

Recommendation 4 Assuming that earmarks and designations will continue in the future at some level, FTA should encourage Congress to select topics that will help the agency reach its strategic objectives by developing, publishing, and marketing a compelling list of research topics. The list, which should be developed as a matter of urgency, should form part of the 3- to 5-year research program plan linking the strategic research plan and FTA's annual program of research.

At the June 6–7, 2006, meeting, the contractor retained by FTA reported on its efforts to analyze the agency's current portfolio of research relative to the research strategies identified in the plan. (With the same terminology as applied in the plan, FTA's research strategies flow from objectives that, in turn, serve the high-level goals articulated in the plan.) The contractor also reported on the proposed "next steps" in filling gaps identified in FTA's portfolio. These gaps were identified by analyzing the scopes of research projects underway by FTA's contractors, through the Transit Cooperative Research Program (TCRP), and in the University Transportation Centers Program.³ The committee is concerned that the approach described may not necessarily capture compelling research topics.

SUGGESTED STEPS FOR DEVELOPING A RESEARCH AGENDA

In the committee's view, four steps should be taken to define research projects that will serve the objectives articulated in FTA's strategic research plan and result in a compelling research agenda:

1. Refine and develop research strategies,

³ Information on these projects was taken from an in-house FTA database.

2. Analyze the existing literature related to these strategies,
3. Identify gaps in ongoing research, and
4. Determine promising research projects.

The following example illustrates these steps.

Refine and Develop Research Strategies

Goal 4 of the FTA strategic research plan is “Improve safety and emergency preparedness.” Objectives 4.1 and 4.2 to serve this goal are, respectively, “Identify solutions to improve transit safety” and “Identify solutions to reduce criminal activity.”⁴ The first step in setting potential research strategies to meet these objectives would be to analyze and identify the full range of hazards including, for example,

- Assaults on passengers,
- Assaults on staff,
- Workplace accidents,
- Passenger injuries in vehicles,
- Passenger injuries in transit facilities,
- Passenger and staff deaths and injuries resulting from crashes,
- Third-party deaths and injuries resulting from strikes and crashes,
- Deaths and injuries resulting from equipment and systems failures, and
- Emergency evacuation of passengers.

The frequency and magnitude of these incidents should be identified. In most cases this should be possible by reviewing relevant data, but in some instances informed judgment may be the only or best way of building up a picture. With safety there is the special problem of rare events, such as the breach of submerged rail tunnels, for which a structured risk assessment is needed. Indeed, such assessments may themselves turn out to be research topics. Once these components have been identified and scaled, then they can be ranked in importance and used to set priorities for research strategies.

Without having examined the data, the committee is not in a position to arrive at judgments about the research strategies identified under Objectives 4.1 and 4.2 of FTA’s strategic plan.

Analyze the Existing Literature

It does not appear from the presentation at the meeting that FTA’s contractor has conducted an assessment of the literature. This is a necessary step, particularly when a topic has been an ongoing subject of research. For example, one research strategy identified in the strategic plan for Objective 4.1 is to “improve grade crossing safety.” A search of the Transportation Research Information Services (TRIS) Online database reveals 82 articles relevant to transit on this topic published in the past 10 years. In addition, the Federal Railroad Administration has funded and evaluated several innovative demonstration projects through its Next Generation High-Speed Rail Technology Demonstration Program. Critical reviews of such literature and efforts by experts in the field can be particularly helpful. For example, a review of the literature on transit ridership, relevant to another goal in FTA’s strategic research plan, was presented and

⁴ Objectives 4.1 and 4.2 are discussed by way of example. Objective 4.3 (Identify solutions to improve transit emergency preparedness) is not addressed explicitly in this report.

discussed at the committee's meeting last summer.⁵ During the meeting, one of the review's authors, Brian Taylor, suggested possible areas of research that FTA could consider. Also, an extensive series of TCRP publications provides guidance to practitioners on how to improve ridership through system and service changes.⁶ These publications review existing studies and synthesize the results for practical use. Areas in which the authors could find no relevant studies or in which results cited are of questionable reliability because they are out of date or for methodological or other reasons, indicate possible areas for research by FTA. A thorough review of the literature can also indicate when knowledge exists to address a problem but the results have not been disseminated or applied.

