



**University Transportation Research Center
RFP Cover Sheet**

Title: Smartphone Pilot Study - A Study to Use Smartphone App in Household Travel Survey

Proposal Number: Z-18-03

Sponsor: NYMTC

Date Issued: March 7, 2019, Revised on March 11, 2019

Pre-Proposal Meeting Date: None

Final Proposal Due at UTRC: April 24, 2019

RFP Closing Date: April 24, 2019

This RFP is issued under the NYSDOT contract C030794 on behalf of NYMTC; CFDA# 20.205

If you plan to apply:

Please contact Penny Eickemeyer at peickemeyer@utrc2.org to let us know you are assembling a proposal. We will make sure you receive any additional information that becomes available about this RFP.

Proposal submission guidelines:

Please submit your proposal electronically to UTRC at through the UTRC Submission System <http://www.utrc2.org/welcome-utrc-ii-submission-system> by **WEDNESDAY, April 24, 2019**.

The NYMTC project manager(s) will be able to retrieve the proposals directly from this location.

In addition to submitting your application electronically through UTRC2.org, you must also submit to the NYMTC Program office three (3) hard copies of the submitted proposals. These hard copies must contain identical information to what you submitted through UTRC2.org. Any type of binding is acceptable. The hard copies must be received by NYMTC no later than 5:00 PM EST on **MONDAY, April 29, 2019** (note that this is later than the UTRC2.org deadline). NYMTC recommends that you use an overnight delivery or courier service that allows you to track and document delivery and receipt.

Please address your hard copy submittal as follows, using all of the information shown:

Ismet Apdiroglu
New York Metropolitan Transportation Council
25 Beaver Street, Suite 201
New York, NY 10004

Contact telephone number regarding hard copy submittal only: (212) 383-7414.

Funding available:

Up to \$300,000 is available from NYMTC. To the extent possible, we request that PIs identify sources of in-kind funding from their home institution (e.g., tuition waiver/reductions, overhead, cost-sharing, faculty release time, etc.).

General guidelines for proposal submission are available at <http://www.utrc2.org/resources>

Budget forms can be downloaded at <http://www.utrc2.org/sites/default/files/budget-Template%20NYSDOT%20and%20NYMTC.xls>

For questions about this proposal, please contact:

Michael Kwacha Chiume, (212) 383-7218, mike.chiume@dot.ny.gov

cc: Munnesh Patel, (212) 383-2528, Munnesh.Patel@dot.ny.gov

cc: Ismet Apdiroglu, NYMTC - Contracts, Ismet.Apdiroglu@dot.ny.gov

cc: Al Hasenkopf, Contract Management, alfred.hasenkopf@dot.ny.gov

cc: Jinzhi Lu, NYMTC – Contracts, Jinzhi.Lu@dot.ny.gov

For questions about budget preparation, please contact:

Penny Eickemeyer, peickemeyer@utrc2.org

Scope of Work

Smartphone Pilot Study A Study to use Smartphone App in Household Travel Survey Z-18-03

BACKGROUND

The New York Metropolitan Transportation Council (NYMTC) is the federally-mandated Metropolitan Planning Organization (MPO) for the downstate New York region. The NYMTC region includes New York City, Long Island and the lower Hudson Valley. It encompasses an area of 2,440 square miles and a population of over 12 million, which is approximately 65% of New York State's population.

NYMTC consists of voting members: Counties of Nassau, Putnam, Rockland, Suffolk, and Westchester, Metropolitan Transportation Authority, New York City Department of Planning (NYCDCP), New York City Department of Transportation (NYC DOT), and New York State Department of Transportation (NYSDOT); and advisory members: New York State Department of Environmental Conservation (NYSDEC), US Environmental Protection Agency (USEPA), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and Port Authority of New York/New Jersey (PANYNJ).

As the MPO, NYMTC conducts comprehensive long-range transportation planning and annually oversees several billion dollars in transportation investments for the most dynamic and complex transportation systems in the nation. NYMTC sponsors and conducts studies, and provides a forum for interagency cooperation and public input into funding decisions.

