

# Human Trajectory Sampling at the City-Day Scale

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## Abstract

A protocol for sampling people for purposes of understanding patterns of mobility and activity-space segregation at the scale of city-days.

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## Protocol

### Select Sampling Points

#### Step 1.

Select a set of points at which sampling will be done. These should be chosen randomly within the boundaries of the census tracts of the city being studied, with probabilities of choosing points within each census tract given by the proportion of the population residing in that tract and adjusted to oversample tracts in which small populations of interest are believed to reside. The selection can be done using R and the *sp* package for R, or with QGIS, or any other software that allows for random selection of points in polygons.

#### SOFTWARE PACKAGE

**QGIS, 3.0** [↗](#)

### Select Sampling Point Times

#### Step 2.

For each sampling point, select the hour at which it will be visited. These hours should be drawn randomly from a uniform distribution of times at which sampling is feasible and safe. Theoretically this could be between 0 and 24, but there are many considerations weighing against approaching people on the street during the night to ask them to participate in a study by tracking their own locations. Standard working hours (e.g. 9-5) are probably more realistic, even if this means that some activity-spaces will have no chance of being part of the sample as a result.

### Snap Sampling Points to Streets

#### Step 3.

The randomly-selected sampling points will not necessarily be in accessible locations. Each point should therefore be moved to the closest public street.

#### SOFTWARE PACKAGE

**sp: Classes and Methods for Spatial Data, 1.2-7** [↗](#)

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## Visit Sampling Points and Recruit Participants

### Step 4.

Stand at the selected sampling points during the selected hours and ask people who pass by if they would like to participate in the study. Materials needed here are:

- Study information sheets and consent forms
- Paper-based mobility survey
- Cards with URL and QR code for data-collection app.
- Mobile phone for demonstrating app.

### SOFTWARE PACKAGE (Android)

#### **SpaceMapper, 3**

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<https://github.com/JohnPalmer/SpaceMapper>