Identify Gaps in Ongoing Research

The committee is concerned about the way in which FTA's contractor has defined the existing portfolio of research projects and organized these projects by strategic plan objective. The committee recognizes, however, that any organizational scheme is somewhat subjective. While establishing a good inventory of work under way and recently completed certainly is important, this inventory should include not only research funded wholly or partially by FTA but also other relevant research that could serve FTA's objectives. Thus, research conducted by states, the American Public Transportation Association (APTA), and the private sector, among others, should be included in the analysis. The quality of the research results must also be determined as part of this analysis. Gap analysis needs to focus on identifying gaps in knowledge rather than gaps in FTA's program based on budgets and numbers of projects.

Determine Promising Research Projects

Determining whether there is a reasonable chance of success from proposed research is a particularly important, albeit difficult, task. Judgments about promising areas of research to address each research strategy should be made by people with insight into the potential for success, including those who possess research expertise in the areas. On occasion, problems may be identified that simply are not tractable as research topics, because of either the cost of addressing them (due to scale, methodological issues, or lack of data) or the difficulty of obtaining a useful result that can be implemented.

NEXT STEPS

The committee continues to believe that a compelling research agenda is the most important missing piece from FTA's strategic research plan. Even before developing this agenda, it would be useful to have the identified research strategies verified by FTA's stakeholders. In parallel, the committee recommends that FTA, or a contractor for FTA, begin conducting critical literature reviews of past and ongoing research for each research strategy to identify gaps in knowledge. A variety of expert groups may be willing to assist in this effort. FTA could consult with groups such as APTA's Research and Technology Committee, the committees in TRB's Technical Activities Division possessing expertise that aligns with several of the research strategies in FTA's plan, and the university transportation centers with transit expertise.

⁵ Brian D. Taylor and Camille N. Y. Fink. *The Factors Influencing Transit Ridership: A Review and Analysis of the Ridership Literature*. 2005. www/uctc.net/papers/681.pdf.

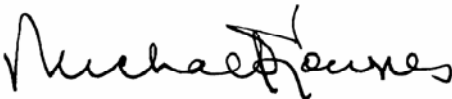
⁶ *TCRP Report 95: Traveler Response to Transportation System Changes*. Various chapters, published as separate reports in the *TCRP Report 95* series. Transportation Research Board of the National Academies, Washington, D.C.

The committee realizes that the development of a compelling research agenda will take considerable time and effort. FTA may want to begin with a particular goal and complete it before moving on to others. As with the strategic research plan, which FTA has characterized as a living document, development of the research agenda should be viewed as an ongoing effort. The committee continues to urge FTA to place priority on making progress in this important area and looks forward to a progress report at the next TRAC meeting.

CONCLUDING OBSERVATIONS

FTA's initial steps in rebuilding its research, development, and demonstration program—the development of a robust strategic research plan and the attainment of a preliminary high score from the Office of Management and Budget from its Program Assessment Rating Tool (PART) analysis—provide a solid foundation on which to build. The committee hopes the advice provided in this letter will assist FTA in moving ahead with the critical next step of developing a multiyear program plan that includes a compelling research agenda.

Sincerely,

A handwritten signature in black ink that reads "Michael Townes". The signature is written in a cursive style with a large, stylized initial "M".

Michael S. Townes,
Chair, Transit Research Analysis Committee

Enclosure A: Committee membership

ENCLOSURE A

TRANSIT RESEARCH ANALYSIS COMMITTEE

(names in bold indicate those present at July 6–7, 2006, meeting)

Michael S. Townes, *Chair*, Hampton Roads Transit, Hampton, Virginia
J. Barry Barker, Transit Authority of River City, Louisville, Kentucky
David Bayliss, Halcrow Group, London, England
Linda Bohlinger, HNTB Corporation, Santa Ana, California
Barbara K. Cline, Prairie Hills Transit, Spearfish, South Dakota
Lester A. Hoel, NAE,⁷ University of Virginia, Charlottesville
Ronald L. Epstein, New York State Department of Transportation, Albany
Paul E. Jamieson, Wabtec Corporation, Spartanburg, South Carolina
Brian Macleod, Gillig Corporation, Hayward, California
Clarence W. Marsella, Jr., Denver Regional Transportation District, Colorado
Michael H. Mulhern, MBTA Retirement Fund, Boston, Massachusetts
Jeffrey Rosenberg, Amalgamated Transit Union (ATU), Washington, D.C.
Nigel H. M. Wilson, Massachusetts Institute of Technology, Cambridge

⁷ NAE = National Academy of Engineering