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CAMERA

COORDINATION AND SUPPORT
ACTION FOR MOBILITY IN EUROPE
Research and Assessment

MOBILITY REPORT 1

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EXECUTIVE SUMMARY

At the turn of the century, Europe entered a new age, with the greatest demand for mobility in recorded human history. Today, European air transport is experiencing a plethora of challenges regarding its capacity, performance, sustainability and interfacing with other transport modes. While the global number of passengers in air travel has risen every year since the inception of commercial aviation, the arrival of the 21st century brought with it a significantly steeper increase travelling by air. 2018 has seen 4.3 billion air passengers and, according to IATA, this will rise to 7.2 billion by 2035 [1.1]. Roughly speaking, this means that every minute of the year around 8,000 people start a flight, and it is very likely that this number will double over the next 15 years.

There are various reasons for this increasing demand for commercial aviation. Since the year 2000, there has been a particularly aggressive growth in the low-cost airlines sector, which has made flying more accessible to a greater number of people. The expansion of economies and higher living standards, especially in emerging economies such as China and India, is putting more people in the air both due to business and leisure travel (and sometimes both, conveniently coined under a single term of "bleisure travel"). Well-established markets for air travel like Europe and North America are already expected to continue growing steadily while rapidly growing economies will see many new flyers. Additionally, the development of more fuel-efficient jets has allowed airlines to provide more direct routes, making the opening of new routes more feasible, even for some less popular routes. Lastly, with greater urbanisation all over the world and more rural regions getting more efficient acccess to airports, air travel is more available to a greater number of passengers.

European aviation is a crucial asset for economic growth and is a large wealth generator for the European Union. It provides transport links with key roles in the integration of Europe: facilitating the growth of businesses and enabling social mobility. The technologies and innovative concepts in aviation are often catalysts for many sectors, making research and development in aviation one of the initiatives with the greatest return on investment. Therefore, it is of vital importance to precisely identify gaps and adequately address challenges that threaten the sustainable development of the European air transport system. The European Union designates significant funds for various research areas via framework programmes such as Horizon 2020 (H2020), with aviation research being a major beneficiary. As part of its coordinating activity, the EU is performing investigative actions across these areas to make sure that use of these funds is optimal and properly addresses the needs of European citizens.

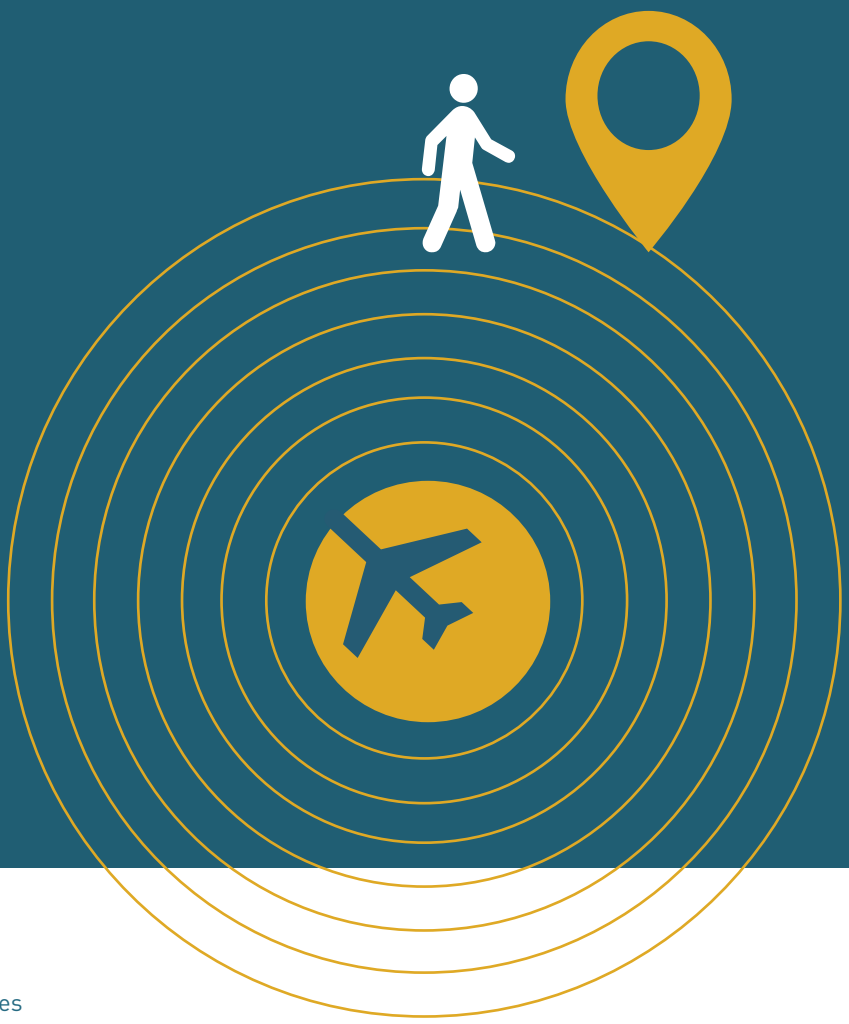
This report is a result of research performed so far in the scope of the CAMERA Coordination and Support Action (CSA). In CAMERA, we investigate research initiatives from the past decade that focus on the European air transport system and its integration with other transport modes, with a special focus on addressing the customer experience and point of view. The focus of this report is the review of the research under FP7 and its successor, H2020, as these have supported a large number of research activities in air mobility in the last decade. Its objective is to analyse 158 selected research initiatives in European mobility research to determine their coverage of mobility challenges, identify potential gaps and form recommendations for future research initiatives. This is the first of four Annual Mobility Reports that CAMERA is planning to publish. It outlines the initial findings and describes the future efforts of this Coordination and Support Action.

In CAMERA, we place a special focus on passengers as a vital part of the air transport system. Air travel is too often observed from the point of view of its providers of mobility (airports, air navigation service providers (ANSPs), airlines, etc.), and not often enough from the passenger perspective. However, recent digital transformation has changed passengers' expectations of air travel. Meanwhile, airports and airlines are meeting passenger demands with varying degrees of success. What is more, air travel often only considers one leg in a passenger's journey, and the interfacing of different travel modes remains under-explored. For a passenger, cruising above the clouds is just one part of the experience. Observing the whole door-to-door chain, a typical air travel itinerary includes various segments such as accessing an airport by road or rail and moving around the terminal(s). In many passenger itineraries, the time spent in the air is the shortest part of their trip. In order to understand the complexity of European air travel system and address the mobility challenges that system is facing, CAMERA frames the whole door-to-door travel chain as the centre of its research. This type of holistic point of view is especially important in today's age of artificial intelligence, increased connectivity and personalised services. The importance of the passenger experience has grown immensely. Moving towards a seamless and efficient door-to-door model, instead of focusing only on the gate-to-gate part, is becoming a standard for innovation in mobility.
Air transport should be at the heart of an integrated, environmentally friendly and efficient transport system. European research communities and industrial partners across all transport branches need to work together to address the critical issues in mobility of European citizens, so that future generations can benefit from reliable, efficient, resilient, safe and sustainable transport systems.

Number of scheduled passengers boarded by the global airline industry from 2004 to 2019 (in millions)
https://bit.ly/2rNTzVm

1

AIR-PASSENGER MOBILITY CHALLENGES

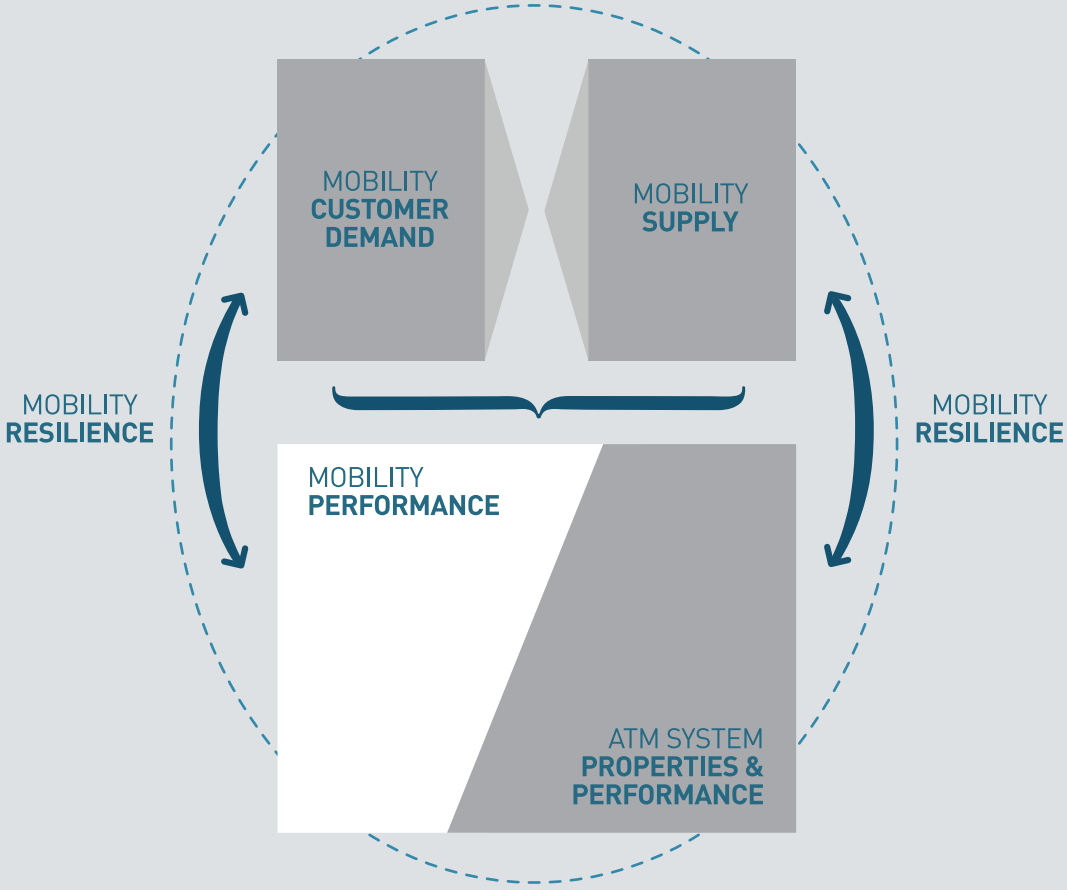


European mobility systems are not exempt from tackling the major challenges facing Europe today - rapid globalisation, digitalisation and climate change, among others. A significant number of challenges that require addressing by the air transport industry have been outlined in the document Flightpath 2050.

These challenges need to be addressed by identifying gaps and bottlenecks that stand on the way of European vision for aviation, as presented in Flightpath 2050. Investing in interdisciplinary research and innovation is the European air transport system's key to keeping up with the increasing demand and maintaining its competitiveness and performance, while providing sustainable mobility.

Relying on the vision outlined in Flightpath 2050, and for the sake of systematic study of the current state and future needs of the ATM research, we have identified five major thematic groups of challenges.

FIGURE 1:
CONCEPT MAP MOBILITY CHALLENGES



LAYER 1 CHALLENGES

Creating an individualised and seamless mobility system for everyone.

Travellers of the 21st century differ in all sort of ways, with diverse demands and requirements as regards the European mobility system. Certain passenger groups might also have particular needs due to physical impairment, travelling with children, or language barriers. Therefore, the future mobility system should be inclusive and provide intermodal solutions for all types of user. In the age of digitalisation, artificial intelligence, and data literacy, the demand for mobility from new generations of customers are becoming increasingly important. Upcoming generations of travellers will be more empowered with these technological advances and higher data availability. For instance, a fast-paced lifestyle has made queuing more undesirable than ever, driving the increasing demand for various self-service options at airports. Travellers of today also show a greater desire to be kept informed about potential disruptions and delays, at all stages of their trip , with the ability to proactively react to potential hicough. On that same note, mobility providers are also realising that they need to provide more options for travellers to manage and customise their travel arrangements. Personalised travel experiences are one of the biggest drivers of customer demand in the age of big data. In the effort to create an easy and user-friendly transport system, single ticketing that incorporates all modes of transport could further increase service quality and seamlessness for users. All of these improvements must also keep in mind safety, security, and environment friendliness.

For these reasons, it is necessary to adopt a passenger-centred perspective in the CAMERA project. The realisation that each customer has unique travel needs has led to increased research into different customer profiles and respective expectations, including aspects of the passenger experience. Mobility providers have realised that these have an impact on the mobility choices that passengers make. In the end, passengers are the users of the system and shape the demand for mobility. Another important aspect is the socio-political acceptance of mobility, with one example being the impact of transport projects. The business aspect addresses the incentives for innovation in new technologies, mobility products, and services and hence the potential for market penetration.

Flightpath 2050
Europe's vision for aviation
https://bit.ly/2zQOpOz

1.2

LAYER 2 CHALLENGES

Improving the overall performance of the mobility system.

The future of the European mobility system cannot be discussed without addressing the performance of the transport system as a whole. One of the main goals, in terms of performance, is set by Flightpath 2050, which explicitly sets a target of 90% of intra-Europe journeys involving an air leg being achievable in under 4 hours door-to-door (4HD2D) by 2050. Many other issues, such as supporting drivers to achieve this challenging goal, need to be linked to this central concept. Some of them are even necessary conditions for reaching the target - accessibility, interoperability, and punctuality are some of these.

In order to describe the current state of the mobility system in Europe and its progress towards the targets envisaged in Flightpath 2050, it is necessary to capture crucial information on the door-to-door journey, including economic and environmental considerations, as performance indicators in a more fact-based discussion of the CAMERA project. This type of framework can help drive innovation in transport and the optimisation of mobility performance. These metrics are valuable to travel process management by monitoring and forecasting the flows within the system. This framework would also provide benchmarks for the evaluation of the impact of new technologies and services.

LAYER 3 CHALLENGES

Improving the resilience and re-configuration of the mobility system.

On a daily basis, commercial aviation is subject to a number of events that can disrupt the air traffic management system: bad weather, an external attack, a crisis, or an ATC strike being just a few of them. If the resilience of the air transport system falls short, this might significantly delay flights, which has the potential to affect a number of passengers due to the cascading effects across the overall network. It is important to understand how quickly and how well the overall system can react to these disruptions in order to ensure seamless and efficient operations and to avoid additional costs. This resilience of the European air traffic system is, without a doubt, a very difficult problem that needs to be tackled on the path to a more efficient mobility system in Europe.

Improving the resilience of the European transport system is an ambitious vision within Flightpath 2050, with the goal being that all flights arrive "within 1 minute of the planned arrival time, regardless of weather conditions". Additionally, the transport system should be capable of automatically and dynamically reconfiguring the journey within the network to meet the needs of the traveller. The goal of CAMERA is to understand and analyse how far we are from providing passengers with an automatic system that tries to minimise their delay on their way to the final destination. How quickly can travel itineraries be reconfigured in the case of major disturbances? To answer these kinds of question, we need a number of metrics that measure how delay is propagated through the system in case of disruption, and how well the system can handle disturbances of various types and intensities.

1.4

LAYER 4 CHALLENGES

Providing safe and efficient air traffic management services.

The increase in the number of flights over the years has meant that the ability of the air traffic system to handle them has reached its capacity, thus resulting in major delays to scheduled flights. Future challenges that this system must face include the provision of services that enable the safe and efficient incorporation of "at least 25 million flights a year of all types of vehicle" while also reducing the environmental impact of the overall system.

