

PASSENGER PROTECTION IN RAIL TRANSIT VEHICLES

AGENCY: Federal Transit Administration (FTA), DOT

ACTION: Notice of Request for Applications (RFA)

SUMMARY: Improving safety and emergency preparedness of public transportation is one of FTA's five Strategic Research Goals. Under this goal, FTA has set forth objectives to improve passenger protection in rail transit vehicle collisions and identify interior feature designs or configurations that minimize passenger injuries in secondary impact scenarios. (Secondary impact refers to an occupant striking part of the vehicle interior surfaces or other occupants during a collision, derailment or sudden stop). FTA seeks applications for research defining the problem of collision-related rail transit passenger injuries and identifying designs or solutions to prevent or mitigate injuries.

DATES: An applicant must submit a proposal electronically to <http://www.grants.gov> by August 11, 2008 for consideration. All potential applicants are advised to begin the <http://www.grants.gov> registration process immediately, if they have not previously submitted Federal assistance applications through <http://www.grants.gov>, in order to be able to meet the deadline. FTA expects to award funds through a cooperative agreement in October 2008. In the event of a system problem or technical difficulty with the application submittal, the applicants should contact the FTA Project Manager for delivery instructions.

ADDRESSES: The website <http://www.grants.gov> allows applicant organizations to electronically find and apply for competitive opportunities from all Federal agencies that award Federal assistance. This website is the single access point for over 1000 Federal assistance programs administered by 26 Federal agencies.

FOR FURTHER INFORMATION CONTACT: Technical, program management and administrative questions should be directed to Roy Chen, Office of Technology (TRI-20), Federal Transit Administration, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, Room E43-440, Washington, D.C. 20590; email address: RoyWeiShun.Chen@dot.gov, or by phone at 202-366-0462.

SUPPLEMENTARY INFORMATION:

Background

FTA's research activities are authorized by 49 U.S.C. Section 5312, Research, Development, Demonstration, and Deployment Projects. Improving Safety and Emergency Preparedness is one of FTA's five Strategic Research Goals. Under this goal, FTA has set forth objectives to improve passenger protection in rail transit vehicle collisions and identify interior feature designs or configurations that minimize passenger injuries in secondary impact scenarios.

While rail transit is a safer form of transportation relative to private automobiles and buses, rail transit collisions still occur and could result in passenger injuries and fatalities caused by secondary impacts. Secondary impacts in rail transit vehicles generally do not result in fatalities

but can cause serious and possibly life-threatening injuries. The severity of injuries is generally dependent on the impact velocity, rate of deceleration and contact pressure.

The Federal Railroad Administration (FRA) and Volpe National Transportation Systems Center have conducted research into crash energy management for occupant protection and interior equipment crashworthiness for high speed passenger rail¹. However, similar research has not been conducted for rail transit vehicles.

Objectives

This RFA seeks applications to define the scope, causes and costs of injuries to rail transit passengers and to identify changes to rail vehicle interior surfaces and configurations that could potentially eliminate or mitigate passenger injuries in secondary impact scenarios.

Project Description

Statistically, light rail systems have higher injury rates on a per passenger-mile basis than heavy rail and commuter rail, because light rail transit systems in most cities operate on city streets with at-grade crossings. Due to the relatively low speed of LRV operation in urban cores (below 35 mph), the majority of the passenger injuries from collisions stem from secondary impacts with some part of the vehicle interior surfaces (seats, grab handles, poles, etc.) or other passengers, rather than injuries from ejection or collapse of the vehicle frame.

Heavy rail systems have fewer injuries per passenger-mile than light rail and commuter rail systems, but more total injuries and fatalities because they carry many more passengers. The higher incidence of injuries and fatalities on heavy rail systems are mostly caused by the higher weight of the vehicles, speed of operation, number of passengers per car, collisions involving another heavy rail vehicle or derailments. However, the existing statistical data does not correlate the collision scenarios and vehicle interior equipment configurations to types or severity of injuries sustained by passengers.

Data from the National Transit Database (2002-2005) indicate an average of 4,433 injuries and fatalities in U.S. heavy rail transit systems per year, 1,625 injuries and fatalities in commuter rail systems and 605 injuries and fatalities in light rail transit systems². However, the data does not discern injuries and fatalities from pedestrians, occupant of rail vehicles or occupant of motor vehicles. Therefore, the extend of injuries and fatalities caused by secondary impacts in rail transit vehicles are unknown.

This research study is intended to be the first phase of a multi-year FTA rail transit passenger protection program (future funding will depend on Congressional appropriations). The ultimate goal of the program is to lay the foundations necessary to generate transit rail vehicle interior surfaces design guidelines to protect passengers during collisions.

