

# Contextual Guidance at Intersections for Protected Bicycle Lanes

## NITC Pooled-Fund Request for Proposals

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For more information, visit: [nitc.us](http://nitc.us)

### 1 Overview

The National Institute for Transportation and Communities (NITC) pooled-fund grant program is intended to help maximize implementation of U.S. DOT's commitment to livable communities 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.

Implementation of protected- or separated-bicycle lanes is increasing rapidly across North America. As recently as 2009 there were only forty such bikeways in twenty U.S. cities. By the end of 2014 there were 210 protected bike lane corridors in sixty-two jurisdictions ([“Green Lane Project”, Inventory of protected bike lanes](#)). Recent national research ([“Lessons from the Green Lanes: Evaluating Protected Bike Lanes in the U.S.”](#) NITC-RR-583) and national guidance ([“Separated Bike Lane Planning and Design Guide”](#); FHWA) document the principal treatments being used at intersections on these bikeways and the benefits and issues associated with them. These reports build upon the 2013 edition of the NACTO Urban Bikeway Design Guide, which detailed a variety of treatments, including mixing zones, variations on through bike lanes, and several types of signalization. A fourth treatment, the “protected intersection” is common in The Netherlands and is gaining interest from practitioners across North America. Currently lacking is both guidance about the context in which these different designs are used to best advantage as well as recommended design elements for each intersection design type. This lack of guidance is resulting in unnecessary variability in design among the same type of treatment (e.g., many variations on what a “mixing zone” should look like). It is also resulting in confusion about the context in which one design is preferred above the others. As there can be significant cost and operational differences between these treatments, appropriate guidance is needed to help steer these decisions.

There are two objectives of this research. The first is to identify the context in which the above-mentioned intersection treatments are most effectively employed. This will ideally result in quantitative guidance about motor vehicle and bicycle speeds, volumes, turning movements and delay, intersection geometry, interactions with transit stops and other factors that will indicate the best treatment. The second objective is to identify the critical elements and dimensions of each treatment so the design treatments can achieve a uniformity and level of standardization across jurisdictions. Design treatments should also include intersection geometry and context for roundabouts and large intersection.

NITC and our partners are issuing a Request for Proposals for qualified research teams to respond to this need. The project budget is **\$250,000** with research completed within a time period of 18 months. Abstracts for proposals are due **August 7, 2015**. Abstracts can be submitted by logging onto the NITC online system at: <http://ppms.otrec.us/> and select grant cycle “**NITC Pooled Fund Round 2**”. **Full proposals are due August 31, 2015.**

## 1.1 Project Partners

This national study brings together cities and local jurisdictions in providing financial support for the project. These include:

- City of Los Angeles, CA
- City of Chicago, IL
- City of Seattle, WA
- Washington, DC
- TriMet
- City of Portland, OR
- City of Cambridge, MA
- Metro (Portland, OR)
- Washington County, OR
- City of Oakland, CA
- SRAM Foundation

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

## 1.2 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 South Florida, 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 not allowed to be present during deliberations and decisions related to their proposals.

## 2 Project Tasks

There are two objectives of this research:

- (1) Identify the context in which different intersection treatments with protected bike lanes are most effectively employed.
- (2) Identify the critical elements and dimensions of each intersection treatment so they can achieve a uniformity and level of standardization across jurisdictions.

To achieve these objectives, we expect this research will entail the following tasks. The tasks described below are intended to provide a logical approach, though 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 that will be provided to the TAC for review and comment (if appropriate). The TAC has a vested interest in the research results, using the findings as potential guidance for designing future protected intersections. Tasks may include:

Task 1. Identify intersection designs including all known variations of mixing zones (including dropped bike lanes), through bike lanes, and signalization to provide an understanding of the current state of the practice. This should include a review of available data, principally from the two above-referenced studies and reports, that to date represent the most comprehensive collection of data related to protected bicycle lanes, as well as other data readily available from the project partners.

Task 2. Conduct a literature review of international research and guidance for comparable protected bikeway designs.

