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Recruitment issues for mobility surveys using GPS tracking with a smartphone app

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Context

In France, the main method used to collect mobility data is Household Travel Surveys (HTS), which are carried by face-to-face interviews or by phone ones.

The development of digital technologies (GPS for example) offers new opportunities for engineers to improve the collection of travel data.

Advantages/Disadvantages of GPS tracking

- +**
- ✓ better knowledge of travel times, durations and speeds
 - ✓ knowledge of routes
 - ✓ mobility data over several consecutive days

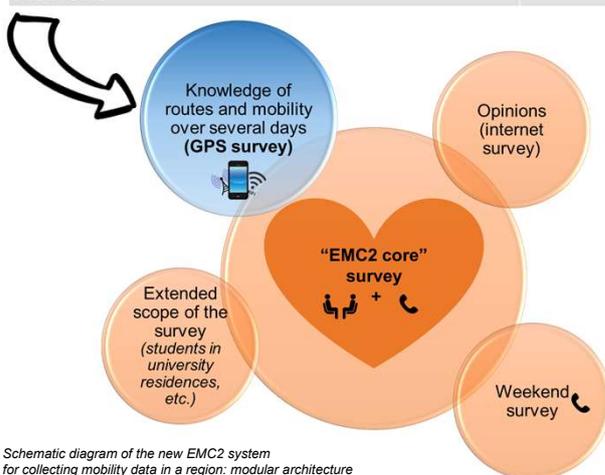
-
- ✓ A technical challenge due to a great number of different smartphone models, of uneven quality, and with different operating systems = multiple developments required
 - ✓ The main problem: **recruitment of volunteers**



Different recruitment methods for surveys based on GPS data collection



Recruitment methods	+ / -	Benchmark of GPS surveys
<i>First method:</i> soliciting a random sample of individuals without a prior survey	- very low acceptance rate - no representativeness of the respondents sample?	Pilot survey in Gothenburg region in 2017 (Eriksson 2018): number of respondents: 70 / target sample size: 2,800
<i>Second method:</i> recruiting volunteers by using both all types of dissemination (social networks, press advertising, web pages) and the principle of crowdsourcing	+ not expensive - no control of the respondents sample - representativeness of the respondents sample? - possibility of applying statistical theory since the target population is not known?	Montreal survey in 2017 (Bouchard 2019): : 2,500 volunteers recruited Montreal region survey in 2018: 8,000 volunteers Pilot survey in Gothenburg region: 410 people downloaded the app and only 279 actually used it
<i>Third method:</i> combining a GPS survey with a conventional household travel survey (HST), called EMC2 in France - Respondents are invited to answer a new GPS survey after the HST one	+ better control of the respondents sample -/+ people with high daily mobility are over represented + knowledge of respondents profil	National Travel Survey, 2007-2008, France (Thi Huong Thao Pham 2016): 30% of the HTS respondents agreed to participate in the GPS survey= 957 volunteers



Schematic diagram of the new EMC2 system for collecting mobility data in a region: modular architecture

Main results: How can EMC2 respondents be encouraged to participate in the GPS survey?

1. Improving the presentation speech of the GPS survey WHY? Some potential obstacles

- fear of being tracked, of an abuse use of personal data
- Difficulty in installing and using the app
- Feeling that the duration of the survey is too long

HOW? highlighting motivations

- Getting involved in a citizen-led initiative (very trendy) by participating in local (transport) policy
- Feeling "privileged", special: having being "selected" to respond
- Testing a new product, a new application: being a pioneer
- Contributing to the production of "unique" and very detailed data

2. Implementing an incentive for a GPS survey ?

- 2 main reasons
- the respondent has to be continuously involved = requires time and attention for at least 5 days
 - the incentive and its acceptance = a form of moral and material "contract" between the respondent and the research institute

The opinion of volunteers? findings provided by a qualitative survey of 35 volunteers for the GPS survey after having being questioned for the HTS (EMC2): different points of view

no compensation required (17 persons) *A preference for a €20 gift voucher (11)*
A preference for a €30 gift voucher (4) *Any incentive, won't respond to the GPS survey (3).*

Methodology used to optimize the recruitment phase of the GPS survey following the EMC2 one (Source: Cerema-Senzo, March 2020)

