



Collaborative Clouds Innovation

Logistics | 2017

alice | Alliance for
Logistics Innovation
through Collaboration
in Europe

2017

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Introduction

Logistics is a key sector for Europe, not only as per its contribution to the GDP, close to 14%¹ being the single biggest industry sector in the EU generating €1 trillion of revenue and providing employment to over 7 million Europeans², but also in its key role on supporting competitiveness of all European manufacturing and retail industries. According to the World Bank, the best 4 logistics performers are from the EU and out of the global top-10, 7 of them are from the EU in 2014 and 2016³.

Keeping current European world leadership in logistics is key for European citizens' future. The EU is the world's largest exporter and biggest trader in goods. However, it is estimated that in the next 10-15 years, 90% of the world's growth will come from outside the EU, so the EU has every interest in making sure that its companies remain very competitive and are able to access new markets and benefit from these sources of growth. Transport and logistics is a key aspect to lead value chains and access these new markets in a competitive way. Efficiency in logistics, therefore, is a key element for further growth and competitiveness of European industrial activity and trade on a global scale.

At the same time, transportation is responsible for around a quarter of the EU greenhouse gas emissions⁴ (data from 2012) and logistics in particular contributes 13% of all emissions globally⁵. The European Union⁶ has identified as one of its objectives the decoupling of economic growth and the use of resources, by a shift towards a low-carbon and energy-efficient economy, and by modernization of the transport sector. The European Commission has established a 60% reduction of Green House Emissions as the target to be reached by 2050 compared to 1990 figures⁷. Concerning the freight transport and logistics sector, similar targets have been established for the reduction of CO₂ emissions⁸. Sustainable economic growth is a fundamental challenge for Europe.

In this context, innovation in freight transport and logistics is key to maintain European leadership in the field and supporting the development and competitiveness of the European industries. The European Commission through the Research, Development and Innovation Framework Programs including the current Horizon 2020 program has invested more than 500 Million € in R&I projects

1 COM(2007) 607 final. "Freight Transport Logistics Action Plan" European Commission, Brussels, 18.10.2007

2 <http://www.european-logistics-platform.eu/>

3 World Bank «Connecting to Compete 2014» and «Connecting to Compete 2016».
https://wb-lpi-media.s3.amazonaws.com/LPI_Report_2016.pdf & <http://lpi.worldbank.org/>

4 http://ec.europa.eu/clima/policies/transport/index_en.htm

5 <http://reports.weforum.org/digital-transformation/the-digital-transformation-of-logistics-threat-and-opportunity/>

6 COM (2010) 546 final "Europe 2020 Flagship Initiative – Innovation Union", European Commission, Brussels, 06.10.2010

7 COM (2011) 112 final. "A Roadmap for moving to a competitive low carbon economy in 2050" European Commission, Brussels, 8.3.2011

8 COM (2011) 144 final "Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system" European Commission, Brussels, 28.3.2011

for a total investment of around 800 Million Euro in the period 2010-2015⁹. The European Commission this way provides strong instruments to support medium- and long-term strategies developed together with industries. ALICE platform, in his 4 years of existence, is building a strong network of industry and research to maximize the impact of results driving to innovation within the sector.

Both, the European Commission and ALICE, share a common interest in better understanding the contribution of EU funded research to the sector's development and maximizing the value of this investment. As a way to provide a framework, the European Commission and ALICE have developed the idea of the Logistics Clouds and the Collaborative Innovation Days (www.collaborativeinnovationdays.eu). Their objectives are:

- ▶ Bring a review of what has been achieved by industrial stakeholders and what are their future vision and plans.
- ▶ Share and discuss achievements of collaborative innovation projects, and the challenges and opportunities addressed by new and ongoing projects.
- ▶ Provide an overview of projects and initiatives in the selected areas and build up strong links across them.
- ▶ Support European Commission to make informed, knowledge-based policy decisions.

The following projects and initiatives have been identified as relevant within this exercise.

- | | | |
|-----------------|---------------------|--------------------------|
| • 4FOLD | • FREVUE | • SMARTFREIGHT |
| • AEOLIX | • iCARGO | • SMARTFUSION |
| • BUYZET | • LEARN | • SMARTRAIL |
| • CITYLAB | • LESSTHANWAGONLOAD | • SPICE |
| • CLICK & TRUCK | • LOGICON | • SPIDER PLUS |
| • CLUSTER 2.0 | • MOBILITY4EU | • STRAIGHTSOL |
| • CO-GISTICS | • MODULUSHCA | • SUCCESS |
| • CORE | • NEXTRUST | • SULPITER |
| • CO3 | • NOVELOG | • SYNCHRONET |
| • DESTINATIONS | • PORTIS | • TRANSFORMERS |
| • DOROTHY | • SAFE-CTS | • TRANSFORMING TRANSPORT |
| • ECOHUBS | • SELIS | • U-TURN |

⁹ Analysis made by ALICE in the frame of SETRIS project: Strengthening European Transport Research and Innovation Strategies* Funded by the European Commission's Horizon 2020 Programme for Research and Innovation under grant agreement No 653739

Understandably, one project alone cannot induce innovation in a specific field, but the joint development of different technologies and methodologies can help stakeholders to advance and adapt to the necessary changes to make the sector progress. The workshops were aimed at gathering some of the most advanced projects around identified themes – in a «cloud» – in order to foster cross-fertilization and collaboration. This way, a ‘critical mass’ of options can be created, and it can be presented to potential implementers as a complete set of solutions to innovate the techniques, procedures and business models to build and manage logistics facing future challenges in a robust and resilient way.

As a starting point, the following key areas for Freight Transport and Logistics have been addressed:

- ▶ Carbon Footprint reduction in Freight Transportation and Logistics;
- ▶ Digitalization, data sharing and trust enabling efficient and sustainable freight transport and logistics;
- ▶ City Logistics.

In this report the main conclusions of the three events are presented. The final conference on the 27th of September in Brussels aims at presenting the results of the thematic workshops, enhancing awareness of the progress made in the sector, and at fostering further exploitation and implementation of research results. Participants will be encouraged to reach consensus on the take-ups of the past workshops and to define the contents of possible future Cloud initiatives.

FINAL CONFERENCE

Conclusive outcome

The European Commission and the ALICE organized three workshops on Logistics Innovation Clouds, which had the objective of consolidating progress and draft future visions and plan for the Logistics sector, as well as to facilitate collaboration and cross-fertilization among different Research & Innovation projects. The Logistics sector is considered an area where collaborative innovation is key to address challenges and opportunities, and the concept of the 'Cloud', as something able to change shape and dimension, aims at offering a new way of collaboration, free from predefined boundaries and constraints.

The **objectives of the events** were:

- Bring a review of what has been achieved by industry stakeholders in the past and what are their future vision and plans.
- Share and discuss achievements of collaborative innovation projects, challenges and opportunities addressed by new and ongoing projects.
- Provide an overview of projects and initiatives in the selected area and build up strong links across them.
- Support European Commission to make informed, knowledge-based policy decisions.

