



## DELIVERABLE

### D3.13 - Policy Recommendations

Project Acronym	TT
Project Title	Transforming Transport
Grant Agreement number	731932
Call and topic identifier	ICT-15-2016-2017
Funding Scheme	Innovation Action (IA)
Project duration	30 Months [1 January 2017 – 30 June 2019]
Coordinator	Mr. Rodrigo Castiñeira (INDRA)
Website	<a href="http://www.transformingtransport.eu">www.transformingtransport.eu</a>
Project Acronym	TT

Document fiche	
Authors:	Akrivi Vivian Kiousi, Despina Anastasopoulos [INTRA]
Internal reviewers:	Leyre Merle [INDRA] Dirk Mayer [SAG]
Work Package:	WP3
Task:	T3.1, T3.2, T3.4, T3.5 and T3.6
Nature:	R
Dissemination:	PU

Document History			
Version	Date	Contributor(s)	Description
0.1	15/05/19	INTRA, PILOT LEADERS	Topics addressed presented in Karlsruhe
0.2	07/06/19	INTRA	1 <sup>st</sup> draft
0.3	26/06/19	INTRA, Reviewers	2 <sup>nd</sup> draft
0.4	28/06/19	INTRA, New content	Final
1.0	03/07/19	INTRASOFT	Final editing

<b>Keywords:</b>	Policy, recommendations, policymakers, new business models
<b>Abstract (few lines):</b>	The purpose of this report is to summarise the collected feedback derived from dedicated interviews with the TransformingTransport (TT)pilots, as well as focus group discussions with the pilot participants and targeted stakeholders from domain related events. The target is to produce a policy brief on the Big Data adoption for the generation of new business models and new business and research opportunities. This report is targeted at policymakers and the transport and Big Data audiences at large.

## DISCLAIMER

This document does not represent the opinion of the European Community, and the European Community is not responsible for any use that might be made of its content. This document may contain material, which is the copyright of certain TT consortium parties, and may not be reproduced or copied without permission. All TT consortium parties have agreed to full publication of this document. The commercial use of any information contained in this document may require a license from the proprietor of that information.

Neither the TT consortium as a whole, nor a certain party of the TT consortium warrant that the information contained in this document is capable of use, nor that use of the information is free from risk, and does not accept any liability for loss or damage suffered by any person using this information.

## ACKNOWLEDGEMENT

This document is a deliverable of TT project. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 731932

# Table of Contents

<b>DEFINITIONS, ACRONYMS AND ABBREVIATIONS .....</b>	<b>6</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>8</b>
<b>1 INTRODUCTION .....</b>	<b>9</b>
1.1 RECOMMENDATIONS ON HOW TO FOSTER BUSINESS VIA THE USE OF BIG DATA.....	11
<b>2 TT POLICY FORMATION METHODOLOGY .....</b>	<b>12</b>
2.1 TT SELF-ASSESSMENT .....	12
2.2 NEW EMERGING TRENDS.....	13
2.3 VALIDATION AND SHARING IDEAS WITH THE WIDER AUDIENCE/TARGETED CONTRIBUTIONS.....	14
2.3.1 <i>Cooperation with LeMO</i> .....	16
2.4 NEXT STEPS.....	16
<b>3 GDPR FOSTERING DATA ECONOMY AND NOT BEING A BARRIER .....</b>	<b>17</b>
3.1 RECOMMENDATIONS .....	17
3.1.1 <i>On GDPR fragmentation</i> .....	17
3.1.2 <i>Government should adopt a Code for Responsible Analytics</i> .....	19
3.1.3 <i>The Path Towards a GDPR “Ability to Innovate Framework”</i> .....	19
3.1.4 <i>New business model</i> .....	21
<b>4 DATA INTEROPERABILITY TO FOSTER COLLABORATION.....</b>	<b>22</b>
4.1 RECOMMENDATIONS .....	22
4.1.1 <i>Contributions on Business to Government Working Group New PSI directive on Open Data</i> .....	23
<b>5 MOVING TO AN OPEN DATA LANDSCAPE .....</b>	<b>25</b>
5.1 THE RAIL CASE EXAMPLE .....	26
5.2 RECOMMENDATIONS .....	27
5.2.1 <i>Governments act as a neutral place where all data sharing happens</i> .....	27
5.2.2 <i>Business to Government Working Group</i> .....	28
<b>6 POLICY RECOMMENDATIONS TO ENHANCE THE ACADEMIA INDUSTRY COLLABORATION. ....</b>	<b>29</b>
6.1 RECOMMENDATIONS .....	29
6.1.1 <i>Privacy Regulation</i> .....	30
6.1.2 <i>Intellectual Property Rights</i> .....	30
<b>7 DOMAIN SPECIFIC RECOMMENDATIONS .....</b>	<b>31</b>
7.1 PORTS.....	31
7.1.1 <i>Data confidentiality (sharing is caring)</i> .....	31
7.1.2 <i>Interoperable Port Community Systems (PCS), enables smooth data exchange.</i> .....	32

7.1.3	<i>Infrastructure for reducing the environmental footprint of port and shipping operations</i> .....	32
7.2	LOGISTICS (E-COMMERCE) DOMAIN .....	32
<b>8</b>	<b>CONCLUSIONS</b> .....	<b>34</b>
	<b>ANNEX 1 – D13</b> .....	<b>36</b>

## Definitions, Acronyms and Abbreviations

Acronym	Title
CO	Confidential, only for members of the consortium (including Commission Services)
CR	Change Request
D	Demonstrator
DL	Deliverable Leader
DM	Dissemination Manager
DMS	Document Management System
DoA	Description of Action
Dx	Deliverable (where x defines the deliverable identification number e.g. D1.1.1)
EIM	Exploitation Innovation Manager
EU	European Union
FM	Financial Manager
MSx	project Milestone (where x defines a project milestone e.g. MS3)
Mx	Month (where x defines a project month e.g. M10)
O	Other
P	Prototype
PC	Project Coordinator
PM	partner Project Manager
PO	Project Officer
PP	Restricted to other programme participants (including the Commission Services)
PU	Public
QA	Quality Assurance
QAP	Quality Assurance Plan
QFD	Quality Function Deployment
QM	Quality Manager
R	Report
RE	Restricted to a group specified by the consortium (including Commission Services)
RUP	Rational Unified Process
STEP	Standard Technology Evaluation Process
STM	Scientific and Technical Manager

<b>TL</b>	Task Leader
<b>WP</b>	Work Package
<b>WPL</b>	Work Package Leader
<b>WPS</b>	Work Package Structure

## Executive Summary

This report is an outcome of the TransformingTransport (TT) project, funded by the European Union (EU) and launched on 1 January 2017. The project focuses on increasing interactions between researchers and innovators while providing support for the improvement of research and innovation framework conditions. The project is conducting analyses that deliver a sound base for policy decision making on enhancing coordination and synergies between different European institutions and programs.