Hence, reducing and handling congestion is one of the major challenges to be addressed. CAMERA analyses the progress towards reducing en-route delay, departure delay, the expected number of additional flights at already congested airports, and the network throughput of additional flights. This includes the move towards the implementation of network congestion management and recovery mechanisms and the establishment of a system that accommodates all vehicle missions and aerial applications.

LAYER 5 CHALLENGES

Designing and implementing an integrated, intermodal transport system.

The efficient integration of different transport modes and the provision of air transport interface nodes is crucial in ensuring progress towards a seamless European mobility system, meaning meeting passenger needs and additional capacity requirements. As a result, the focus of European mobility goals, as outlined in Flightpath 2050, is on the optimisation of services and processes within these nodes and on the integration of air transport infrastructure with other modes - in other words, the goal is to achieve an intermodal network and related processes. This also includes the capability to integrate new (air) mobility concepts and technologies.

CAMERA investigates the progress towards increased interoperability across transport modes, including baggage handling, regulations and standards, or the advancement of single ticketing. All these aspects are considered significant in reducing travel time as well as reducing unnecessary hassle for passengers. Another challenge aims to ensure access and equity for different user groups, therefore monitoring the availability of barrier-free access possibilities or the availability of different ways for the redundant presentation of essential information across all transport modes.

1.6

Mobility Performance Framework

The five aforementioned thematic challenges (or "layers") are presented in CAMERA's Performance Framework (PF). The PF was assembled by a group of experts in mobility and air traffic management research from several research centres across Europe. They analysed the current state and future trends of European mobility and provided a set of key performance areas (KPAs) and measurable key performance indicators (KPIs) for each of these layers. There are eleven different key performance areas (KPA) which are defined to allow the performance of the mobility system to be examined from different perspectives. The same KPA can apply to different mobility layers. Some new areas in addition to the KPAs defined by ICAO are included in the CAMERA performance framework. KPIs are subsumed under each KPA and each layer and were defined with the intention of having a tangible way of quantifying the main goals for the future of the European mobility system. They rely heavily on challenges outlined in Flightpath 2050. Moreover, where possible, a KPI was defined along with its target value, or a concrete value outlined in Flightpath 2050 as a future goal for the European air transport system. As a result, the PF with its KPIs forms a benchmark for the quantitative assessment of research initiatives in Europe. On a macro level, the goal of assessing the state of mobility research in Europe against the PF is to identify gaps and bottlenecks in the European air transport system. Here, we present a summary of each layer. The full list of KPIs can be find in Annex 1.

KPAs:

1. DIGITALISATION AND INFORMATION
2. INTEROPERABILITY
3. ENVIRONMENT
4. SAFETY
5. SECURITY
6. CAPACITY
7. PREDICTABILITY
8. EFFICIENCY
9. COST EFFECTIVENESS
10. FLEXIBILITY
11. ACCESS AND EQUITY

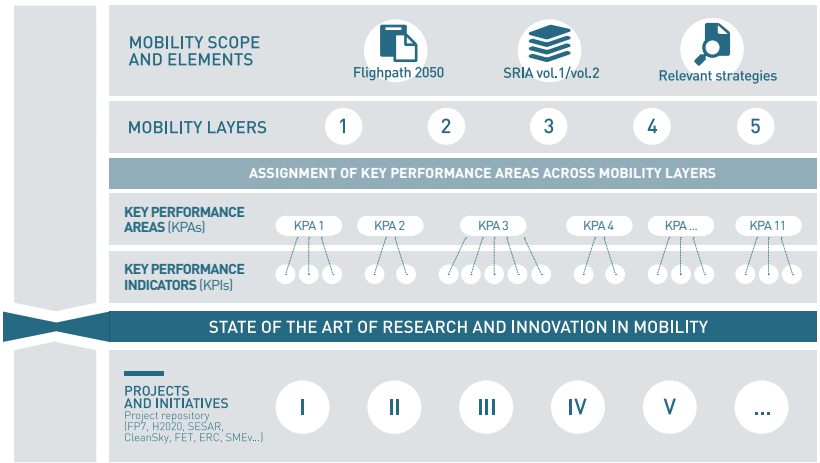
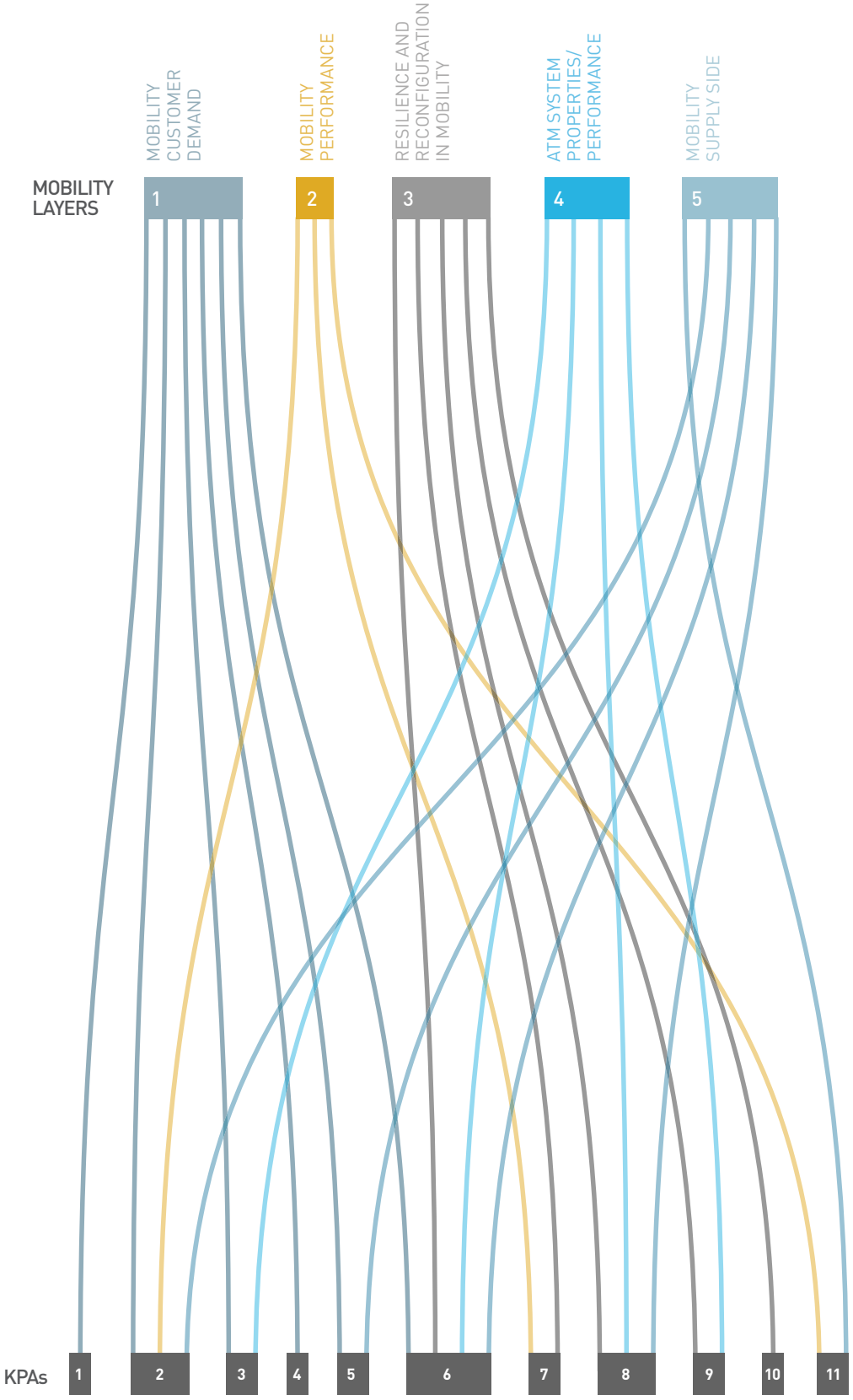


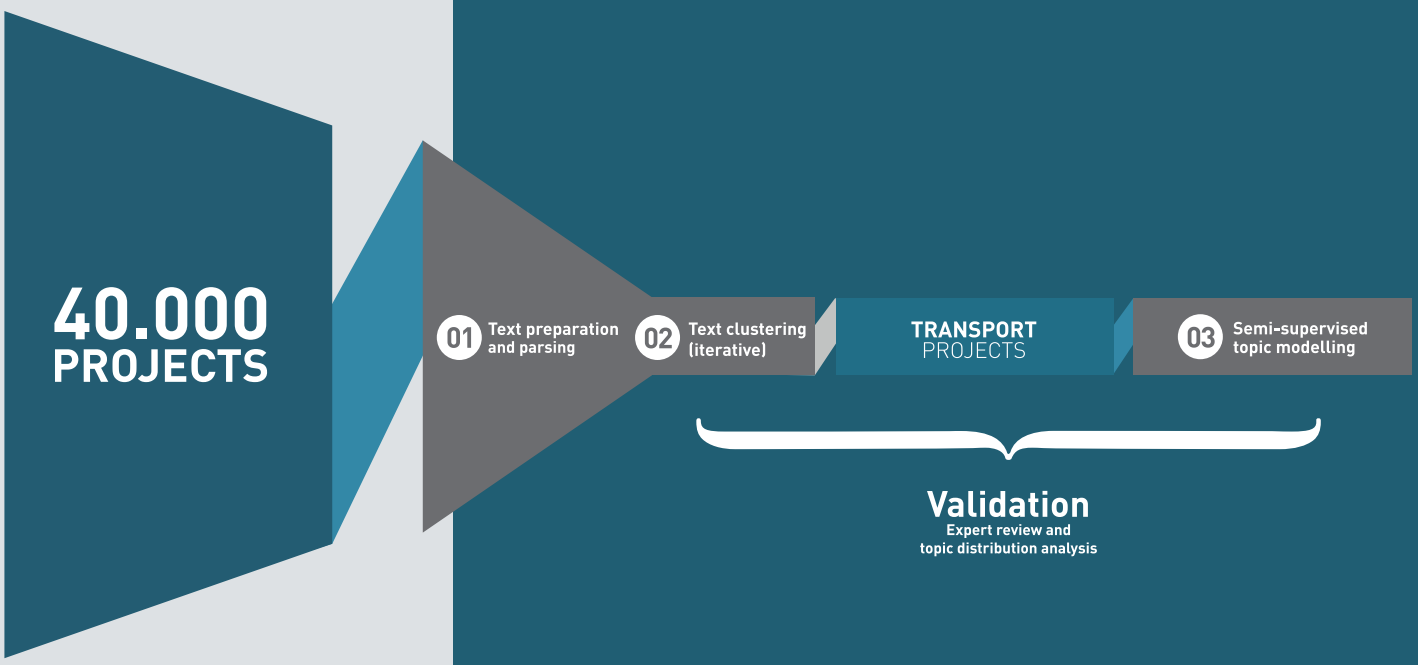
FIGURE 2:
MOBILITY PERFORMANCE FRAMEWORK

FIGURE 3:
MAPPING MOBILITY LAYERS AND KPAs



2

PORTFOLIO OF MOBILITY-RELATED EU-FUNDED RESEARCH INITIATIVES



The first step of the CAMERA assessment is to identify all projects funded under the FP7 and H2020 programmes relevant to improving air passenger mobility in Europe. To ensure that all meaningful projects for this scope are considered, automatic clustering models have been developed and run over the whole database of projects funded under these programmes regardless of their original topic.

This FP7 and H2020 project information is freely available at the EU Open Data Portal [3.1] and [3.2], which contains all data included in CORDIS such as title, funding programme, project abstract, EC contribution, partners and coordinator.

The full dataset contains over 40,000 projects on very diverse topics, most of them not in the scope of mobility research. In order to narrow our analysis specifically to the projects relevant for this study, we needed to filter out the irrelevant (non-mobility) projects. The dataset provides a field with a code which classifies each project into a predefined topic. Even though those codes can be considered a good orientating point for classifying the projects, they are still too generic and cannot really shed light onto a concrete topic researched in each project. However, each dataset also contains a title of the project and a short summary (abstract), which proved to be very useful for classifying projects according to their research topics.

For the clustering of the 40,000 projects, we have relied on Natural Language Processing (NLP) algorithms (i.e., text mining). Without algorithmic tools, relying on the traditional expert-based approach, this task would have been highly resource-consuming. The NLP algorithms have seen a large upsurge in efficiency and accuracy in the past several decades and are often able to differentiate between topics at levels closely comparable to human interpretation.

First, we needed to obtain a reduced dataset to be used in further analysis and that contains a set of research initiatives that focus on European mobility research. The algorithm we employed for this task works in a semi-supervised way and provided us a set of 158 projects, divided into nine automatically created topics, relevant to mobility research. Each topic is represented by a cloud of words (terms, tags), so we refer to each topic as a word cloud.

H2020 Projects
EU research projects under Horizon 2020
https://bit.ly/2ckXLmz

FP7 Projects
EU research projects under FP7
https://bit.ly/2Dgtbcv

2.1

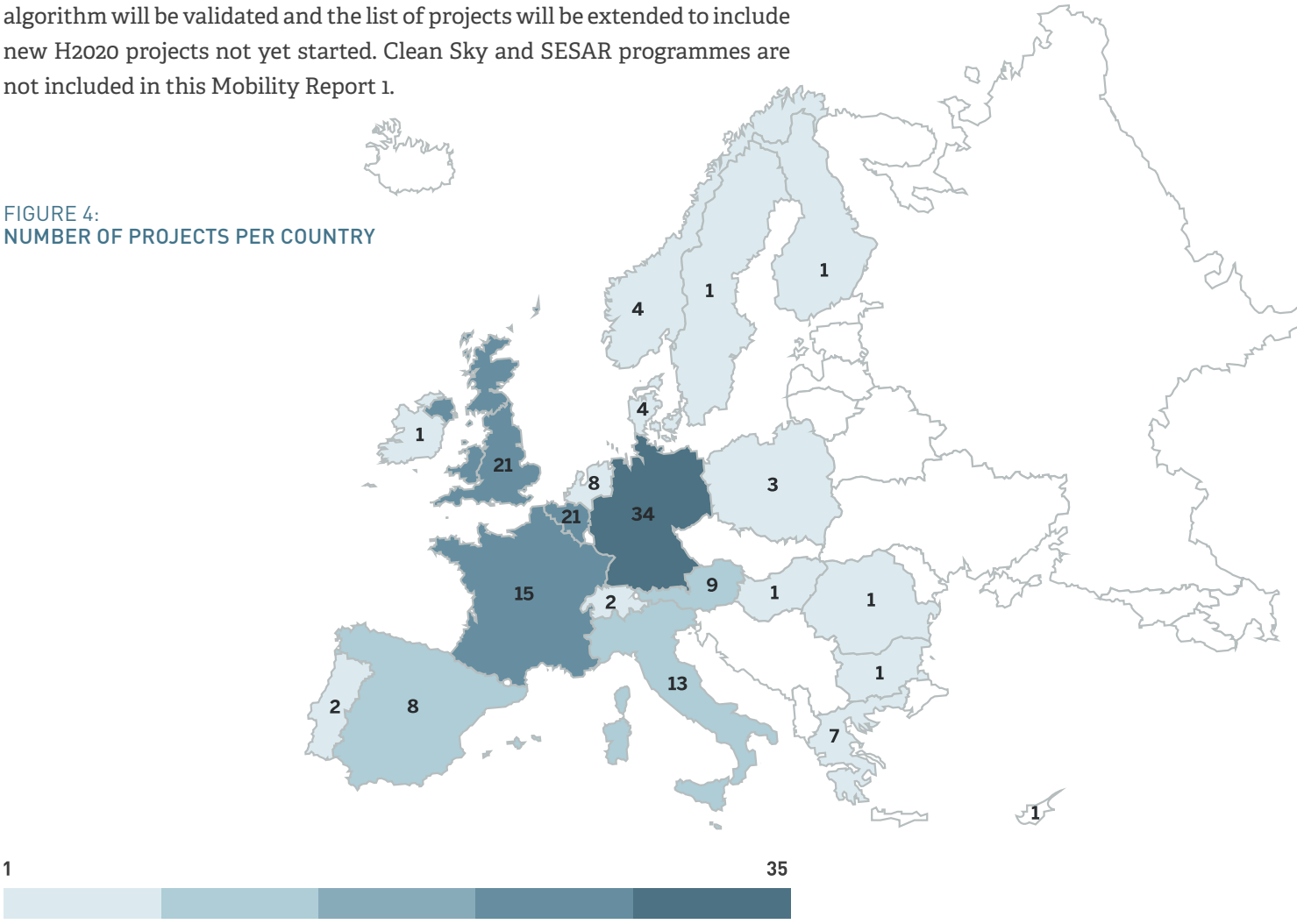
Geographical distribution

The map shows the distribution of the projects by coordinating country for the analysed mobility projects.