As a starting point, the following **key areas for Freight Transport and Logistics** have been addressed:

- Carbon Footprint reduction in Freight Transportation and Logistics;
- Digitalization, data sharing and trust enabling efficient and sustainable freight transport and logistics;
- City Logistics.

The Cloud events have been key opportunities for exchanging ideas and useful information between different actors, supporting the foresight of future needs of the sector as backed by a survey made to participants.

The Final Conference served as a closure event where to present the results of the thematic workshops, enhancing awareness of the progress made in the sector, and at fostering further exploitation and implementation of research results. In brief, these are the main conclusions raised in each of the key areas above mentioned.

Carbon Footprint reduction in Freight Transportation and Logistics

Logistics operators and users are well aware of the need to drastically reduce the freight transport carbon footprint to meet the ambitious goals set by COP 21 and subscribed by the EU and its Member Countries. The main industrial stakeholders' achievements and future plans for decarbonisation were presented during the Cloud Event¹³. Main conclusions of the cloud were:

- ▶ Achieve a zero (or neutral) freight logistic emissions by 2050 is a sound objective.
- ▶ Clear Carbon footprint reduction paths are needed and supported by smart (de) regulations.
- ▶ The development of consistent carbon footprint measurement and reporting in freight transport and logistics is a must to drive decarbonisation.
- ▶ Supply Network Coordination and Collaboration, Synchromodality (including smart steaming) and vehicles improvement and adaptation to logistics are major concepts and areas contributing to decarbonisation.

These conclusions, further explained and detailed in the summary of the corresponding workshop, were strongly backed and supported by participants in the final conference. Additional aspects were also highlighted in the final event:

- Short and medium term financial targets are crowding out industry attention instead of focusing on the **urgency to act NOW to achieve the CO₂ reduction targets** in time to keep a moderated and affordable impact on climate change. Companies' procurements strategies are still focused on cost and short term value, hence environmental performance is too low in the list of shippers' criteria for carrier selection. Moreover, logistic emissions are scope 3 emissions for the shippers and most of Logistics Service Providers and Freight Forwarder, so not under their direct control but on their subcontractors', making it very difficult to manage. The lack of a CO₂ footprint agreed calculation methodology is a further hindrance to progress to action. Some smart regulation may shake the status quo and drive faster adoption and would boost and drive decarbonization.
- **EU TEN-T Corridors Coordinators** need to move beyond infrastructure planning and starting to look at **corridor operability and service continuity managing impacts of Infrastructure disruption**¹⁴. These events incentivize reverse modal shift hurting environment, economic performance and social aspects: congestion, drivers fatigue, etc.

¹³ Presentations can be downloaded from http://collaborativeinnovationdays.eu/Freight_1st/presentation.html

¹⁴ This refer to events as the one in Summer 2017 when the collapse of a tunnel in Germany due to some works planned without a proper Business Continuity Plan involving all stakeholder created a lot of chaos on a key European Transport Corridor.

- The **big opportunity for load optimization is still misunderstood** because of the way load factor is measured (only considering meters or weight). The mandatory need of horizontal collaboration to get a breakthrough is also impeding fast deployment in the sector. However, **Synchromodality is raising**, probably because it can be achieved within a shipper with better transport and inventory planning, without the need for horizontal collaboration. A cheaper rate for “slow” transport solutions is key to drive an habit change within the existing procurement strategies of shippers.
- There is a need to **extend the boundary for emission calculations – well beyond tank to wheel emissions**. Science based targets and Life Cycle Analysis (LCA) are key to focus resources on appropriate solutions. Some carbon footprint reduction solutions, are not that good when analyzed under LCA lenses (e.g. Battery LCA of electric vehicles, aluminum vs. steel)

Digitalization, data sharing and trust enabling efficient and sustainable freight transport and logistics

According to the World Economic Forum analysis, there is \$1.5 trillion¹⁵ of value at stake for logistics players and a further \$2.4 trillion worth of societal benefits as a result of digital transformation of the industry until 2025. In other words, industry stakeholders should take notice and come together to prioritize digital transformation initiatives, given the potential for significantly high value to be created for the society. The main conclusions of the Cloud event were:

- ▶ The European Logistics Industry needs to lead the digital transformation of the sector
- ▶ Digitalisation is an enabler to connect existing closed platforms of larger industry players or to foster new business models, such as crowdsourced platforms.
- ▶ Data sharing and building trust are pre-requisites to ensure digital transformation.
- ▶ Societal and environmental impact of new services enabled by digitalisation needs to be better assessed and understood.

These conclusions are further explained and detailed in the summary of the corresponding Cloud Event and were strongly backed and supported by participants in the final conference.

15 <http://reports.weforum.org/digital-transformation/the-digital-transformation-of-logistics-threat-and-opportunity/>

Some additional aspects were also highlighted in the final event:

- **Building standards and/or interoperability for cross modal transport activities is in urgent need.** It needs to be driven by policy with strong dialogue with industry. Ensuring interoperability at technical, semantics and non-technical levels, such as governance schemes, and trusted processes on how to exchange data. The Digital Transport and Logistics Forum¹⁶ is a good framework to facilitate discussion from a policy perspective.
- **Lack of trust is one of the factors that hinders data sharing.** It is vital importance to work on processes/framework and mechanisms for data sharing that are trusted and supports openness. Moreover, transformational new business processes are possible thanks to digitalization beyond digitalizing only current processes. Digital transformation will be built upon value transferability in digital supply chains.
- New business models and digitalization will have a **deep impact on the social dimension, skills and employment** which needs to be further examined.

A pan-European Logistics Information Space can only be created if the following aspects are duly considered and ensured: connectivity, willingness to do, decentralisation, security and trust.

City Logistics

City Logistics is a cornerstone aspect on the quality of people's life. On one hand, it is supporting people to access goods but it is also an important and growing contributor to traffic in cities and it is responsible for 25% of urban transport related CO₂ emissions and 30 to 50% of other transport related pollutants (particulate matter, Nitrogen Oxide). The main conclusions of the Cloud Event were:

- ▶ More attention to city logistics planning and development is needed from city authorities in SUMP.
- ▶ Increased Public-Private Collaboration is needed in the City Logistics domain.
- ▶ City Logistics is currently in a paradigm change that needs to be better understood to realize societal and environmental opportunities (in particular with the growth of e-commerce).