¹ <http://www.volpe.dot.gov/sdd/pubs-crash.html>

² <http://transit-safety.volpe.dot.gov/Data/SAMIS.asp>

The proposed research will result in a publishable report that includes the following tasks:

- 1) Literature review of rail transit passenger protection research and studies. What studies have been completed that address interior design or occupant protection strategies during a collision, derailment or emergency stopping? What has been the overall assessment of injury potential from interior design choices?
- 2) Survey of existing rail transit vehicles interior surfaces and configurations. Define the potential hazards or safety features built into current vehicle designs, seating equipment, seating arrangement and other interior components. Articulate the range in designs and their potential effectiveness or possible weakness
- 3) Survey of existing standards and regulations related to rail transit passenger protection. Indicate areas where further standardization may be needed.
- 4) Analysis of accident statistics and typical crash scenarios to assess the potential type and severity of passenger injuries in rail transit vehicle collisions and derailments. Define severity in consideration of vehicle interior design characteristics.
- 5) Definition of follow up research and analysis to mitigate rail transit passenger injuries. What additional research should be performed including possible simulation studies using vehicle interior design characteristics and human response dynamics or field experiments?

Note: Mitigation of collision injuries to those who are *not* occupants of rail transit vehicles is the subject of separate research. It is beyond the scope of the research for which applications are requested in this announcement.

Award Information

FTA may fund one or more applications under this program. Funding for each cooperative agreement under this program will range from \$50,000 to \$175,000. The total available funding is \$175,000. Future funding will depend on appropriations. FTA will participate in activities by attending review meetings, commenting on technical reports, maintaining frequent contact with the project manager and approving key decisions and activities, including redirecting activities if needed.

Cost Sharing or Matching

Federal transit funds are available to research projects at up to 100 percent of the project cost. However, cost sharing will be an evaluation criterion.

Eligibility Information

Eligible recipients include State and local government agencies, public and private transit agencies, universities, non-profit organizations, consultants, legally constituted public agencies, operators of public transportation services, and private for-profit organizations.

Proposal Content

This announcement includes all of the information that you need to apply. The following form is available in grants.gov and is required to be completed:

1. SF 424 Mandatory

Most of SF424 is self explanatory. The application should answer the following items as follows:

- 1a: "application"
- 1b: "annual"
- 4a: [leave blank]
- 4b: "26"

Other Attachments Form:

1. The application should attach a pre-application (not more than 15 pages in length) as outlined in Chapter II (Item 9.b) of FTA Circular 6100.C: Transit Research and Technology Programs: Application Instructions and Program Management Guidelines. http://www.fta.dot.gov/laws/circulars/leg_reg_4121.html

This pre-application should also address the six criteria laid out below in the Application Review Information section. The project budget justification should include identification of any matching funds and their source. The Formal Application described in the Circular is not being requested at this time.

2. The application should attach information on the qualifications of key personnel, including biographies.

Application Review Information

A review panel will be convened to review each proposal. Project proposals will be evaluated based on the following criteria;

1. Proposed Research, which includes demonstrated understanding of the problem to be investigated, the applicability of the proposed research to the requirements, the adequacy and uniqueness of the research approach, the need for each proposed research task, and the expected results. Projects should be narrowly defined to focus on improving passenger protection in rail transit vehicle collisions and identifying interior features, surfaces and configurations that minimize passenger injuries in secondary impact scenarios
2. Qualifications of Key Personnel, which includes knowledge of and prior experience with secondary impact crash injury biomechanics, simulation of crash effects on passengers, rail transit vehicle designs, and crash energy management research.

3. Technical Management Plan, which includes the management approach for planning, scheduling, administering, coordinating and conducting the work effort.
4. Past Performance on activities relevant to the proposed work.
5. Cost and Cost Sharing.
6. Plan for evaluation and data collection. The proposal must address how success will be measured (e.g., new contributions to the body of knowledge related to rail transit safety).

Award Administration Information

The notification date for successful applications is expected to be during September of 2008. Following receipt of the notification letters, the successful entities will be required to submit the Formal Application as outlined in Chapter II (Items 10-25) of FTA Circular 6100.C: Transit Research and Technology Programs: Application Instructions and Program Management Guidelines http://www.fta.dot.gov/laws/circulars/leg_reg_4121.html through the FTA Transportation Electronic Award Management (TEAM) system website.

FTA will manage the cooperative agreement through the TEAM system. Before FTA may award Federal financial assistance through a Federal grant or cooperative agreement, the entity must submit all certifications and assurances pertaining to itself and its project as required by Federal laws and regulations. FTA has consolidated the various certifications and assurances that may be required of its awardees and projects into a single document published in the *Federal Register*. Fiscal year 2008 Annual List of Certifications and Assurances for FTA Grants and Cooperative Agreements and guidelines was published in the *Federal Register* on October 25, 2007 and posted on the FTA website at: http://www.fta.dot.gov/funding/apply/grants_financing_7411.html .

Recipients will be required to manage their projects in accordance with FTA Circular 6100.C: Transit Research and Technology Programs: Application Instructions and Program Management Guidelines: http://www.fta.dot.gov/laws/circulars/leg_reg_4121 . This includes requirements for project management and administration, including quarterly reporting, financial management, and payments. Any contracts awarded to other parties using FTA funds must comply with FTA Circular 4220.1E: Third Party Procurement Guidelines, posted on the FTA website at http://www.fta.dot.gov/laws/circulars/leg_reg_4063.html.