Germany leads coordinator-countries with 34 projects, followed by Belgium and the UK with 21 projects. In total, centres located in 21 different European countries have coordinated at least one R&D mobility initiative since 2007. The map reflects a fairly broad geographical range of institutions leading mobility research projects, with several countries established as the leading hubs of mobility research in Europe.

In the subsequent versions of this Mobility Report, the performance of the algorithm will be validated and the list of projects will be extended to include new H2020 projects not yet started. Clean Sky and SESAR programmes are not included in this Mobility Report 1.

FIGURE 4:
NUMBER OF PROJECTS PER COUNTRY



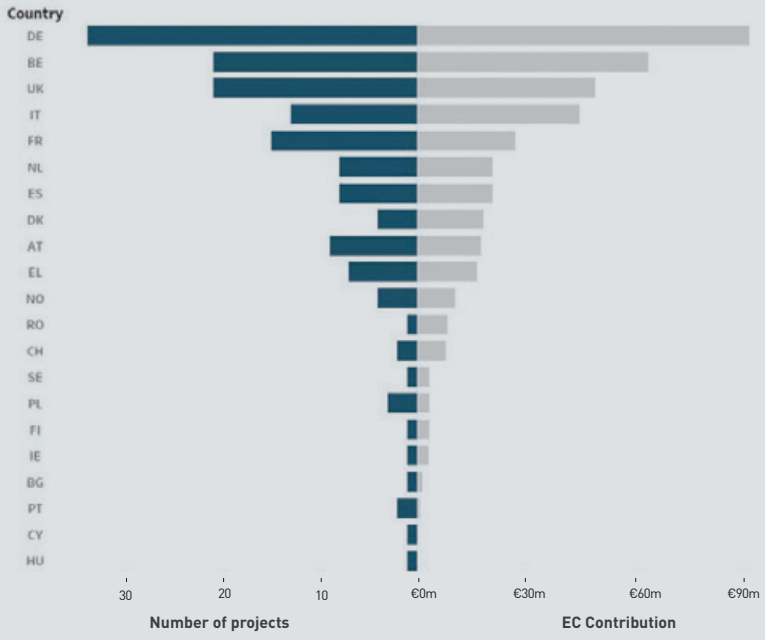
In Figures 4 and 5, we again outline the number of projects per leading country together with the total financial contribution received from the European Commission for those projects.

There is a fairly linear correlation between the total contribution a country received and the number of projects they led, with a few countries deviating from this trend (e.g. France). However, such slight deviations are normal as they can be influenced by other variables such as duration of the project, number of participating member entities, or special needs of a particular project. Better understanding of the financial distribution will be achieved through further analysis as CAMERA continues.

FIGURE 5:
NUMBER OF PROJECTS PER LEADING COUNTRIES

Country	EC Contribution	Number of projects
AT	€17 557 955.66	9
BE	€63 584 969.58	21
BG	€1 525 500.00	1
CH	€7 859 245.00	2
CY	€397 593.00	1
DE	€91 361 593.70	34
DK	€18 195 845.28	4
EL	€16 565 192.00	7
ES	€20 787 698.55	8
FI	€3 345 611.00	1
FR	€26 994 170.51	15
HU	€321 077.00	1
IE	€3 249 341.00	1
IT	€44 793 570.00	13
NL	€20 817 881.77	8
NO	€10 527 423.38	4
PL	€3 394 130.00	3
PT	€796 666.60	2
RO	€8 480 812.60	1
SE	€3 478 222.51	1
UK	€48 982 551.11	21
Grand Total	€413 017 050.25	158

FIGURE 6:
TOTAL FINANCIAL CONTRIBUTION RECEIVED FROM THE EUROPEAN COMMISSION



2.2

Leading coordinating entities

In terms of EC contribution, CHIC - a fuel cell-powered bus project coordinated by Evobus GmbH - is the largest on the list of projects retained for analysis, with €25.9m of total EC contribution under the Fuel Cells and Hydrogen Joint Undertaking (FCH JU) programme. If we analyse the top coordinators in terms of number of projects, we arrive at the following list, led by Fraunhofer:

FIGURE 7:
LEADING ENTITIES AND PROJECTS

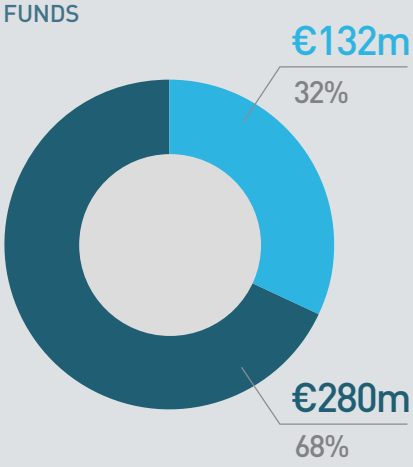
COORDINATOR	TOTAL EC CONTRIBUTION COORDINATED	NUMBER OF PROJECTS COORDINATED
FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.	€10 212 473.33	8
EUROPEAN ROAD TRANSPORT TELEMATICSIMPLEMENTATION COORDINATION ORGANISATION - INTELLIGENT TRANSPORT SYSTEMS & SERVICES EUROPE	€8 565 947.25	6
ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS	€6 874 744.00	4
VDI/VDE INNOVATION + TECHNIK GMBH	€6 368 736.50	4
UNION INTERNATIONALE DES CHEMINS DE FER	€13 090 538.00	3
AVL LIST GMBH	€6 981 650.25	3
UNION INTERNATIONALE DES TRANSPORTS PUBLICS	€6 169 697.00	3
POLITECNICO DI TORINO	€ 6 101 513.00	3
UNIVERSITY OF NEWCASTLE UPON TYNE	€5 209 711.00	3
FORUM DES LABORATOIRES NATIONAUX EUROPEENS DE RECHERCHE ROUTIERE	€4 877 050.45	3
EDINBURGH NAPIER UNIVERSITY	€4 490 095.00	3

Historical evolution

The following graph represents the distribution of the funds across the years from the start of the 7th Framework Programme, taking into account the starting year of the projects. Although this programme was launched in 2007, most of the projects started in 2008, as the graph shows. This also reveals a decreasing trend from the beginning of the programme to its end in 2013 (with some of the last projects starting in 2014 with the transition to H2020). This trend does not only appear in the mobility research area but in the whole programme as well, and as such should be considered a conclusion or result. However, when comparing the funds allocated during FP7 with those in H2020, we observe a slight difference in total contribution. This gap can be partly explained by H2020 still being in progress, contrary to FP7. Therefore, the total H2020 EC contribution allocated to mobility research projects should increase in the coming years and the gap (seen on the pie chart shown on Figure 8) should be bridged.

Additionally, this gap also exists because the current study does not include any SESAR or CleanSky projects, and these two programmes attract a large percentage of the funds allocated to the Transport area. In following editions of this Annual Mobility Report, new projects will be added as a result of both new projects being funded and the initial list of projects being revised.

FIGURE 8 AND FIGURE 9:
DISTRIBUTION OF THE FUNDS



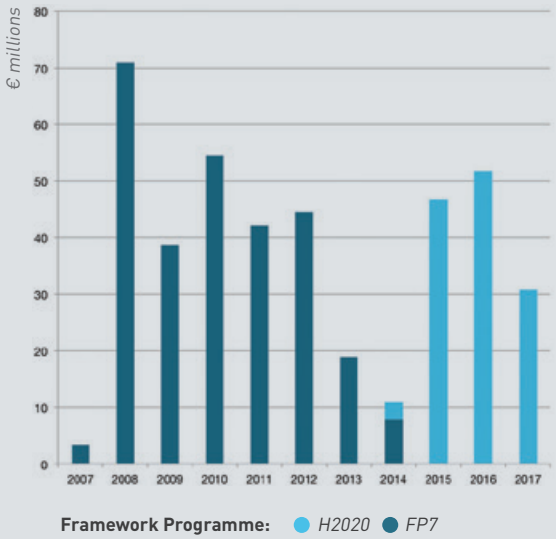


FIGURE 10:
EVOLUTION OF EC CONTRIBUTIONS TO MOBILITY RESEARCH OVER TIME

	FP7 Projects		H2020 Projects		Total Sum of EC contribution	Total number of projects
Row Labels	Sum of EC Contribution	Number of projects	Sum of EC Contribution	Number of projects		
2007	€3 345 611.00	1			€3 345 611.00	1
2008	€70 929 125.82	18			€70 929 125.82	18
2009	€38 653 237.73	21			€38 653 237.73	21
2010	€54 516 227.50	17			€54 516 227.50	17
2011	€42 124 529.88	25			€42 124 529.88	25
2012	€44 416 160.01	21			€44 416 160.01	21
2013	€18 870 307.40	8			€18 870 307.40	8
2014	€7 801 869.53	3	€3 082 575.25	2	€10 884 444.78	5
2015			€46 746 077.79	15	€46 746 077.79	15
2016			€51 743 887.54	16	€51 743 887.54	16
2017			€30 787 440.80	11	€30 787 440.80	11
Grand Total	**€280 657 068.87**	**114**	**€132 359 981.38**	**44**	**€413 017 050.25**	**158**

Project size

FIGURE 11

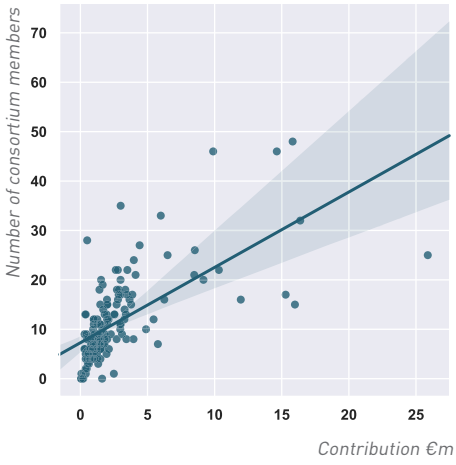
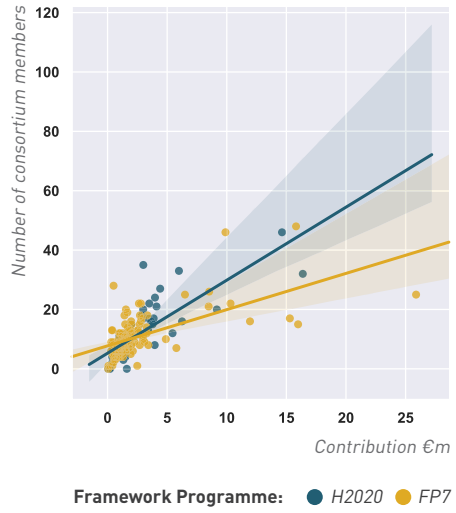


FIGURE 12



Figures 11 and 12 show that the majority of research initiatives receive an EC contributionof less than 5 million euros, especially in H2020 as there were no "level 2" projects. In fact, only 2 of the 9 projects with an EC contribution larger than €10m are funded under the H2020 budget, showing that the budget for FP7 projects was typically larger than for those in H2020. These diagrams aim to investigate correlation characteristics between the sizes of projects in terms of funding and both project duration and consortium size. The average size of a consortium assembled for a mobility research initiative is around 11 members, and the average duration of a project comes to about 2.5 years.

Only 6 out of the 158 projects had more than 30 members, and 15 had between 20 and 30 partners, meaning the majority of the consortiums had fewer than 20 members, as can be observed in Figure 11. Interestingly, those projects with the largest consortiums (over 30 partners) received financing ranging from 3 million euros up to around 17 million euros, which is a significant range. This shows that the largest projects in terms of consortium size are not necessarily also the ones to receive the highest financial contributions. The projects with the highest number of participating entities are usually those closer to market, which typically includes validation exercises, prototypes, etc. and have a higher cost (as was the case with CHIC, the project with the largest EC contribution in the analysis). While there is no strong correlation between financial contribution and consortium size for large values of both of these variables, a stronger linear correlation can be established if we isolate projects with lower consortium size and funding. When we observe medium size projects with up to 20 participating members that received contribution of up to 5 million euros, we note a fairly rapid linear growth in financial contribution with each additional project member.

Moreover, both H2020 and FP7 projects exhibit similar behaviour in this regard, as can be seen in Figure 12.

Comparing financial contribution with the duration of the project, we again observe different behaviour for the lower and higher values of both variables. For typical projects of up to 3 years, the increase in financial contribution with respect to the duration of the project is less than for longer projects: a large number of shorter projects received contribution of up to around 2.5 million euros. However, for a project duration of 3 years, the situation becomes more dispersed. It is especially interesting to note the significant variance in received funding for projects of 4 years, as seen in Figure 13. Similar effects can be observed for projects of 3 years, though with much lower variance. These effects indicate the need to further investigate the relationship between the time invested into a project and the financial contribution it received. Further detailed analysis should aim to better understand this trend and identify potential variables that can explain these non-linear effects, i.e. the specific variables that dictate these financial differences: type of action, delayed projects, etc. This is needed for a deeper understanding of the financial flow in mobility research. CAMERA will dedicate effort to providing such an analysis in further Annual Mobility Reports.