16 <http://www.dtlf.eu/>

These conclusions are further explained and detailed in the summary of the corresponding Cloud Event. They were strongly backed and supported by participants in the final conference. Additional aspects were also highlighted in the final event:

- ▶ Demand of transport is changing, especially due to new supply chain dynamics (i.e. e-commerce, etc.). However, there is a **lack of city logistics data**. Being freight transport in cities a very complex system, better understanding of the real contribution of city logistics and freight transport to congestion, pollution as well as understanding of the current “city logistics system” performance is a priority. Authorities urgently need this for their urban planning. An important factor to be considered is the different level of perception between Public and Private sectors (e.g.: public sector perceives e-commerce as having an impact in the next years. Privates state that it is already an issue and a challenge¹⁷).
- ▶ **Cities need to define their urban logistic models considering two main factors: density of deliveries and logistics infrastructure available** (i.e. ports, highways, logistics hubs, rails, metros, etc.). Local authorities can directly influence urban freight transport by regulating urban space and the access to it (in terms of truck types, emissions). The solutions imposed by local governments are often based on enforcement and restrictions but they need to be mixed with rewarding schemes. Local authorities need to increase their leadership in defining and promoting mixed (e.g. public-private) cooperation models¹⁸ with a multi-criteria and multi-stakeholder approach. All these aspects as well as their connectivity with long distance transport need to be considered when building the SULP
- ▶ There are some **general applicable patterns in which the new technologies may have a critical role**; autonomous deliveries in the historical centre of cities, centralized deliveries in malls, locating critical consolidation hubs in the outskirts of cities (and possible ways to locate private warehouses, which may have an impact to urban mobility and services).
- ▶ From **individuals’ perspective, attention to green solution is finally given**. Citizens are starting to pay attention to green solutions, including more responsible attitudes related to the freight transport (e-commerce). In this perspective, urban logistics constitutes an instrument and an opportunity for growth and sustainability in cities (e.g. reverse logistics, construction waste management, etc.).

17 <http://www.interreg-central.eu/ SULPITER>

18 Cooperation models are quite important in order to avoid problems at global level. Indeed, solutions imposed by local governments may generate negative impacts in global supply chains (e.g.: measures such as time windows, must take into consideration also the operations of global express couriers)

Overall Conclusions and Results

The main general conclusions of the Cloud events are the following:

- ▶ **Collaborative Innovation Days have demonstrated a high added value for participants:** in one day a broad overview of key industry leader's achievements and future plans as well as of European R&I projects developments and outcomes could be shared within the innovation ecosystem. Many participants considered this opportunity rather unique in its set-up. Productive discussions and new ways of addressing current challenges have been facilitated in the context of each Cloud.
- ▶ **The concept of Clouds is suitable as a framework to develop Collaborative Innovation.** 'Cloud' is a dynamic concept; it is something able to change shape and dimension, guaranteeing a high degree of freedom and flexibility. A variety of cross-modal and cross sectorial stakeholders are engaged in a fully multidisciplinary approach. Logistics Clouds serve to address a specific challenge, opportunity, or innovation area in an open environment and discussion area preceded by an "up to speed" session for better understanding industry and research state of the art. The idea is giving input to regulatory activities, when necessary, support a faster result uptake, and identify success.
- ▶ **The topics addressed in the Logistics Clouds have been fully backed by a strong participation of stakeholders.** The initiative has been really welcomed by all stakeholders and the topics selected have been judged of high interest and on appropriate scope. More than 70 registered participants in average for a final participation of 55-60 people for each workshop and around 100 participants for the final event shown broad interest. Based on this experience and in consideration of the flexibility of the concept, stakeholders shared the need to organize Cloud events on more concrete topics enhancing closer interaction and enriched discussions.



1ST WORKSHOP

Carbon Footprint reduction in Freight Transportation and Logistics

The First Collaborative Innovation Day was focused on the carbon footprint reduction in freight transportation and logistics. Logistics operators are well aware of the need to drastically reduce the freight transport carbon footprint to meet the ambitious goals set by COP 21 and subscribed by the EU and its Member Countries. The first workshop was focused on this main issue, presenting how collaboration, synchromodality and new vehicle technologies can all cooperate to reach the targets in the foreseen timescale. In order to deal with the problem, some opportunities for Decarbonizing Freight Transport have been identified:

- ▶ Restructure Supply Chain
- ▶ Shift freight to lower carbon modes
- ▶ Improve asset utilization
- ▶ Rise energy efficiency
- ▶ Alter the energy mix

The **main industrial stakeholders' achievements and future plans for decarbonisation** were presented (see Annex 1)¹⁰

More in detail, the topics addressed during the first workshop were:

- **Synergies and Collaboration in the Supply Chain:** both Coordination and Collaboration can produce significant gains in terms of efficiency and sustainability; they represent a big step towards the transition from individually managed supply chains to open supply networks that are expected to provide better asset, vehicles and infrastructure utilization (i.e. load factors, intensity, etc.). This is possible through the creation of connected neutral data sharing platforms between shippers, intermodal terminals operators, logistic service providers and added value service providers to connect freight transport offer and logistics demand. The challenge in this area is to build appropriate business models and case studies enabling extensive scale-up of current isolated examples. Building trust among operators and in technology is a key aspect that needs to be addressed.
- **Co-modality and synchromodality:** the main objective is the achievement of EU wide co-modal transport services within a well synchronized, smart and seamless network, supported by corridors and hubs, providing optimal support to supply chains. It involves a step change from the current system by synchronizing intermodal services between modes and with

¹⁰ Presentations can be downloaded from http://collaborativeinnovationdays.eu/Freight_1st/presentation.html

shippers, (referred to as ‘synchromodality’), aligning equipment and services and integrating these into networks. While some actors in the supply chain are increasingly demanding for speed (heading to 1 or 2 hours deliveries) other parts may be more open to a trade-off between speed and cost/reliability. Multiple speeds (or smart steaming) may create value for the entire supply networks. Better visibility and predictability of “in-transit inventory” may facilitate the case for slow steaming, not only in the maritime leg but also in the inland transport. It is also foreseen that in the short term advanced terminal and hubs management systems should be able to accommodate the demand in a dynamic way. Hubs and logistics clusters are in the position to facilitate both co-modality and synchromodality enhancing their roles, location and functioning.

- Vehicles improvement and adaptation to logistics:** The aim should be providing commercial vehicles able to fulfil the needs of an integrated logistic system. Recent and up coming projects clearly demonstrate that vehicle improvements can realize significant transport efficiencies of 25% or more. Gains are coming from a further exploitation of HCV vehicles for non-city applications, dedicated truck concepts, combining vehicle and logistics efficiency, to transport multimodal loading units in non-city transportation. Dedicated vehicle concepts for urban logistics. Furthermore smart loading units (adaptable, connected, interoperable) will improve the load factor. Automation and automated driving for increased efficiency with regard to handling of loading units a/o cargo, operation at hubs, terminals and distribution centers, safe and efficient use of road infrastructure and vehicles. Appropriate drive trains to use renewable energy, increased efficiency of ICE vehicles, optimized drag adaptive to the driving circumstances and the load/cargo. To ensure a proper implementation, regulation needs to be more focused in order not to hamper innovation. There is a need for a smart regulation to allow innovations and to bring them to the market. There is a need for standardization to enable the use of new technologies from different sources. There is a need to motivate the end-user to purchase new technologies.

The **main conclusions** of the **Logistics Cloud: “Carbon Footprint reduction in Freight Transportation and Logistics”** have been:

- Achieve a zero (or neutral) freight logistic emissions by 2050** is a sound objective. Considering the forecasted growth of freight transport and logistics for 2030 and 2050, current emissions and the international agreement to keep average global temperature «well below» 2°C above preindustrial times, a reduction of about 80-85% of emissions per shipment is needed. The target of a free (neutral) Carbon Footprint City Logistics in 2030 set by the White Paper is as challenging as important. Ambitious targets need to be set for 2050. European Commission and ALICE may embrace these targets in a clearer way within their strategy.

