



# Request for Proposals for Pooled Fund Project

## Applying an Equity Lens to Automated Payment Solutions for Public Transportation

<http://nitc.trec.pdx.edu/>

### 1 Overview

The **National Institute for Transportation and Communities** (NITC) is a program of the [Transportation Research and Education Center](#) (TREC) at Portland State University. NITC is the U.S. Department of Transportation's national center for livable communities and one of the U.S. DOT's national university transportation centers.

NITC is a Portland State-led partnership with the Oregon Institute of Technology, University of Arizona, University of Oregon, University of Texas at Arlington, and University of Utah.

Improving the  
mobility of people  
and goods  
to build strong  
communities

NITC's pooled-fund grant program is intended to help maximize implementation of U.S. DOT's commitment to improving the mobility of people and goods while providing regional and local agencies, such as metropolitan planning organizations, transit agencies, and municipalities, more opportunity to be invested in research. Research statements were solicited from partner agencies, and the following research need was selected by the NITC Executive Committee to move forward for funding.

#### 1.1 Project Outline

Transit agencies are modernizing their fare collection systems in an effort to reduce the expense of collecting cash and increase operating efficiency. Reducing cash in the transit system not only lowers costs to maintain and operate the system, but also provides an opportunity to collect enhanced ridership data to optimize routes and better serve the community. As technology continues to innovate mobility, the ability to connect customers across multiple modes with an automated fare payment solution has become a hallmark for many public agencies. Yet the equity implications for people who may be excluded or greatly inconvenienced by paying for transit through non-cash based collection technologies are not well understood.

What are the perceived and realized outcomes of equity solutions employed by public agencies to address automated payment technologies? How does the automated payment systems impact customers that live or work in transit deficient areas; the underbanked and unbanked customers; riders that do not own smartphones or have readily available internet access; and other customers that are potentially excluded from these automated payment solutions? How are agencies addressing these issues and how effective are these solutions? The results of this research will provide a framework to answer these questions, and will be used by public transportation agencies, mobility service providers, advocacy groups,

and technology providers/vendors to develop and implement equitable solutions that provide the best possible impact to the community they serve.

To achieve this goal, the project will examine existing and emerging automated “cashless” payment technologies and identify the associated equity impacts for each technology. Data will be provided by the partner agencies, however new data from surveys and outreach may be needed to identify the most impactful and cost-effective methods for addressing ‘excluded’ users in modern fare collection technologies. For each mitigation strategy, this study will utilize cost-effectiveness measures to evaluate implementation costs of reaching different excluded user groups. The study will identify technology or solution gaps that need to be implemented to effectively address users excluded by automated “cashless” payment solutions.

NITC and our partners are issuing a Request for Proposals for qualified research teams to respond to this need. The project budget is \$150,000 with research completed within a time period of 18 months. **Proposals are due October 19, 2018, 5pm PST**, and must be submitted by logging into NITC’s online system at: <https://ppms.trec.pdx.edu>. Please select grant cycle “**NITC Pooled Fund Round 3**”.

## 1.2 Project Partners

This national study brings together cities, transit agencies, and a private partner in providing financial support for the project. These include:

- City of Gresham, OR
- City of Eugene, OR
- Denver RTD, CO
- Lane Transit, OR
- moovel

Additional partners will share data from ongoing or near-term rider intercept studies. These include:

- TriMet, OR (rider intercept study)
- WMATA, DC (rider intercept study for evaluation of cashless pilot)

A subset of these partners will serve on the project Technical Advisory Committee (TAC). The TAC will provide project oversight and feedback and will be responsible for reviewing any products, deliverables, and reports produced during the project.

Several of the identified transit agency partners have deployed one or more forms of cashless fare collection technologies. Additionally, Lane Transit District will be deploying a new fare collection technology during the summer of 2019.

## 1.3 Eligibility

Faculty members and research faculty eligible to serve as Principal Investigators (PIs) at Portland State University, the University of Oregon, the Oregon Institute of Technology, the University of Arizona, the University of Texas at Arlington, or the University of Utah may submit proposals.