The purpose of this report is to summarise the collected feedback derived from dedicated interviews with the TT pilots, as well as focus group discussions with the pilot participants and targeted stakeholders from domain-related events. The target is to produce a policy brief on Big Data adoption for generating new business models and new business and research opportunities. This report is targeted at policymakers and the transport and Big Data audiences at large.

The project's methodology provides the necessary ground to discuss the benefits as well as the obstacles regarding the concerned Big Data topics as experienced by policymakers, and stakeholders from industry, academia, research program owners, intermediaries and scientists.

The recommendations that emerged during the policy activity refer to the main topics listed in the next chapter.



# 1 Introduction

Digitalisation has not touched all industrial sectors in Member States and EU Regions equally. According to European Commission data for 2017, transport had a modest index of digital intensity, lower than 15 %<sup>1</sup>. Big Data is one of the key enabling technologies (IOT, Internet of Things, Cloud computing), whose combined interaction with all these technologies has led to the creation of the concepts like 'Industry 4.0' and 'industrial internet of things (IIoT)'. These refer to automated production based on real-time data exchange, which is likely to reduce operational costs, improve performance and broaden the range of products and services offered.

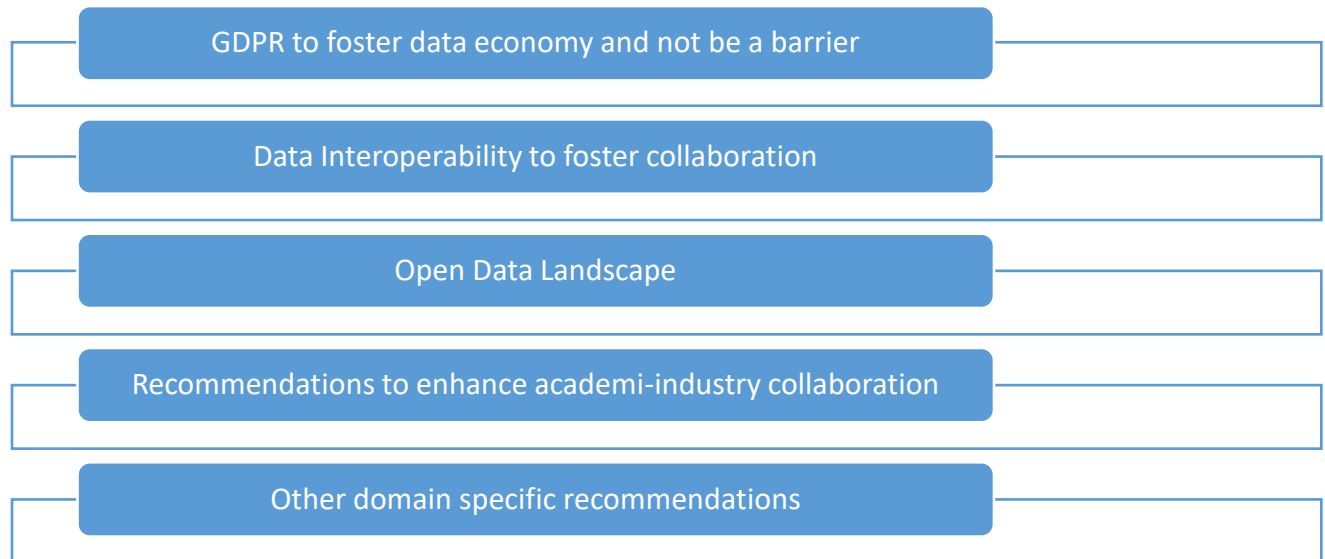
Partners from the TT project worked towards the industry 4.0 concept and particularly on the Big Data use for improving business in the mobility and logistics sector. The consortium has been exchanging and learning from each other for more than two years already, facing technology and policy issues, working towards common goals and striving to raise awareness on Big Data in the transport domain. Under these lines they have prepared a policy brief report to:

- share experiences, with each partner presenting the specificities of the issues and obstacles they had faced in using Big Data, highlighting the learning process and showcasing the best practices operating on the partners' territories;
- voicing their recommendations for better integrated Big Data technologies with an eagerness to cooperate towards an enhanced environment that could assist the Big Data transformations and businesses.

This report reflects the outcomes of the discussions during the policy extraction activity and prioritises policy issue suggestions for recommendations that emerged in the following main thematic areas:

---

<sup>1</sup> [http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/635528/EPRS\\_BRI\(2019\)635528\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/635528/EPRS_BRI(2019)635528_EN.pdf)



The main document purpose is threefold:

- to inspire policymakers around embracing the opportunity for data and analytics to transform public service delivery,
- to sound a note of caution about the challenges this agenda poses for the public sector, and
- to make recommendations for how government might begin to realise the former whilst addressing the latter

The team of TT organised dedicated interviews where pilot owners, intermediaries and academic partners brought together to discuss the most important aspects within each thematic area that they had personally identified as important. The aim of this activity was also to examine the areas beyond the already “established” thematic areas of existing Big Data discussions. The reason for that was that since an issue is mentioned and prioritised, the focus then turns to mobilising the full range of research evidence relevant to the various features of the issue itself.

The recommendations in the following chapters were reinforced with the input collected through interviews with focus groups and suggestions derived from discussions with stakeholder audiences where the suggestions for policy recommendations were presented to stakeholder groups identified by the consortium.

The output of the above was to summarise the collected feedback into the current document meant for the researchers, industry and policymakers. The following sections provide the identified benefits and specific examples of obstacles that the participants have faced, along with their recommendations to address them.

## 1.1 Recommendations on how to foster business via the use of Big Data

From "smart" government to transformational government, Big Data and Open Data can foster collaboration. They can create real-time solutions to challenges in agriculture, health, transportation, and more, promote greater openness, and usher in a new era of policy- and decision-making. There are, however, a range of policy challenges to address regarding Big Data and Open Data, including access and dissemination, digital asset management, archiving and preservation, privacy, security, etc.