NYMTC conducts a Regional Household Travel Survey (RHTS) roughly every 10-12 years to collect travel behavior characteristics and related demographic information of residents. This is a labor, time, and cost-intensive effort. Traditional methods of collecting travel data have shown considerable drawbacks, indicating a great need for new methods of data collection as the models used to analyze the transport system demand for more detailed and high quality-data. As such, NYMTC and other MPOs continue to seek approaches to improve the quality of the data collected, encourage participation, and reduce costs.

Travel surveying efforts are currently a critical component in transportation planning as they provide the necessary data for NYMTC's travel demand forecasting model, the New York Best Practice Model (NYBPM), and travel behavior analysis. Recent technological advances have contributed to changes in the procedures used for collecting travel data, and subsequent improvements in data quality. Looking forward into the next two decades, these technological advances could bring further changes, and therefore need to be reviewed, compared to current practice, and evaluated for appropriateness for deployment in the near-term and beyond.¹

¹ Lawson, Catherine T. 2016. Innovative Travel Data Collection. Recommendations Report to NYMTC. https://www.nymtc.org/Portals/0/Pdf/Data%20%26%20Model/Innovative%20Travel%20Data%20Collection/Innovative_Travel_Data_Collection.pdf

OBJECTIVE

Practitioners and academics throughout the transportation industry view the smartphone as the next evolution of passive sensing technologies that support reduction in respondent burden while improving the quality of travel data.² Likewise, smartphones provide an avenue for active data collection with enhanced travel diary capabilities and integration with smartphones (and other data collection technologies).³

The main objectives of this study are to a) design and develop a proof-of-concept smartphone app for New York Metropolitan Transportation Council's (NYMTC) future household travel survey, b) conduct a small scale smartphone based RHTS pilot study for New York metropolitan area to test the feasibility of use in future travel surveys, and c) prepare a final report with recommendations for development and deployment of smart phone technology to supplement traditional Regional Household Travel Surveys. The project consists of following seven (7) tasks:

TASK 1 – Propose (develop or enhance if already exists) a Smartphone Travel Survey App

TASK 2 – Design the Travel Survey Questionnaire for the Smartphone App (2010/2011 RHTS questionnaire will be used as a reference and streamlined to fit the app)

TASK 3 – Develop Sample Design for Smartphone App Testing

TASK 4 – Prepare and Implement Recruitment/Public Outreach/Incentive Plan

TASK 5 – Collect Travel Survey/Data

TASK 6 – Process Data (verify, edit the data)

TASK 7 – Final Report (with recommendations) & Data Files

The Consultant is urged to be as specific as possible when describing the activities that will be performed to support all requirements and tasks. **The proposing team shall include Survey and App development firms to conduct the study or if developing the survey app in-house, a reference and example of at least one (preferably more) successful app(s).**

II. SCOPE OF SERVICES

TASKS

TASK 1 - Propose (Develop or Enhance) Smartphone Travel Survey App

² Lawson, Catherine T. 2016. Innovative Travel Data Collection. Recommendations Report to NYMTC. https://www.nymtc.org/Portals/0/Pdf/Data%20%26%20Model/Innovative%20Travel%20Data%20Collection/Innovative_Travel_Data_Collection.pdf

³ Greaves, Stephen, et al. 2015. A Web-Based Diary and Companion Smartphone app for Travel/Activity Surveys. In Transportation Research Procedia 11 (2015) 297-310. Available online at www.sciencedirect.com.

The Consultant shall propose to develop or enhance a smartphone travel survey app that can successfully be implemented in the New York metropolitan area, encourage participation and reduce participant burden, while keeping costs down. If the proposed app is an “off the shelf” type and has been tested/implemented in other regions or the New York metropolitan area, it should be improved with the most up-to-date technology available and trip detection algorithm for the NY metropolitan environment. Examples of existing apps include:

- a. Trip Tracker App - a 511NY RideShare product that allows a rider to log trips through the mobile app and website. Logging trips allows you to follow your progress and personal statistics including how much you save on fuel & maintenance and how many calories you burn by walking and biking.

<https://www.511nyrideshare.org/web/statewide-511ny-rideshare/trip-tracker-mobile>

- b. Florida DOT Rural Household Travel Survey Mobile App - an instrument to conduct household travel surveys in Florida rural areas.

http://www.fsutmsonline.net/images/uploads/mtf-files/Florida_Rural_Household_Travel_Survey_Mobile_App_Arnold_Knoblauch.pdf

Deliverables

- a. Draft and Final Technical Memoranda on the structure of the proposed smartphone survey app, data processing mechanism of trip recognition, and its applicability for the NY metropolitan area.
- b. A draft smartphone survey app with documentation.