- ▶ **Clear Carbon footprint reduction paths are needed and supported by smart (de) regulations.** A variety of Freight Transport and Logistics decarbonisation opportunities are available. Currently, only those opportunities that combine efficiency (i.e. reduction of cost) and reduction of Green House Gas (GHG) Emissions are deployed in the market. This path is not enough to achieve global ambitious decarbonisation targets. In light of the COP21 Agreement in Paris, how can industry stakeholders quickly agree on developing safe and trustworthy approaches to more environmentally friendly technologies? Regulators supported by Industry may accelerate decarbonisation by setting a medium-long term plan with clear framework conditions for the logistics operators' investments in greener technologies, and by setting a common and fair playing field that could allow greener solutions to be more competitive. Cities are taking action by means of regulations and restrictions; a more overarching and consistent approach could bring greater benefits by ensuring the necessary critical mass for private investments together with larger market opportunities. This is also impacting logistics service providers that need to deal with as many types of regulations and measures as cities. Moreover, regulations targeting performance (i.e. vehicle safety, security, emissions, etc.) could have a positive impact on decarbonisation. Supporting regulation in this field would drive faster innovation deployment. Despite the important investments in rail freight transport, considered to be the best mode towards decarbonisation, no significant shift has yet been achieved. A fundamental increase and upgrade of rail freight performance based on users's (shippers', manufacturers', retailers' and wholesalers') needs is required to achieve the targets set out in the White Paper.
- ▶ **The development of consistent carbon footprint measurement and reporting in freight transport and logistics is a must to drive decarbonisation.** For freight transport and logistics currently there is no wide deployed framework for carbon footprint consistent and comparable measurement and reporting. The Global Logistics Emissions Council led by Smart Freight Centre is progressing on this with the support of the LEARN project. Research and Innovation projects proposing solutions to reduce carbon footprint should ensure that proper analysis of the overall impact is provided to industry and regulators to support them in taking better informed decisions.
- ▶ **Supply Network Coordination and Collaboration and Synchronomodality** (including smart steaming) are major logistics concepts **contributing to decarbonisation and reduction of congestion** from the shippers' and logistics service providers' perspective; they need to be further supported and promoted to enhance cargo consolidation.

2ND WORKSHOP

Digitalization, data sharing and trust enabling efficient and sustainable freight transport and logistics

The second Collaborative Innovation Day was focused on digitalization, data sharing and trust enabling efficient and sustainable freight transport and logistics. The event was aimed at dealing with ICT innovation and new available services, identifying the barriers to achieve a dynamic collaborative supply chain. Logistics is a sector that will be strongly impacted by the fast digitalisation of information and communication. This is calling for an urgent change of relations between stakeholders, and – mainly – a change of business models based on collaboration and trust. The second workshop on digitalization highlighted the need for increasing these aspects among operators, trying to identify the best way forward. Additionally, technologies such as blockchain or neutral trusted platforms such as the Industrial Data Space may facilitate trust building while ensuring compliance with antitrust regulations.

The **main industrial stakeholders' achievements and future plans on digitalization** have been presented (see Annex 2)¹¹.

More in detail, the topics addressed during the second workshop were:

- **Data sharing and Trust:** Supply network collaboration and coordination rely on capabilities to share, transform and use data among all the collaborating partners. The challenge in this area is to understand the non-technological barriers that prevent data sharing, and to develop adequate countermeasures and approaches. The main theme which need to be addressed is to ensure interested parties that their data are secured and the privacy of sensitive data is kept. Relevant topics to be further studied in this respect include (cyber) security, privacy and trust, data ownership, information & data sharing policies. Additionally, technologies such as blockchain or neutral trusted platforms such as the Industrial Data Space may facilitate trust building while ensuring compliance with antitrust regulations.
- **European Information Spaces and Service Ecosystems:** interoperability among IT systems of the various transport and logistics chain actors has to be ensured by best practices for standardized communication throughout Europe. Information systems developed for independent applications need to be interconnected in a simple and seamless way (plug and play) . Collaboration between actors is essential, to create synchronized services and to cope with future pressures on efficiency, flexibility and sustainability: it is foreseen to build collaboration spaces and ecosystems where a variety of applications and services are fully accessible and consistent.

¹¹ Presentations can be downloaded from http://collaborativeinnovationdays.eu/Freight_2nd/presentation.html

- **New services enabled by digitalization:** digitalization creates more efficient transport services that are more responsive to customer needs and more resilient to changing external conditions. The result of this increased adaptability will be that the best possible mode is used at all times, following logistics requirements and prevailing network conditions.

The main conclusions of the **Logistics Cloud: “Digitalization, data sharing and trust enabling efficient and sustainable freight transport and logistics”** have been:

- ▶ **The European Logistics Industry needs to lead the digital transformation of the sector.** According to the World Economic Forum analysis, there is \$1.5 trillion¹ of value at stake for logistics players and a further \$2.4 trillion worth of societal benefits as a result of digital transformation of the industry until 2025. In other words, industry stakeholders should take notice and come together to prioritize digital transformation initiatives, given the potential for significantly high value to be created for the society. Logistics has introduced digital innovations at a slower pace than some other sectors. This slower rate of digital adoption brings enormous risks that, if ignored, could be potentially catastrophic for even the biggest established players in the business. Concerted action is needed to ensure that digital transformation is not only driving new markets and economic growth but also societal benefits in terms of reduction of emissions, energy and congestion. Urgent change of relations between stakeholders, a change of business models founded on collaboration and trust in order to achieve the benefits is envisioned by the Physical Internet (PI) concept. In this context, building standards for cross modal activities is in urgent need that needs to be driven by policy with a strong dialogue with industry.
- ▶ **Digitalisation is an enabler to connect existing closed platforms of larger industry players or to foster new business models, such as crowdsourced platforms.** Freight transport and logistics efficiency is driven by volumes. Main network of logistics operators is typically very efficient as the volumes could be fully consolidated to achieve full vehicle utilization. However, most of the times, volumes in the last mile are not enough to ensure a higher efficiency and then there is a need to collaborate with other companies in a seamless way. Moreover, there are a number of limitations preventing full optimization of the network as shippers typically request to have private networks within the operation of an external Logistics Service Provider, hence creating siloes in volumes consolidation and preventing

further network (multi company) optimization. Digitalisation may enable better and easier connectivity as well as dynamic management of the network in a very efficient way but there are only a few players ready to change their business and logistics strategy to share and collaborate in this way. In this framework, a number of new start-ups are trying to get those gains for the benefit of their business cases and are doing their best to disrupt current business models.

► **Data Sharing and building Trust are pre-requisites to ensure digital transformation.**

The challenge in this area is to understand the non-technological barriers that prevent data sharing, and to develop adequate countermeasures and approaches to ensure proper development.