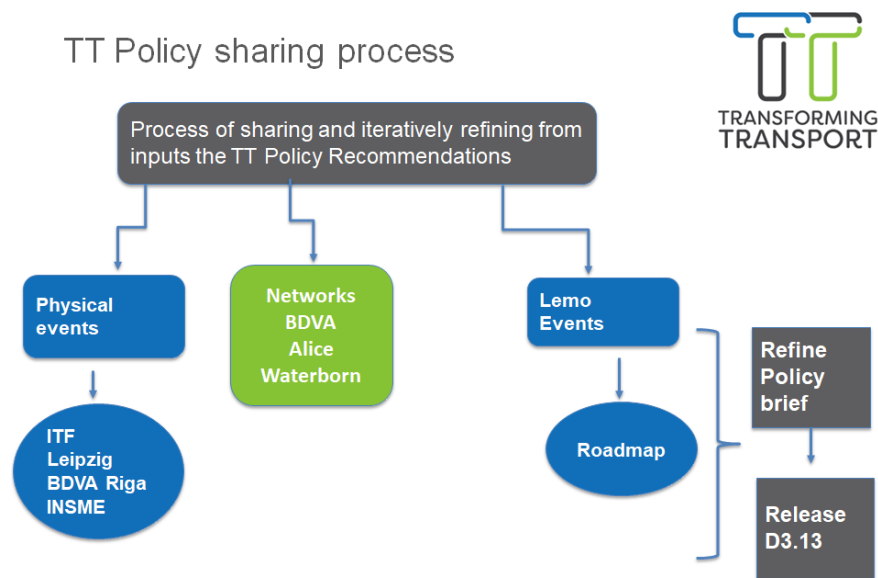
This policy brief examines the ways in which the current policy frameworks address a number of these identified policy challenges. Moreover, it suggests recommendations that can serve as a starting point for revising the current policy frameworks to promote the adoption of big data. Big Data technologies alone are not, however, a silver bullet for transforming the public sector. Underlying data issues like quality, standards and bias still need to be recognised and addressed, and governments must have the capability to conduct, interpret and consume the outputs of data and analytics work intelligently.

The chapters below address, in short, the topics and the key challenges and recommendations that were deemed helpful to both stakeholders and the government to move faster on Big Data adoption.

## 2 TT policy formation methodology

The figure below depicts, in short, the methodology used for suggestion formation and validation that took place via interactions in targeted events with targeted stakeholders.

- TT SELF-ASSESSMENT – Combing the TT library to identify emerging topics and build a ground of discussion for the targeted interviews with pilot leaders
- ASSESS Key emerging topics from all 13 pilots via targeted interviews with pilot leaders
- VALIDATE & EXCHANGE VIEWS on emerging topics with stakeholders and advisory Group of TT (HLAB) and stakeholder at targeted events
- CREATE TT policy recommendations
- SHARE our outcomes with the policy community and let policymakers decide on available options



### 2.1 TT self-assessment

The work implemented during earlier stages of the project, particularly from activities relating to the data management plan and pilots requirements activity, was used to produce this report

and to direct the methodological framework in order to elicit suggestions for policy recommendations.

Why did we choose the TT policy interview process? Because interviews are quite interactive and help interviewees express themselves, allowing more room to document issues of importance. The methodology followed included a list of backbone questions that were amended slightly depending on the pilot and allowed room for a brainstorming discussion.

Particular focus of the project policy activities was placed on capturing opinions with regards to:

- **increasing interactions** with pilots to elicit the required information between industry researchers and innovators
- **providing the support for the improvement of research and innovation framework conditions** that deliver a sound base for policy decision making
- **enhancing coordination and synergies** between different stakeholders
- **enhancing business opportunities**

During the Interview brainstorming activity, pilots were asked to comment on:

- **Emerging topics and new trends** relating to Big Data
- **limits** affecting their business area in relation to Big Data
- Opportunities to develop new business models and opportunities to grow their business
- any **legal issues** raised during the pilot demonstrations and any workarounds they came up against in moving to the next step (i.e. formulating stakeholder agreements to be able to use specific datasets – Thales had to sign an agreement to be able to use the weather data belonging to a third party)
- the **perceived values** of big data
- **guidance and opinions/recommendations** towards national or regional authorities (per case)

## 2.2 New emerging trends

New emerging trends, hot topics or possible drivers that were expressed included: data fusion, high performance computing, machine learning, AI, real time applications and automation of

traffic. Other domain-based trends mentioned were: Data driven operations across the network (rail), optimisation of railway infrastructures placing safety first, collaborative business models with a clear emphasis on X2C practices (logistics), real automation of processes, automated actuation of industry 4.0 (how to get and manage data), etc.

The partners also identified some additional key trends that may be of interest:

- Data driven operations across the network (rail)
- Collaborative business models with a clear emphasis on X2C practices (e-commerce logistics)
- Real automation on processes

### 2.3 Validation and sharing ideas with the wider audience/targeted contributions

Highlighted networks to disperse the suggestions during and beyond the contract duration such as BDVA, ALICE, ERTICO, CEDR, and WATERBORNE have been targeted and approached via affiliations with specific partners. The objective is to share these suggestions directly on open relevant activities and documents while at the same time share the consortium's suggestions at numerous events.

After the interviews and discussions with experts we wanted to validate the assumptions that were derived in order to validate our work. This involved the participation of TT partners in policymaking events to discuss with other experts the issues identified and exchange ideas about similarities or additional issues that could be applied. Overall the issues cited in this deliverable where the main topics communicated, for which the TT partnership received positive feedback. Audiences showed particular interest in issues such as data interoperability and GDPR. Through these idea sharing events, TT investigated the possibilities for contributing its recommendations to the main European Technology Platforms in all transportation domains during and after the project. Notable activities and outcomes from these events are presented below.

Highlighted events:

- TT partner ITML, with the cooperation of WP 10 leader AUEB, presented in Alice on 4 April 2019 during the Collaborative Innovation Day: Logistics Information Spaces event,

featuring ideas that had emerged from the internal policy activity and expanded on lessons learned and exploitation opportunities deriving from the TT experience for the logistics and e-commerce domain. The presentation was created as a collaborative output of WP3 and WP 10 entitled: *From Data to Value sharing the logistics challenges*. A general statement deriving from the open discussions is that change in the sector is not coming fast enough and agreements between stakeholders are still difficult. Big Data can improve the service and operation level, but governments need to also assist partnerships and provide the necessary conditions to help the logistics companies and processes. From the inputs and brainstorming raised during the discussion, TT has suggested targeted points for recommendations sited in this deliverable under section 7.2.

- TT partners are planning to contribute on Alice's forthcoming events and are currently seeking opportunities to contribute in working documents.
- TT partner INTRASOFT gave a targeted policy-oriented presentation at the International Transport Forum that took place in Leipzig on 23 May 2019. In this international event with hundreds of policymakers it shared a targeted presentation entitled "*The role of policy in the Big Data landscape (The case of Transforming Transport)*". The focus of the audience and the questions raised related to issues on data interoperability, considered the most important issue to be tackled by policymakers. The project investigates possibilities to cooperate and contribute towards activities related to policy with the OECD since it is running a parallel activity with topics touched on by TT.
- TT partner INTRASOFT presented at the INSME Annual meeting which took place on 6-7 June 2019 issues gathered by the project and reviewed during the Logistics for SMEs event in the panel for the Mediterranean region. The panel discussed how logistics and supply chains are being restructured in the light of digitalisation and changes in international trade flows. INTRA shared the outputs of the internal policy activity and introduced the key trends identified, as well as policy recommendations deriving from the TT case studies.
  - INTRASOFT, as an active member and contributor of INSME, will seek opportunities to showcase the TT outputs in the next months.
- TT partner INTRASOFT presented the policy suggestions depicted in this document in the Riga BDV PPP Meetup 2019 held in Riga from 26-28 June 2019: Policy session where the

TT suggestions on policy recommendations were addressed. Numerous projects participated in the event from which interesting collaborations were identified.

