

## Summary

# The application of cellular network data for travel behavior research

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*Travel behavior have for a long period of time primarily been studied by surveys. For the past 20 years especially abroad also data from mobile phones have been applied. In this report we give a brief overview of the application of mobile phones and in particular network data in this field of research.*

Cellular network data is generated by interactions between mobile phones and the cellular network, i.e. cell towers or base stations. There are three ways in which such data is generated, the first of which relates to active use of the phone for calls, text messages or internet access. This is *actively* generated data, stored by the mobile operator for billing purposes, and is often referred to as call detail records (CDR). Data is also generated when the phone is not in active use, e.g. location updates when the phone moves between location areas. This data is collected more continuously, but is not as geographical precise as the actively generated data. A third way to obtain data is by sending a special query to a device to determine its location. The query is carried out by the telecom company and is used, for example, by emergency services to locate a phone in case of an emergency.

Telecom companies have built cellular networks with a high geographical coverage. This, combined with the fact that a high share of the population regularly uses mobile phones, opens possibilities for a range of research on mobility that was previously difficult to investigate due to scarcity of data.

Cellular network data has been applied to several research areas in the field of transportation, for instance, the counting of vehicles, monitoring of tourists movements and as a validation tool against other data sources. Several studies point in the direction that this type of data may be applicable for travel behavior research. The main challenges addressed in the literature are privacy/ethics, selection bias and the accuracy of the positioning of the phones.