

Transit Climate Change Adaptation Assessment Pilots

Agency: Federal Transit Administration (FTA), DOT

Action: Notice of Request for Applications (RFA)

Summary:

The Federal Transit Administration (FTA) is soliciting proposals for transit climate change adaptation assessment pilots. The pilots will fund transit agencies or partnerships with transit agencies to assess the vulnerability of transit agency assets and services to climate change hazards such as heat waves and flooding. The pilots will also assess initial adaptation strategies and link these strategies to transit agency organizational structures and activities. One of the pilots will focus on demonstrating the integration of adaptation assessment within an asset management system. Each pilot will submit to FTA a final report on the activities conducted, main findings, and applicability to other transit agencies. FTA contemplates making approximately four cooperative agreement awards, ranging from \$50,000 to \$175,000 each. Total funding available is \$525,000. Eligible recipients are either 1) a public transportation provider or, 2) a university, non-profit, private, or public entity working in partnership with a public transportation provider.

Dates: An applicant must submit a proposal electronically to <http://www.grants.gov> by 12pm Eastern Time on Thursday, August 25 for consideration. All potential applicants are advised to begin the 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.

Addresses: Proposals must be submitted electronically to <http://www.grants.gov>. Emailed proposals will not be accepted. The website 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: Tina Hodges, Office of Budget and Policy, Federal Transit Administration, U.S. Department of Transportation, 1200 New Jersey Avenue SE, Washington, D.C. 20590; tina.hodges@dot.gov; (202) 366-4287.

Supplementary Information:

Background:

Climate-related changes are already observed in the United States and will increase in the future, according to the U.S. Federal government's Global Change Research Program. These include increases in heavy downpours, rising temperature and sea level, increasing severity of drought and wildfires, and thawing permafrost. Reducing greenhouse gas emissions will lower the

severity of these impacts over the long-term. However, even if aggressive action is taken to reduce emissions, climate change impacts will continue for many years because of past emissions. As such, both mitigation (reducing greenhouse gas levels) and adaptation (reducing vulnerability of human and natural systems to climate impacts) is required. This project focuses on adaptation.

Climate change has particular impacts on public transportation. Subway tunnels, busways, tracks, and maintenance facilities are vulnerable to an increase in flooding from more intense rain storms, sea-level rise, and storm surge. Extreme heat can cause deformities in rail tracks, at minimum resulting in speed restrictions and, at worst, causing derailments. Public transportation is also called upon to provide evacuation services during the type of extreme weather emergencies that are projected to become more common with climate change. Transit dependent populations are particularly vulnerable. Adapting transit to climate change impacts is critical to maintaining a state of good repair, protecting the safety of travelers, and ensuring mobility.

In recent years, multiple state and local governments have developed climate adaptation plans. Partnerships between academic institutions, non-profits, and state and local governments have been some of the most successful efforts. In the transportation sector, researchers and practitioners have begun to consider the impacts of climate change on transportation infrastructure, most notably in Transportation Research Board Special Report 290 and in the U.S. Department of Transportation's Gulf Coast Study. However, to date, little work has focused on public transportation assets and operations.

The pilots solicited in this notice are part of a larger FTA effort that includes a synthesis report and series of workshops. The synthesis report should be available in July, and can serve as background information and a starting point for recipients. Applicants can find more background on the FTA website at <http://www.fta.dot.gov/sustainability> (under the climate change link) and on the U.S. DOT Climate Change and Transportation Clearinghouse site at <http://www.climate.dot.gov>. The Federal Highway Administration (FHWA) has also produced several useful resources, available at <http://www.fhwa.dot.gov/hep/climate/resources.htm>.