- TNO which was the session moderator, after after the TT expression of interest to present in the session along with a side interview to discuss the outcomes, invited TT partner INTRASOFT to contribute to BDVA position paper on privacy preserving technologies. The input provided in form of a paper is available only to BDVA members at the below space until the closing of its review by external experts, expected to end on the 5 July 2019. The BDVA internal link space is:

<https://jam4.sapiam.com/groups/meAUIRzqW2WQSePaemuxn3/documents/c69HDIYEyliuhn6s0eQo0M>

- The contributing projects of this session are invited to contribute to the policy brief under preparation and WP3 leader INTRA has agreed to pass on the TT insights and suggestions to this important document. The draft preparation document will be under construction at the below link available at:

<https://drive.google.com/file/d/1YvBTyOVj7bNd2uYOMFKQsJLGgMDudIT-/view?usp=sharing>

- Additionally, and after interest expressed from Policy Canvas project, TT will contribute to the Big Policy canvas project roadmap available at <http://roadmap.bigpolycanvas.eu>

### 2.3.1 Cooperation with LeMO

TT has agreed on a project partnership with the LeMO project. TT and LeMO have agreed to exchange specific deliverables to kick start the cooperation and Capture additional value (insights) by comparing the outcome of each other's case studies. Since the case studies in LeMO do not cover the entire transport sector like in TT, the latter participated in the LeMO HLAB Project Meeting in 2018 and the LeMO Webinar in 2019. LeMo will use the findings of TT on the formation of the LeMO Roadmap.

## 2.4 Next Steps

The dissemination of the ideas collected will not stop. TT partnership seeks immediate opportunities to continue knowledge sharing with regards to policy. For example, Valencia Port, which is part of the Waterborne network, will help TT to share its suggestions. This will also



happen through all other possible sources identified by the partners, with the support as well of TTs HLAB experts and TTs extended network.

## 3 GDPR fostering data economy and not being a barrier

Data protection “made in Europe” could give European companies a competitive edge as users become increasingly aware of privacy issues. Despite its complexities and difficulties regarding its implementation, the GDPR can be a major step towards strengthening individual ownership of personal data. However, from TT’s experience the pilots report that they came across fragmented policies regarding GDPR across Europe. While GDPR can have a positive effect, it could also end up strengthening the position of incumbent tech giants and throw the EU further behind the US and China in the emerging race for Big Data adoption.

### 3.1 Recommendations

The market for Big Data analytics, tools and technologies is dynamic and evolving rapidly. As part of the broader digital and knowledge economies, the businesses and organisations that are leading innovation in the Big Data space, along with those deploying Big Data in their organisations, have an important role to play in supporting economic growth. In areas where Big Data and analytics are used to identify cost savings and increase efficiency, they can contribute to a direct improvement in productivity. Given the GDPR’s often vague formulations it might ultimately be in the hands of national courts to decide to which side the scale will tilt in providing definitions or defining cases that are considered a breach of privacy. In TT the Pilots cover seven different transport domains and had to utilise vast datasets to demonstrate the real scenarios selected. As expected, and as currently happening in businesses that face obstacles arising from GDPR, the pilots did follow specific methodologies to facilitate the obstacles raised, which resulted in delays to complete their mandate.

#### 3.1.1 On GDPR fragmentation

##### Too much regulation or too little

Due to ignorance in translating the use or non-use per case of specific data, many stakeholders are impeded from sharing data, rendering Big Data use and analysis impossible. This is because EU countries are not yet GDPR literate and well prepared. Shortly before the May 25, 2018 deadline, the German digital association stated that only one-fourth of German companies said

that they will be fully compliant with the regulation in time<sup>2</sup>. The regulation also attracts criticism from both industry representatives and privacy rights advocates who seek more targeted support from national regulators. Furthermore, opponents often describe the regulation as too complex, restrictive and creating substantial legal uncertainty for companies. In particular, when the TT pilot demonstrations were underway, the project partners pinpointed unique cases where they could not use some datasets. There was a question mark around such data being of a personal nature, which ultimately hindered their use. For example, the Tampere pilot faced the issue of separating personal from and non-personal data in a data set owned by a taxi company. The specific issue was the tracking and localisation of a taxi driver and whether these data are personal data within the GDPR framework.

The impact was that companies had to spend too much to weed out such cases and lengthy negotiations took place to allow the participating organisations to go to the next stage. The issue represents one of several actual drawbacks from a business perspective and for possible new business ventures when expressed in time and money.

A direct suggestion from TT consortium would be to:

- **push the EU member states to adopt and apply GDPR to the same extent.** TT pilots commonly reported **GDPR fragmentation**. In certain occasions where the definitions of the type of specific datasets were not clear or where questionable, their use was not easy or was not possible at all. To illustrate, while in Finland the location plus timestamp can be considered personal data, this is not the same across all countries. In Germany, this is considered personal data as well, although there are 16 different interpretations of GDPR - according to the "Länder".
- provide guidelines or assistance to member states and service operators on which data is considered personal data, especially in relation to vehicle data and camera data. With respect to camera data, member states have different interpretations on whether, for example, traffic camera images or video include personal data (license plate data combined with location and time is considered personal data in Finland), depending on the resolution of the images.

---

<sup>2</sup> <https://www.dbresearch.com/>

- **foster the quick adoption and understanding of the type of data** at hand and help define who owns the data via cabinets with special bodies that assist the industry and provide a consultancy role so there is no need to rely on private consultants.
- encourage the authorities to become more alert on cases **where GDPR weakens competition and competitiveness**. In such a case **authorities could direct lawmakers to facilitate taking the necessary measures to support business**.

### 3.1.2 Government should adopt a Code for Responsible Analytics

By suggesting more access to data silos, we do not wish to abandon the need for ethical standards. TT is suggesting that **Government should adopt a Code for Responsible Analytics** to help it adhere to the highest ethical standards in its use of data and analytics, respecting the spirit of the right to privacy<sup>3</sup>. Auxiliary data and analytics should not be used to infer personal or intimate information. In cases where this kind of data is needed for public policy reasons, consent should be sought explicitly, and data and analytics capabilities should always be acquired based on a clear and openly communicated public policy justification. Our consortium experts having the experience of dealing with sensitive data (i.e. airports, e-commerce and urban pilots) and having to invent technical workarounds to conduct analytics and obtain interesting results, can transfer this knowhow to relevant government stakeholders and help them to pursue their Big Data agendas with strong ethics and integrity. Afterall, the most important element is the capability to conduct, interpret and consume the outputs of data and analytics work intelligently.