TASK 2 – Design Travel Survey Questionnaire for Smartphone App

Working with NYMTC staff, design a travel survey questionnaire that is applicable for collecting data for Travel Forecasting Model development. Design a customized survey mobile app for Android and Apple Operating System (OS) users. The app should be user-friendly, require minimal user data entry, be intuitive and multi-lingual.

It is further recommended that the following application features be considered while designing the Survey App:

- i. Reducing respondent burden – The user interface should be designed to reduce respondent burden in a smartphone travel diary app.
- ii. Battery life - Proposals should contain details on how the app-maker balances the trade-off of data quality and battery consumption. All smartphone survey applications should be tested for battery life.
- iii. Data plans - Proposals should detail how the application transmits data collected during the travel day.

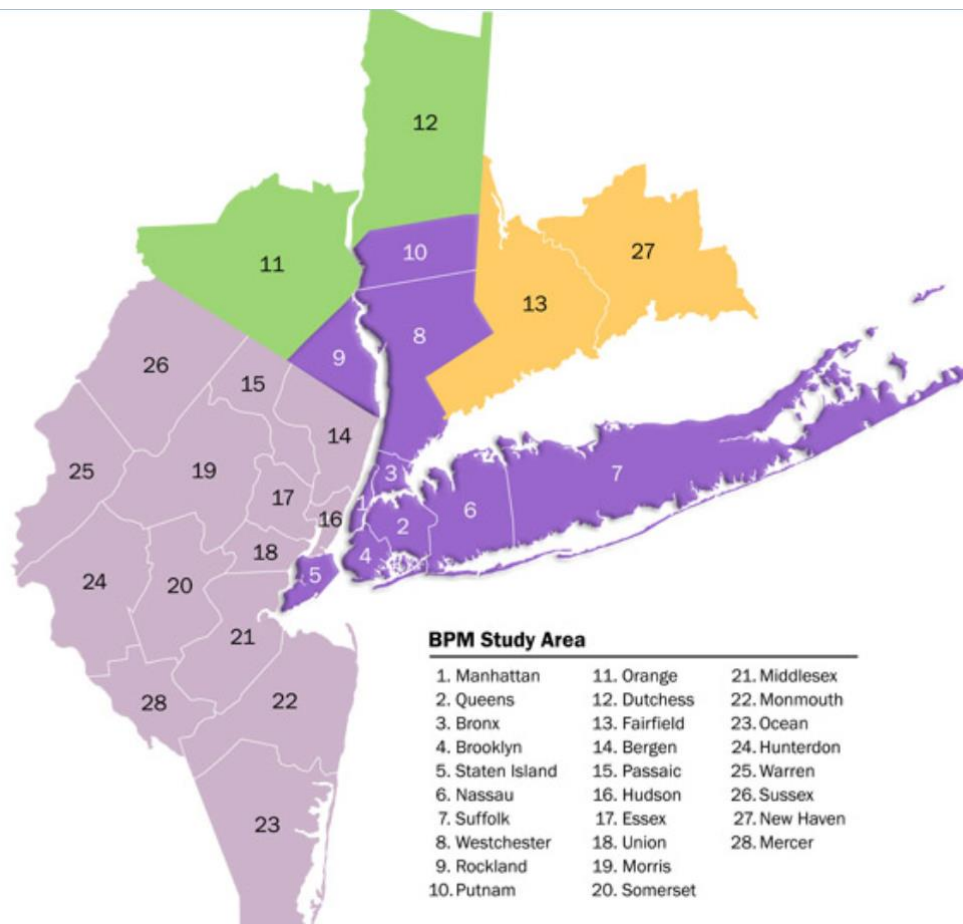
- iv. Equity - Proposals should detail what steps will be taken to ensure that all users, regardless of technical competency, will be able to use the application as intended.
- v. Data processing & Validation - Proposals should detail how data gathered from the application will be processed and presented to the user.
- vi. Privacy - Proposals should detail how the participants' data will be protected.

