

CONSENT TO PARTICIPATE IN RESEARCH

BostonWalks

You have been asked to participate in a research study conducted by Prof. Andres Sevtsuk, from the City Form Lab at the Massachusetts Institute of Technology (M.I.T.). This study is sponsored by M.I.T.

The information below provides a summary of the research. Your participation in this research is voluntary and you can withdraw at any time.

- **Purpose**

The BostonWalks study aims to collect data on active mobility behavior of the Metro Boston population. The study focuses specifically on walking, biking, and the use of public transportation. The collected data will help inform policies to create a more equitable and sustainable multimodal transportation system in Metro Boston.

- **Study Procedures**

Participants are required to fill an initial online questionnaire, followed by a two-week tracking period using a smartphone tracking app. Participants can use the app to validate (correct/delete) recorded trips, and receive re-occurring summaries about their mobility behavior.

- **Risks & Potential Discomfort**

There is the risk of a data breach. We use IT infrastructure with the highest possible standard, 100% security can however never be ensured.
The collected movement data are processed in an anonymized way and accessible only to the research team.

You should read the information below, and ask questions about anything you do not understand before deciding whether or not to participate.

- **PARTICIPATION AND WITHDRAWAL**

Your participation in this research is completely VOLUNTARY. If you choose to participate, you may subsequently withdraw from the study at any time without penalty or consequences of any kind. If you choose not to participate, that will not affect your relationship with M.I.T. or your right to healthcare or other services to which you are otherwise entitled.

- **PURPOSE OF THE STUDY**

As our cities and society evolve, so too must our transportation systems. They need to adapt to changing requirements from urban design, economic growth, population expansion, as well as challenges related to climate change and public health. Effective transportation planning is crucial in this process and requires access to accurate and up-to-date data to describe, model, and evaluate current and future mobility behavior trends. Data about observed travel behavior, typically in form of GPS traces, represent an essential source for all modern urban transport modelling and simulation research. The BostonWalks study by the City Form Lab at MIT aims to collect such data for Metro Boston, specifically focusing on more sustainable travel modes such as walking, biking, and public transportation. This data collection effort is sorely needed as such data for the Metro Boston region was last recorded in 2010-11, following which new forms of mobility (such as e-scooters, bikesharing, and Uber/Lyft) have entered the market and behavioral patterns and choices have shifted due to the pandemic.

- **PROCEDURES**

If you volunteer to participate in this study, we would ask you to do the following:

To participate in the study, you first need to fill in our initial online questionnaire. By starting this initial online questionnaire, you agree to the consent form which is linked on the very first page of the questionnaire. The questionnaire will ask about basic socio-demographic information (e.g., household structure, income, education, etc.) as well as mobility habits (e.g., weekly commute/leisure trips, car-ownership, etc.). The questionnaire also checks whether you are eligible to participate in the tracking part of the study.

If you are not eligible, you cannot continue with the study. All your data collected through the initial questionnaire will be permanently deleted.

If you are eligible, you will be invited to download an app and register using an email address. When registering in the app, you will need to agree to the terms and conditions of MotionTag (the app developer). Those are linked on the registration page and can be opened directly in the app. The app runs on your smartphone in the background and automatically detects your mobility patterns (e.g., where you are traveling, and using which modes of transport). This is done through sophisticated state-of-the-art machine learning algorithms. During this phase of the study, your main task is to validate and potentially correct the detected trips. You will need a maximum of 5 minutes per day to validate your daily trips. The tracking part of the study takes two weeks. After that, you can simply delete the app from your phone. If you forget to do so, we will suspend your account so that the app does not continue to record your movements.

Throughout the whole study, the collected data includes:

- Primary identification data
 - Identification number and e-mail address
- Survey data
 - Questions about mobility behavior
 - Socio-economic data
 - Name (only if successfully completed the tracking phase)

- Smartphone application
 - Time of localisation
 - Geo-coordinates and accuracy (determined by the GPS chip)
 - Acceleration values (determined via smartphone sensors)
 - Gyro sensor/gyroscope values (determined via smartphone sensors)
 - Barometer/air pressure data (determined via smartphone sensors)
 - Magnetometer (determined via smartphone sensors)
 - Movement activity from operating system
 - Recognition reliability (confidence) of the movement activity
 - User agent (device type, operating system version, app version)

- **POTENTIAL RISKS AND DISCOMFORTS**

The only risk for you resulting from participating in this study relate to potential data breaches in our IT systems. This risk is slim to none. The IT infrastructure used at M.I.T. as well as the infrastructure of the tracking app both follow the highest possible security standards regarding data storage and transmission.