### 3.1.3 The Path Towards a GDPR “**Ability to Innovate Framework**”

GDPR applies to all companies that process personal data within the EU, no matter where they and their servers are located or where the data is processed. Aspects of the regulation that could hamper their business model – e.g. user consent requirements, using personal data only for the purpose they were originally collected for, minimising data collection in general – can limit the companies from using the fruits of their research investments. In other words, the companies cannot benefit after conducting pilots or demonstrations that feature key findings based on these datasets.

GDPR creates a new system that requires national data protection authorities from every EU country to consult and agree as a group on cases for using specific datasets required by Big Data technologies. As mentioned earlier, the TT pilots came across fragmented policies regarding GDPR across Europe, so they experienced an imbalance between privacy rights, hindering their

---

<sup>3</sup> <https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai>

**ability to innovate.** Because of this, TT articulated additional suggestions to be considered by policy experts, mainly as consultancy and supported offered by authorities. This refers particularly to the definition/identification of targeted cases whenever it is hard for industry to decide on the privacy of a sample dataset.

Uncertainty about the interpretation of GDPR also affects the service operators in acquiring data in certain cases, such as for achieving accurate situational awareness. For instance, vehicle fleet operators may be reluctant to provide data of their fleet to service operators since they are not certain which parts of the data are considered personal data (e.g. do truck movements include personal data when the driver takes a break?).

Despite its complexities and difficulties regarding its implementation, GDPR can still be seen as a major step towards strengthening individual ownership of personal data. There's no doubt there will be much pressure to handle and intense consultation that will need to take place. However, if risks to Europe's tech industry and Big Data strategy continue to emerge and aspects of GDPR weaken competition and competitiveness, **lawmakers should not hesitate to make necessary adjustments**, wherever possible, and without compromise to the legitimate protection of user rights. The suggestion lies on the formation of a new consultation framework that assists innovation. The pilots suggested the use of **extra training** or **assistive tools (i.e. electronic platforms)**. These tools/trainings can employ a user-friendly **natural language to clarify the provided definitions on questions raised**. Moreover, the explanations to be offered to everyday users should be easily understandable in comparison to the current legal lengthy documents offered by national authorities who do not cover such cases extensively.

The pilots are also recommending that national or regional authorities be the ones interpreting complicated issues such as Data Ownership/Governance (i.e. who owns the data) rather than relying on private consultants. After the examples encountered mainly in airports, railway, urban environments, the pilots expressed suggestions on the right to data portability that could **break "data silos"**, provided this is properly implemented in line with government guidelines. This would also lower barriers to allow new market entries for emerging technologies, platform provider companies and start-ups.

Finally, it was noted that GDPR asks companies to provide data in a common machine-readable format but does not prescribe a certain standard for it. In this respect, armed with significant experience during the 30-month project, TT expert can transfer valuable knowhow gained from their experience to targeted bodies, aiming towards the definition of a standard readable format of specific datasets.

#### 3.1.4 New business model

GDPR-imposed restrictions on the processing of personal data are not necessarily a negative development from a business perspective, an idea also expressed by the TT pilots. As users might become increasingly privacy aware, European companies with a business model focused on trust and data protection could gain a competitive edge with products and services “made in Europe”.

Such a change requires that businesses will evolve to follow the principles of “data protection by design and by default” and gain respective certifications to meet the necessary requirements. Several partners having gained knowhow on such aspects via their participation in the TT pilots. These partners could be valuable experts and could contribute to setting industry standards and in a consultancy role contribute to adjust users’ expectations. This path however is related to the individual exploitation of such partners since they recognise new opportunities, with several discussions having been raised where partners investigate opportunities.

## 4 Data interoperability to foster collaboration

The advancements in the organization's workflow at different levels include data storage, data management, data maintenance, data integration, and data interoperability. Among these levels, data integration and data interoperability can be the two major focus areas for the organisations which tend to upgrade and streamline their workflow.

Many pilots raised the issues they faced when it came to interacting or collaborating with other companies. The pilots focused on dimensions of variety and veracity of data to be handled, and to analyse the interoperability-related challenges of Big Data. Variety is defined as dealing with unstructured, semi-structured and structured data from different sources. Veracity directly refers to the accuracy of data, which can be diminished by data inconsistency and data quality problems. Both variety and veracity are aspects of Big Data that are increasingly being recognised when trying to extract value and make Big Data operational, especially in the attempt to reach mutually beneficial goals. This involves the sharing of information and knowledge between organisations and through the business processes they support by means of the exchange of data between the organisations' ICT systems.

### 4.1 Recommendations

TT is making clear suggestions that focus on the requirements for data analytics technologies across different publishers of data and across different domains, springing from the actual experiences on how data can be integrated, used, and stored (which actually raised serious discussions in the case of airports for example). The suggestion is that more actions should be taken to foster data use, specifically:

- i. More guidance should be provided by higher level authorities on **how data should be stored**, transferred, shared etc.
- ii. Attention should be given to data Integrity. Governments should push for regulating **stakeholders on the type of data they provide across platforms, ensure that these data are reliable and of good quality**, and set requirements regarding data quality. These considerations should be included in the procurement procedures. The required data quality should be at a level sufficient enough to assure the feasibility of the intended (and future) use of the data. For instance, in a possible domain example beyond TT, if automated mobility is expected to be supported in the near future, the quality of the data (including reliability and latency) should support the requirements of automated mobility.

- **A new Advanced Analytics Team should be established at a national level**, with responsibility to continuously ensure that data is available and to assign access points that the quality of the data meets certain requirements. Also, the same team must ensure that certain organisations enrol in the data digitisation process (in cases where data sets do not follow user-friendly formats in processing when applying Big Data analytics strategies).
  - **TT can provide guidance to authorities on the type of quality standards that may be required to address the needs expected from Big Data technologies.**
- Standardisation issues were also mentioned by the pilots: the issue of data digitisation is mentioned several times in cases where not all data follow the necessary format required by Big Data technologies so that these data are useful. Increased use of standardised interfaces eases the replication of the pilots. TT will contribute knowhow gained regarding standardisation committees.

#### 4.1.1 Contributions on Business to Government Working Group New PSI directive on Open Data

Overall, data integration and data interoperability present complex challenges for organisations deploying Big Data architectures due to the heterogeneous nature of data they use. This requires a comprehensive approach to negotiate the challenges in integration and interoperability. Also, **responsibility for generating value from Big Data and analytics sits in different places in different organisations and governments.**

Hence, TT can link to areas of activities that the commission is currently undertaking and more specifically to the Business to Government Working Group New PSI directive on Open Data: <https://ec.europa.eu/digital-single-market/en/guidance-private-sector-data-sharing>.