FIGURE 13

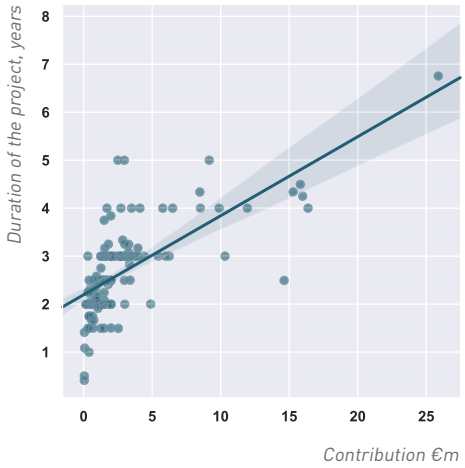
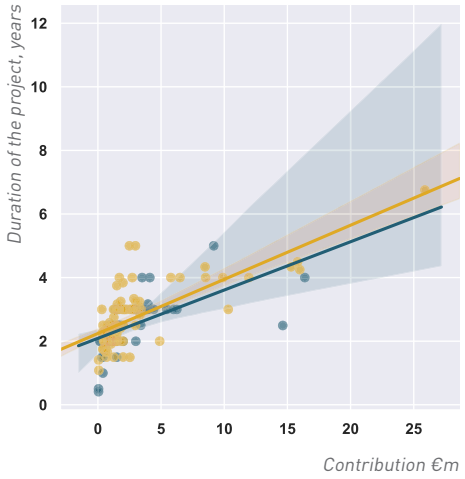


FIGURE 14



3 RESULTS AND INSIGHTS

Using text mining methods, mobility research projects have been extracted from the full CORDIS database of H2020 and FP7 projects, which contained over 40,000 projects at time of analysis.

As a first step, the grouping of the projects has been performed in a semi-automatic fashion, relying on a semi-supervised version of a popular Latent Dirichlet Allocation (LDA) algorithm. LDA is a topic modelling technique that is typically used to detect underlying topics across a corpus of text documents. The basic idea is that each document can be described by a distribution of topics and each topic can be described by a distribution of words. Therefore, LDA starts from the assumption that each document possesses a contained number of topics and, by attributing presence of certain words in a document to one of those topics, groups similar documents (or, in our case, projects) together. LDA discovers topics by spotting groups of words that frequently occur together in documents. In the semi-supervised version of this algorithm, the creation of the topic model is initially guided by a small set of words that were chosen as the most relevant for the topic we wish to capture. After that initial seed, the algorithm autonomously performs topic modelling. Using a vector of terms as guidance enables the algorithm to separate topics with smaller representation in the corpus (in this case, mobility research projects) and guide the classification of documents. [4.1]

This part of topic modelling resulted in a selection of 158 projects. These projects were denoted as relevant for mobility research by the LDA algorithms, and for that reason we refer to them simply as mobility projects. The full list of selected mobility projects for this mobility report can be found in Annex 2.

3.1

Clustering Mobility Research Initiatives

Word clouds

Starting from the content of projects' textual descriptions, LDA analyses were carried out to explore underlying content patterns in those texts, to group the most similar documents together. Thus, in addition to obtaining a set of mobility projects used for this analysis, the second result of this topic modelling technique was the grouping of the selected projects into nine automatically created groups - i.e., topics.

As the algorithm is semi-supervised, no explicit label is given to these groups; rather, each topic is described by a set of keywords, and we refer to a group of projects belonging to the same topic as a word cloud. For easier reference, an umbrella name was coined for each word cloud. The umbrella terms were chosen by observing a list of keywords for each cloud and descriptions of the projects with the highest scores for that cloud. Here we present each word cloud composed of its automatically extracted keywords. In addition to more descriptive and longer titles, shorter ones are used when more convenient (given in brackets).

LDA Topic Modelling
What Is LDA (Topic Modeling)?
https://bit.ly/2xly2h8

FIGURE 15
AVIATION AND AIR TRANSPORT TECHNOLOGIES, INFRASTRUCTURE AND OPERATIONAL CONCEPTS (AIR TRANSPORT TECHNOLOGIES)

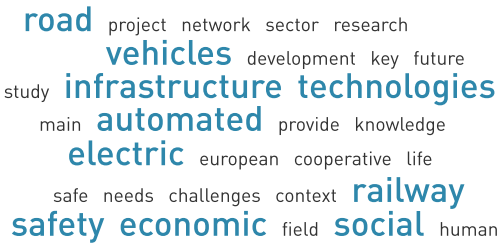


FIGURE 16
GROUND TRANSPORT, INCLUDING ITS SAFE, SUSTAINABLE AND SOCIAL DIMENSION (GROUND TRANSPORT)

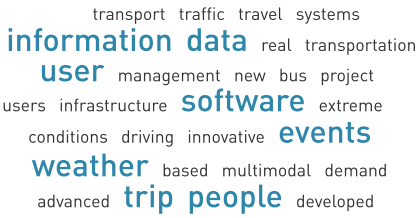


FIGURE 17
INTELLIGENT TRANSPORT SYSTEMS FOR PASSENGER, TRAVEL SERVICES (INTELLIGENT TRANSPORT)

FIGURE 18
FREIGHT TRANSPORT, WITH A FOCUS ON POLICY OPTIMISATION, SUSTAINABILITY AND FUTURE CHALLENGES (FREIGHT TRANSPORT)

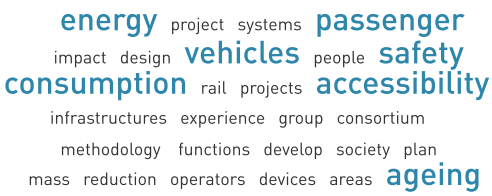


FIGURE 19
TOWARDS A SAFER, MORE ACCESSIBLE AND GREENER PASSENGER-CENTRED TRANSPORT (NEW CONCEPTS IN TRANSPORT)

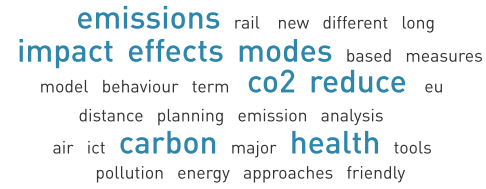


FIGURE 20
ENVIRONMENTAL IMPACT CAUSED BY TRANSPORT FROM A GLOBAL PERSPECTIVE (ENVIRONMENTAL IMPACT)

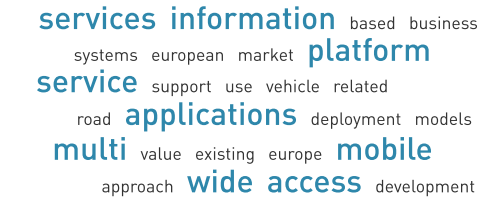


FIGURE 21
INFORMATION SYSTEMS AND SERVICES SUPPORTING THE SOCIO-ECONOMIC TRANSPORT DIMENSION (SOCIO-ECONOMICS)

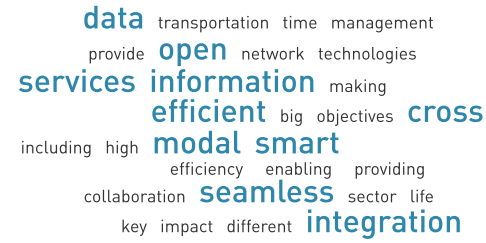
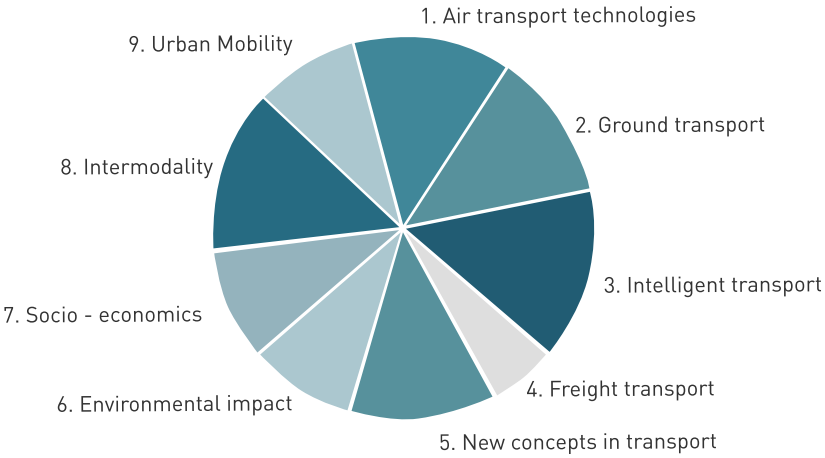


FIGURE 22
TECHNOLOGIES AND SERVICES TO ENABLE SEAMLESS INTERMODAL TRANSPORT (INTERMODALITY)

FIGURE 23
URBAN MOBILITY NEW CONCEPTS AND SERVICES (URBAN MOBILITY)

The topic modelling algorithm assigns a probability distribution that describes how well the project fits into each of the nine word clouds, to each of the 158 mobility projects selected. Therefore, by observing these probability distributions, we can extract a dominant topic/cloud for each project as the one with the highest probability. The pie-chart below shows the distribution of projects' dominant topics. The majority of the selected projects pertains to the third cloud, named "Intelligent transport systems for passenger travel services". On the other hand, the cloud with the weakest representation in the corpus is "Freight transport" with only 5.7% of the projects having it assigned as their dominant topic.

FIGURE 24:
DISTRIBUTION OF PROJECTS' DOMINATING TOPIC



A general overview of the clouds and the distribution of dominant topics across the selected projects shows a satisfying initial performance of the algorithm when it comes to selecting projects relevant for air transport, but also a need for further refinement. While each project is assigned a dominant cloud, it is also important to observe the full probability distribution. Indeed, for a large number of projects the dominant topic is established only by a marginal probability over other topics. For example, if we observe cloud 2, "Ground transport", we can notice that many highly scored projects in that group focus on intermodal transport (e.g. project "The dynamic between airlines and high-speed trains in Europe"). Such projects typically also have high scores in cloud 1, "Aviation and air transport technologies".

However, other projects focus solely on ground transport (e.g. "Grid for Vehicles - Analysis of the impact and possibilities of a mass introduction of electric and plug-in hybrid vehicles on the electricity networks in Europe"). Some of these projects could thematically be better placed in a different word cloud (e.g. "A Measurement tool to determine the quality of the passenger experience"), but the algorithm most likely 'decided' to assign them a highest score for cloud 2 due to its content's largely referencing ground transport. Similarly, a project entitled

"Co-modal airport" has been assigned to cloud 3, Intelligent transport systems for passenger travel services, as it had the highest probability of belonging there; however, one can easily see how it could also be assigned to Air transport technologies or New concepts in transport. To address this issue, we introduce a metric that quantifies the level of confidence for assigning a project solely to its dominating topic. When a project is assigned a very high score for one particular cloud, we can confidently claim that it thematically belongs to that cloud. On the other hand, when a project has a more uniform probability distribution over clouds, its confidence metric will be low. This occurs when the topic of such projects is spread across several clouds and cannot be confidently assigned to one particular cloud. Unsurprisingly, many projects are spread across several clouds as many projects are of an interdisciplinary nature. We discuss the effects of this confidence metric in more detail in the descriptive analysis presented below.

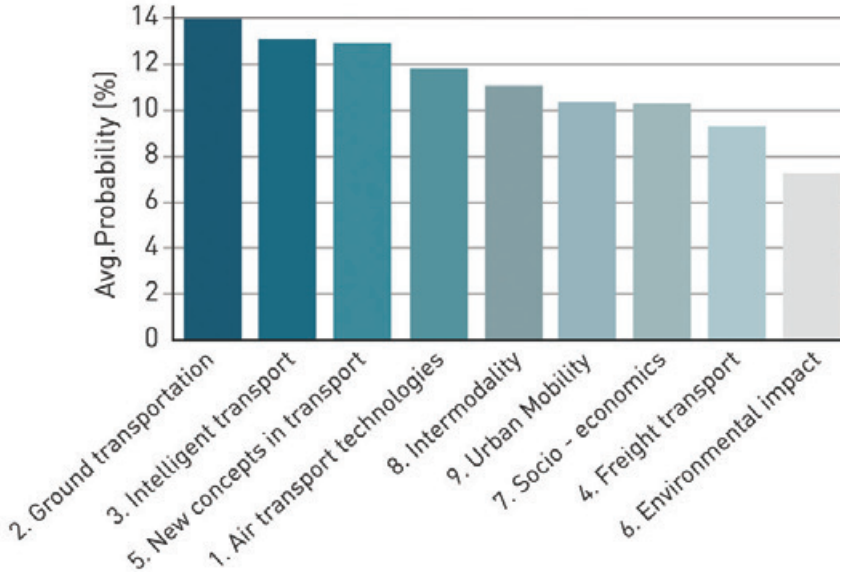
Descriptive analysis

In this part, we present inter-relationships between clouds and projects. Topic distributions rarely have one peak and thus a single project often covers multiple topics. The goal of this analysis is to better understand how topics are distributed within projects and how well each topic is supported. By exposing the topic distributions of projects, we can extract the general picture of how research in mobility is being tackled and what the predominant topics could be.

Analysis of the Word Cloud presence

To understand the presence of each word cloud (topic) in the corpus of projects, in Figure 25 we plot the average probability that a given topic appears in any project. For every given topic, this is calculated as the sum of the probability of each project belonging to the topic divided by the total number of projects.

FIGURE 25:
AVERAGE PROBABILITY THAT A GIVEN TOPIC APPEARS IN ANY PROJECT



This metric gives some insights into how well each topic is covered in the given corpus of documents. As we can observe, the distribution of topics is very uniform across projects. With an average probability of 13.91% , "Ground transport" is the most probable topic, followed closely by "Intelligent transport" with a 13.05% average probability. "Environmental impact" is much less represented, with a probability of 7.31%.

First of all, this indicates that the topics are very sparsely distributed. Secondly, the probability distribution presented in Figure 25 shows the most and least covered topics in the observed set of mobility projects. Concretely, the most probable topic addressed in a randomly selected project is ground transport. On the other hand, the least addressed challenges in mobility projects analysed are those concerning the environmental impact of mobility.

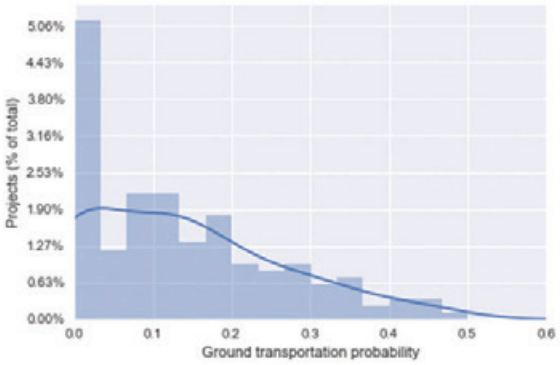


FIGURE 26.A

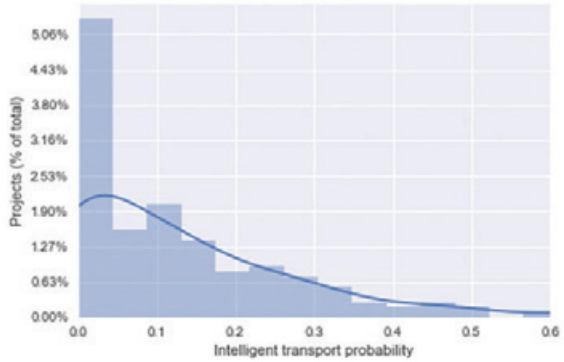


FIGURE 26.B

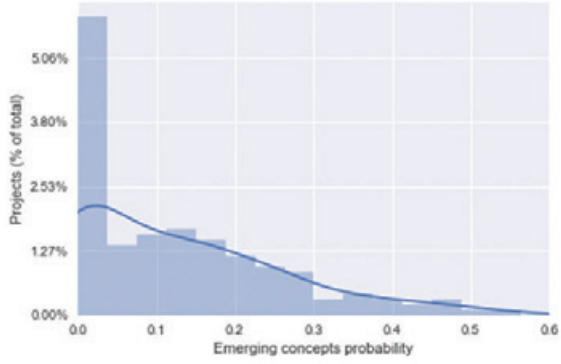


FIGURE 26.C

The following set of nine probability distributions, shown in Figure 26A-26I, depicts the frequency with which a project is assigned a certain probability for a particular topic. For example, if we observe the distribution for the topic "Intelligent transport", and fix a probability of 0.3, we can see that around 0.7% of the total of number of projects were assigned a 30% chance of relevance to the "Intelligent transport" cloud. In general, all distributions exhibit a similar topology, with a high peak just greater than 0% as, for each word cloud, the majority of the projects are irrelevant for that cloud. Also, we can see that only a few projects get assigned predominantly to one cloud (probability greater than 50%).