Apart from that, there are no known risks for you resulting from this study, as we rely on passive data collection. Your participation in this study is voluntary. All data collected during the study will be treated as strictly confidential and used exclusively for research purposes. The evaluation of the data is pseudonymised and the results are published in aggregated form, so that no conclusions can be drawn about specific individuals. The name and home address details collected in the first survey will only be used to mail the compensation for participation and to identify people from the same household. These details will not be passed on to third parties under any circumstances.

You have the option of having the data we collect about you blocked or deleted at any time. To do this, simply send us an e-mail with the subject "*Please delete my data*" to bostonwalkingstudy@gmail.com. Please use the e-mail address with which you registered with our service. Your data will then be removed from the live system and will not be included in any further analysis. The data deletion is irrevocable and takes place on all data carriers including back-up storage.

The research may involve risks that are currently unforeseeable.

- **ANTICIPATED BENEFITS TO SUBJECTS**

You will receive summaries of your mobility behavior by email and within the tracking app. These can give you insights on how much time you spend traveling, which modes of transport you use to cover how much distance, and how sustainable your mobility behavior is.

- **ANTICIPATED BENEFITS TO SOCIETY**

The data collected through this study has a wide range of applications in transportation and city planning. The study will provide updated data, particularly regarding post-pandemic behavior and the increased use of active transportation. The data will help us understand the effect of demographic differences on mobility behavior, thereby enabling research on issues of social equity and transport justice that cannot be addressed with current data. The data can be used to analyze usage patterns of public and active transportation, particularly in marginalized groups. It will also help to quantify disparities and inform infrastructure investment and public policy decisions. Additionally, the data can be used to improve current transportation planning frameworks, incorporating the latest observed travel behavior, seasonal variations, and the relationship with social indicators. These frameworks can be used for the design, behavioral and economic evaluation of new infrastructure projects such as walking, biking, and public transportation facilities.

- **PAYMENT FOR PARTICIPATION**

You will receive financial compensation of \$25 for participating in and completing the study. We consider the participation as complete, if you have filled the initial questionnaire as well as used the tracking app for two weeks. The compensation will be in form of a gift card which we will email to the email-address you provided in the tracking app. We will trigger the email within 4 weeks at the latest after you complete the study. You must redeem your gift card within 6 months of your completed participation. Once redeemed, your gift card is valid at least 5 years.

- **FINANCIAL OBLIGATION**

Neither you nor your insurance company will be billed for your participation in this research.

- **PRIVACY AND CONFIDENTIALITY**

The only people who will know that you are a research subject are members of the research team at MIT. No information about you, or provided by you during the research, will be disclosed to others without your written permission, except: if necessary to protect your rights or welfare, or if required by law. In addition, your information may be reviewed by authorized MIT representatives to ensure compliance with MIT policies and procedures.

The smartphone app we use to collect your data was developed by MotionTag in Germany. As MotionTag is based in the EU, they are contractually bound to strict data protection requirements in accordance with the EU Data Protection Regulation (EU-DSGVO). Data transmission to MotionTag takes place via a cryptographically encrypted secure connection.

In the present project, MIT uses smartphone-based GPS tracking to collect data on mobility patterns. MIT uses the technology of the company MotionTag to record location-based data and to automatically recognize modes of transport. All research staff who access this data will have to sign a non-disclosure agreement (NDA).

When results of the research are published or discussed in conferences, any type of results will be communicated in aggregated form, e.g.: “the population living in zip code XXXXX typically use bikes for X% of their trips” OR “the population between 21 and 40 years of age show higher usage of bike and public transport than older population groups”. The research team does not intend to or have an interest in evaluating results from individual participants.

All researchers involved in the project will need to sign a non-disclosure agreement (NDA).