► **Societal and environmental impact of new services enabled by digitalisation needs to be better understood.**

eCommerce is growing fast and in a sustained way having an important impact on supply chain and last mile freight transport. Key drivers are start ups that develop and test new solutions that are closely linked to B2C activities, having direct impact on the way and amount deliveries are made within urban areas. Traditional business processes will be broken up by digitalisation. Indeed, new and developing technologies are seen as main influencers and potential game changers for certain logistics operations and/or logistics as a whole. In detail, development of technologies such as: robotisation, human machine interfaces, automation of transport and drones, automated delivery vehicles, Internet of Things (IoT), augmented reality, big data, blockchain, Industry 4.0 and 3D printing, machine visualisation and learning, fifth generation smartphones (5G), enhanced system interoperability, etc. are key to match socio-economic trends and needs such as ageing, demographic changes, oil price volatility, crowdsourcing and crowd shipping, shared economy, globalisation and localisation, consumer needs, changing behaviours and growth of e-commerce. There is a clear need to understand how these technologies may impact logistics operation and therefore socio-economic aspects such as environment, energy, safety and security, employment and growth. The development of all these technologies is supported by the European Commission. Higher collaboration between technology driven actions and field applications is needed. And in particular the need for a transition strategy for those citizens displaced by digitalization and in terms of education of future generations that will need totally different skills to work in a digitalized world.

3RD WORKSHOP

City Logistics

Freight transport is «global» and «local» at the same time – involving long-distance intercontinental shipping as well as door-to-door individual delivery. While the previous workshops were mostly dedicated to long-distance freight transport, this third workshop was focused on City Logistics.

Urban freight affects in a relevant way the quality of people's life, since it is an important traffic component in cities and it is responsible for 25% of urban transport related CO₂ emissions and 30 to 50% of other transport related pollutants (particulate matter, Nitrogen Oxide). In this context, it is fundamental to understand the potential for stakeholders cooperation, including the need of new business models, in order to improve city logistics efficiency and sustainability. The different interests of actors involved in urban logistics (local authorities, shippers, retailers and logistics service providers and consumers) need to be addressed to find solutions satisfying all of them.

The **main stakeholders' achievements and future plans for City Logistics** were presented focusing on the challenges of reducing congestion, reducing emissions, increasing cooperation and enhancing land use and planning (see Annex 3)¹².

More in detail, the topics addressed during the third workshop were:

- **SULP (Sustainable Urban Logistics Plans): Are they needed? How to include regional connections?** The Sustainable Urban Logistics Plan (SULP) is a specific Plan for designing logistics solutions within mid-term horizon and managing urban freight processes. It should consider the integration between networks and operations, the improvement of the interaction between long distance freight transport and urban freight including also the regional area.
- **Private and Public collaboration; new procurement strategies.** Local authorities could encourage zero emission transport, stimulating operators to provide more sustainable transport solutions via procurement strategies, which should properly consider the development of city hubs such as (urban or extra-urban) consolidation centres.
- **New Consumption patterns: Technology-driven or responding to social demand?** The full integration of urban freight in the city depends on the evolution of people lifestyle. Different models of urban development and regional land uses together with demographic trends and the new behavioural patterns such as teleworking or e-commerce impact the organisation of last-mile delivery. Available technologies allow door-to-door delivery at any time, thus generating a number of trips that impact strongly on the urban traffic. New business models, like crowd-shipping or crowd-delivering, can have an impact on the demand for passenger transport and goods transport, that could become either complementary or antagonistic.

¹² Presentations can be downloaded from http://collaborativeinnovationdays.eu/Freight_3rd/presentation.html

The consequences of these consumption patterns should be evaluated to implement measures able to harness the opportunities offered by technological development and preserve the quality of life of our cities.

The main conclusions of the **Logistic Cloud: “City Logistics”** were:

- ▶ **More attention to city logistics planning and development is needed from city authorities in SUMP.** Growth of e-commerce and also new delivery business in cities are changing the framework in which citizens access services and goods. This is creating a paradigm change in city logistics that is impacting the city liveability. Currently measures are focussed on banning diesel trucks and other restrictions for the movement of goods. This should be accompanied with clear measures and clearer understanding and planning of logistics activities in cities to ensure citizens proper access to services and goods. Within SUMP, Logistics Plans should be addressed and considered. Cities are rarely addressing how digitalisation opens a large playground for them to plan and steer flows within the city area. Both (private and cities solutions) should be exploited on technical innovations (e.g., linking digital solutions with physical assets for delivery) as well as process innovations and impact assessments.
- ▶ **Increased Public-Private Collaboration is needed in the City Logistics domain.** Some cities are facing problems derived from congestion and emissions. While this is happening, studies show that urban delivery vehicles in cities can have a utilization rate as low as 24%. In order to make efficient and smart utilization of city transport infrastructure, a model for the city logistics needs to be developed and further private-public collaboration can support further integration of traffic flows in cities. Examples such as concessionary systems associated to greener city logistics models need to be further explored and exploited.
- ▶ **City Logistics is currently in a paradigm change that needs to be better understood to realize societal and environmental opportunities.** E-commerce is growing at a double-digit rate in almost every country in Europe which entails a tremendous increase in city deliveries. While this is seen as a major contributor to traffic, emissions and congestion, there is still an opportunity to achieve a transformation to a more efficient delivery capability decoupled from environmental and mobility nuisances. In parallel, new technologies such as modularisation of transport units, autonomous delivery vehicles and drones are presented as potential technologies to be implemented in the near future. Impact of these solutions and the way these systems could transform city dynamics need to be further explored and understood.

Overall Conclusions and Results

The main general conclusions out of the 3 events are the following:

- ▶ **Collaborative Innovation Days have demonstrated a high added value for participants:** in one day a broad overview of key industry leader's achievements and future plans as well as of European R&I projects developments and outcomes could be shared within the innovation ecosystem. Many participants considered this opportunity rather unique in its set-up. Productive discussions and new ways of addressing current challenges have been facilitated in the context of each Cloud.
- ▶ **The concept of Clouds is suitable as a framework to develop Collaborative Innovation.** 'Cloud' is a dynamic concept; it is something able to change shape and dimension, guaranteeing a high degree of freedom and flexibility. A variety of cross-modal and cross sectorial stakeholders are engaged in a fully multidisciplinary approach. Logistics Clouds serve to address a specific challenge, opportunity, or innovation area in an open environment and discussion area preceded of an "up to speed" session for better understanding industry and research state of the art. The idea is giving input to regulatory activities, when necessary, support a faster result uptake, and identify success.
- ▶ **The topics addressed in the Logistics Clouds have been fully backed by a strong participation of stakeholders.** The initiative has been really welcome by all stakeholders and the topics selected have been judged of high interest. More than 70 registered participants in average for a final participation of 55-60 people for each workshop. Based on this experience and in consideration of the flexibility of the concept, in future more concrete topics should be foreseen in order to target a smaller number of participants and thus enhance closer interaction and enrich discussions.

The final conference will take stake of the vibrant discussions had during the three workshops, build on them and consolidate the main outcomes in a proposal for future actions by the industrial stakeholders, the research providers, and the concerned decision makers. This proposal will also contribute to the preparation of future EC programmes for research and deployment.

Following the participants contribution, it will be also possible to identify themes for further cloud events to be planned for the months to come.