The current document of the PSI report and particularly Article 13, highlights the high Value Datasets. It proposes a hybrid solution consisting of both implementing and delegated acts regarding the choice of legal instruments for establishing the list of high value datasets to be made available for free and via APIs. There will be a list of broad categories of high value datasets in the Annex (e.g. Geospatial, Statistics etc.). This list of categories will be updated by assigned experts. Many models have been created in TT and many datasets required time to be processed. For example, every dataset was of different quality and format in airport pilots. Similarly, in one

of the ports cases and the e-commerce pilot. Armed with vast experience during the actual demonstrators, TT can link to areas of activities that the commission is currently working on. TT experts can support assigned working groups in working towards the harmonisation of high value datasets to make data economy more efficient. TT can contribute to the assessment of interoperability challenges from a business perspective so that policymakers can increase their understanding of the challenges involving the integration of data for analytical purposes, as well as regarding the role of both technical and data standards, in order to improve interoperability.

Specifically, TT proposes contributing to the W3C and Joinup working teams

(<https://joinup.ec.europa.eu/document/big-data-interoperability-analysis>) and to getting involved in ISA activities ([https://ec.europa.eu/isa2/home en](https://ec.europa.eu/isa2/home_en)), in addition to working on defining **common dataset structures for the named important datasets** together with other experts.



## 5 Moving to an Open Data landscape

Many pilots raised the issue regarding the use of **Open Data being necessary for offering new services or to generate research** since the accessibility of Open Data and cloud services allow industries and citizens to develop new services and applications.

Findings between pilots differ since such suggestions depend on different business areas and how the use of Open Data was necessary for the offering of new services. Specifically, airports and railway companies were hesitating to hand over their data since they consider that such data reveals information to their competitors. Moreover, ports expressed different opinions regarding the openness depending on the type of organisations involved in the discussion and the stakes at hand.

Data confidentiality has been by far the biggest obstacle to overcome during the implementation of the TT pilots. Signing the confidentiality clauses already defined in the grant agreement was not sufficient in some cases such as for port and terminal management departments, in the rail domain, etc. In addition, IT departments were reluctant to share their data infrastructure or to grant external connections. To achieve remarkable results from an analytics perspective, organisations must provide key business data. These data are extremely sensitive, as they could have an economic impact if direct competitors, such as other terminals in the port, gain access to them. To solve this issue, many of the pilot partners signed a more restrictive data confidentiality agreement internally so they can proceed with the actual demo.

This fact shows that, in practice, current data confidentiality policies are not enough in the context of Big Data projects. For instance, the concrete technical measures to implement are not usually present in policy recommendations. Examples of such measures introduced in the side agreements under the TT demos include deploying a VPN (case of airports), granting access only to specific machines, monitoring downloaded data to provide read-only access to specific tables of data sources.

From our point of view, **it is not enough to reach a confidentiality agreement but also important on how this agreement** will be technically enforced and monitored during pilot development and beyond. The introduction of GDPR as we have seen in the previous section has worsened the situation in some occasions, particularly since data confidentiality has now become a high priority issue that puts additional pressure on Big Data projects.

## 5.1 The Rail case example

When digitalisation developed across industrial and economic sectors, rail transport embraced it unevenly since it involved many challenges. Rail companies have already implemented a vast array of new services and applications using digital technologies for providing more information and leisure services aboard trains, improving the monitoring of their assets or automating more operations. This is perceived by many stakeholders as an opportunity, owing to the benefits it can offer, but also as a challenge.

The introduction of new market forces in the rail sector requires easy and fair access to the information about the network. The relevance of providing comprehensive, up-to-date and open information stems, in particular, from two issues:

1. the need to provide all users with the same level of information (in a context where, typically, there is information asymmetry between the incumbent, i.e. the main national railway that has historically operated the rail services, and the newcomers);
2. the need to efficiently use the often-scarce resources represented by the rail capacity, which requires informing the likely users of the available capacity on each section or node of the network.

With the subsequent development of automotive and air transport, railways relinquished their leading position in technological and technical innovation.

The EU has been forging a cross-policy approach and programs to ensure a solid policy framework, finance research and infrastructure, develop standards and connectivity, and use data effectively. This should enable rail actors to capture digitalisation's potential, improve their efficiency and serve their customers better, representing a key lever to improve rail competitiveness.

This is why it has become one of the EU's main priorities to:

- Open the datasets, which is key to industry competitiveness
- Advance digitalisation, which represents an opportunity for rail and brings numerous benefits such as improved capacity, better traffic management, reliability, energy efficiency, increased services and lower operating costs.

- Increase connectivity

Further assistance from the European Commission and national authorities is required in educating the several stakeholders on understanding Big Data, how to monetise its use and to think more openly on sharing information.

In the case of TT the rail companies involved have exhibited problems in utilising some datasets owned by third parties who won a specific contract to provide service to the operator. To gain access to specific data they went through a period of formulating legal agreements that applied only for the duration of the project.

This experience inspired further thinking on how governments should tackle the data ownership and proposed additional further assistance from the Commission and national authorities to educate stakeholders on understanding what Open and Big Data are about, the value they bring, how we can monetise their use and develop new business models and how to get stakeholders to think more openly on sharing information.

- Airport and Port Example. Airports and port companies/stakeholders are hindered from opening their data since they consider that such data reveal information to their competitors
- Ports expressed different opinions depending on the type of organisations involved and business at stake.

## 5.2 Recommendations

TT demonstrates results to gain **trust from industry in order** to push Big Data use by being open to new capabilities, but also to **encourage a shift in regulation** to incorporate Big Data in several processes. So far things are rather strict, and **change is not coming fast enough** to allow the fast adoption of Big Data.

### 5.2.1 Governments act as a neutral place where all data sharing happens

TT suggests **that governments act as a neutral party where all data sharing happens and since they have the strength through regulation, to decide on data handling for appropriate use**. This necessitates a structured, transparent and up-to-date overview on existing initiatives. Providing comprehensive criteria on respective targets and relevant concerns, combined with references to the current efforts, will enable concerned parties to efficiently retrieve required information and reduce both existing uncertainty and lack of knowledge.

### Urban pilot example:

- *The TT urban pilots have successfully demonstrated the need for data sharing. Companies that won public contracts do not like to share their data with others. If these data become available, thanks to a government push, cities can better understand logistics dynamics, analyse traffic flows more effectively and handle traffic in a better way.*

#### 5.2.2 Business to Government Working Group.

Data held by companies can be very relevant in guiding policy decisions or improving public services. In this respect, TT suggests that Data Market Economy should move to a structure where agreements and sharing becomes easy since they generate efficiency gains, where everyone operates using a “data openness index”.

**TT can link to** particular areas within relevant activities that the Commission is working in at the moment, such as the **business to government working group**. The latter has experts that have identified good practices on B2G data sharing in order to contribute to more efficient and better public service delivery. It can also advise the Commission on new areas for potential support regarding B2G data sharing through the EU’s Research and Innovation Framework Programme or other programmes. The Commission appointed 23 experts to an Expert Group on Business-to-Government Data Sharing<sup>4</sup>, but also subgroups in which TT could participate actively by sharing interesting examples derived from TT use cases.

