Travel survey data: Comparative analysis from different travel survey methods

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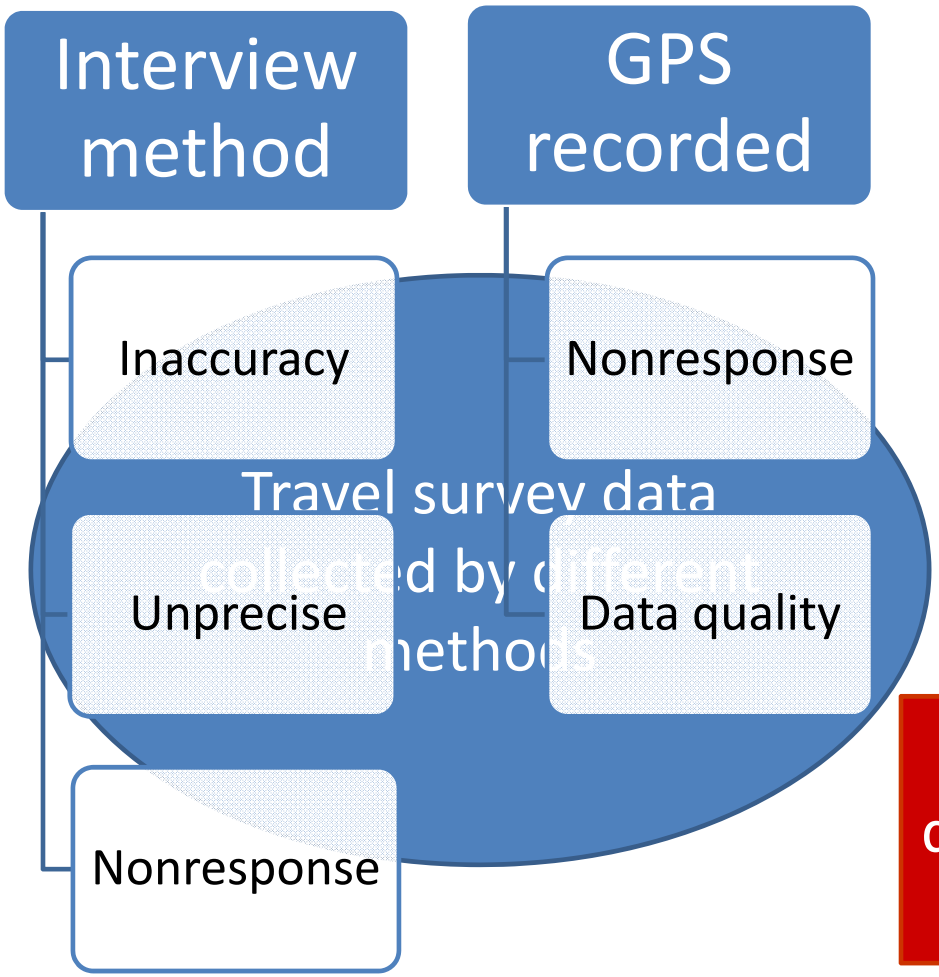
Introduction



The under-estimate of travel in transport planning

Objective of study: compare the differences of travel data from two survey methods and find out its causes

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Methodology

Interview Survey:

- 95 participants
- data collected by GPS and travel diary self-administrated
- duration: 1 week
- data collected: personal information, start time, end time, travel duration, origin, destination, travel distance, trip purposes