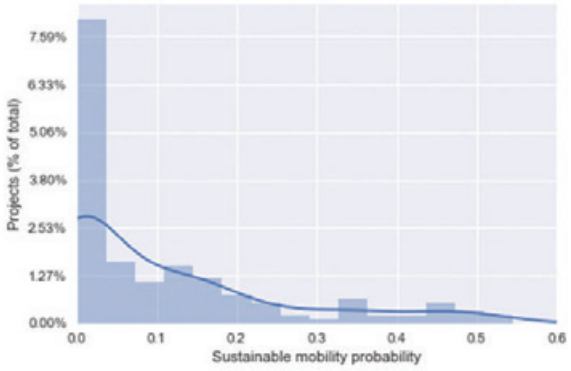


FIGURE 26.D

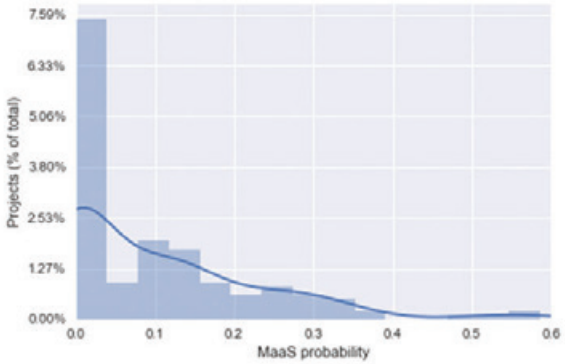


FIGURE 26.E

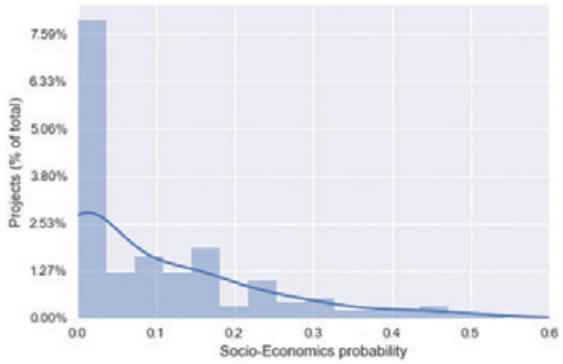


FIGURE 26.F

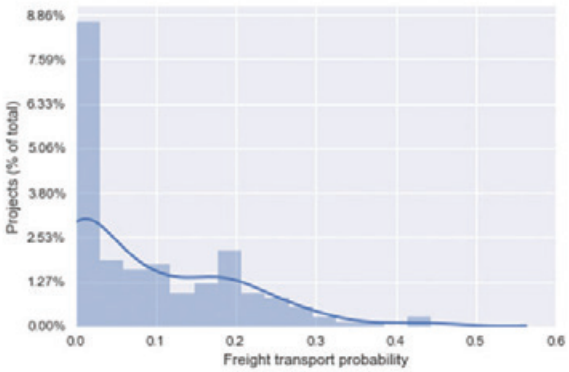


FIGURE 26.G

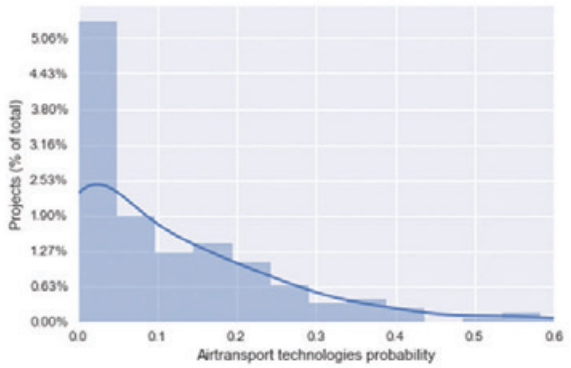


FIGURE 26.H

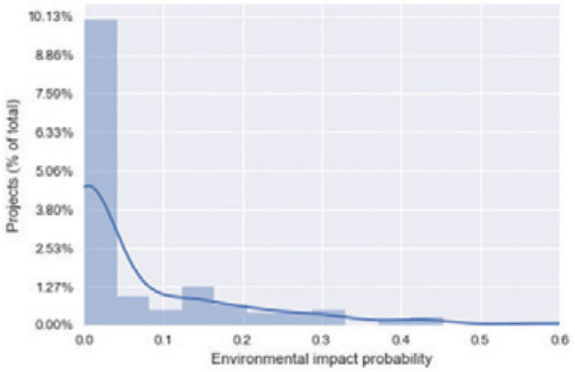


FIGURE 26. I

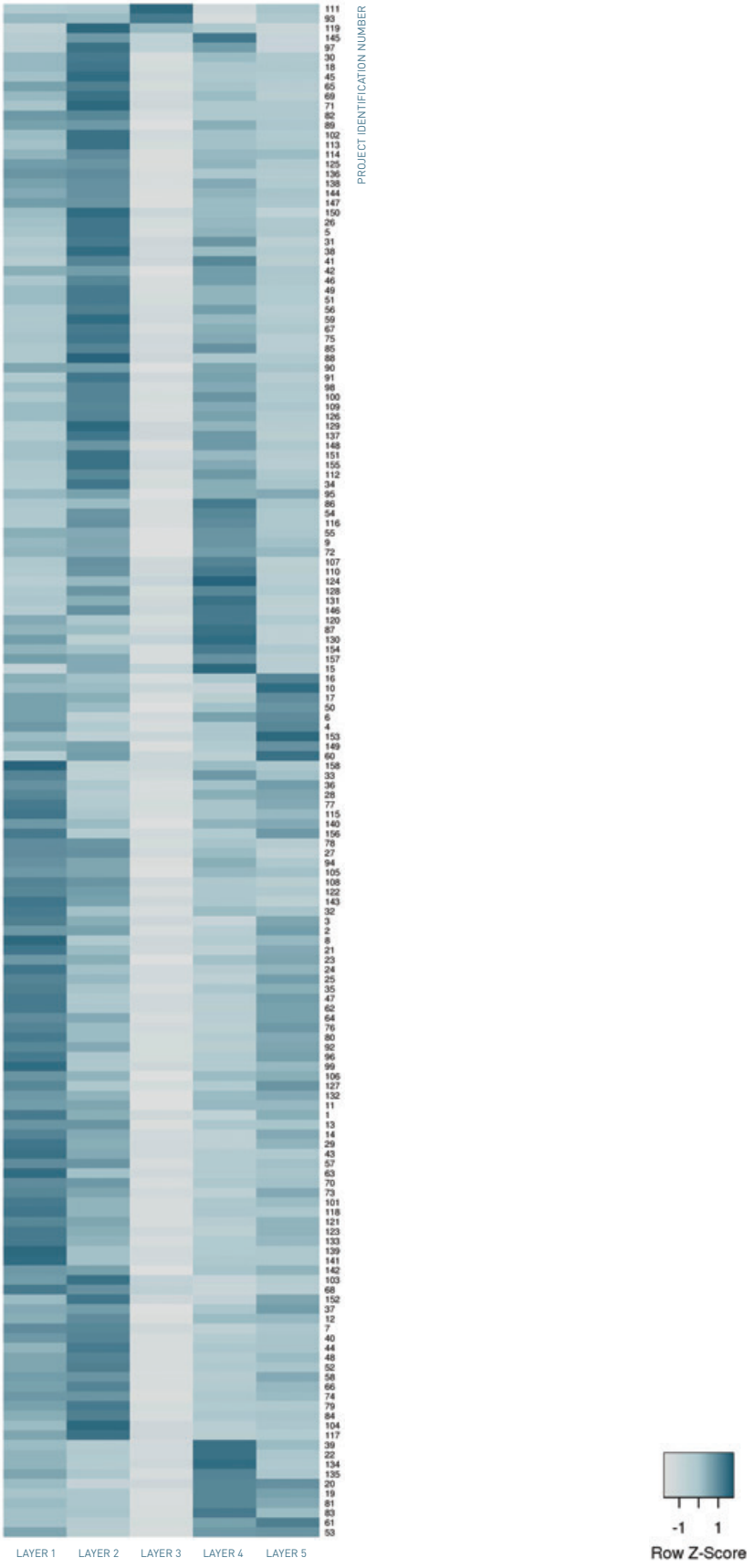
3.2

Evaluation of mobility projects against the mobility challenges

To analyse the impact of R&I initiatives on the defined mobility challenges inspired by Flightpath 2050, we performed a comparison of the project summaries across five layers defined in the CAMERA Performance Framework. This methodology also relied on text mining techniques. In order for the text mining algorithms to better understand each layer of mobility challenges, the performance framework was extended with additional textual data describing the challenges. The extended text corpus contains a number of documents (reports, research papers, etc.) dealing with pivotal ideas relevant to each layer. The documents for each layer were selected by the experts from that area of research.

For the assessment of textual data, we rely on vector representations of analysed texts based on so-called term frequency - inverse document frequency (TF-IDF). TF-IDF is a commonly used language model in text mining that intends to reflect the importance of a word in a document over a corpus of documents. The general philosophy behind the concept is that the more the word is used in one document and less in others, the higher its importance for its particular document. To analyse the content of mobility projects, we relied on the semantic similarity metric called cosine similarity that compares two vector representations of a text document.

FIGURE 27:
SEMANTIC SIMILARITY BETWEEN PROJECT DOCUMENTS AND MOBILITY LAYER DOCUMENTS



The heatmaps in Figure 27 demonstrate the similarity results between mobility projects and layers of the performance framework. Darker blue colours (Z-score closer to 1) represent a higher semantic similarity. Essentially, projects with higher similarity score for a particular layer indicate a better coverage of the challenges defined in that layer. The full list of projects with their corresponding indices can be found in Annex 2.

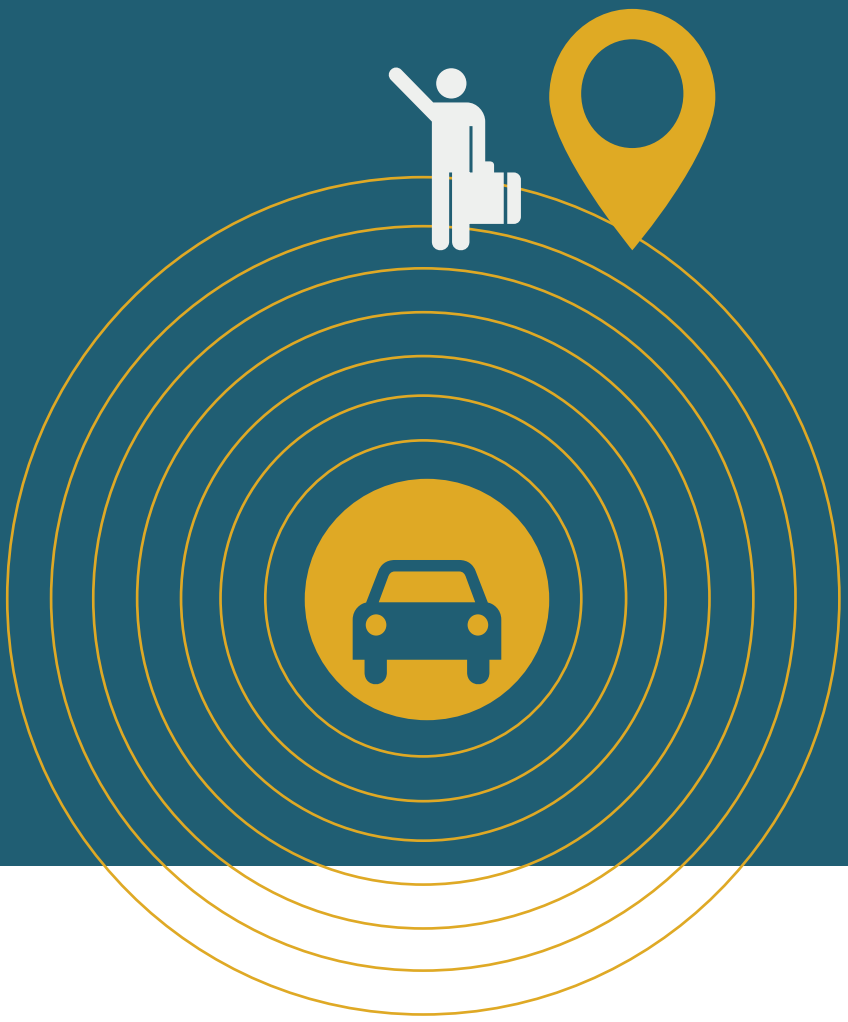
As a general observation, we can notice that layer 3, which defines the challenges regarding resilience and re-configuration in transport systems, seems to have the worst coverage with only a handful of projects addressing those challenges. One project with a high score with respect to that layer is "Common Framework for a European Life Cycle based Asset Management Approach for transport infrastructure networks", a coordination and support action that analyses the challenges that need to be addressed in order to achieve a well integrated, optimally performing transport infrastructure network in Europe. Indeed, after further inspection of the mobility projects, we noticed very few projects addressing these challenges ("Mobility Optimization: Permits for Emissions from Driving" that studies mobility optimisation from the perspective of road congestion; "Strengthening European Transport Research and Innovation Strategies" that analyses six topics of "common interest" with one of them being resilience of transport systems; etc.).

Observing the rest of the layers, many projects seem to cover the challenges defined in the first two layers: Mobility supply side and Mobility performance. Slightly lagging behind are the last two layers outlining challenges regarding ATM performance and Mobility demand. Moreover, the heatmap above indicates that research initiatives covering challenges in mobility performance tend to have poor coverage of mobility demand challenges: all the projects with the highest scores in layer 2 have very low scores in layer 5. We need more in-depth study of the mobility performance in context of its demand if we want to address the increasing demand and sustainable development of the European transport system. On the other hand, observing the last two layers, we notice there are a certain number of projects covering mobility demand as much as they cover ATM performance challenges.

As the main interest of CAMERA lies in research including air transport, it is interesting to observe the relationship between projects covering the ATM performance challenges and how well those projects cover challenges defined in other areas. These initial results indicate that there is room for improvement when it comes to researcing initiatives addressing mobility challenges across several categories.

4

WHAT NEXT?



The Coordination and support Action for Mobility in Europe (CAMERA) is only in its first year. The analysis presented in this Mobility Report describes the insights obtained from the initial preparatory exploration and text mining of the database of H2020 and FP7 research initiatives. This analysis was performed on a macro-level, or with the intention of analysing the general state of European mobility research projects.

The macro-analysis presented in this document will be heavily expanded on through three subsequent Mobility Reports. Concretely, the list of selected mobility projects will be revised and extended (e.g. to include SESAR and CleanSky projects). In addition to the expanded dataset, we plan to cover more variables in the macro-analysis, with special attention paid to their confounding potential. Consequently, this will result in a more insightful presentation of financial and geographical distribution of research projects, going beyond the project size or duration.