---

<sup>4</sup> <https://ec.europa.eu/digital-single-market/en/news/meetings-expert-group-business-government-data-sharing>

## 6 Policy recommendations to enhance the Academia Industry collaboration.

On state level, state and regional support schemes primarily focus on the state or region's priorities and economic needs. These schemes sometimes are complementary to the provided funds at federal level. On University level, state universities receive federal funding that may have broad purposes attached to them. Universities usually align their research output with the needs of local industrial and commercial partners.

For actors in the industry, a collaboration with the Academic world stimulates their creativity, entrepreneurship, risk taking and opens new ways of approaching things and thinking out of the box. Both partners though, improve their image through such collaborations, since the Academic partners gain valuable experiences and improve their image that could result in increasing the opportunities to attract new funding opportunities based on collaboration and the companies get valuable reference for the developed service or product.

Concerning the collaboration between Academia and Industry the following benefits have been identified:

- Academia provides the theoretical framework of Big Data use that can be applied and tested (which brings the added value to companies).
- Academic partners benefit by getting access to real world projects, and the opportunity to evaluate theoretical knowledge in practice through specific applications, when they work with partners coming from industry.
- Despite the fact that many universities have established technology transfer offices for the Big Data matters, they still don't have direct contact with the market to get the required deep understanding of the market needs as well as such a high level of interaction with the stakeholder.
- The industry does not have the resource to invest in research and their bridge to innovative breakthroughs is the Academic world

### 6.1 Recommendations

The following paragraphs provide recommendations to overcome the obstacles that were identified during the workshops and the interviews conducted:

It was suggested by the participants, that policymakers and funders from both sides of the domain (research, industry) should also work together to identify topics and research areas where collaboration is possible and important. **The development of further cooperation networking bodies or activities** that provide policy guidelines for future at the academic and industrial levels, facilitating the development of new actions coordinated by the governments of both sides, could foster their collaboration.

#### 6.1.1 Privacy Regulation

Privacy is another potential barrier to cooperation, when the private sector is involved. Industrial partners usually seek ways to profit from managing or exploiting data. On the other hand, Academic partners might have other objectives, such as using data to expand their research without commercialising the exploitation of the data. Apart from this case, the cooperative schemes that come from both sides become even more complicated since different policies are applied in these two (operational) regions and sometimes they differ between countries. For example, we spot between countries different policies and norms when it comes to consent. A few European partners believe that recent data breaches involving leaks of personal records, coming from industrial partners, would not have happened if stronger policies for informed consent and data aggregation were uniformly adopted.

For better cooperation, there needs to be harmonisation in the general approach and also in specific laws. The limited shared understanding of what privacy means makes it difficult to know how to treat it. suggestions on that are also reflected at the GDPR dedicated chapter.

#### 6.1.2 Intellectual Property Rights

There are lots of misunderstandings between the Industry and the European Universities concerning IP transfer protocols and partnership agreement variation, however it is not impossible to overcome them. Standardising mechanisms to increase incentives and overcome IPR issues would benefit academia-industry projects and, therefore, promote new cooperation actions between innovation actors. It is worth mentioning that the IPR issue is more related to the EU -between countries cooperation rather than Academia – Industry collaboration.

## 7 Domain Specific Recommendations

Some domain specific recommendations that were expressed per domain are also depicted below.

### 7.1 Ports

Many ports have developed into strategic nodes for energy generation, trade, storage and distribution, and increasingly important clusters of industry and the blue economy since they constitute the main link from maritime transport to any inland destination. In addition, some ports have been identified as critical infrastructure due to their strategic importance. Within this context, TT has successfully exploited the opportunities offered by Big Data to make port and terminal operations more efficient.

Improvements in liner connectivity, productivity cockpits in port terminals, and multimodal links that bring integration among systems increase the level of port efficiency in developing regions, offering the advent of predictive data and decision support capabilities. Below are some targeted suggestions from the pilot partners beyond the overall suggestion expressed for digital infrastructure. These suggestions are aimed at eliminating unnecessary paperwork which can cause delays in handling cargo, improving security, reducing costs and improving environmental sustainability.

#### 7.1.1 Data confidentiality (sharing is caring)

As mentioned previously, data confidentiality has been by far the biggest obstacle to overcome during pilot implementation. Signing the confidentiality clauses already defined in the grant agreement was not enough for Port and Terminal management departments. Moreover, IT departments were reluctant to share the data infrastructure or to grant external connections. **To achieve remarkable results from an analytics perspective, organisations must provide key business data.** These data are extremely sensitive, as they could have an economic impact if direct competitors, for instance other terminals in the port, access them. To overcome this issue, pilot partners signed a more restrictive data confidentiality agreement internally. This shows that, in practice, current data confidentiality policies are not enough in the context of Big Data projects. For instance, the concrete technical measures that must be implemented are usually not present in policy recommendations. Examples of such measures introduced in our agreement include deploying a VPN, to granting access only to specific machines, monitoring downloaded

data or to provide read access only to specific tables of the data sources. From our point of view, it is not enough to reach a confidentiality agreement but also to demonstrate how this agreement will be technically enforced and monitored during pilot development. The introduction of GDPR has actually worsened the situation, as data confidentiality has currently become a high priority in logistics industry.

#### 7.1.2 Interoperable Port Community Systems (PCS), enables smooth data exchange.

TT can contribute to the requirements for designing an interoperable system that can support the correct and secure exchange of information between public and private stakeholders by enabling a single submission of data which becomes available for (selected) third parties to optimise, manage and automate port and logistics processes (e.g. documentation for exports, imports, hazardous cargo, ship manifest information, port health formalities and maritime statistics reporting).

#### 7.1.3 Infrastructure for reducing the environmental footprint of port and shipping operations

Port operations and development plans relating to activities on both land and sea may have negative impacts on the environment (biodiversity, water quality, air quality and climate change). New Big Data technologies can mitigate these effects, for instance by predicting air emissions to support decision making in operations and reduce the port's environmental footprint.

## 7.2 Logistics (e-commerce) domain

The concept of sharing is as old as human civilisation. The sharing economy has virtually disrupted all sectors, creating a multitude of platform-based marketplaces that connect individuals, enterprises and communities at a peer-to-peer level. The sharing economy is making cities redefine land-use strategies, minimise their costs, optimise public assets and collaborate with other actors (for-profit organisations, non-profit organisations, social enterprises, communities, other cities) to develop policies and frameworks that encourage innovation in this area. Nonetheless, there is a need for more effort to be invested on the sharing side since there is a registered lack of governance and regulation to support collaborative practices<sup>5</sup>.