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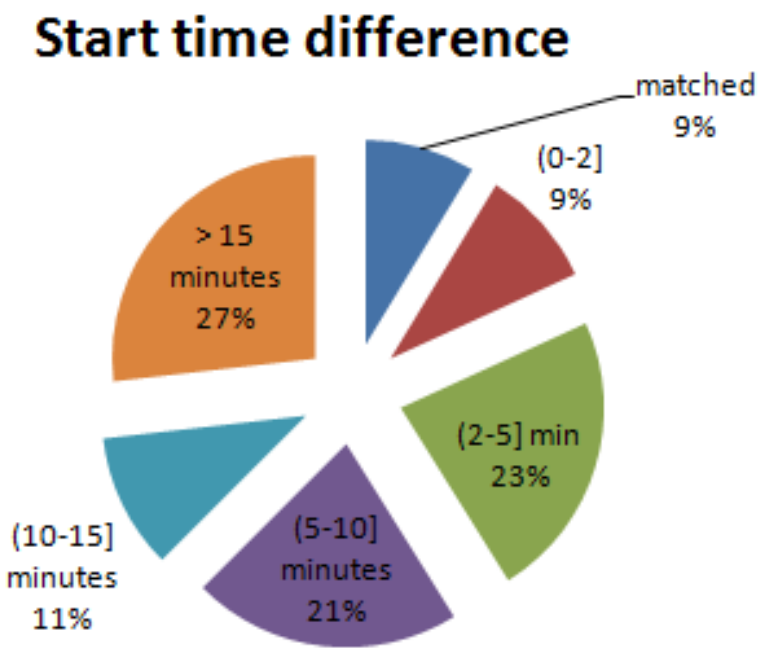
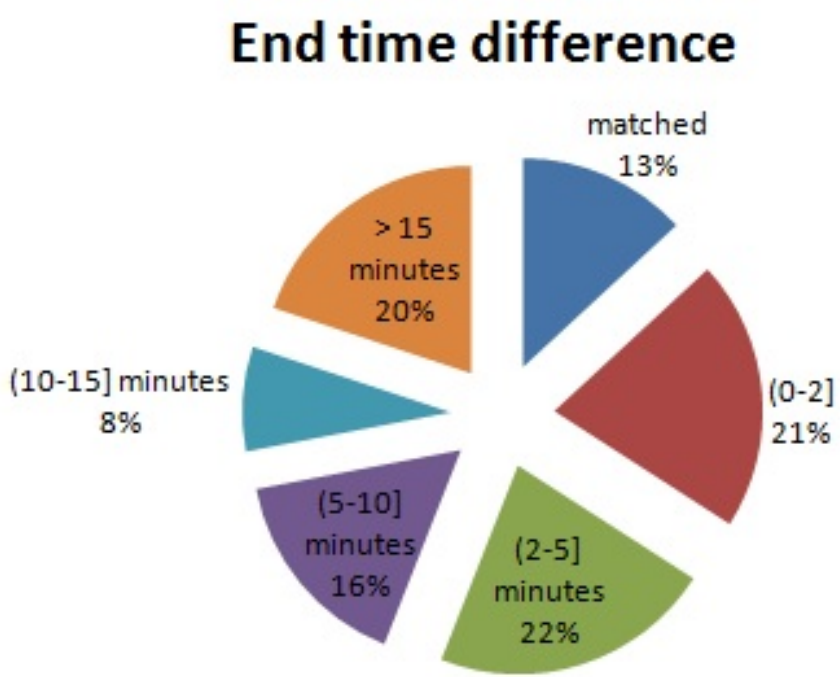
Results – Response rate

