

# BMW

## Behaviour and mobility within the week

DURATION OF THE PROJECT  
01/01/2007 – 31/01/2009

BUDGET  
350.802 €

KEYWORDS  
Weekly patterns, dynamic, transport demand and supply

### CONTEXT

Analysing mobility demand leads more and more to researches taking into account behaviours. One of the most serious approaches is activity-based models. The main idea in this promising line of thought is to view traffic not as a stand alone phenomenon, obeying its own logic, but rather as a derived effect of activity patterns. Yet, most of the models (with rare exceptions like Mobidrive) are built on the paradigm that mobility is essentially linked to work and therefore exhibits daily cycles. Even if useful, this emphasis on the daily horizon contradicts the intuitive knowledge that a substantial fraction of people and household activities are repeated from week to week, not from day to day. Moreover surveys have shown that other purposes (shopping e.g.), more relying on weekly cycles, also induce an important part of mobility. This context is the motivation for this project.

### PROJECT DESCRIPTION

#### Objectives

The project is to work on two complementary views of weekly mobility: the longitudinal disaggregate behavioural aspects over the week and the transversal aggregate measure of traffic for each successive day of the same week. The objectives are then to:

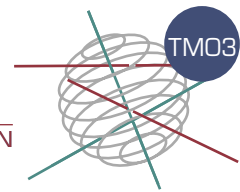
- collect data to validate the project view that weekly cycles are important in the household mobility decision;
- propose a descriptive analysis of the resulting weekly activity patterns and their impact on day to day variations in travel demand;
- reconcile these variations with observed variations measured in the field;
- enrich both activity-based demand models and dynamic origin/destination traffic models to include weekly cycles;
- disseminate the obtained conclusions with special attention given to policy implications and readability for non-specialists.

### Methodology

The main idea is to consider two urban kernels between which travel is frequent and not restricted to a single purpose. A sample of individuals will then be selected in both kernels, and a specially designed survey will be conducted over a week, in order to describe activity patterns over that week with a reasonable degree of accuracy. In parallel, traffic counts and travel times will be measured between the two kernels during the same week, both on motorways and secondary roads. Since a permanent monitoring system on secondary roads is lacking in Belgium, a novel travel time data collection approach based on tracking of cell phones (floating car data) will be applied for this purpose. The data from the survey and traffic data will then be cleaned and a descriptive analysis conducted with two complementary aims: a general statistical description of each data set, but also a correlation analysis between the traffic variations from day to day and the relative importance of travel between the two kernels as resulting from the weekly demand pattern analysis.

The descriptive analysis will then be pursued by a more detailed modeling phase. A weekly activity pattern model will be developed and validated. It will also be used to describe the possible substitution effects for non-mandatory activities between days. On the other hand, dynamic origin/destination models will be applied to transform the observed variations in traffic patterns into variations to a basic (average) OD-table. Both results are then compared, in that the consistency is checked between the aggregated day-to-day demand changes predicted by the activity based approach and changes in the structure of the dynamic OD-tables inferred from traffic data. This comparison increases insight in both modeling approaches on the one hand (important from a methodological point of view), and the day-to-day variability of traffic demand on the other hand (important from the point of view of applicability to sustainable policy). Special attention will be given to the description of variations of demand between days, an area ignored by the majority of existing tools. These variations will be considered both in terms of volume and mode constraints (as resulting from the activity patterns).





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The tasks will be shared between the partners as follows:

1. Preliminary analysis [GRT – KUL - ETHZ ]
2. Behavioural survey design [GRT - ETHZ ]
3. Survey traffic measures design [KUL]
4. Behavioural data collection and cleaning [GRT - ETHZ ]
5. Traffic data collection and cleaning [KUL]
6. Data descriptive analysis and correlation [GRT - KUL - ETHZ ]
7. Model enrichment [GRT - KUL - ETHZ ]
8. Final reporting and dissemination [GRT - KUL]
9. Coordination and management [GRT]

## EXPECTED RESULTS AND/OR PRODUCTS

As this project is a first attempt to collect data about mobility behaviours over a week, this information will be a fruitful source of data for all the Belgian research teams involved

in mobility behaviours and transport demand topics.

Moreover the descriptive analyses achieved on these data sets will be of interest for Belgian policy planners and decision makers. They will, hopefully, demonstrate the importance of taking into account the weekly rhythms in mobility behaviours for sustainable transport policies.

Since the "week" approach is quite sparsely followed within the transport research community, the innovative methodologies developed for this project as well as the provided results will surely receive opportunities to be disseminated through communications in international conferences or publications in scientific journals.

A workshop broadly open to not only the scientific community but also be the administrations and organisations involved in Belgian mobility policies will be organised at the end of the project. This will be an opportunity to disseminate the acquired knowledge to these policy planners and decisions makers

## PARTNERS - ACTIVITIES

The FUNDP Transportation Research Group (GRT) explicitly focuses on the behavioural analysis of the travels and mobility of individuals, using aggregate and disaggregate models. The main active developments are a synthetic population description for Belgium and a comprehensive activity-based demand model.

The research unit Traffic and Infrastructure Planning is part of the Civil

Engineering Department of Leuven University (KUL). Four main lines of research may be distinguished in the work of our unit: real-time traffic flow aspects, dynamic traffic models, reliability and robustness of traffic networks and traffic network design.

The ETH/IVT Zurich has been the coordinator of a continuous six-week travel survey called Mobidrive.

## CONTACT INFORMATION

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### Follow-up Committee

For the complete and most up-to-date composition of the Follow-up Committee, please consult our Federal Research Actions Database (FEDRA) by visiting <http://www.belspo.be/fedra> or <http://www.belspo.be/ssd>