Task 3. Review of elements and dimensions of intersection treatments employed in North American cities, including interviewing staff from the project partners responsible for project design and implementation. The intent of this task is to gain an understanding on decision points and outside pressures that may impact design as well as the technical detail of designs such as pros and cons, why designs work well/do not work well, and insight about what changes cities would make to improve designs.

Task 4. Review of available data and best practices incorporating design and interactions of transit stops at intersections with protected bicycle lanes, including interviewing staff from the project partners responsible for project design and implementation.

Task 5. Data collection at an appropriate number of locations with the subject intersection treatments in various contexts. Data would include motor vehicle and bicycle speeds, volumes, turning movements, delay, transit vehicle activity, crashes (when available), context (e.g. type of land use), and other data deemed important by the researchers.

Task 6. Data analysis to identify key factors involved in bicycle-automobile crashes, impacts on pedestrian travel and safety, and other appropriate measures safety at each subject intersection with specific attention to crash type, injury severity and frequency.

Task 7. Prepare a final report. This report should include recommendations to support research objectives, including:

- identifying the best performing intersection treatments based on context; and
- key design components of each intersection treatment with recommendations for designs that should be advanced for consideration of context.

*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. For budgeting purposes, proposers should plan for at least one in-person meeting with the TAC to coincide with a national conference or meeting that the majority of TAC can be present. Travel costs should be included in the budget.

### **3 Project Requirements**

PIs will be asked to provide progress reports and performance metrics related to their funded research for federal reporting. 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.

### 3.1.1 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.

### 3.1.2 Publications and Presentations

PIs and students 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 should 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.

### 3.1.3 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 **December 31, 2016**. 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.

## 3.2 Budget

NITC plans to award up to \$250,000 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 publishable results, especially in refereed journals. 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. *The project budget can include travel funds to present project results at conferences.* (Note that this is different from other NITC research projects.)

Funding for students is expected in all projects, 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 US 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 November 1, 2015 and completed by January 31, 2017. Please plan to submit the draft final report by December 31, 2016.
- 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.

### 3.3 Matching Funds

Matching funds are provided by the project partners. Should the budget exceed \$250,000, the proposer will be expected to find additional cash match for funds requested from NITC.

### 3.4 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 <http://ppms.otrec.us/> and select grant cycle "**NITC Pooled Fund Round 2**". **Abstracts are due August 7, 2015. Full proposals are due August 31, 2015 at 5:00 PM PDT.** Complete the Proposal Form (Word document) and Budget Form (Excel spreadsheet) and submit on-line (<http://ppms.otrec.us>). 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:

- **PSU:** Proposal Internal Approval Form (PIAF): <https://sites.google.com/a/pdx.edu/research/lifecycle/proposal/psu-proposal-approval>
- **OIT:** Office of Strategic Partnerships: <http://www.oit.edu/office-of-strategic-partnerships>  
Preliminary approval form: [http://www.oit.edu/libraries/portland\\_osp/a\\_oit\\_proposal\\_approval\\_form\\_paf.pdf](http://www.oit.edu/libraries/portland_osp/a_oit_proposal_approval_form_paf.pdf)
- **UO:** Apply through Electronic Proposal Clearance System (E-PCS) and Office of Research Services and Administration: <http://orsa.uoregon.edu/>
- **USF:** Division of Sponsored Research: <http://www.research.usf.edu/dsr/sponsored-research.asp>
- **UU:** UU Office of Sponsored Project: <http://www.osp.utah.edu/>

## 5 Contact Information

For questions about this RFP, please contact Hau Hagedorn, Research Program Manager, 503-725-2833, [hagedorn@pdx.edu](mailto:hagedorn@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)
- Jenny Liu, Portland State University, 503-725 4049, [jenny.liu@pdx.edu](mailto:jenny.liu@pdx.edu)
- Joel Volinski, University of South Florida, 813-974-9847 [volinski@cutr.usf.edu](mailto:volinski@cutr.usf.edu)

For more information, visit <http://nitc.us/>.