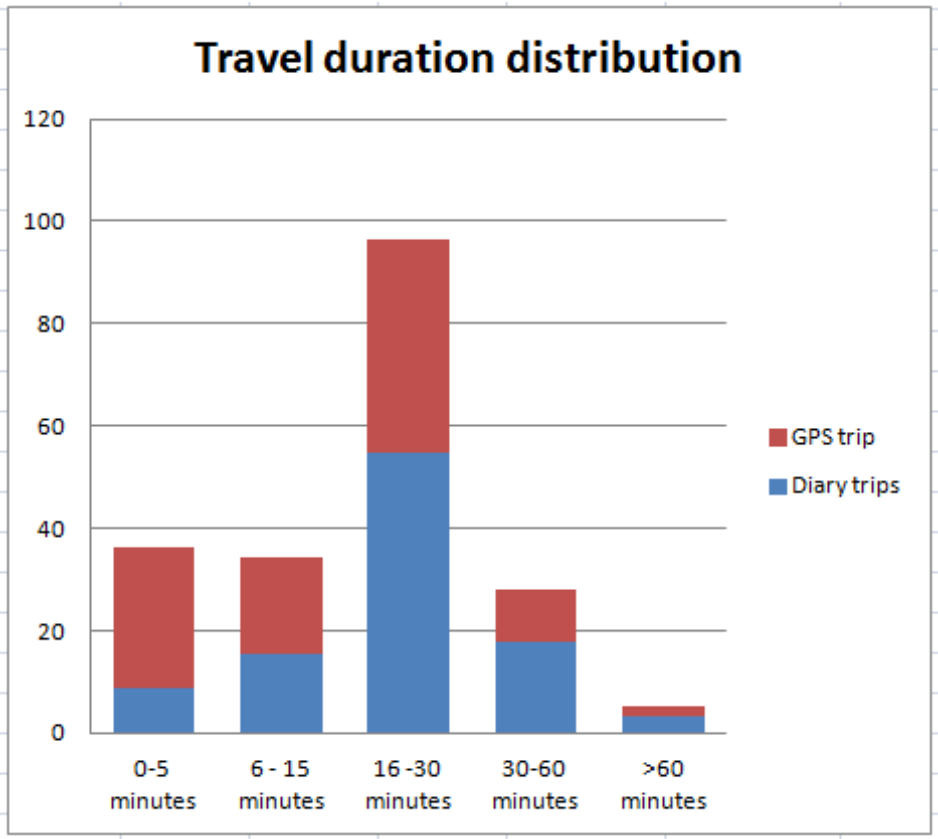
Survey method	Identified	Missing trips (non- identified)	Total
GPS recorded	1150	530	1680
Diary reported	1150	722	1872

