BIG MOBILITY DATA ACCELERATING THE ENVIRONMENTAL TRANSPORT & MARITIME SECTORS

BigMobilityData Policy Brief

Recommendations to lever on Big Data for a greener and more digital Europe

SEPTEMBER 2021

Main Authors



This Policy Brief Compilation booklet has been produced with the support of Trust-IT Services, provider of the Horizon Results Booster, funded by the European Commission. The Policy Briefs have been written by projects and project groups that took part in the Horizon Results Booster.

Disclaimer

The information, views and recommendations set out in this publication are those of the projects that took part in the Horizon Results Booster and cannot be considered to reflect the views of the European Commission. The Horizon Results Booster is funded by the European Commission N° 2019/RTD/J5/OP/PP-07321-2018-CSSDEVRIR-CSSDEVRI01.

Table of contents

Executive Summary	
Overview2	
Topic	
Policy challenges	
Recommendations	
1: Funding for Research and Innovation on Big Mobility Data ICT methods and technologies	
2: Dissemination actions to foster uptake and trust in Big Mobility Data methods and technologies	
3: Support actions to improve collection and access to Big Mobility Data	
4: Foster Development of a Legal and Ethical Framework for the collection and use of Big Mobility Data	
BigMobilityData Project Group	



1

owadays, large amounts of mobility data are widely collected from several devices, ranging from GPS enabled devices, to Internet of Things devices for autonomous vehicles and maritime vessels. These devices generate what is called Big Mobility Data that need ad-hoc ICT methods and infrastructures to be collected, stored and analysed in an ethical and privacy preserving way.

Big Mobility Data is a group of projects addressing joint development of methods and solutions in the field of Big

Data applied in the mobility data analysis in environment, transport and the maritime sector organised under the Horizon Results Booster programme (HRB) of the European Commission.

HRB supports effective transfer of research and innovation project results to policymakers, industry and society by offering services for dissemination, exploitation and business plan development to projects supported under the 7th Framework Programme (FP7) or Horizon 2020 funding schemes.

Overview

The widespread usage of location devices (smartphones, social media but also vehicles like cars, trucks or vessels) is enabling the creation, collection, storage and analysis of large amounts of complex mobility data, called Big Mobility Data. The proper collection, storage and analysis of such data will benefit a number of applications from maritime surveillance systems, to energy efficiency and fuel consumption and circular economy concepts. Big Mobility Data also requires the development of proper research infrastructure for ethic-sensitive analysis, scientific discoveries and applications.

1.1 Topic

Movement data is complex: we not only need to represent the location and the time of where an object has been, but we also need to consider contextual information: e. g. Was the area crowded? How was the weather? Which other vessels were in the same area? What is the review of a visited restaurant or hotel? Was a vessel passing through a fishing protected area?

Big data usage enriches the development of trajectory data, Smart-ICT enhanced maritime fleet management, circular economy and air pollution trends. Big Data is widely used to understand the complexity of our contemporary, globally-interconnected society.

1.2 Policy challenges

Inferring useful knowledge from large amounts of complex mobility data is still an important challenge. Specifically, we are still missing ICT methods and technologies to:

- collect, store and analyse large amounts of complex movement data and ready-to-use methods for enriched trajectory data;
- 2. define multi-disciplinary research infrastructure for big social data analytics, highlighting the awareness of ethical and legal challenges of analysing such data and by incorporating values and norms for privacy protection, fairness, transparency and pluralism;
- develop IoT cloud-based maritime performance & monitoring system for the entire lifecycle of a ship, aimed to optimise energy efficiency, emissions reduction and fuel consumption, whist introducing circular economy concepts in the maritime field;
- surveil navigation in marine areas, in particular the determination of the exact location and activity of vessels;
- capture the personal exposure to air pollutants, as well as their health impacts with Privacycompliant methods;
- 6. determine the **identity and nature of maritime activity using passive sensors**.

pon the landscape and GAP analysis, the BigMobilityData project group has defined four actionable recommendations for policymakers on national and European level, with the aim to advance the ICT methods and technologies for a greener and more digital Europe.

1: Funding for Research and Innovation on Big Mobility Data ICT methods and technologies

The more data and analytical tools, the higher the impact on a greener and more digital Europe will be. Big data supports the monitoring environmental factors and circular economy. It is therefore important to provide funding opportunities for researchers to develop innovative ICT methods, algorithm and platforms that can support the collection and analysis of big mobility data also taking into consideration the privacy and ethics issues that might arise when dealing with such kinds of data.

2: Dissemination actions to foster uptake and trust in Big Mobility Data methods and technologies

On the one hand dissemination actions are needed to foster the wide uptake of improved access to big mobility data and tools, contributing to a greener and more digital Europe. On the other hand, dissemination and awareness raising are key in fostering trust and explainability of the results, as the main incentives for stakeholder (including private citizens) participation to mobility studies.

3: Support actions to improve collection and access to Big Mobility Data.

Big Data is crucial in the support to monitor environmental factors. Environmentally related metrics are needed to minimize the negative impact of maritime activity. To monitor these metrics in a trustworthy way, passive surveillance systems that will collect data from which we will be able to infer illegal activities that harm environment and GHG emissions of vessels at sea should be developed and implemented.

Methodologies that help monitor societal aspects such as citizen behaviours or air quality measures require a strong multi-disciplinary collaboration to be successful. Various aspects of each stage of the chain must be considered to provide reliable insights. Multidisciplinary collaboration can be facilitated through the implementation of a big mobility data platform. Adoption of available tools to improve collection and access to big mobility data is therefore key. Policy makers may promote specific actions, including relevant funding lines, to enable the establishment of such common platforms and related tools.

4: Foster Development of a Legal and Ethical Framework for the collection and use of Big Mobility Data

It is important to implement the appropriate data protection, GDPR compliance and IP legal frameworks to protect the fundamental rights of the individuals concerned. Undoubtedly, Data Management Plans should specify that all the data used in projects, when necessary, will be anonymised, to be able to make optimal use of big mobility data. Due to this, the development of a custom-tailored ethical and legal framework is critical for correlating the freedom of research with fundamental rights of individuals. Policy makers are encouraged to communicate the importance of these legal mechanisms to the institutions responsible for developing such frameworks.

BigMobilityData Project Group

BigMobilityData is a cluster of 6 National and EU H2020 research projects in Big Data aimed at bringing innovation and sustainability in the transport, maritime and environmental sectors.

Project Group Leader: Chiara Renso (CNR, MASTER project)

Contact: chiara.renso@isti.cnr.it



master-project-h2020.eu





project.sobigdata.eu

smartship2020.eu



i4sea.com





polluscope.uvsq.fr



BIG BIG BIG ACCELERATING THE ENVIRONMENTAL TRANSPORT & MARITIME SECTORS

The HRB - Horizon Results Booster is an initiative funded by the European Commission, Directorate General for Research and Innovation, Unit J5, Common Service for Horizon 2020 Information and Data.

