Reflection P5

This research was conducted from November 2014 till June 2015, for a total of 8 months. The starting point for the development of this research was the observation of the big amount of open data available today and of the potential of technologies, such as GPS, which is not much exploited in mobility studies. The main goal of the research was to bridge the gap between spatial planners and people travel patterns information. In fact, today policy makers and spatial planner need to have much more accurate information about actual people travel behaviour, in order to make better decisions. This lack can be overcome thanks to the use of technologies such as GPS and GIS, which can be useful tools in achieving this task.
At first, the research question was more focused on OpenStreetMap, but then the objectives and the research question were adjusted during the study process, as also other datasets were taken into account.

The research started with literature reviews, searching and reading all the related studies about people travel behaviour, travel patterns analysis, and GPS as tracking technology. Traditional methods, such as qualitative survey and travel diaries, are still widely used for studying people movement. This study aims to fill the gap adding empirical research on the relation between urban form and travel patterns using real data, collected by GPS, integrated with open data from various sources. The proposed research was implemented for ten case studies: ten urban neighbourhoods in three cities in the Netherlands (Amersfoort, Veenendaal, and Zeewolde).
An important part of the research was about the choice of indicators and measures related to mobility. For this task, 25 papers were reviewed and, in the end, 17 indicators were chosen to be implemented.
Another important step was getting acquaintance with the datasets, in particular regarding OpenStreetMap and GPS real data. Since land use information in OSM was not so reliable, other datasets were taken into account. In the end, BBG was used for the analysis.
After having prepared and preprocessed the data in QGIS and PostgreSQL, the implementation could be started. The main focus here was on the computation of a series of built environment measurements to describe the services and facilities presented in each neighbourhood, in terms of proximity, density and accessibility. The difficult part in this phase was related to the integration of different datasets with various levels of accuracy and completeness.
All the indicators developed were then validated by GPS real data, in order to see if there was a match between theoretical and actual performances of each neighbourhood. This task was quite challenging since it was about comparing different values and finding correlations between them. In order to achieve this, statistical analyses were carried out, over the visualization of the data in GIS software.
The final products were maps and spider diagrams showing the different levels of performances of each neighbourhood in terms of mobility. In such a way, it was possible to rank the neighbourhoods according to greater sustainable mobility and to investigate the key factors which influence actual people travel behaviour.

During the entire research it was managed to stick to the planning. A scheme of the division of the workload during the whole process is presented in the thesis report (see Section 1.5). Although some problems occurred during the research, there was no significant delay, thanks to good planning, but also thanks to the facilities and data made available by the supervisors.

The performed research is strongly in line with the MSc Geomatics programme since it covers different aspects of the field of geomatics faced in various courses, such as spatial data acquisition,

storage, analysis and visualization. GIS software was used for implementing spatial data and for visualization tasks; whereas database was mainly used for storing large datasets like OpenStreetMap and GPS data logs and for retrieving information from them. This work was also a trigger for the author to obtain new knowledge in PostgreSQL language and to familiarize with specific spatial analysis tools. Finally, through this research experience it was gained in how to deal with the entire process of project management.

The research also contributes to the society. In fact, the aim of this study is not only technical, providing a standard procedure to assess mobility patterns, but it is also societal, as neighbourhood performances are directly related to people and their lifestyles. These kinds of study can be used as SDSS (Spatial Decision Support Systems) by policy makers and spatial planners, since they provide them with additional information about the actual movement of people and the relationship between their travel behaviour and the built environment. In particular, this approach can be used as an evaluation method of the sustainable mobility potential of neighbourhoods during planning stages of new neighbourhoods, but also for monitoring performance and propose policy and planning interventions on existing neighbourhoods.
In addition, the spatial explicitness of the analysis in geographic information systems (GIS) can be a powerful tool for bridging the gap between residents and policy makers, strengthening the link between GIS and public participation. In fact, unlike other studies, the implemented performance indicators are easy to interpret and communicate and therefore they can be effortlessly understood by residents.
Finally, this research can provide a basis for policy makers for improving transportation planning, reducing car travel and promoting use of public transport in order to reduce air pollution and encourage sustainability. Through a better understanding of the factors that play a key role in sustainable mobility, it is possible to plan interventions and facilities in order to improve the current mobility patterns.