ANNEX 1

Projects 1st Workshop

NAME OF PROJECTS	FRAMEWORK PROGRAMME	DURATION	TITLE
4FOLD	HORIZON2020	2016-2018	Reduction of International transport of Empty Containers by Folding
CLICK & TRUCK		2016	
CLUSTER 2.0	HORIZON2020	2017-2020	Open network of hyper connected logistics clusters towards Physical Internet
CO3	FP7	2011-2014	Collaboration Concepts for Comodality
ECOHUBS	FP7	2012-2015	Environmentally Coherent measures and interventions to debottleneck HUBS of the multimodal network favoured by seamless flow of goods
LEARN	HORIZON2020	2016-2019	Logistics Emission Accounting and reduction Network
LESS THAN WAGON LOAD	HORIZON2020	2017-2020	
MODULUSHCA	FP7	2012-2016	Modular Logistics Units in Shared Co-modal Networks
NEXTRUST	HORIZON2020	2015-2018	Building sustainable logistics through trusted collaborative networks across the entire supply chain
SAFE-CTS	HORIZON2020	2015-2017	Efficient and cost-effective intermodal road-rail container freight system
SMART-RAIL	HORIZON2020	2015-2018	Smart Supply Chain Oriented Rail Freight Services
SYNCHRONET	HORIZON2020	2015-2018	Synchro-modal Supply Chain Eco-Net
TRANSFORMERS	FP7	2013-2017	Configurable and Adaptable Trucks and Trailers for Optimal Transport Efficiency

Impact of Project Imbalances in trade cause the need to reposition empty containers. When containers have been unstuffed there is often a lack of cargo for the return journey. Ocean carriers end up spending about €25 billion a year on repositioning empty containers to the point of their next cargo. On average 20% of the containers transported on sea, and 40% transported on land are empty. Transportation and handling of empty containers is inefficient, it cuts into shipping lines profitability and it adds to unfavorable greenhouse gas and fine particle emissions.

The **4FOLD** foldable container is a truly innovative product that could cause a revolutionary change in the worldwide container transport business. In folded condition, the containers' volume is only 25% of that of a standard container. With conventional methods, four empty containers can be bundled and shipped, handled and stored as one conventional container.

**Current TRL
or TRL expected**

Start TRL: 8
Target TRL: 9

**Exploitation
of results**

As a result of the tests by different logistic parties the final details to successful implement **4FOLD** as a solution to reduce empty transportation and as a result reduce emission of greenhouse gas and fine particle emissions. **4FOLD** Foldable containers is co-funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No. 711257.

Website

www.cordis.europa.eu/project/rcn/203538_en.html

Project description

CLICK&TRUCK is a B2B opportunistic collaborative solution which connects in real time the needs of Industrial companies and the available capacities of carriers.

CLICK&TRUCK vocation is to connect in real time shipping goods offer and demand via a collaborative platform. This digital solution helps to reduce intermediaries, simplifying exchanges and optimizing flows. The platform is time saving and give sustainable and economic efficiency. This solution is part of the Physical Internet philosophy due to its interconnectivity and its flow optimization.

CLICK&TRUCK operates in real time trucks fill rate (planned or current trips) and industrial 'needs.

Targets & Partners

Partners : GS1 (interconnectivity) , Les Mines Paritech (predictability)

Achievements & Impacts

On average more than 20% of available capacities are not exploited and companies have trouble to find the right carrier to deliver their small and medium orders. That's how **CLICK&TRUCK** came about. We adapt the opportunistic sharing economy concept to the road field, the platform facilitate businesses between carriers and industrials. We created an algorithm which matches shipper orders with an existing carrier's route plan if he had available spaces, at the right time.

Regarding the environmental issues, greenhouse gas emissions are reduced thanks to a better use of trucks.

Follow up & Lessons learnt

CLICK&TRUCK has been launched at the end of 2016 with a pilot version. It would be premature at this stage to evaluate the results. We need to create a high traffic and this may take time. But we are already exploring new features.

For example, in the future, we will integrate energy criteria (Trucks Euro standards, GNV...) in the transport search and we will calculate in real time the contribution of Click&Truck to reducing greenhouse gas emissions.

Website

www.clickandtruck.com

Clusters 2.0 project

Impact of Project

The vision of **CLUSTERS 2.0** is to leverage the full potential of European Logistics Clusters for a sustainable, efficient and fully integrated transport system. **CLUSTERS 2.0** is aligned with the Physical Internet deployment roadmap defined by ALICE

Its achievement will be based on the following aspects:

- ▶ Enhancing and advancing towards a better co-ordination between logistics actors in clusters
- ▶ Improving co-ordination and connectivity between European logistics clusters.
- ▶ Making optimal use of an Open Network of Logistics Clusters

The following actions will be performed during the project:

- ▶ Optimized handover and asset management through real time services at depots and terminals Developing New Modular Loading Units and innovative handling technology to accelerate handling processes
- ▶ Establishing CargoStream a European wide community for freight sharing and collaboration (demand side)
- ▶ New governance models introducing the role of a neutral agent forming the basis for new business model
- ▶ Enhanced services on the supply side introducing the concept of Proximity Terminal Networks (PTN)
- ▶ Regulation and policy enhancing the set-up of collaborative cluster environments

Current TRL or TRL expected

CLUSTERS 2.0 will make use of partly existing technology and prototypes, partly elements will be developed newly. Technological Readiness Level (TRL) vary from TRL 2 to TRL 9, however none of the foreseen solutions to be developed in **CLUSTERS 2.0** exists to date. The position of **CLUSTERS 2.0** is within the “lab-to-market” spectrum and it is envisaged to achieve a TRL 7 by the end of the project ensured by an iterative and agile development process enabled by the Living Labs.

**Exploitation
of results**

Three Living labs, considered as potentially exploitable, will be developed during the project:

- ▶ **INNOVATIVE CLUSTER HANDLING TECHNOLOGY:** It develops intermodal connections with the new modular logistics units (NMLU) prototypes, new transshipment and handling technologies. Initially in Crailsheim, Oesingen, Roosendaal, Venlo and Brussels Airport
- ▶ **SYMBIOTIC NETWORK OF LOGISTICS CLUSTERS:** it aims at connecting TEN-T corridors' hubs with other hubs together. Additionally, a Dynamic Terminal Management Platform to synchronize cross-company processes in terminals. First stage: Dourges, Duisport, Bologna, PLAZA. Second stage: Athens port, Brussels Airport, Heathrow and Trelleborg
- ▶ **PROXIMITY TERMINAL NETWORK & CLUSTER COMMUNITY SYSTEM:** validating into real business context the outputs as Cluster building blocks and the establishment of value added services at Bologna Freight Village and Trieste.

Website

www.clusters20.eu

Impact of Project

- ▶ **co³** developed and validated (demonstrated) new value chains and business strategies between major companies/shippers allowing them to have logistic cost reductions of 10-20 %, with carbon footprint reductions of 20-30%.
- ▶ An international legal framework has been elaborated by leading law offices.
- ▶ The indispensable role of a neutral trustee was introduced, to facilitate the collaborative process and compliance with the competition rules.
- ▶ The most critical issue to make Horizontal Collaboration successful is the mental shift.
- ▶ The gain sharing mechanism is crucial to create stability and fairness in the collaboration.
- ▶ In the project period of 3 years (September 2011 – August 2014), the developed tools, technologies and business models were applied and validated in the market place via pilot studies and 6 'test cases'.
- ▶ Finally, the **co³** consortium promoted and facilitated matchmaking and knowledge sharing through over 50 conferences and practical workshops to transfer knowledge and increase the awareness and acceptance of horizontal collaboration.