Deliverables

- a. A final smartphone survey app customized for the NYMTC pilot study that considers the above-mentioned features.
- b. Draft and Final Technical Memorandum on survey app design, including discussions on features and limitations.

TASK 3 – Develop Sample Design for Smartphone App Testing

The Consultant shall develop a sample design based on the suggested minimum sample size. The suggested minimum sample size for this pilot study is 1,000 households (HHs): 500 HHs in New York City (NYC) and 500 HHs outside NYC in the other 23 counties of the NYMTC Best Practice Model region (see figure below).



Challenges of conducting the smartphone app survey in the NYMTC region, such as survey recruitment, sampling bias, incentive, trip pattern recognition etc., shall be identified and presented (with indication if addressed/resolved or just acknowledged) in the sample design.

Deliverables

- Draft & Final Technical Memoranda on sample design.

TASK 4 – Prepare and Implement Recruitment/Public Outreach/Incentive Plan

The recruitment of respondents is a critical phase for traditional travel diaries and is likewise expected to be for a smartphone based method.⁴

Determine and develop the most effective way to recruit households to participate in the smartphone based survey; this approach should be implementable in the full household survey in the future. This task includes developing and implementing an innovative public outreach plan and instruments, including social-media, help of NYMTC member

⁴ Allstrom, Andreas, et al. 2016. Smartphone based travel diary collection: experiences from a field trial in Stockholm. In Transportation Research Procedia 26 (2017) 32-38.

agencies (e.g., NYSDOT, NYCDOT, MTA, Port Authority of NY/NJ and NJ Transit), and employing innovative means to incentivize participation, including cash and/or other gift ideas, which is to be presented in an incentive plan.

Deliverables

- Draft & Final Technical Memoranda on household recruitment, including public outreach plan and instruments and an incentive plan.

TASK 5 – Collect Travel Survey/Data

The Consultant shall execute the smartphone app survey and collect data from the respondents recruited under Task 4. NYMTC suggests multiple weekday data collection, preferably Tuesday to Thursday in a two-month data collection period immediately after the survey design is approved. To minimize the risk of collecting/incorporating bias in the process, the Consultant shall monitor data collection progress promptly, which includes an initial routine data check for missing records, distribution of households by socio-demographic characteristics, etc. Any problematic records and sample distribution shall be identified, flagged and reported in a weekly note to the NYMTC project manager. The consultant should make sure that the system used is user-friendly and accommodates the needs of different respondent groups.

Deliverables

- a. Weekly Progress Reports on the progress of the data collection.
- b. Monthly Progress Reports on the implementation of the survey.
- c. Interim monthly survey data files and associated documentation.

TASK 6 – Process Data (verify, edit the data)

The Consultant shall examine the initially monitored survey data, and verify and edit the records if feasible. The consultant is encouraged to propose and implement innovative ways to edit the records. Such editing might be necessary if the results reveal unrecognized trips due to incorrect survey app activity from signal loss or a malfunctioning trip recognition algorithm. Background point data should also be investigated, since this may reflect a different route than what the respondent had indicated. Data processing procedures shall be documented in the technical memorandum.

Deliverables

- Draft and Final Technical Memoranda on data processing.

TASK 7 – Final Report (with recommendations) & Data Files

The Consultant shall incorporate corrections and comments from NYMTC staff on all final deliverables. The consultant shall analyze effectiveness of the pilot survey and determine feasibility of use of the survey app for the future household survey. The

Consultant shall be responsible for submitting all survey documentation and deliverables to NYMTC in the specified time frames. The Consultant shall sign a Non-Disclosure Agreement (NDA) and maintain confidentiality of the collected data. The Consultant shall deliver the final data set and associated deliverables within 90 days of the completion of data collection.

Deliverables

- a. Final data sets, data files and associated documentation (data dictionary).
- b. Draft & Final Recommendation Report.
- c. Presentation to the NYMTC staff and Program Finance and Administrative Committee (PFAC).

Research Period

The total period of performance of the study is eighteen (18) months. However, the bulk of the work is expected to be completed within one year, while completing and getting acceptance of the final report may be completed within the eighteen-month term.