A large part of future efforts will be dedicated to refining and validation of Natural Language Processing (NLP) algorithms in future iterations of CAMERA. This will include the development of more precise classification methods, semantic and confidence metrics, and a more detailed identification of the challenges tackled in the expanded set of mobility projects. The projects will be analysed with the Key Performance Indicators in mind, as identified in the Performance Framework (KPIs, see Annex 1), leading to a more detailed and prolific macro-analysis across the established challenges (presented through five layers and over 60 KPIs).

In addition to the macro-analysis, a micro-analysis of carefully selected research projects is planned. This analysis will rely on the Mercury modelling tool, a framework developed over a years of collaboration between the Innaxis Foundation and the University of Westminster. Mercury is capable of minutious modelling of passenger mobility, not only during air travel segments, but along the full door-to-door travel chain. It takes airport connections, rebooking, and airport access and egress times into account. Mercury is a data-driven simulator that can create realistic delay distributions for flights and passengers. The selection of the projects for micro-analysis will rely on the results of the NLP-based macro-analysis as well as expert analysis of a reduced set of mobility projects. The final set of projects will be assessed using existing or future features of Mercury, subject to some constraints such as data availability, reproducibility, etc.

5 CONCLUSIONS AND RECOMMENDATIONS

European aviation is facing a number of challenges that need to be addressed in order to secure its sustainable and competitive advancement. To fully meet the mobility needs of the European Union's citizens and society, European air transport needs to be studied in a holistic context that accounts for other transport modes that link together with air transport (road, rail, waterborne).

For this reason, in CAMERA we focus on mobility research initiatives across different transport modes in addition to specific ones that integrate aviation into their research. Bringing such an approach to the study of mobility can lead to finding innovative solutions to achieving the European aviation vision for the year 2050, as outlined in Flightpath 2050, and lead to meeting the rising demand of current and future travellers.

The CAMERA initiative thus focuses on developing automatic methods of first detecting projects of interest in an automatic fashion before analysing and extracting key challenges tackled in identified mobility projects. Techniques developed in CAMERA provide automatic tools for performing an assessment of research projects. Moreover, relying on artificial intelligence methods enhances the analytical capabilities of the frameworks for assessing and reviewing large datasets. In order to do this, a benchmark was developed (a performance framework) that sets a reference point for the assessment of mobility research initiatives as framed by key challenges for the future development of mobility. The challenges in the developed framework were presented through the use of key performance indicators, which are mostly manifested as measurable features of mobility systems with tangible targets that need to be achieved in the future transport system. These indicators were assembled across five thematic layers and cover key points in transport systems that include air travel: mobility supply and demand, mobility performance and performance of the air traffic management system, and resilience of mobility systems against disruptive events.

Motivated by the fact that we live in an era of digitalisation and information, passenger needs were a driving factor for defining these key

ıand an

even more personalised and seamless travel experience. In order to keep up with these demands, businesses will have to change their operational models and adopt emerging technologies and innovative concepts.

Commercial aviation serves the needs of both the individual citizen and society, and thus passengers should be viewed as highly influencing factors in the process of building the future vision of aviation. As Flightpath 2050 states, in 2050 "the passenger experience is paramount". Airports need to ensure rapid and efficient passing through security checks and boarding processes. Airlines need to provide comfortable, enjoyable and personalised transport while enabling passengers to stay connected throughout their entire journey. Moreover, the understanding that passengers' experiences start long before they step onto the aircraft hugely influences future prosperous business models. Passengers need to be informed about multiple aspects of their trip before, during and after the journey. Mobility service providers linking passengers to air transport will play especially crucial roles in providing an efficient and fast door-to-door experience.

Initial exploratory analysis performed so far identified a set of 158 mobility projects. The analysis was performed on a macro-level, exploring the projects' goals and assessing them in two ways: against the challenges defined in the performance framework and through automatic clustering of projects into nine different groups. Automatic grouping of the projects revealed a fairly diverse coverage of various research areas in mobility. The selected projects cover a number of crucial topics for mobility, such as innovative technological concepts, socio-economic and environmental aspects of mobility, sustainable development, and so on.

The initial assessment of key challenges defined by the performance framework indicates the need for further research in several areas. Initial findings show that research into the resilience of transport systems, that places a passenger at the centre of those systems, is a mostly unexplored area. Closely following is research that focuses on passenger demands. Lack of knowledge in this area can be flagged as a critical gap in light of the importance of the passenger experience in shaping the future of European air transport systems. Finally, across the board, there is a need for more multidisciplinary research on mobility. The number of holistic research initiatives that simultaneously address various mobility issues should be increased in order for Europe to be globally recognised as providing a high-level mobility experience and delivering excellent mobility research results. The findings derived so far will serve as starting points for further research in CAMERA. The next three mobility reports will deliver more detailed analysis of mobility research in Europe, with a comprehensive list of insights, observed trends, and recommendations for overcoming gaps and bottlenecks.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Hospital de Bellvitge Fondo

ANNEXES

ANNEX 1
Key performance indicators for assessing mobility research projects

1. MOBILITY CUSTOMER DEMAND INDICATORS

KPA	KPI	TARGET VALUE	URBAN PASSENGERS	LONG-DISTANCE PASSENGERS
Interoperability	Availability of options for flex ticketing & single ticketing (e.g. rail & fly): Number of tickets required for all journey segments	1	LOW	HIGH
Flexibility	Options and availability for transport on demand: Percentage of travel segments offering transport on demand	≥90%	MEDIUM	HIGH
Digitalisation & Information	Availability of on-board content and entertainment: Percentage of total journey time where on-board entertainment/content is offered	≥80%	LOW	HIGH
	Availability of (free) Wi-Fi connection on-board and during all phases of the journey: Percentage of travel segments offering free Wi-Fi	100%	MEDIUM	HIGH
	Average passenger satisfaction rating on a standard, 5-point Likert scale (with neutral mid-point)	4.5	MEDIUM	HIGH
Access and equity	Share of availability of personal assistance services (on-ground/on-board/hotline, for information and assistance, and for impaired passengers etc.) during multiple journey segments	≥90%	HIGH	HIGH
	Number of different fare schemes available for different user groups	Minimum of 6 ticket options • Budget • Economy • Premium • student discount • family/ group discount • retirement discount	HIGH	HIGH

Environment	CO2 efficiency of transport ("environmental footprint"): equivalent CO2 emissions (in terms of radiative forcing) per passenger per km.	Reduction of greenhouse gas emissions (GHG) by at least 60% compared to 1990 levels	HIGH	HIGH
Safety	Number of fatalities per 108 journeys (target level of safety)	Target levels of safety of different transport sectors	HIGH	HIGH
	Level of passenger safety perception	"Perfectly safe"	HIGH	HIGH
Security	Share of mobility providers applying common data protection rules	Enforcement level of Europe-wide data protection laws across mobility providers	MEDIUM	HIGH

KPA	KPI	TARGET (VALUE)	URBAN PASSENGERS	LONG-DISTANCE PASSENGERS
Access and equity	4-hour reach: The distance that can be attained, within Europe, from 90% of European doors of origin in exactly 4 hours	N/A	N/A	N/A
Efficiency	Time efficiency performance: percentage of journeys for which the best possible journey time/actual time of travel exceeds 0.8.	N/A	N/A	N/A
	Energy efficiency of transport: average energy needed per passenger per km.	N/A	N/A	N/A
	Cost efficiency: total (supply) cost per passenger per km.	N/A	N/A	N/A
Interoperability	Transition-journey ratio: average of (time spent during transitions / total travel time for the journey)	N/A	HIGH	MEDIUM
	Security efficiency: average of (time spent in security checks / total travel time for the journey)	N/A	HIGH	HIGH
Capacity	Journeys within 4 hours door-to-door	90% of journeys	MEDIUM	HIGH
	Frequencies: number of possible itineraries for the same OD per unit of time	N/A	HIGH	MEDIUM
Predictability	Percentage of passengers arriving more than 15 minutes late at destination	N/A	HIGH	MEDIUM
	Variability of delay at arrival: standard deviation of delays at destination.	N/A	N/A	N/A

KPA	KPI	TARGET (VALUE)	URBAN PASSENGERS	LONG-DISTANCE PASSENGERS
Cost-effectiveness	Percentage of passengers claiming their right in the case of a disrupted journey	100%	HIGH	HIGH
	Minimum average buffer time required for flights to ensure that 90% of passengers arrive less than 15 minutes late at their final gate	N/A	N/A	N/A
	Cost of non-air transport modes, for airport access/egress, per km of journey	N/A	LOW	MEDIUM
Capacity	Daily average percentage of delayed passengers	as low as possible	N/A	N/A
	En-route processes delay amplification factor	< 0	N/A	N/A
	Turnaround processes delay amplification factor	< 0	N/A	N/A
	Frequency of non-air transport modes, for airport access/egress, expressed as WLUs* per minute	N/A	N/A	N/A
Flexibility	Percentage of delayed journeys reconfigured	N/A	HIGH	HIGH
	Percentage of delayed journeys where all alternative travel options covering the entire itinerary are automatically sent to connected passengers	100%	HIGH	HIGH
Predictability	Percentage of airport departure or arrival delays exceeding 15 minutes in airports with an average ATM Airport Performance (ATMAP) of the day with a value of 1.5 or higher.	<10%	N/A	N/A
	Average delay of public transport used to access an airport	N/A	N/A	N/A
Efficiency	Percentage of passengers affected by delayed journeys, who are notified thereof	100%	MEDIUM	MEDIUM
	Time (average) within which 90% of connected passengers with delayed journeys are automatically notified of all alternative travel options covering the entire itinerary	5 minutes	MEDIUM	MEDIUM

*Workload units - e.g. seats, vehicles, passengers or similar.

KPA	KPI	TARGET VALUE
Environment	Horizontal en-route flight-efficiency of the last filed flight plan (% additional distance) ("KEP")	3.7 to 3.9%
	Horizontal en-route flight-efficiency of the flown route (% additional distance) ("KEA")	2.2 to 2.4%
	CO2 emissions (tonnes per flight)	-0.79 to -1.6
Capacity	En-route ATFM delay (minutes per flight)	0.24 to 0.5
	Departure delay - all causes (minutes per departure)	-1 to -3
	Additional flights at congested airports	+0.2 to 0.4 million
	Network throughput additional flights	+7.6 to 9.5 million
Cost-effectiveness	Average determined en-route unit cost (in €2009)	€37.77 to €42.25
	Gate-to-gate ANS cost per flight	-€390 to -€380
Operational efficiency	Average flight time (minutes per flight)	-4 to -8

KPA	KPI	TARGET (VALUE)	URBAN PASSENGERS	LONG-DISTANCE PASSENGERS
Capacity	Capacity utilisation: Capability of transport infrastructure to withstand disruptions and absorb disturbance	n/a	N/A	N/A
	Integration of new or amended mobility solutions: Cost of infrastructure implementation (time and monetary) relative to overall benefits for society	⩽1	N/A	N/A
Interoperability	Data and information sharing: Share of mobility providers sharing data across the passenger journey	⩾90%	N/A	N/A
	Regulation and liabilties: Share of mobility providers automatically applying the same regulatory framework	⩾90%	N/A	N/A
	Baggage handling: number of times passengers have to check/ transfer luggage during a door-to-door journey	1	medium	high
	Single ticketing: Share of mobility providers applying the same booking and ticketing tool enabling automatic booking and ticketing of an intermodal journey in a single transaction	⩾90%	N/A	N/A
	Intermodal integration: Share of airports having integrated facilities for changes of transport modes (mainline/ light rail or long-distance bus station within a maximum ten minutes of airport terminal)	⩾90%	low	high
Access and equity	Use of different ways for redundant presentation of essential information (pictorial, verbal, tactile) across all transport modes	Availability of three different ways of representing information	HIGH	HIGH
	Share of availability of barrier-free access across all transport modes during door-to-door passenger journey	100%	HIGH	HIGH

Security	Share of transport modes applying the same comprehensive security standards	⩾90%	N/A	N/A
Efficiency	Provide automated on-the-go real-time itinerary information travellers at any stage of the journey: Share of availability of real-time intinerary information for all trips	⩾90%	HIGH	HIGH

ANNEX 2
Corpus of Mobility projects

	Acronym	Coordinator	Coordinator Country	EC Financial Contribution	Programme	Start date	End Date	Title	Dominant word cloud
1	METPEX	COVENTRY UNIVERSITY	UK	2699074	FP7	2012-11-01	2015-10-31	A MEasurement Tool to determine the quality of the Passenger EXperience	6
2	DATASET2050	FUNDACION INSTITUTO DE INVESTIGACION INNAXIS	ES	1327016.5	H2020	2014-12-01	2017-11-30	Data driven approach for a Seamless Efficient European Travelling in 2050	9
3	OPTIMISM	COVENTRY UNIVERSITY ENTERPRISES LIMITED	UK	1345921	FP7	2011-10-01	2013-09-30	Optimising Passenger Transport Information to Materialize Insights for Sustainable Mobility	6
4	CREATE	UNIVERSITY COLLEGE LONDON	UK	3870146.25	H2020	2015-06-01	2018-05-31	Congestion Reduction in Europe: Advancing Transport Efficiency (CREATE)	8
5	TRANSNEW	UNIVERSITY OF NEWCASTLE UPON TYNE	UK	1480156	FP7	2010-01-01	2011-12-31	Support for realising new Member and Associate States' potentials in transport research	3
6	FANTASSY	PANEPISTIMIO PATRON	EL	560750	FP7	2012-08-01	2014-10-31	Future Aircraft design following the carrier-pod concept as an enabler for co-modal seamless transport, passenger safety and environmental sustainability	3
7	USE-IT	FORUM DES LABORATOIRES NATIONAUX EUROPEENS DE RECHERCHE ROUTIERE	BE	955624.72	H2020	2015-05-01	2017-04-30	Users, Safety, security and Energy In Transport Infrastructure	3
8	MOPED	UNIVERSITY OF LEEDS	UK	278807.4	FP7-PEOPLE	2013-03-28	2015-03-27	Mobility Optimization: Permits for Emissions from Driving	4
9	REFINET	CENTRE SCIENTIFIQUE ET TECHNIQUE DU BATIMENT	FR	998235.51	H2020	2015-05-01	2017-04-30	REthinking Future Infrastructure NETworks	4
10	FOX	FORUM DES LABORATOIRES NATIONAUX EUROPEENS DE RECHERCHE ROUTIERE	BE	929753.53	H2020	2015-05-01	2017-10-31	Forever Open infrastructure across (X) all transport modes	3
11	NODES	UNION INTERNATIONALE DES TRANSPORTS PUBLICS	BE	2800000	FP7	2012-10-01	2015-09-30	New tOols for Design and OpEration of Urban Transport InterchangeS	2
12	CAPACITY4RAIL	UNION INTERNATIONALE DES CHEMINS DE FER	FR	9890105	FP7	2013-10-01	2017-09-30	Increasing Capacity 4 Rail networks through enhanced infrastructure and optimised operations	9
13	ROADIDEA	FORECA CONSULTING OY	FI	3345611	FP7	2007-12-01	2010-09-30	Road Map for Radical Innovations in European Transport Services	9
14	COMPASS	EDINBURGH NAPIER UNIVERSITY	UK	1499945	FP7	2011-11-01	2013-11-30	OPTIMISED CO-MODAL PASSENGER TRANSPORT FOR REDUCING CARBON EMISSIONS	2
15	AM4INFRA	MINISTERIE VAN INFRASTRUCTUUR EN MILIEU	NL	1499860.0	H2020	2016-09-01	2018-08-31	Common Framework for a European Life Cycle based Asset Management Approach for transport infrastructure networks	9
16	ModAir	AIRBUS GROUP SAS	FR	599747	FP7	2012-09-01	2014-04-30	Co-modal Airport	3
17	INTERCONNECT	EDINBURGH NAPIER UNIVERSITY	UK	1491927	FP7	2009-06-01	2011-05-31	INTERCONNECTION BETWEEN SHORT AND LONG-DISTANCE TRANSPORT NETWORKS	2
18	SAFIER	AVL LIST GMBH	AT	1500000	FP7	2009-02-01	2012-10-31	Support Action for Implementation of ERTRAC's Road Transport Research Priorities	3
19	SAT-RDMP	INSTYTUT LOTNICTWA	PL	369377	FP7	2011-01-01	2013-03-31	Small Air Transport - Roadmap	5
20	FUSETRA	Dornier Aviation GmbH	DE	397772	FP7	2009-12-01	2011-08-31	Future Seaplane Traffic - Transport Technologies for the Future	7
21	ORIGAMI	EDINBURGH NAPIER UNIVERSITY	UK	1498223	FP7	2011-02-01	2013-04-30	OPTIMAL REGULATION AND INFRASTRUCTURE FOR GROUND, AIR AND MARITIME INTERFACES	2
22	PPLANE	OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES	FR	3279005	FP7	2009-10-01	2012-10-31	Personal Plane: Assessment and Validation of Pioneering Concepts for Personal Air Transport Systems	5
23	MOBILITY4EU	VDI/VDE INNOVATION + TECHNIK GMBH	DE	2873078.75	H2020	2016-01-01	2018-12-31	Action Plan for the future of Mobility in Europe	2
24	STARS	POLITECNICO DI TORINO	IT	1805665.0	H2020	2017-10-01	2020-03-31	Shared mobility opporTunities And challenges foR European citieS	2
25	MUGICLOUD	WIRELESSCITIES NETWORKS SL	ES	50000.0	H2020	2017-08-01	2018-01-31	PLUG AND PLAY intelligent transport system for bus and coach sector	7