Proposals may include multiple investigators, and collaborative projects across disciplinary and campus boundaries are encouraged. Proposals including multiple investigators must identify one lead PI contact responsible for reporting and associated administrative tasks. NITC Executive Committee members are allowed to submit proposals, but are a part of the selection process for this RFP.

## 2 Project Tasks

There objectives of this research are to:

- (1) Examine existing and emerging automated “cashless” payment technologies and identify the associated equity impacts for each technology.
- (2) Use available or new data from surveys and outreach to identify the most impactful and cost-effective methods for addressing excluded users.
- (3) For each mitigation strategy, utilize cost-effectiveness measures to evaluate implementation costs of reaching different excluded user groups.
- (4) Identify technology or solution gaps that need to be implemented to effectively address users excluded by automated “cashless” payment solutions and the equity groups.

To achieve these objectives, we expect this research will include the tasks outlined below. These tasks are intended to provide a logical approach, but we are open to suggestions from proposers on how to best accomplish the research objectives with the available funds and time constraints. Proposals should be written in sufficient detail to demonstrate the PI’s understanding of the issues and the soundness of approach to meeting the research objectives.

For each task, please indicate the deliverable the research team will provide to the TAC for review and comment (if appropriate). Tasks may include:

**Task 1: Complete a literature review of different cashless fare collection technologies and equity impacts for each technology.** At a minimum, researchers will examine: smartcard fare collection, mobile ticketing, open payment (e.g. bank card), ticket vending machines, integrated payment solutions for multi-modal trips, and any other identified by research team. This review will include data on existing equity mitigation solutions (e.g. retail network). Potential impacted users should be grouped into a minimum of four distinct user groups:

1. users by age - representing youth and older customers;
2. users impacted by spatial limitations by living in communities underserved by transit or other amenities;
3. users that are underbanked or unbanked with no access to bank cards; and
4. users that have limited or no access to the internet.

- **Deliverable 1:** Summary of literature review

**Task 2: Conduct surveys and data analysis to evaluate equity mitigation strategies to address equity impacts from cashless fare collection technologies.** Researchers will conduct surveys and outreach for the Cities of Gresham and Eugene, Denver RTD and Lane Transit. Additional outreach to other agencies should be completed to identify what other agencies are doing to address equity concerns due to new fare collection technologies. The focus for the surveys should include Title VI topics and look at both transit and non-transit riders.

- **Deliverable 2:** Survey results

**Task 3: Identify effectiveness and agency costs associated with existing equity mitigation strategies to address equity concerns for automated fare collection technologies.** Researchers will conduct outreach to agencies to identify the effectiveness of implemented solutions to address equity concerns associated with their deployed fare collection technology. This can be new or existing solutions. Costs for operating

and maintaining these solutions as well as the overall effectiveness of reaching the equity gaps will be included.

- **Deliverable 3:** Findings for effectiveness of various equity mitigation technologies by equity group.

**Task 4: Develop case studies for focusing on the effectiveness of implemented equity solutions using data from Tasks 1-3.** Evaluate impact of automatic fare collection on identified equity groups including gaps. Case studies will be developed for Denver RTD and Lane Transit District with input from the agencies.

- **Deliverable 4:** Case Study for identified transit agencies

**Task 5: Utilize cost-effectiveness measures to evaluate implementation costs for various equity mitigation solutions for reaching different excluded user groups.** Create an adaptable framework for estimating the effectiveness of implementing equity mitigation strategies and the implementation costs of reaching different equity groups identified. The framework should also identify the scalability and transferability of the strategies to other another geographic and socioeconomic setting for a variety of mobility fleet/service sizes.

- **Deliverable 5:** Adaptable Framework

**Task 6: Prepare the final report.**

Prepare a final report that documents the details of the tasks described above.

*Note:* Proposers should include (a) quarterly conference calls with the TAC, (b) deliverables for each task (as appropriate), and (c) at least one in-person meeting with the project panel. Proposers should also discuss how they intend to communicate and work with the TAC throughout the project. Proposers should plan that NITC and the project panel will require no less than 2 weeks for review before the meeting occurs. Travel costs should be included in the budget.