Current TRL or TRL expected

Start TRL: 2
Target TRL: 7

Exploitation of results

- ▶ The results of this project **co³** were important in the development of Physical Internet roadmaps for ETP-ALICE.
- ▶ Several start-ups and initiatives in the market are launched to reach the first steps of collaboration in reducing empty runs, sharing loads and sharing other modes of transport on certain lanes.
- ▶ The H2020 project NexTrust has been started in 2015, runs for 40 months as a follow-up of **co³**.

Website

www.co3-project.eu

EcoHubs project



Impact of Project

ECOHUBS led to:

- ▶ 20% increased capacity in a European port;
- ▶ 15% increased capacity in another European port;
- ▶ Increase in turnover of between 1.6 and 2.3 million euro for an European port;
- ▶ Savings of many millions of euro in each of the 4 Use Cases in a European terminal;
- ▶ Savings of over 800 thousand euro a year in another European terminal;
- ▶ A CO₂ footprint reduction of 56% in a European terminal;
- ▶ A payback period of between 2 and 3 years for **ECOHUBS** technical partners;
- ▶ Similar benefits being achieved by UIRR members not in the project to those presented above for the UIRR members who were partners in **ECOHUBS**.

Current TRL or TRL expected

Start TRL: 5

Target TRL: 8

Exploitation of results

The end-users are benefitting already from the developments in the project, as can be seen above. The technology partners have products in the market which have already led to sales.

Website

www.ecohubs.eu

Impact of Project

LEARN will help industry, supported by other stakeholders, to benefit from practical means to track and report the carbon footprint of logistics activities and support the implementation of emission reduction measures. This includes a roadmap to progress towards an eco-label for the transport chain, which signifies the possibility to ensure the usability and ensured added value of such a label.

Hence **LEARN** will contribute significantly to the removal of barriers within the system:

- ▶ Political barriers: lack of co-ordinated leadership at national and international levels to harness the potential contribution of logistics efficiency carbon reduction;
- ▶ Organisational barriers: missing global recognition of the GLEC framework as the starting point for GHG calculation, reporting and reduction framework;
- ▶ Technical barriers: lack of technical support mechanisms to allow coverage for logistics emissions accounting of all elements of transport chains
- ▶ Communication barriers: a global coordination to bridge the gap between industry needs, policies, research, funding and other support needs to be implemented; and then move on to help identify how a harmonised approach to carbon accounting in the logistics sector.

Current TRL or TRL expected

Start: GLEC Framework is aligned with major methodologies at individual mode level, but only front-runner companies (HP, HP Enterprise, Intel, DP-DHL, Schenker, K+N, Geodis, SNCF, Damco) have committed to adopt the Framework.

Expectation is that the harmonised approach taken by GLEC Framework will be adopted by green freight programs and calculation tools spread to a selection of major shippers and LSPs. Also used to inform future policy developments in line with business needs.

Exploitation of results

Results of **LEARN** will feed back alongside other inputs into the GLEC Framework for Logistics Emissions Methodologies which is industry's own standard for the calculation and reporting of logistics carbon footprint. Uptake of the framework by individual companies will increase with proactive use of the calculation results to inform logistics emissions strategies and drive progress in achieving sectoral carbon reduction targets.

The blueprint for an eco-label will be available for further development and implementation in cooperation with green freight programs and potentially public authorities.

Website

www.learn-rdm.eu/en/about/

LessThanWagonLoad project



Impact of Project The **LESSTHANWAGONLOAD** project has the objective to develop a smart specialized logistics cluster for the chemical industry in the Port of Antwerp. This objective will be realised by developing:

- ▶ a new rail transport solution for single pallets with an Automated Wagon Loading System and
- ▶ new added value rail freight services for the Antwerp chemical cluster.

These potential new services consist of parking, repair, picking and cleaning for chemical wagons, rail connected cross docking of pallets and improved rail connections by setting up mixed trains with conventional and maritime container volumes. Realising the **LESSTHANWAGONLOAD** project will contribute in a substantial way in realizing the EC's ambition to shift 30% of road freight over 300km to low-emission modes by 2030. The potential benefits of the project for European society are:

- ▶ environmental improvements,
- ▶ reduced costs of rail freight,
- ▶ increased inter-modality and higher resilience of the transport system,
- ▶ local economic growth and employment,
- ▶ less congestion and traffic casualties and
- ▶ less risk on social dumping.

Current TRL or TRL expected TRL 1 at the start , TRL 7 expected in 3 years. From design to working prototype

Exploitation of results The consortium partners are highly ambitious in developing ground-breaking concepts (e.g. LWL), but also in developing new technology (e.g. automated loading of wagons) and in working out collaborative business models to bundle volumes and maximise equipment utilisation within the cluster. With the strong involvement of operational companies and the industry, we are convinced that the newly developed concepts, technologies and services - if proven viable - will be very rapidly implemented and exploited.

Website www.lessthanwagonload.eu

Impact of Project

MODULUSHCA was a first genuine contribution to the development of Physical Internet at the European level, in close coordination with North American partners and the international Physical Internet Initiative. **MODULUSHCA** advanced particularly in the field of developing the concept of interconnected logistic and to develop a first set of modular loading unit concepts providing a basis for an interconnected logistics system for 2030.

MODULUSHCA integrated five interrelated working fields:

- ▶ developing a vision addressing the user needs for interconnected logistics in the FMCG domain;
- ▶ the development of a set of exchangeable (ISO) modular logistics units providing a building block of smaller units;
- ▶ establishing digital interconnectivity of the units;
- ▶ development of an interconnected logistics operations platform leading to a significant reduction in costs and CO₂ emissions that will be;
- ▶ demonstrated in two implementation pilots for interconnected solutions.

Current TRL or TRL expected

Start TRL: 2

Target TRL: 6

Exploitation of results

MODULUSHCA partners agreed within the Consortium Agreement that the goal of the project is to develop an industry standard in terms of layout, size, and functional features for modular logistic units. Reaching the **MODULUSHCA** project end, the consortia partners and Board of Directors considered necessary to continue with the work done. A “Modularization Task Force” under the umbrella of ALICE (European Logistics Technology Platform) was created further developing the standards within FMCG aiming to stimulate further industry driven applications and outreach.

Website

www.modulushca.eu

Impact of Project

NEXTRUST aims to build trusted networks that will fully integrate shippers, logistics service providers, and intermodal operators as equal partners. The project coordinates pilots which will aim to:

- ▶ Remove 40 % of lorries;
- ▶ Remove 15 % of delivery vehicles;
- ▶ Reduce GHG by 70 %;
- ▶ Increase load factors by 50 %.