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26	FREIGHTVISION	AUSTRIATECH – Gesellschaft des Bundes fur Technologiepolitische Massnahmen GMBH	AT	1999622.7	FP7	2008-08-14	2010-02-13	Vision and Action Plans for European Freight Transport until 2050	1
27	OPTIMUM	INSTITUT FRANCAIS DES SCIENCES ET TECHNOLOGIES DES TRANSPORTS, DE L'AMENAGEMENT ET DES RESEAUX	FR	77700	FP7-PEOPLE	2011-06-01	2014-05-31	Optimised ITS-based Tools for Intelligent Urban Mobility	3
28	DATE	THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF OXFORD	UK	201392.8	FP7-PEOPLE	2011-06-01	2013-05-31	The dynamic between airlines and high-speed trains in Europe	3
29	USEMOBILITY	ALLIANZ PRO SCHIENE EV	DE	930781	FP7	2011-01-01	2013-02-28	Understanding Social behaviour for Eco-friendly multimodal mobility	2
30	FUTURE-RADAR	AVL LIST GMBH	AT	3499376.25	H2020	2017-01-01	2020-12-31	Future Research, Advanced Development and Implementation Activities for Road Transport	1
31	IMPACT-1	DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV	DE	299951.5	H2020	2016-09-01	2018-02-28	Indicator Monitoring for a new railway PAradigm in seamlessly integrated Cross modal Transport chains - Phase 1	5
32	CATS	GEAJ-M VALLOTTON ET T. CHANARD ARCHITECTES-URBANISTES FSU SA	CH	2970245	FP7	2010-01-01	2014-12-31	City Alternative Transport System	4
33	ICARUS	FUNDACION ONCE PARA LA COOPERACION E INCLUSION SOCIAL DE PERSONAS CON DISCAPACIDAD	ES	562540	FP7	2012-06-01	2014-06-30	Innovative Changes in Air transport Research for Universally designed Services	5
34	POSMETRANS	STEINBEIS INNOVATION GGMBH	DE	576413.75	FP7	2010-01-01	2011-12-31	POlicy measures for innovation in TRANSport sector with special focus on Small- and Medium sized Enterprises - factors and recommendations for success and sustainability -	4
35	TT	INDRA SISTEMAS SA	ES	14631935.45	H2020	2017-01-01	2019-06-30	Transforming Transport	5
36	NeTIRail-INFRA	THE UNIVERSITY OF SHEFFIELD	UK	5453555.0	H2020	2015-06-01	2018-05-31	Needs Tailored Interoperable Railway	2
37	GHG-TRANSPORD	FRAUNHOFER Gesellschaf zur Foerderung der Angewandten Forschung E.V.	DE	940676	FP7	2009-10-01	2011-12-31	Reducing greenhouse-gas emissions of transport beyond 2020: linking R&D, transport policies and reduction targets	7
38	FOSTER-ROAD	AVL LIST GMBH	AT	1982274	FP7	2013-03-01	2016-12-31	Future of Surface Road Transport European Resarch	1
39	CargoMap	SLOT CONSULTING KERESKEDELMI, SZOLGALTATO, TANACSADO KFT	HU	321077	FP7	2011-10-01	2013-12-31	Air Cargo Technology Road Map	5
40	TENSE	THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF OXFORD	UK	278807.4	FP7-PEOPLE	2012-07-07	2014-07-06	Trends in City Expansion and Transport: the Non-Sustainability of Exurbia	8
41	CONDUITS	ISTITUTO DI STUDI PER L'INTEGRAZIONE DEI SISTEMI (I.S.I.S) - SOCIETA'COOPERATIVA	IT	947915	FP7	2009-05-01	2011-06-30	Coordination Of Network Descriptors for Urban Intelligent Transportation Systems	5
42	MODERN	CONSILIUL LOCAL AL MUNICIPIULUI CRAIOVA	RO	8480812.6	FP7	2008-10-15	2013-02-14	MODERN - MObility, Development and Energy use ReductioN	8
43	GOAL	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO	NL	933935	FP7	2011-09-01	2013-09-30	"GOAL: Growing Older, stAying mobiLe: The transport needs of an ageing society"	7
44	HERMES	UNIVERSITY OF NEWCASTLE UPON TYNE	UK	730150	FP7	2011-11-01	2014-04-30	Establishing a CompreHEnsive transport Research information Management and Exchange System	3
45	CLOSER	FRAUNHOFER Gesellschaf zur Foerderung der Angewandten Forschung E.V.	DE	1499887	FP7	2010-01-01	2012-12-31	Connecting LOng and Short-distance networks for Efficient tRansport	2
46	SUITS	COVENTRY UNIVERSITY	UK	4111361.26	H2020	2016-12-01	2020-11-30	Supporting Urban Integrated Transport Systems: Transferable tools for authorities	8

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47	MaaS4EU	INTRASOFT INTERNATIONAL SA	BE	3660256.25	H2020	2017-06-01	2020-05-31	End-to-End Approach for Mobility-as-a-Service tools, business models, enabling framework and evidence for European seamless mobility	9
48	NICHES+	POLIS – Promotion of Operational Links with Integrated Services, Association Internationale	BE	1237078	FP7	2008-05-01	2011-04-30	New and Innovative Concepts for Helping European Transport Sustainability - Towards Implementation	8
49	CAPIRE	RENAULT SAS	FR	1699819	FP7	2010-12-01	2014-11-30	Coordination Action on PPP Implementation for Road-Transport Electrification	1
50	EMEurope	TUEV RHEINLAND CONSULTING GMBH	DE	9167595.69	H2020	2016-10-01	2021-09-30	ERA-NET Cofund Electric Mobility Europe	5
51	INTRASME	COVENTRY UNIVERSITY ENTERPRISES LIMITED	UK	1442019	FP7	2012-10-01	2014-09-30	Innovative Transport SME Support Action	4
52	TIPS	STEINBEIS INNOVATION GGMBH	DE	1087911	FP7	2012-10-01	2014-09-30	Enhancing the capacity of EU transport projects to transform research results into innovative products and services	5
53	TIGER	Consorzio per la Ricerca e lo Sviluppo di Tecnologie per il Trasporto Innovativo	IT	10316063	FP7	2009-10-01	2012-09-30	Transit via Innovative Gateway concepts solving European-Intermodal Rail needs	1
54	NEARS	Deutsches Zentrum fuer Luft – und Raumfahrt EV	DE	470375	FP7	2011-01-01	2012-09-30	New European Aviation Research Strategy	3
55	LEARN	STICHTING SMART FREIGHT CENTRE	NL	1999677.5	H2020	2016-10-01	2019-03-31	Logistics Emission Accounting and Reduction Network	7
56	ICT4FEV	VDI/VDE INNOVATION + TECHNIK GMBH	DE	999474	FP7	2010-05-01	2012-09-30	Information and Communication Technologies \nfor the Full Electric Vehicle	4
57	TRACY	FACHHOCHSCHULE ERFURT	DE	633600	FP7	2011-10-01	2013-12-31	Transport needs for an ageing society	7
58	CARTRE	European Road Transport Telematics Implementation Coordination Organisation – Intelligent Transport Systems & Services Europe	BE	2999999.75	H2020	2016-10-01	2018-09-30	Coordination of Automated Road Transport Deployment for Europe	3
59	SETRIS	UNIVERSITY OF NEWCASTLE UPON TYNE	UK	2999405.0	H2020	2015-05-01	2018-04-30	Strengthening European Transport Research and Innovation Strategies	1
60	City-HUB	UNIVERSIDAD POLITECNICA DE MADRID	ES	1296085	FP7	2012-09-01	2015-02-28	City-Hub	2
61	ICOA.10.09	ACADEMIE DE L AIR ET DE L ESPACE	FR	56000	FP7	2008-11-01	2010-03-31	International Conference on Airports, October 2009 Paris	3
62	MIND-SETS	ISTITUTO DI STUDI PER L'INTEGRAZIONE DEI SISTEMI (I.S.I.S) - SOCIETA'COOPERATIVA	IT	1755558.75	H2020	2014-12-01	2017-05-31	Mobility Innovations for a New Dawn in Sustainable (European) Transport Systems	2
63	CATCH	MRC McLean Hazel Limited	UK	1482891	FP7	2009-08-01	2012-01-31	Carbon Aware Travel Choices in the climate-friendly world of tomorrow	2
64	2MOVE2	LANDESHAUPTSTADT STUTTGART	DE	5772839.81	FP7	2012-12-01	2016-11-30	New forms of sustainable urban transport and mobility	8
65	ETISPLUS	PANTEIA BV	NL	2852252	FP7	2009-09-01	2012-12-31	European Transport policy Information SystemDevelopement and implementation of data collection methodology for EU transport modelling	6
66	ACCESS 2 ALL	EUROPE RECHERCHE TRANSPORT	FR	797422	FP7	2008-12-01	2010-11-30	Mobility Schemes Ensuring Accessibility of Public Transport for All Users	9
67	SIMBA II	European Road Transport Telematics Implementation Coordination Organisation – Intelligent Transport Systems & Services Europe	BE	499925	FP7	2008-05-01	2010-04-30	Strengthening road transport research cooperation between Europe and emerging international markets II	2
68	TRANSTOOLS 3	DANMARKS TEKNISKE UNIVERSITET	DK	1951208.48	FP7	2011-03-01	2014-02-28	Research and development of the European Transport Network Model – Transtools Version 3	6
69	ARCHIMEDES	AALBORG KOMMUNE	DK	15982442	FP7	2008-09-15	2012-12-14	Achieving Real Change with Innovative Transport Measures Demonstrating Energy Savings	8
70	DECOMOBIL	HUMANIST	FR	311000	FP7	2011-10-01	2014-09-30	Support action to contribute to the preparation of future community research programme in user centred Design for ECO-multimodal MOBILity	9

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71	ASSIST	FRAUNHOFER Gesellschaf zur Foerderung der Angewandten Forschung E.V.	DE	1226438	FP7	2011-04-01	2013-03-31	Assessing the social and economic impacts of past and future sustainable transport policy in Europe	2
72	S_LIFE	POLE VEHICULE DU FUTUR	FR	2122349	FP7	2012-01-01	2014-12-31	European Synergies and Co-operation for Sustainable vehicle along the Life-Cycle	7
73	PUBLIC PUT IN MOTION	TECHNISCHE UNIVERSITAT BERLIN	DE	216782	FP7-PEOPLE	2010-05-01	2012-12-31	Public participation and urban transport innovation. The European light rail renaissance and user involvement, city revitalization, urban mobility agenda	8
74	TRANSANTIAGO2008	TECHNISCHE UNIVERSITAT BERLIN	DE	136421.27	FP7-PEOPLE	2009-06-05	2011-03-04	Constructing Users for Public Transport: The Case of Transantiago	8
75	FOSTER RAIL	UNION INTERNATIONALE DES CHEMINS DE FER	FR	1659439	FP7	2013-05-01	2016-04-30	Future Of Surface Transport Research Rail	1
76	DELTA	ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS	EL	1080340	FP7	2009-01-01	2010-12-31	Concerted coordination for the promotion of efficient multimodal interfaces	9
77	4SBLOCK	INVEPAT GO SL	ES	50000.0	H2020	2016-12-01	2017-04-30	Pavement Building System based on Detachable and Embedded Blocks	8
78	IFM Project	ITSO LIMITED	UK	740000	FP7	2008-01-01	2010-06-30	Interoperable Fare Management Project	6
79	LeMO	STIFTINGA VESTLANDSFORSKING	NO	1492627.0	H2020	2017-11-01	2020-10-31	Leveraging Big Data to Manage Transport Operations	6
80	GoF4R	UNION DES INDUSTRIES FERROVIAIRES EUROPEENNES - UNIFE	BE	2000000.0	H2020	2016-11-01	2018-10-31	Governance of the Interoperability Framework for Rail and Intermodal Mobility	9
81	TEAM	UNIVERSITY COLLEGE DUBLIN, NATIONAL UNIVERSITY OF IRELAND, DUBLIN	IE	3249341	FP7-PEOPLE	2009-11-01	2013-10-31	Training in European Asset Health Management	1
82	LIVINGRAIL	FRAUNHOFER Gesellschaf zur Foerderung der Angewandten Forschung E.V.	DE	985259	FP7	2012-12-01	2015-05-31	Living in a sustainable world focused on electrified rail	8
83	CARE	AEROSPACE VALLEY	FR	2269392	FP7	2012-01-01	2014-12-31	Clean Aerospace Regions	3
84	LOGINN	CETIM CENTER FOR TECHNOLOGY AND INNOVATION MANAGEMENT GMBH	DE	1000000	FP7	2012-11-01	2015-04-30	LOGistics INNovation uptake	5
85	FR8RAIL	TRAFIKVERKET - TRV	SE	3478222.51	H2020	2016-09-01	2019-08-31	Development of Functional Requirements for Sustainable and Attractive European Rail Freight	5
86	HELI4RESCUE	FRAUNHOFER Gesellschaf zur Foerderung der Angewandten Forschung E.V.	DE	1047524.8	FP7	2012-08-01	2014-06-30	Heavy Payload Helicoper for Last Mile Rescue	5
87	NOVELOG	ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS	EL	4413842.0	H2020	2015-06-01	2018-05-31	New cooperative business models and guidance for sustainable city logistics	8
88	LOGMAN	AUSTRIATECH – Gesellschaft des Bundes fur Technologiepolitische Massnahmen GMBH	AT	1824560.46	FP7	2009-08-31	2011-08-30	LOGistics & MANufacturing trends and sustainable transport	2
89	3IBS	UNION INTERNATIONALE DES TRANSPORTS PUBLICS	BE	2970000	FP7	2012-10-01	2015-03-31	The Intelligent, Innovative, Integrated Bus Systems	3
90	TIDE	POLIS – Promotion of Operational Links with Integrated Services, Association Internationale	BE	2100000	FP7	2012-10-01	2015-09-30	Transport Innovation Deployment for Europe	8
91	CETRRA	TSB Innovationsagentur Berlin GmbH	DE	505622	FP7	2008-06-01	2010-09-30	Actions to stimulate participation of cooperation partners in surface transport research	3
92	FUTRE	ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS	EL	876860	FP7	2012-10-01	2014-09-30	FUture prospects on TRansport evolution and innovation challenges for the competitiveness of Europe	1