IV. PROPOSAL FORMAT AND CONTENTS

Respondents are requested to submit their proposal using the following format. There is no limitation on the number of pages permitted, **but concise proposals** are requested, in 12-point font. Proposals should be as detailed as necessary to explain their approach to the project and the technical methods to be utilized.

For the purpose of evaluation, each proposal must be submitted in two (2) parts. Part I shall consist of the Technical and Management Submittal. Part II is the Cost Submittal. Each part of the proposal must be complete in itself in order that the evaluation of both parts can be accomplished independently and concurrently, and the evaluation of the Training and Management Submittal can be strictly on the basis of its merit. Cost information is not to be included in the Technical and Management Submittal. Each proposal should follow the format listed below:

A. Part I: Technical Submittal

1. Title Page, indicating: Name, address and phone number of the proposer, including a contact person and the name of the person(s) who prepared the proposal.
2. Table of Contents

3. Executive Summary (1-2 pages). Provide a brief description of your approach and highlight how your firm's capabilities and experiences will help meet the project's objectives.
4. Approach and Scope of Services. Describe your approach for performing the work and how it will accomplish project objectives. Provide a detailed scope of services which describes what will be done. The proposal should reflect understanding and comprehension of project scope and objectives. You may base your scope of services on the outline provided under Section II., or suggest alternatives/modifications which could improve the ability of NYMTC to meet its objectives.

NYMTC wants to allow maximum flexibility for the ideas, initiative, and creativity of the proposer. Alternative tasks and suggestions are encouraged and will be reviewed with interest within the framework of the stated objectives and scope of the project. Fully explain and justify your approach.

5. Experience. Describe the experience of your organization and the proposed staff related to the conduct of the program and the extent of the applicable technical skills of proposed key personnel. Prior experience of the proposer is of great importance to NYMTC. Experience in public relations and outreach and transportation planning is highly desirable. Include information about the team's experience in work of this type, size and scope. Identify key personnel assigned to this project who have worked on such projects. Include names, addresses and telephone numbers of contact persons with listed clients. NYMTC reserves the right to request information from any source so named.

Please include the experience for any subconsultant firms, including Survey and App development firms to conduct the study.

6. Organization, Staffing and Schedule. Identify the individual who will serve as principal investigator as well as the names and titles of all key personnel who will be assigned to work on this program (including any sub-consultants). Include resumes or excerpts for all such personnel. Provide the estimated amount of time required for each person (by task) and describe the level of involvement. Describe the level of interaction contemplated with NYMTC.

If sub-consultants are to be used, explain the need, indicate the arrangement, and detail how coordination will be achieved between the parties.

Please include a Gantt Chart, showing the duration (start to finish) for each task in terms of months (i.e. Month 1, Month 2, etc.) since the actual start date is an estimate. If the proposal involves a joint venture or sub-consultants, it must be clear as to how tasks will be distributed or shared in the scope of work.

B. Part II: Cost Submittal

Proposals should indicate direct and indirect costs, hourly rates and hours by task, travel costs, and material costs to assist NYMTC in understanding how the total cost for the work was estimated. The winning proposal will result in a fixed cost contract based on details provided.

Please provide a budget chart which shows for each task the deliverable and cost. Task headings in the Budget Chart are to match the scope task headings.

Templates for the cover page for both the technical submittal and cost submittal are available on the general guidelines for proposal submission page at <http://www.utrc2.org/resources>

Budget forms can be downloaded at <http://www.utrc2.org/sites/default/files/budget-Template%20NYSDOT%20and%20NYMTC.xls>

V. PROPOSAL EVALUATION CRITERIA

A. General

Proposals will be evaluated by the designated selection committee based on the technical, management, programmatic, and cost criteria described below. Technical considerations are of greater importance than pricing considerations. However, price is a significant factor in NYMTC's evaluation of proposals. Programmatic considerations will impact NYMTC's final award selections. Technical proposals will be scored based on the information provided under Section IV, Part I: Technical Submittal in accordance with the pre-established criteria listed in Section B below. The cost portion of Section IV, Part II: Cost and Contract Submittal will be point scored in accordance with the pre-established criteria listed in Section C below.

Proposal evaluation shall be accomplished by a representative committee comprised, as appropriate, of technical, program, and management personnel.