TT is suggesting policy recommendations in the logistics field to assist the businesses to flourish. One recommendation is to develop a new regulation for enabling easier authorisations in commercial activities. To illustrate, the system can authorise stakeholder B to collect a parcel if the parcel is shipped to stakeholder A but cannot be collected by that stakeholder. An additional

---

<sup>5</sup> [http://www3.weforum.org/docs/White\\_Paper\\_Collaboration\\_in\\_Cities\\_report\\_2017.pdf](http://www3.weforum.org/docs/White_Paper_Collaboration_in_Cities_report_2017.pdf)



recommendation for policymakers involves establishing white labelled public click and collect points. This recommendation can result in positive outcomes both for the business but also for cities since helps administrations move towards a distributed system to manage traffic in specific city locations, reduce traffic and facilitate city decarbonisation. In addition, it helps the business by making it easier to predict delivery.

## 8 Conclusions

The modern world generates a staggering quantity of data – and government business is no exception.

This report provided a broad outline of suggestions on easier adoption of Big Data that has the potential to improve public administration, services, businesses and citizen experience.

Beyond the direct recognised benefits for organisations that deploy Big Data analytics, there is significant potential for new markets to emerge in products and tools related to Big Data. Businesses involved in Big Data technologies are at the cutting edge of the digital sphere, offering innovative and niche services. Within this context, the EU has ambitious plans for governments to foster the formation of technology hubs across Europe.

TT deliberately set high ambitions for how public sector leaders should be thinking about Big Data, as well as how and when they could intervene to enforce change.

It followed a list of activities to articulate the suggestions presented in this document. It collected feedback from relevant events and conducted interviews with the pilot leaders. This provided opportunities for the project to gather valuable information and use it to benefit the public, especially since when it comes to policymaking, the major focus of the government should be towards benefitting society. Many targeted contributions in the form of policymaking documents have already been completed, and more are planned for the future.

Main topics addressed are GDPR, data interoperability, migration to an open data landscape and the need to enhance the industry-academia collaboration. TT found that academia and industry stakeholders believe that they benefit more when they collaborate. These parties have expressed their concerns and obstacles based on their experience and have suggested ways to overcome the challenges in order to foster such collaboration.

That said, support for the Big Data industry should never drive the decision-making process for government – the primary concern must always be taxpayers and citizens. Nonetheless, where commercial partnerships make sense, it is important to send an important signal of confidence for Big Data initiatives and related sectors within the economies of EU Member States.

This document was prepared by the TT project team in order to propose certain recommendations for improving stakeholder collaboration and Big Data adoption based on discussions with experts from industry, academia, policymaking or government administration.

It calls on policymakers or institutions from the EU to consider the obstacles described in this report and suggested recommendations and treat them with priority when new policies are being planned. After all, the strength of the businesses under any government depends widely on the policies that the government applies.

## ANNEX 1 – D13

The below questionnaire was used to interview the pilot leaders of TT. It was aimed at collecting information to help policymakers address issues or obstacles, supporting them in making informed policy decisions and planning future policies, measures and initiatives that reflect their own insights. Respondents were asked to customise their answers, especially in points that concern the pilot and the issues that have arisen or that could arise, and in this way benefit from the expertise that the pilots gained out of this experience.

All ideas were shared with stakeholder consultation and community involvement as outlined in the DoA Task 3.5 detailed below:

**TASK DESCRIPTION T3.5 - Knowledge Transfer & Policy Recommendations** (Lead: INTRA, Contributors: UPM, UDE). This task involves undertaking knowledge transfer activities, as well as providing recommendations to Europe-wide policymakers in the transport sector. Based on explicit rules concerning intellectual property rights, the task will provide a set of actions to influence policymakers in the transport domain, transferring knowledge and enhancing the development of improved transport policy. This will involve the participation of TT partners in policymaking events, invitations to policymakers to participate in TT events and also the dissemination of TT's recommendations in the main European Technology Platforms in all transportation domains: ERTRAC, ERRAC, FERHL, ALICE, ERTICO, CEDR, and WATERBORNE. As such, T3.5 will closely collaborate with T3.2 to target the aforementioned audiences. Overall, the goal is to provide recommendations to policies set out by the respective institutions in the transport domain. Recommendations will be based on the solutions pursued by TransformingTransport in the relevant WPs.

**Which stakeholder group(s) would you attribute yourself to –**

\* To be addressed by pilot leaders? Check all stakeholders of the pilot that apply.

- Public research
- Private research
- Higher education
- Research funding

- Policy making
  - Business/industry
  - Other: Applied research
- a) What do you consider in your business area as an emerging trend, hot topic or possible drivers for using Big Data.  
*(Each WP pilot should consider their domain and reflect suggestions on trends that tend to improve their business areas).*
- When it comes to create a new policy on this specific topic what actions should be taken, or barriers should be overcome? You also consider the end users perspective in your business area (for the pilots involving users).
- b) What do you consider as limits in your business area when it comes to Big Data?  
*(Each WP pilot should consider their domain and reflect from their experience what has limited or what barrier they had to overcome in their business when they applied the Big Data solution in the pilot).*
- c) Reflecting your business areas during the implementation of your pilot case, did you face any legal issues?  
*(Each WP pilot should consider if they faced challenges regarding for example GDPR, need for a Data protection Agreement, national laws, EC guidelines, etc.).*
- Did you face any major obstacles when having to adopt any policies related to any of the following: legal, policy-related, social/ ethical, political, economic, technological, while doing the implementation of the pilot.
- d) How has Big Data added value to your pilot project (and as an effect your business/ organisation)? *(Each WP pilot should consider the implementation phase of the pilot and share their experience of how the Big Data improved the business case).*
- e) What are the main risks you have faced when it comes to Big Data during the implementation or in your experience?  
*(Each WP pilot should consider the implementation phase of the pilot and share the risks they had to overcome. This could be related for example to data hosting or storage, data use, failure*

*of reaching an agreement for data sharing, technical interoperability, anonymisation processes, APIs, IPRs or any other).*

- f) How did you maintain compliance related to Big Data during the pilot case? *(Each WP pilot should consider the implementation phase and express if they had to take extra actions for adopting additional company policies, or tools and processes to conduct the pilot i.e. for using data security processes/data protection related mechanisms and processes, utilising public policies or anything other).*
- g) Has your pilot identified any internal procedures or policies that promote social and/or ethical values e.g. Yes or No (if Yes, please elaborate \_\_\_\_\_)
- h) Is there any guidance / opinion / recommendation communicated to your pilot (inclusive participating partners) from a national or local authority relating to (big) data? Yes or No (if Yes please elaborate? \_\_\_\_\_)
- i) How can Open Data become useful in future collaborations? (\_\_\_\_\_)
- j) When it comes to IP issues, what are some examples of universities and industry that have worked this out well if these have been experienced during the implementation of your pilot? (\_\_\_\_\_)