*Please reach out to NITC's Research Program Administrator, Eva-Maria Muecke, [emuecke@pdx.edu](mailto:emuecke@pdx.edu), if you have questions about the scope and/or tasks of the project.*

## 3 Project Requirements

PIs will be asked to provide progress reports and performance metrics related to their funded research for federal reporting. Additional reporting requirements may also be required to match partners. Adequate progress and performance on previously funded research is an overriding consideration for the funding of future grants, including this RFP. Those that have not submitted progress reports or final reports will not be considered for funding and risk having funds withheld from current grants. Similar restrictions will apply to any future NITC funding opportunities.

### 3.1 Progress Reports

Semiannual progress reports are required according to NITC's funding requirements. These reports will support NITC's federal reporting responsibilities. Reports will be submitted on-line and include: accomplishments, dissemination activities, products (e.g. submitted publications, conference presentations, websites, etc.), detailed information on project participants, including faculty, students, and partners,

impact of the project, and changes/problems. As part of the final progress report, we will also require information regarding undergraduate and graduate students participating in the research, and information relating to publications and presentations presented at academic/professional meetings resulting from the funded research. Additional progress reports to match partners may also be required.

### **3.2 Publications and Presentations**

PIs who are funded by NITC will be expected to prepare articles based on research findings for publication in refereed journals and make presentations at national conferences. Through these venues, researchers and students will receive additional peer-review feedback on their work and should incorporate this into their projects. Electronic copies of all papers submitted to journals or conferences that are based on the project research should be provided to NITC. NITC support has to be acknowledged in all work that results from NITC funding. Student contributions to research should be acknowledged in publications via acknowledgement, footnote or co-authorship. Travel funds in the amount of \$3000 will be provided by NITC for sharing and presenting results at conferences or similar opportunities.

### **3.3 Final Report/Products**

PIs shall produce a final report that will be reviewed by the TAC. For proposals for this RFP, PIs should plan on submitting a draft final report conforming to style guidelines (templates will be available on the web) by **May 30, 2020**. The report should document the research project in total, including a complete description of the problem, objectives, approach, methodology, findings, conclusions, and recommendations. The final report should document all data gathered, analyses performed, and results achieved.

PIs are responsible for incorporating peer-review comments into the final report. Before publishing, final reports that incorporate comments will be reviewed by an editor to ensure standard formatting requirements are met. When a report is produced as part of a joint effort, NITC will work with the matching/sponsoring entity to ensure that one report will meet the requirements of all partners. All final reports will be produced as part of a numbered report series, and will include the USDOT disclaimer and NITC and partner funding attribution. All final reports will be posted on-line. More details about project requirements can be found in the “*Principal Investigator’s Guide to Sponsored Activities*” posted online.

### **3.4 Budget**

NITC plans to award up to \$150,000 for this project. Applicants must use the NITC Budget Form. Proposal budgets should be conservative and cost-effective, and should be primarily directed at new and original work. Funds should be spent in a manner that provides results that can be used and implemented by the project partners. In general, faculty salary (summer or academic year), student support, and tuition/fee reimbursement are allowable expenses. A limited amount of travel for data collection purposes and materials and supplies may be included, provided that they are a direct expense related to completing the work. PIs can also budget travel for the in-person meeting with the TAC.

Funding for students is expected, such as research assistant tuition and salary. Federal indirect costs (overhead) specific to each NITC university and OPE (fringe benefits) should also be included in the budget. *Tuition charges are not subject to indirect costs.* Equipment purchases (equipment is generally defined as items over \$5,000) and international travel are not permitted unless specific justification is provided and *prior* approval is obtained from NITC and the U.S. DOT. Budget for expenses normally considered part of university F&A (phones, facilities, regular office supplies, computers, etc.) should not be included.