Multiple models for adaptation assessment are available, such as:

- New York Climate Adaptation Assessment Guidebook, <http://onlinelibrary.wiley.com/doi/10.1111/j.1749-6632.2010.05324.x/pdf>
- Federal Highway Administration Conceptual Model Assessing Vulnerability and Risk of Climate Change Effects on Transportation Infrastructure, http://www.fhwa.dot.gov/hep/climate/conceptual_model62410.htm
- Center for Science in the Earth System (CIG), University of Washington; and King County, WA, Planning for Climate Change: A Guidebook for Local, Regional, and State Governments, <http://cse.washington.edu/cig/fpt/guidebook.shtml>
- ICLEI Adaptation Database and Planning Tool (ADAPT), http://www.icleiusa.org/programs/climate/Climate_Adaptation/climate-resilient-communities-program

- United Kingdom Climate Impacts Program (UKCIP), Risk Framework, <http://www.ukcip.org.uk/>

Objective:

FTA seeks to increase knowledge of how transit agencies can adapt to climate change. FTA's objectives are to advance the state of the practice in adapting transit assets and operations to the impacts of climate change, to assess lessons learned for application to other transit providers, and to build strategic partnerships between transit agencies and climate adaptation experts. To avoid duplication of existing efforts and to maintain a focused scope, this project focuses specifically on public transportation adaptation. FTA will fund transit adaptation assessment pilots towards these ends.

The adaptation assessment pilots will include the following key elements:

1. Identify current and future climate hazards relevant to public transit agency assets and operations.

Using the best available climate change data, identify climate hazards relevant to the transit agency. These pilots are not intended to fund new climate science nor new downscaling of climate data to the regional level. Instead, the pilots will use existing climate change data. This is in order to maintain manageable scope and cost, and focus resources on assessment specific to transit agencies, an area that is less developed to date. It is anticipated that projects will leverage partnerships with climate experts to determine the best data to use and receive guidance on how to interpret and apply it to implications for transit agency assets and operations. The pilot should also assess current climate hazards. For instance, if the agency has experienced increased maintenance costs due to storm or severe weather damage in recent years, or if there are specific instances where asset life cycles or performance have been reduced due to severe weather conditions, this information should be collected.

2. Characterize the risk of climate change on agency infrastructure and operations.

Risk is defined as the product of the likelihood of the impact occurring and the magnitude of the consequence should the impact occur. A risk assessment can be used to prioritize those impacts of most concern, given limited resources. Risks can be categorized on a two-dimensional risk matrix, where those risks with the highest likelihood of occurrence and greatest magnitude of consequences are the top priority. The likelihood of impact is the probability that a given climate hazard (such as more intense rainstorms) will occur, and that it will result in a transit impact (such as flooding of a maintenance facility) over the lifetime of the transit asset. The vulnerability of transit assets and operations is a function of their exposure to climate hazards, their sensitivity to those hazards, and their adaptive capacity. As such, it is important to assess thresholds above which transit assets begin to experience climate impacts (for example, inches of rain per hour above which drainage systems and pumps are overwhelmed). It is also important to examine sensitivity indicators - that is, aspects of transit assets that indicate that they are more

prone to damage than other, similarly exposed assets (for instance, poorly maintained track with weak ballast is more susceptible to rail buckling).

3. Develop initial adaptation strategies.

At this stage, the partners assess strategies to reduce the vulnerability of transit assets and operations to climate impacts. This includes strategies such as engineering of new assets to withstand environmental conditions anticipated in the future (e.g. construction materials better suited to higher heat days), retrofits of existing assets (e.g. adding barriers to prevent water incursion into tunnels), more intensive maintenance schedules (e.g. more frequent cleaning of drains), systems planning (e.g. siting of new facilities outside of expanded flood plains), and improved operations plans for weather emergencies (e.g. ensuring evacuation services to transit dependent populations and moving rolling stock to higher ground). Adaptation strategies should be evaluated based on cost savings from avoided impacts as well as implementation costs. Strategies should also be evaluated based on their feasibility, efficacy, and ability to withstand a range of climate hazards. Strategies should additionally be evaluated based on their negative or positive impacts on other areas (co-benefits). For instance, capturing rain water to use for washing buses reduces flooding, reduces greenhouse gas emissions from water purification and pumping, and reduces water utility bills.