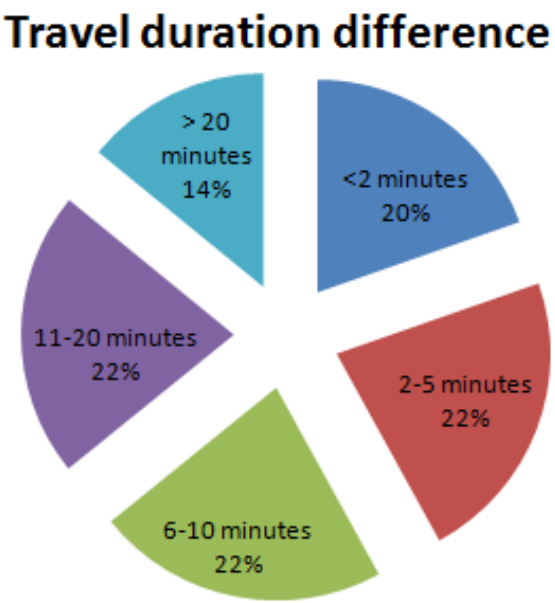
Starting time and end time accuracy



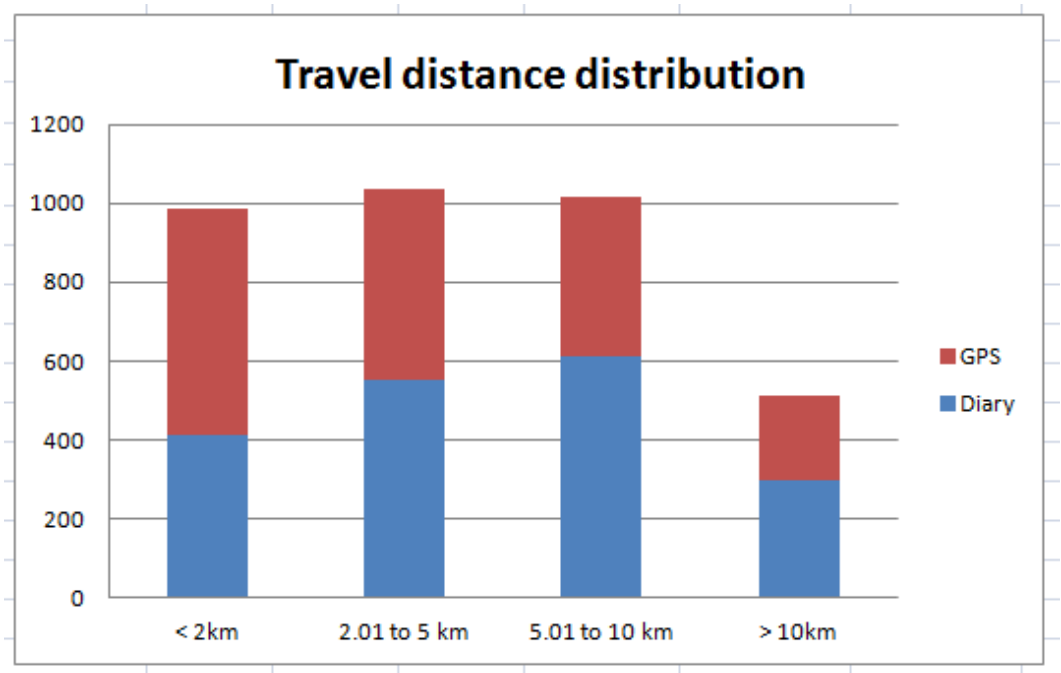


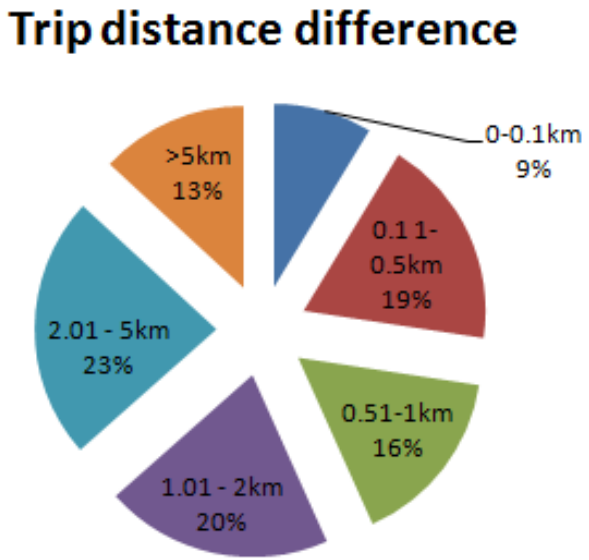
Travel duration comparison





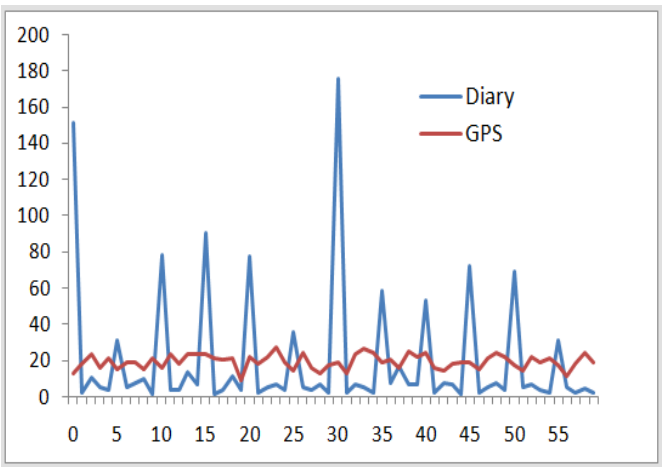
Trip distance comparison



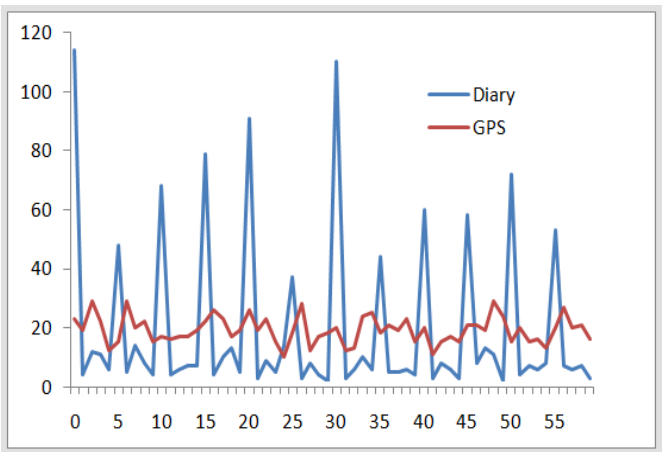


Temporal precision

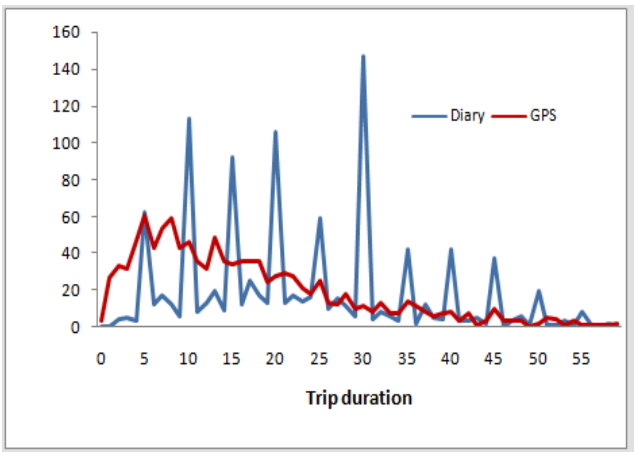
Trip distribution by minute of starting time



Trip distribution by minute of end time



Travel duration distribution



Spatial accuracy

Distance reported	Diary (%)	GPS (%)
1 ; 2 ; 3; 4; 5; 6; 7 .... precise of 1 km	64	13
0,5 ;1,5 ; 2,5; 3,5 ...precise of 0,5 km	18	12
0,1; 0,2; 0,3 ; 0,4; 0,6 ; 0,7; 0,8; 0,9; 1,1 ... precise of 0,1 km	18	75
Total	100	100

Missing trips comparison

The missing trips by GPS (38%)

- **Timetable:** the trips made in the evening were better recorded. Missing trips rate is about 40% in the day but only 26% the evening.
- **Travel time and travel distance:** the missing trips rate is greater when the travel distance/time is short.
- **Travel purposes:** The missing trip rate for pick-up/drop off purpose accounted for the highest percentage

The missing trips by GPS (32%)

- **Timetable:** the higher missing trip rate by diary with the starting time from 12h to 17h with 41% trip missed
- **Mobility:** The most mobile people tend to forget to note in the travel diary .
- **Travel time and travel distance:** The missing trips rate is greater when the travel distance/time is short.

Conclusions

- **For the starting time:** with 70 percent of trips was reported before the time recorded in GPS, but the majority of the time difference is less than 10 minutes.
- **For ending time:** 56 percent of trips had the difference less than 5 minutes.
- **Trips duration and trip distance :** more 80 percent of trips was over-reporting, it mean that the respondents reported their trips longer than the GPS recorded.
- **The missing trips by GPS:** The missing trips by GPS are often short distance trips, made the morning by people who have less than 5 trips in the day, for personal, purposes.
- **The missing trip by Diary :** were influenced by the long distance or duration trip, the time of day and the number of trips undertaken in the day.

Recommendations

- This study demonstrates that the GPS can be used successfully to supplement travel diary survey.
- The GPS technology can be used for the travel data quality improvement.
- The replacement of the conventional travel survey by GPS travel survey demands more time to overcome the limits of the GPS