Big data in Transport: Research opportunities, challenges and limitations

In order to meet this challenge, proposals should address all following aspects:

—Identification of areas and contexts in which ICT investments and exploitation of data should be implemented. Examination of a series of different case studies and contexts throughout Europe, in order to provide useful information and suggestions on the prerequisites of successful big data implementation in the transport sector from a socio-economic point of view.

—Identification of methodological issues and the development of necessary tools in order to allow for effective data mining and data exploitation.

—Analysis of the barriers and limitations of the transportation system to exploit big data opportunities. This point should address issues that range from technical to institutional. For example, many transportation agencies and authorities, transport industries, etc. may not consider profitable the investment in collecting and analysing big data, worrying also about the associated costs and risks of data collection and sharing.

—Examine the institutional and governmental issues and barriers concerning the application of big data in transport providing policy recommendations towards ""data openness"" and sharing. Issues of legitimacy and public acceptance (e.g. privacy, data security, etc.) are important and should be adequately addressed.

The Commission considers that proposals requesting a contribution from the EU of between EUR 0.5 and 1.5 million each would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Technological developments, particularly related to the extended and expanding use of ICT in the transport sector, allow the collection of unprecedented volumes of data across all modes and transport systems. These volumes of data, known also as ""big

data"", have generated a strong interest in the transport research community as well as in the relevant industries and among policy makers.

From freight transport and supply chain optimisation to evacuation modelling and crowd dynamics under extreme phenomena, and from short-term traffic forecasting to travel behavioural research and the use of social media for efficient transport operations, the so-called trend of big data has created a wide spectrum of challenges and opportunities in the field of transport research. Indicative areas of research in all transport modes could, for example, cover travel behaviour (by incorporating in modelling processes heterogeneous sources of information), logistics and consumer preferences, network capacity planning and optimisation (e.g. in the case of toll roads), risk management, response to extreme weather events or other emergency situations. Disaggregated data analysis by users' groups (e.g. age, gender) will contribute to better focus specific needs and trends. At the same time, the collection and possible exploitation of ""big data"" pose a number of questions both in methodological terms as well as in legal, institutional and social ones, which need to be addressed. The main challenge is therefore to investigate the implications of the utilisation of big data in the transport field.

Appropriate exploitation of big data can help policy makers at the EU, national and regional level, as well as relevant decision makers to take informed decisions. Better data can help transport authorities and industries to understand the behaviour of travellers and consumers, also in disaggregated groups (e.g. age and gender), provide targeted information and identify policy interventions.

Work under this topic is therefore expected to contribute to evidence–based decision making by improving knowledge on methodological and exploitation issues taking also into account economic and technical considerations.

It is also expected to contribute to an early identification of critical issues linked to privacy, data security, legal and institutional aspects. It may therefore facilitate the development of an appropriate legal framework for the collection and exploitation of big data in the area of transport.

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