4. Link strategies to agency organizational structures and activities.

Climate change will affect the full range of transit agency departments and activities, including operations, maintenance, planning, environmental review, design, construction, and emergency preparedness. Climate change adaptation will be most effective when mainstreamed throughout the agency's processes, increasing institutional awareness and ensuring that adaptation is addressed in all relevant areas in an efficient and non-duplicative manner. Particularly of interest to FTA is integration of climate adaptation assessment with asset management and state of good repair efforts. Incorporation into an agency's asset management system is a convenient and targeted approach as both efforts involve developing inventories of assets and taking a risk-based approach to factors that affect asset conditions. Asset management systems also offer a streamlined framework for incorporating climate adaptation into capital plans, rehabilitation cycles, and budgets. With scarce resources, adaptation assessments within an asset management system would provide agencies a strategic tool for optimizing resource allocation while minimizing and mitigating risk. The pilots should examine how best to navigate the particular institutional and funding issues transit agencies face. Measuring and presenting climate adaptation information and performance to the public and key stakeholders should also be explored.

Although not a part of this adaptation assessment pilot, the next steps include implementation of adaptation strategies and monitoring and reassessment.

All steps of the adaptation assessment should involve staff from across the transit agency. Involving frontline staff in these areas brings key information and engagement. Maintenance

staff are often well aware of key factors such as which bus lots and sections of right of way are likely to flood. All steps should also leverage partnerships, bringing in experts from a range of relevant backgrounds such as climate science, civil engineering, and urban planning.

For more information on adaptation assessment, recipients may rely on assessment models such as those referenced in the background section above.

The level of depth of the assessment may vary and must be described in the project description and reflected in the budget. In addition, transit agencies vary in size and complexity leading to differently scaled adaptation assessments.

The lead recipient for each adaptation assessment pilot will submit to FTA a final report. The general outline of the report will be as follows:

1. Background (including parties involved, previous adaptation work by the transit agency or locality or state in which located)
2. Climate impacts relevant to transit agency
3. Risk assessment
4. Assessment of initial adaptation strategies (including costs, feasibility, co-benefits)
5. Linkage of strategies to transit agency organizational structure and activities
6. Next steps (other work anticipated in this area)
7. Lessons learned applicable to other transit agencies and FTA
8. Recommendations for future transit adaptation efforts

The final report should be in a form that is sharable with other agencies, and may be posted to the FTA website.

In addition to the final report, recipients will also provide FTA throughout the project with copies of other relevant written products such as analyses and presentation slides.

Recipients are expected to share information between pilot projects and to disseminate the findings of their work broadly. Recipients may be invited to speak at FTA sponsored workshops.

Award Information:

FTA contemplates making approximately four cooperative agreement awards, ranging from \$50,000 to \$175,000 each. Total funding available is \$525,000. The funding award to selected projects may be less than the amount requested by the applicant. The period of performance is 15 months following approval of the work plan.

After awards are announced, recipients will participate in a conference call with FTA to discuss the pilot project. FTA will provide feedback on the draft work plan, the goals of the project, and any additional assistance/resources that FTA may have available. The recipient will then submit a revised work plan, which must be approved by FTA before commencing work.

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. FTA staff will also facilitate knowledge sharing between pilot projects as well as with other U.S. DOT efforts.

Cost Sharing or Matching:

The federal share may be up to 100 percent of the project cost. However, cost sharing will be an evaluation criterion.

Eligibility Information:

Eligible recipients are either 1) a public transportation provider or, 2) a university, non-profit, private, or public entity working in partnership with a public transportation provider. If the project involves a partnership, the application must clearly identify a lead organization to serve as the recipient and manage the funding arrangements with FTA. FTA will evaluate partnerships as a unit. A public transportation provider must be either the lead or one of the partners.

Proposal Content:

This announcement includes all of the information that an eligible applicant needs to apply. All items must be submitted through the grants.gov portal.