As stated earlier, you have the right to withdraw from the study at any time, without providing any justification. To do so, please send an email to bostonwalkingstudy@gmail.com. You can also simply delete your account within the app. If you do so, you will be deleted from our systems and all of your data will be permanently deleted.

- **FUTURE DATA USE**

Your non-identifiable data (such as your socio-demographic information and trip data) collected as part of the research might be stored, used for future research studies by the MIT team, and/or shared with other researchers for future research studies without additional informed consent from you or your legally authorized representative. Your data might be shared with other academic research institutions or non-profit entities.

Traditionally used identifying information about you such as your name, address, etc. will be removed before storing, using, or distributing the data for future research. When the study is completed, all identifiable data will be destroyed after the required data retention period.

Your data will be available for any research question, such as research aimed at understanding the development and causes of many diseases and conditions or the development of new scientific methods. Any type of data sharing arrangement will be based on NDAs. It will never include any personal information which one could use to personally identify you from the raw data.

When your participation is complete and data analysis has concluded, your data will be stored for the required retention period, and permanently deleted thereafter. Even if you have not yet completed the study, you may request to have all your data deleted and excluded from any type of analysis.

- **CONSEQUENCES OF WITHDRAWAL**

There are no consequences for you if you choose to withdraw from the study at any time. You do not need to provide any justification to do so. However, please note that you are only eligible for the compensation if you complete the full study.

Also note, that if you withdraw from the study, we will delete you from our systems. That means that you will not receive any emails anymore, and all of your data will be deleted.

- **WITHDRAWAL OF PARTICIPATION BY THE INVESTIGATOR**

The investigator may withdraw you from participating in this research if circumstances arise which warrant doing so. This is specifically the case for professional drivers which skew the collected data.

The MIT research team will make the decision and let you know if it is not possible for you to continue participating in the study. The decision may be made either to protect your health and safety, or because it is part of the study procedures.

- **NEW FINDINGS**

During the course of the study, you will be informed of any significant new findings, such as changes in the risks or benefits resulting from participation in the research or new alternatives to participation, that might cause you to change your mind about continuing in the study. If new information is provided to you, your consent to continue participating in this study will be re-obtained.

- **IDENTIFICATION OF INVESTIGATORS**

In the event of a research related injury, please immediately contact one of the investigators listed below. If you have any questions about the research, please feel free to contact:

- Prof. Andres Sevtsuk, a.sevtsuk@mit.edu, (617) 253-7419, 77 Massachusetts Ave, Cambridge, MA 02139
- Dr. Rounaq Basu, rounaq@mit.edu, (617) 253-7419, 77 Massachusetts Ave, Cambridge, MA 02139
- Adrian Meister, ahgm@mit.edu, (880) 857-0981, 77 Massachusetts Ave, Cambridge, MA 02139

• **RIGHTS OF RESEARCH SUBJECTS**

You are not waiving any legal claims, rights, or remedies because of your participation in this research study. If you feel you have been treated unfairly, or you have questions regarding your rights as a research subject, you may contact the Chairman of the Committee on the Use of Humans as Experimental Subjects, M.I.T., Room E25-143B, 77 Massachusetts Ave, Cambridge, MA 02139, phone 1-617-253 6787.

SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE

I have read (or someone has read to me) the information provided above. I have been given an opportunity to ask questions and all of my questions have been answered to my satisfaction. I have been given a copy of this form.

BY SIGNING THIS FORM, I WILLINGLY AGREE TO PARTICIPATE IN THE RESEARCH IT DESCRIBES.

Name of Subject

Name of Legal Representative (if applicable)

Signature of Subject or Legal Representative

Date

SIGNATURE OF PERSON OBTAINING INFORMED CONSENT

I have explained the research to the subject or his/her legal representative, and answered all of his/her questions. I believe that he/she understands the information described in this document and freely consents to participate.

Name of Person Obtaining Informed Consent

Signature of Person Obtaining Informed Consent

Date (must be the same as subject's)

SIGNATURE OF WITNESS (If required by COUHES)

My signature as witness certified that the subject or his/her legal representative signed this consent form in my presence as his/her voluntary act and deed.

Name of Witness

Signature of Witness

Date (must be the same as subject's)