Funding for salary that goes beyond normal academic or summer compensation will not be allowed. In the case of joint projects with faculty from other NITC universities, the second university activity should be budgeted as a separate budget for that university. In addition:

- Projects should be budgeted to begin on or after **December 1, 2018** and completed by **June 30, 2020**. Please plan to submit the draft final report by **May 30, 2020**.
- New awards to prior investigators will depend on successful completion of previously-funded projects and timeliness of research progress and reporting.
- NITC reserves the right to request reductions or other changes to budgets of submitted proposals. Budgets should be conservative and cost-effective, and should follow all budget guidelines for indirect cost rates, allowable expenditures, etc.
- Awards are cost-reimbursable.

### 3.5 Matching Funds

Matching funds are provided by the project partners. Should the budget exceed \$150,000, the proposer will be expected to find additional cash match for funds requested from NITC.

### 3.6 Evaluation Criteria

All proposals will be reviewed by a TAC consisting of a subset of the partner agencies. The TAC will evaluate and rank the proposals using the criteria below and will convene to discuss the merits of each proposal:

- (1) the proposer's demonstrated understanding of the problem;
- (2) the merit of the proposed research approach and methodology; and
- (3) experience and qualifications of the proposers.

## 4 How to Apply

### 4.1.1 Project Proposals and Budgets

PIs interested in submitting proposals must submit an Abstract online at <https://ppms.trec.pdx.edu>.

**Abstracts are due September 30, 2018.** Select grant cycle "NITC Pooled Fund Round 3." **Full proposals are due October 19, 2018 at 5:00 PM PDT.** Complete the Proposal Form (Word document) and Budget Form (Excel spreadsheet) and submit on-line. Proposals are typically 10 to 12 pages long. Please do not use prior year forms.

Proposals and budgets must be approved by the PI's home university research office prior to submission and **will not be considered without their approval**. PIs must follow their university's requirements for approval of proposals, including match commitment and use of human subjects (if applicable). Further questions regarding university approval should be directed to the home university research administration office or the home university Executive Committee member:

- **Oregon Tech:** Office of Strategic Partnerships: <http://www.oit.edu/faculty-staff/sponsored-projects-grants-administration>  
Preliminary approval form: <http://www.oit.edu/docs/default-source/spa/proposal-approval-form.pdf?sfvrsn=4>

- **PSU:** Proposal Internal Approval Form (PIAF):  
<https://sites.google.com/a/pdx.edu/research/lifecycle/proposal/psu-proposal-approval>  
Note that an additional NITC-specific form will also be required and sent to PIs after they submit their projects abstracts.
- **UO:** Apply through Electronic Proposal Clearance System (E-PCS) and Office of Research Services and Administration: <http://orsa.uoregon.edu/>
- **UA:** Research, Discovery & Innovation: <http://research.arizona.edu/>
- **UTA:** Research Administration: <http://www.uta.edu/uta/research.php>
- **UU:** UU Office of Sponsored Project: <http://www.osp.utah.edu/>

## 5 Contact Information

For questions about this RFP, please contact Eva-Maria Muecke, Research Program Administrator, 503-725-2897, [emuecke@pdx.edu](mailto:emuecke@pdx.edu). Each campus has a representative on NITC's Executive Committee who can discuss the process:

- Marc Schlossberg, University of Oregon, 541-346-2046, [schlossb@uoregon.edu](mailto:schlossb@uoregon.edu)
- Keith Bartholomew, University of Utah, 801-585-8944, [bartholomew@arch.utah.edu](mailto:bartholomew@arch.utah.edu)
- Roger Lindgren, Oregon Institute of Technology, 541-885-1947, [roger.lindgren@oit.edu](mailto:roger.lindgren@oit.edu)
- Avinash Unnikrishnan, Portland State University, 503-725-2872, [uavinash@pdx.edu](mailto:uavinash@pdx.edu)
- Arlie Adkins, University of Arizona, 503-880-3110, [arlieadkins@email.arizona.edu](mailto:arlieadkins@email.arizona.edu)
- Stephen Mattingly, University of Texas, Arlington, 817-272-2859, [mattingly@uta.edu](mailto:mattingly@uta.edu)

For other questions, please contact Hau Hagedorn, Associate Director, 503-725-2833, [hagedorn@pdx.edu](mailto:hagedorn@pdx.edu).