The proposal must include:

1. SF 424 Mandatory Form
This standard form is available at <http://www.grants.gov> and is largely self explanatory.
2. Project Proposal Narrative
You must submit a project proposal narrative of **not more than 10 pages** in length. It must include:
 - a. *Project Title*
 - b. *Abstract* (300 words or less)
 - c. *Project Description/ Draft Work Plan*
This section should include the purpose/goal and a detailed description of the effort to be funded. It should identify the activities to be undertaken in detail by major task with principal output and schedule. The narrative should describe any existing adaptation efforts, the types of climate change effects and impacts to be addressed, and the geographic focus of the project (e.g. transit system-wide, particularly vulnerable section of service area such as floodplain area, maintenance shop area, etc). It should identify the key person(s) and organizations along with their qualifications. It should clearly identify the lead agency for the pilot. This section should explain how information and analysis

resulting from the pilot will be relevant to the transit industry and describe plans to disseminate this information.

d. Budget

Provide project budget with breakdown by categories and work products. Provide supplemental information to explain where not self-evident. The project budget justification should include identification of any matching funds or in-kind match and source. Proposing agencies should ensure that adequate funding, staffing and technical resources are available to successfully complete the project. This section should also describe how the proposed effort fits with other climate change adaptation, vulnerability assessment, asset inventory or other related, on-going efforts, if applicable.

e. Response to Evaluation Criteria

This section should address evaluation criteria listed under the application review information section below if not already addressed in items (a) - (d) above.

3. Letters of Partnership and Support

If the proposal involves a partnership, the applicant must attach a letter, signed by all of the partners, stating the agreement of the partners to participate jointly in the project. A transit agency must be either the lead or one of the partners. If, after selection, one partner withdraws, a replacement partner must be added with similar qualifications. Applicants may also attach letters of support from other stakeholders. Such letters strengthen the proposal by demonstrating collaboration and coordination with other agencies or entities in the pilot.

Application Review Information:

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

1. Well thought out, feasible, and responsive project plan and technical approach. Project plan and technical approach are well thought out, feasible, and responsive to the objectives and key elements of adaptation assessments described in the objectives section above.
2. Broad organizational involvement. Project involves transit agency staff, including frontline staff, from a wide range of fields impacted by climate change, such as maintenance, operations, engineering, planning, and emergency preparedness and response. Project approach aims to mainstream adaptation efforts throughout the agency's process, increasing institutional awareness and effectiveness. Particularly of interest to FTA is integration of climate adaptation planning with asset management and state of good repair efforts.
3. Applicability to other transit agencies. Proposals will be evaluated based on the applicability of their approaches and potential findings to other U.S. transit agencies and the quality of the plan for assessing lessons learned and disseminating results.

4. Demonstrated interest and commitment.
5. Qualifications of key personnel. Relevant knowledge related to public transportation and climate change adaptation (e.g., risk assessment, engineering).
6. Past Performance. Quality of prior performance on activities relevant to the proposed work.
7. Strategic partnerships. The project will engage stakeholders or partners that will strengthen the outcomes. The project proposal demonstrates that the capabilities of the entities to be involved in the project complement one another and that collaboration and coordination will be mutually beneficial.
8. Cost and cost sharing.
9. Geographic and transit system diversity (size, modes, etc).

Award Administration Information

The notification date for successful applications is expected to be in the fall of 2011. 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 6100.1C: 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 FTA's grant management system (TEAM). 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 the projects into a single document published in the Federal Register. The Annual List of Certifications and Assurances for FTA Grants and Cooperative Agreements and guidelines is published in the Federal Register and posted on the FTA Web site at: http://www.fta.dot.gov/funding/grants_financing_93.html.

Recipients will be required to manage their projects in accordance with FTA Circular 6100.1C: Transit Research and Technology Programs: Application Instructions and Program Management Guidelines: http://www.fta.dot.gov/laws/circulars/leg_reg_4121.html. This includes requirements for project management and administration, including quarterly reporting, financial management, and payments.

Costs incurred prior to FTA award are not eligible as project expenses.