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93	OPTION	STICHTING VU	NL	2493318	FP7	2010-05-01	2015-04-30	Optimizing Policies for Transport: accounting for Industrial Organisation in Network markets	4
94	SKILLRAIL	INSTITUTO SUPERIOR TECNICO	PT	454525	FP7	2009-12-01	2011-11-30	Education and Training Actions for high skilled job opportunities in the railway sector	3
95	TOSCA	THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF CAMBRIDGE	UK	743196	FP7	2009-08-01	2011-03-31	Technology Opportunities and Strategies towards Climate-friendly trAnsport	7
96	DYN@MO	STADT AACHEN	DE	8524314	FP7	2012-12-01	2016-11-30	DYNamic citizens @ctive for sustainable MObility	8
97	GREENSHIPPING	DANMARKS TEKNISKE UNIVERSITET	DK	50000	FP7-PEOPLE	2014-03-01	2016-02-29	GreenShipping	5
98	BE LOGIC	ECORYS NEDERLAND B.V.	NL	1998497.52	FP7	2008-09-01	2011-02-28	Benchmarking Logistics and Co-modality	2
99	VR-HYPERSPACE	THE UNIVERSITY OF NOTTINGHAM	UK	3424849	FP7	2011-10-01	2014-09-30	The innovative use of virtual and mixed reality to increase human comfort by changing the perception of self and space	6
100	SATIE	European Road Transport Telematics Implementation Coordination Organisation – Intelligent Transport Systems & Services Europe	BE	1380996	FP7	2011-09-01	2014-08-31	Support Action for a Transport ICT European large scale action	1
101	CITY MOVE	CENTRO RICERCHE FIAT SCPA	IT	3291255	FP7	2010-01-01	2013-03-31	City multi-Role Optimized Vehicle	1
102	ERRAC ROAD MAP	UNION INTERNATIONALE DES CHEMINS DE FER	FR	1540994	FP7	2009-06-01	2012-07-31	ERRAC Road Map	3
103	NEAT	SIMULA RESEARCH LABORATORY AS	NO	3957001.25	H2020	2015-03-01	2018-04-30	A New, Evolutive API and Transport-Layer Architecture for the Internet	9
104	TRANS-AFRICA	UNION INTERNATIONALE DES TRANSPORTS PUBLICS	BE	399697	FP7	2008-06-01	2010-11-30	Promoting Public Transport in Africa	7
105	ELIPTIC	FREIE HANSESTADT BREMEN	DE	5988745.35	H2020	2015-06-01	2018-05-31	Electrification of public transport in cities	7
106	AINARA	EASYMILE	FR	1618623.0	H2020	2015-05-01	2017-10-31	Automation and INtelligence solutions for Automated Road trAnsport systems	5
107	OPTIRAIL	VIAS Y CONSTRUCCIONES SA	ES	2700000	FP7	2012-10-01	2015-09-30	DEVELOPMENT OF A SMART FRAMEWORK BASED ON KNOWLEDGE TO SUPPORT INFRASTRUCTURE MAINTENANCE DECISIONS IN RAILWAY CORRIDORS	9
108	CAICULUS	UNIVERSIDAD COMPLUTENSE DE MADRID	ES	170121.6	H2020	2017-09-01	2019-08-31	Causes And ConseqUences of Low Urban accessibility. Defining proper policy responses	6
109	CARONTE	FRAUNHOFER Gesellschaf zur Foerderung der Angewandten Forschung E.V.	DE	1256869.53	FP7	2014-09-01	2016-02-29	Creating an Agenda for Research ON Transportation sEcuity	3
110	PLATINA II	Via donau – Österreichische Wasserstraßen-Gesellschaft mbH	AT	1999995	FP7	2013-09-01	2016-02-29	Platform for the implementation of NAIADES (PLATINA II)	1
111	ECCONET	TRANSPORT & MOBILITY LEUVEN NV	BE	1633087	FP7	2010-01-01	2012-12-31	Effects of Climate Change On the inland waterway and other transport NETworks	2
112	WEATHER	FRAUNHOFER Gesellschaf zur Foerderung der Angewandten Forschung E.V.	DE	1462318	FP7	2009-11-01	2012-04-30	Weather Extremes: Assessment of impacts on Transport Systems and Hazards for European Regions	2
113	MEDIATE	STIFTELSEN SINTEF	NO	1097797	FP7	2008-12-01	2010-11-30	MEthodology for Describing the Accessibility of Transport in Europe	6
114	SCORE	VDI/VDE INNOVATION + TECHNIK GMBH	DE	1497841.25	H2020	2016-10-01	2018-03-31	Score board of competitiveness of European transport manufacturing industries	1
115	IMOVE	SOFTECO SISMAT SRL	IT	3393566.25	H2020	2017-06-01	2019-11-30	Unlocking Large-Scale Access to Combined Mobility through a European MaaS Network	9
116	LOG4GREEN	PROJEKTKOMPETENZ.EU – Gesellslchaft fur Projekttenwicklung unf Management MBH	AT	2544574	FP7	2011-12-01	2014-11-30	Transport Clusters Development and Implementation Measures of a Six-Region Strategic Joint Action Plan for Knowledge-based Regional Innovation	1

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117	InnoMarket	COPENHAGEN BUSINESS SCHOOL	DK	212194.8	H2020	2015-08-01	2017-07-31	Innovation in the road freight transportation chain facilitating sustainability and low cost: A socio-technical perspective on work and development of road freight transport markets.	7
118	CROWDFLOWS	UNIVERSIDADE DE COIMBRA	PT	342141,6	FP7-PEOPLE			CrowdFlows – Crowdsourcing for Travel Demand Prediction	8
119	TREND	POLITECNICO DI TORINO	IT	3000000	FP7	2010-09-01	2013-11-30	Towards Real Energy-efficient Network Design	4
120	SMART-WAY	FRAUNHOFER Gesellschaf zur Foerderung der Angewandten Forschung E.V.	DE	1793501	FP7	2010-02-01	2012-06-30	Galileo based navigation in public transport systems with passenger interaction	1
121	FUTRA2013	TUTECH INNOVATION GMBH	DE	60000	FP7-PEOPLE	2013-05-01	2013-10-31	Hamburgs Forschungsnacht der Mobilität (Hamburg FUture TRAnsport Night 2013)	6
122	SKILLFUL	Forum des Laboratoires Nationaux Europeens de Recherche Routiere	BE	2991672.2	H2020	2016-10-01	2019-09-30	Skills and competences development of future transportation professionals at all levels	7
123	SuMAC	VRIJE UNIVERSITEIT BRUSSEL	BE	160800.0	H2020	2017-02-01	2019-01-31	Sustainable Mobility, Affordable Cities: How do workplace sustainability plans shape transport affordability in Brussels and Sofia?	8
124	P3ITS	European Road Transport Telematics Implementation Coordination Organisation – Intelligent Transport Systems & Services Europe	BE	398000	FP7	2010-01-01	2011-09-30	Pre-commercial Public Procurement for ITS innovation and deployment	9
125	TrACE	MINISTRY OF TRANSPORT, COMMUNICATIONS AND WORKS	CY	397593.0	H2020	2017-09-01	2018-08-31	The Establishment of a Transport Analytics Centre of Excellence in Cyprus (TrACE)	3
126	Logistics for LIFE	INSIEL - INFORMATICA PER IL SISTEMA DEGLI ENTI LOCALI S.P.A.	IT	1420000	FP7	2010-01-01	2012-06-30	Logistics Industry Coalition for Long-term, ICT-based Freight Transport Efficiency	5
127	GO4SEM	VRIJE UNIVERSITEIT BRUSSEL	BE	993673	FP7	2013-09-01	2015-08-31	Global Opportunities for SMEs in Electro-Mobility	5
		UNIVERSITY OF ATHENS - NTUA						Plan on Green Corridors Issues	
129	SCOUT	VDI/VDE INNOVATION + TECHNIK GMBH	DE	998342.5	H2020	2016-07-01	2018-06-30	Safe and COnnected aUtomation in road Transport	5
130	CITYLAB	TRANSPORTOKONOMISK INSTITUTT	NO	3979998.13	H2020	2015-05-01	2018-04-30	City Logistics in Living Laboratories	8
131	EXCROSS	DEEP BLUE SRL	IT	932782	FP7	2011-10-01	2014-04-30	EXploiting safety results aCROSS transportation modes	3
132	HyTEC	AIR PRODUCTS PLC	UK	11948532	FP7	2011-09-01	2015-08-31	Hydrogen Transport in European Cities	6
133	EBSF	UNION INTERNATIONALE DES TRANSPORTS PUBLICS - UITP	BE	15810606	FP7	2008-09-01	2013-02-28	European Bus System of the Future	3
134	FRARS-2	ENVISA SAS	FR	74340	FP7	2011-11-16	2012-12-15	Future Regional Aircraft Requirements Survey - Part 2	7
135	FABRIC	INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS	EL	6495000	FP7	2014-01-01	2017-12-31	FeAsiBility analysis and development of on-Road chargIng solutions for future electric vehiCles	2
136	E-GOMOTION	POLITECNICO DI TORINO	IT	1295848	FP7	2011-01-01	2013-12-31	Job opportunities in vehicle electrification	7
137	Prominent	STICHTING STC-GROUP	NL	6249997.75	H2020	2015-05-01	2018-04-30	Promoting Innovation in the Inland Waterways Transport Sector	1
138	CHIC	EVOBUS GMBH	DE	25878334	FP7	2010-04-01	2016-12-31	Clean Hydrogen in European Cities	6
139	NEAR2050	INSTITUT FUR INNOVATIONS- UND TRENDFORSCHUNG KURZ IITF	AT	399891.25	H2020	2016-10-01	2018-03-31	NEAR2050 - future challenges for the rail sector	4
140	TELLIBOX	RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN	DE	3099665	FP7	2008-04-01	2011-03-31	Intelligent MegaSwapBoxes for Advanced Intermodal Freight Transport	1
141	FInest	KUEHNE + NAGEL MANAGEMENT AG	CH	4889000	FP7	2011-04-01	2013-03-31	Future Internet enabled Optimisation of Transport and Logistics Business Networks	5
142	CONCERTOUR	FIT CONSULTING SRL	IT	652199	FP7	2008-01-01	2009-09-30	CONCERTED INNOVATIVE APPROACHES, STRATEGIES, SOLUTIONS AND SERVICES IMPROVING MOBILITY AND EUROPEAN TOURISM	1

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143	PUBTRANS4ALL	RODLAUER CONSULTING EU	AT	1807662	FP7	2009-09-01	2012-11-30	Public Transportation - Accessibility for All	6
144	CIVITAS MIMOSA	COMUNE DI BOLOGNA	IT	15290808	FP7	2008-10-15	2013-02-14	CIVITAS Making Innovation for MObility Sustainable Actions	8
145	MOVE IT!	STICHTING MARITIEM RESEARCH INSTITUUT NEDERLAND	NL	2790344	FP7	2011-11-01	2014-10-31	Modernisation of Vessels for Inland waterway freight Transport	6
146	G4V	RWE DEUTSCHLAND AKTIENGESELLSCHAFT	DE	2531257,75	FP7	2010-01-01	2011-06-30	Grid for Vehicles - Analysis of the impact and possibilities of a mass introduction of electric and plug-in hybrid vehicles on the electricity networks in Europe	2
147	KOMODA	INSTYTUT LOGISTYKI I MAGAZYNOWANIA	PL	1018739	FP7	2008-01-01	2009-12-31	Co-modality - towards optimised integrated chains in freight transport logistics	5
148	ITS OBSERVATORY	European Road Transport Telematics Implementation Coordination Organisation – Intelligent Transport Systems & Services Europe	BE	1337259.5	H2020	2015-05-01	2017-10-31	ITS Observatory	3
149	ENABLE	ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS	EL	503702	FP7	2009-09-01	2011-08-31	Stimulate Sustainable Freight Transport Systems with Latin American countries	1
150	FLOW	RUPPRECHT CONSULT-FORSCHUNG & BERATUNG GMBH	DE	3781696.0	H2020	2015-05-01	2018-04-30	Furthering Less Congestion by creating Opportunities for more Walking and cycling	1
151	BESTFACT	PTV PLANUNG TRANSPORT VERKEHR AG.	DE	2720688	FP7	2012-01-01	2015-12-31	Best Practice Factory for Freight Transport	8
152	eMobilita	UNIVERSITY OF NATIONAL AND WORLD ECONOMY	BG	1525500.0	H2020	2017-03-01	2020-02-29	Electromobility in urban transport: a multi-dimensional innovation (socio-economic and environmental effects)	8
153	LogiCon	INSTYTUT LOGISTYKI I MAGAZYNOWANIA	PL	2006014	FP7	2013-09-01	2015-08-31	Lean Secure and Reliable Logistic Connectivity for SMEs	1
154	iCar Support	European Road Transport Telematics Implementation Coordination Organisation – Intelligent Transport Systems & Services Europe	BE	1949767	FP7	2009-12-01	2012-11-30	Intelligent Car Support	9
155	GREENTRANSPORT-TV	ICONS SRL	IT	691910	FP7	2009-06-01	2010-11-30	Enhancing public awareness on the results of European research actions on Climate Friendly Transport Systems through the professional use of television media	5
156	PORTIS	STAD ANTWERPEN	BE	16376774.63	H2020	2016-09-01	2020-08-31	PORT-Cities: Integrating Sustainability	8
157	BuyZET	ICLEI EUROPEAN SECRETARIAT GMBH (ICLEI EUROPASEKRETARIAT GMBH)*	DE	999618.75	H2020	2016-11-01	2019-04-30	BuyZET Procurement of innovative solutions for zero emission urban delivery of goods and services	8
158	DEMHOW	THE UNIVERSITY OF BIRMINGHAM	UK	1262193	FP7	2008-03-01	2010-11-30	Demographic Change and Housing Wealth	3

CAMERA

COORDINATION AND SUPPORT
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Research and Assessment

CONSORTIUM

CONTACTS

Coordinator
Innaxis
innovation@innaxis.org

CREDITS

Author
CAMERA Consortium

Document design and editing
Deep Blue

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