Report on Environmental effects of behavioural actions

The report presents a comprehensive methodological framework for WP 4 aimed at evaluating the effects of behavioural interventions through modelling and simulation; and based on that identifies the data requirements that can be combined with activities planned for task 4.1, that defines the need to formulate a methodological framework through which the GPS trajectory data from the citizens of each iSCAPE city are to be analysed.

The methodological framework outlined in the deliverable aims to address the following three major aspects:

1) Key determinants of behaviour among citizens regarding pro-environmental activity-travel behaviour[1];
2) The effect of information that encourages pro-environmental activity-travel behaviour and its evaluation;
3) The upgrade of policy models for capturing both sides of policies (i.e. the effect on the environment and the effect on behavioural actions).

The above points address several tasks outlined in WP 4 (i.e. 4.1 and 4.2, 4.3 and 4.4.) but at the same time, as part of WP 2, supports the Living Lab

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[1] for example, the use of a bicycle or public transport for shorter trips

framework and its aligning activities for the city of Hasselt.

A number of data requirements as well as survey tools and instruments have been developed within the scope of this deliverable, these include:

- a web-based questionnaire asking details on socio-demographic characteristics and individual perceptions, attitudes and personal norms in relation to pro-environmental travel behaviour (i.e. lesser use of cars and more use of active travel modes),
- an android-based smartphone application (called SPARROWS, see Figure 1) for collecting data regarding individual travel activity routine and
- a hypothetical scenario-based questionnaire to investigate the effect of air quality information on travel mode choices.
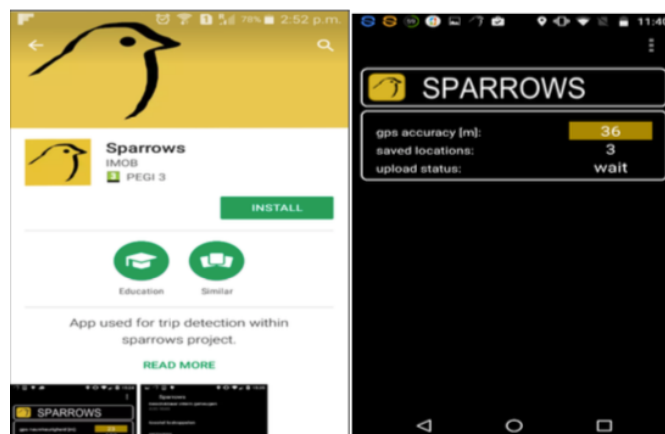

Figure 1 SPARROWS user interface before and after installation

Based on these survey instruments an information based behavioural intervention was designed; this was primarily based on the analysis of activity-travel data of individuals against four dimensions: 1) Exposure analysis, 2) GHG emissions, 3) Involvement in physical activity and 4) Hot and cold car engine starts.

Rule-based algorithms are being developed not only to estimate individuals' contribution to these four dimensions but at the same time they are providing information about what could be possibly changed in the activity-travel routine to minimize the resulting negative impacts. With this in mind the focus was more towards changing those aspects of travel behaviour which are relatively easier to change e.g. the use of public transport when it is easily available and also reasonable in terms of travel time, linking flexible and non-mandatory activities to reduce the number of trips and cold starts.

The results of this analysis were disseminated as a customized information

pack that describes the impact of activity-travel behaviour of an individual and also provides information that quantifies the impact of small changes in behaviour.

The same methodological framework was applied for the behavioural intervention study conducted for the citizens of Hasselt. Citizens were recruited with the support of the city of Hasselt that helped in disseminating the study within various forums. The study started with 53 citizens and the results of the information based behavioural intervention indicated that around 40% of individuals have shown commitment to change their behaviour. Other citizens have indicated an increase in their awareness around the activity travel routine and its impact on environment. Additionally, the statistical analysis of activity-travel behaviour data collected before and after the intervention suggests a significant reduction in car use for short trips, which in turn causes significant increase in the use of active travel modes.

The full report will be published in March 2018.