Award shall be made to the offeror whose proposal in NYMTC's judgment represents the best overall value to the state considering all technical and cost/price evaluation factors.

At the conclusion of the evaluation period, all proposers will be advised in writing of their status under the solicitation. However, it is expressly understood that this Request for Proposals does not commit NYMTC/NYS DOT to award a contract, pay any costs incurred in the preparation of a proposal to this request, or to procure or contract services or supplies. Further,

NYMTC/NYSDOT will have no obligation or liability whatsoever to the vendor selected as a result of this solicitation unless and until a contract satisfactory to NYMTC is.

B. Technical and Management

The technical and management proposal will be scored and will represent 75% of total score of a proposal.

1. Experience and Credentials (40%)
 - a. Quality of credentials and experience of key staff (20%). Quality, extent and relevance of experience, education and skills of key personnel (to include any subconsultants).
 - b. Quality, extent and relevance of current and prior experience of the team (including subconsultants) in conducting similar efforts (20%).

Experience of Survey and App development firms to conduct the study shall also be evaluated.

2. Approach (20%)
 - a. Organization & Quality of Proposal Submitted (4%)
 - b. Quality of Approach, including creativity of approach and identification of risk/limitations (10%)
 - c. Thoroughness and Reasonableness of Scope of Work (6%)
3. Organization and Staffing (10%)
 - a. Reasonableness of Staff Allocation (6%)
 - b. Reasonableness of Hours Proposed (4%)
4. Schedule Factor – Showing a start *of* work within 15 days of execution, provide a schedule (Gantt chart). (5%)

C. Cost and Contract (25%)

The cost portion of the cost payable by NYMTC and contract proposal will be point scored and will represent 25% of the total score for a proposal. The calculation of a cost score will be determined by comparing the cost proposed for each competitive proposal to the lowest priced, technically acceptable proposal.

FUNDING

\$300,000 has been budgeted for this project. NYMTC believes this is a reasonable estimate for the total cost of the work being requested.

Proposals with a NYMTC cost over the budgeted amount will also be considered, provided the NYMTC cost does not exceed the budget estimate by more than 10%. (Note: Cost-sharing funds may increase the total project cost further.)

SPECIAL NOTES

Principal investigators should be familiar with and follow the requirements of New York State (the Compliance Procurement Lobbying Law of 2005) with regard to consultant contract procurement. Information can be found on the NYSDOT web site (www.NYS DOT.gov) under “Business Center,” then “Consultants,” then “Non-Architectural Engineering,” then “Active Solicitations.”

In particular, please note that communications between Contractors, Consultants/Principal Investigators, and Vendors with the Department are restricted during the period of time when services for more than \$15,000 have been requested (Request for Proposals issued), up until the time when the Consultant is selected. During this time communications, where a reasonable person would infer that the communication was intended to influence the procurement, should be limited to Department staff identified in the solicitation as “designated contacts.” Any communication with an employee, who is not a designated contact which is intended to influence the solicitation, could result in the outside party being prohibited from competing for the solicitation. A second violation will ban the Consultant/Principal Investigator from competing for any Department solicitation for four years.

The designated contacts for this solicitation are:

Michael Kwacha Chiume, Project Manager, (212) 383-7218, mike.chiume@dot.ny.gov

cc: Munesh Patel, (212) 383-2528, Munesh.Patel@dot.ny.gov

cc: Ismet Apdiroglu, NYMTC - Contracts, Ismet.Apdiroglu@dot.ny.gov

cc: Al Hasenkopf, Contract Management, alfred.hasenkopf@dot.ny.gov

cc: Jinzhi Lu, NYMTC – Contracts, Jinzhi.Lu@dot.ny.gov

Questions seeking clarification on this RFP will be accepted up to two weeks prior to the due date for proposals and should be e-mailed to the above contacts.

- Proposals should indicate direct and indirect costs, hourly rates and hours by task, travel costs, and material costs to assist NYMTC in understanding how the total cost for the work was estimated. The winning proposal will result in a fixed cost lump sum milestone contract based on details provided.
- Proposals must be submitted by April 24, 2019. NYMTC has a contract in place with the Region 2 University Transportation Research Center, and this Request for Proposals is being offered to the members of that consortium. Members should submit proposals through the administrators of that consortium.