NEXTRUST unique core is the trustees role to facilitate a legally anti-trust compliant environment respecting the EU internal rules of a liberal market.

Current TRL or TRL expected

Start TRL: 2-7

Target TRL: 8

Exploitation of results

The key element to market uptake is the link of project results with the **NEXTRUST** Industry Board (NIB). The NIB is an external steering group consisting of relevant actors from business (manufacturers, retailers, service providers), academia and civil society. Relevant partners there will use their market channels to accelerate the adoption, which in and of itself amplifies the impact of the project results. A **NEXTRUST** Collaboration Hub is the innovation platform creating the intended market “stickiness” to relevant stakeholders.

Website

www.nextrust-project.eu

SAFE-CTS project



Value Proposition

The CTS-technology (Container Transfer System Technology) will enable a synergized and efficient distribution network through:

- ▶ Cheaper
- ▶ Faster
- ▶ Smarter
- ▶ Greener
- ▶ Global sustainable mean of transportation



Cases, expected impacts and interim major results

The CTS-system will contribute to a more efficient and sustainable way of moving goods, whilst being cost-reductive and environmental friendly.



Collaboration opportunities

A Global Collaboration through and between countries and businesses is paramount. Key competences on each level is vital to a global sustainable supply chain.

Each user is inter- connected on one or more level, either on strategic, tactical and/or a operational level.

As provider or receiver of the physical network the importance of inter-collaborative connections is important to achieve the disruptive, global and sustainable distribution network, necessary to deliver a greener, smarter and more economical way of moving goods.



Website

www.safegl.eu

Impact of Project

The **SMART-RAIL** project is improving rail freight services offered to shippers, focusing on reliability, lead time, costs, flexibility and visibility. **SMART-RAIL** creates awareness to the rail sector on the positioning of rail freight in the supply chain and the logistical costs created for the users in case of poor performance on these service criteria.

The rail freight system is very complex and interconnected and as a result, improvements to the rail organisation require cooperation of many stakeholders. **SMART-RAIL** is developing innovative business models and solutions for (improved) data/information exchange enabling and facilitating the required cooperation.

Three operational cases (Continuous Improvement Tracks/Living Labs) have been implemented to test and improve the innovative measures in a real life situation. This approach has proven to be very effective to identify the key barriers and organisational problems to be solved which would not be found in a theoretical context.

Current TRL or TRL expected

Start TRL: 2-4

Target TRL: 4-7

Exploitation of results

Results being transferred to different stakeholders:

- ▶ R&I recommendations for Shift2
- ▶ Strategy & Policy recommendations for DGMOVE and rail sector
- ▶ Logistical and rail data/information system recommendations for RNE and ongoing H2020 projects (Aeolix & Selis)
- ▶ Operational recommendations for the rail sector
- ▶ Operational recommendations for rail users

Website

www.smartrail-project.eu

Synchro-Net project



Impact of Project

The main progress in each **SYNCHRO-NET** solution set modules are:

- ▶ Slow Steaming Simulation&Control will be very important, to keep into account the real needs of the stakeholders, in order to focus the efforts on what the market will require in the future. The needs of the final users must be both part of the product and of what the final user will pay for.
- ▶ Real-time Synchro-modal Logistics Optimisation: The ability of the **SYNCHRO-NET** model to take a more “holistic” view of supply chain optimisation is expected to drive major cost savings for operators, to enable reduced emissions&congestion, and better management of risk in the supply chain.
- ▶ Dynamic Stakeholder Impact Assessment Module: The use of a sophisticated methodology does develop the functionality and to understand stakeholder's objectives and patterns of use will ensure that the solution is practical and commercially oriented.
- ▶ Synchro-modal Supply Chain Risk Analysis Module: This module provides the decision-maker with novel Key Risk Indicators showing expected delays, potential safety issues and probabilities of failing links in the supply chain.
- ▶ Synchro-operability Communications and Governance Architecture: The combination of communication, open interfacing, governance and cloud-service enablement makes the **SYNCHRO-NET** architecture unique and can be considered as a further asset for exploitation.

Current TRL or TRL expected

Start TRL: 1-2

Target TRL: 7

Exploitation of results

SYNCHRO-NET will be marketable as an overall system that consists of various modules targeting different groups of end-users. The modules can and will be marketed individually. The **SYNCHRO-NET** consortium had defined three business demonstrators and continuously develops new use case scenarios to provide information on the application of **SYNCHRO-NET** in real life.

Website

www.synchronet.eu

Transformers project



Impact of Project

By combining reduced energy consumption with load optimisation for long haul transport, **TRANSFORMERS** targets a 25% energy consumption reduction per tonne.km of goods transported through innovations including:

- ▶ A semi-trailer mounted “Hybrid-on-Demand” (HoD) electric driveline.
- ▶ Mission-based, transformable vehicle aerodynamics.
- ▶ An internal trailer design offering optimised load capacity.
- ▶ Mission adaptability allowing optimisation for each transport mission.

The innovative solutions to increase the efficiency of long haul goods transportation have been developed from end user requirements. A Load Optimisation Trailer increases capacity within current EU regulations, along with a novel multi-segment lowerable roof to optimise aerodynamics. A distributed, trailer mounted “Hybrid on demand” electric driveline has been integrated into the Energy Efficiency Trailer, which also features aerodynamic optimisation including an innovative single segment lowerable roof. The electric driveline supports the conventional tractor driveline, and features intelligent energy control. Both trailers are under test at present. A pre-standardisation tractor-trailer communication interface proposal facilitates future market penetration. Practical and economic viability of the innovations is being evaluated, and effects on the highway infrastructure are investigated.

Current TRL or TRL expected

Start TRL: 2

Target TRL: 4-5

Exploitation of results

The **TRANSFORMERS** innovations have been developed with fast market uptake in mind, and it is anticipated that developments of the various innovations will be taken to market in the future, depending on the outcome of on-going testing. Full results will be available in June 2017. Support may be needed to influence regulatory and standardisation activities, to facilitate the market introduction of “Hybrid on Demand” technologies.

Website

www.transformers-project.eu



ANNEX 2

Projects 2nd Workshop

NAME OF PROJECTS	FRAMEWORK PROGRAMME	DURATION	TITLE
AEOLIX	HORIZON2020	2016-2019	Architecture for European Logistics Information exchange
CO-GISTICS	CIP	2014-2017	COoperative loGISTICS for sustainable mobility of goods
CORE	FP7	2014-2018	Optimised Resilient Secure Global Supply-Chains
iCARGO	FP7	2011-2015	Intelligent Cargo in Efficient and Sustainable Global Logistics Operations
LOGICON	FP7	2013-2015	Lean Secure and Reliable Logistic Connectivity for SMEs
SELIS	HORIZON2020	2016-2019	Towards a Shared European Logistics Intelligent Information Space
TT	HORIZON2020	2017-2019	Transforming Transport

Impact of Project

AEOLIX will develop a platform for connecting logistics information systems of different characteristics, intra and cross-company, for immediate (real-time) exchange of information in support of logistics-related decisions. The ambition is to develop architecture for a distributed open system which will exchange information among key logistics actors (commercial companies as well as relevant authorities), enabling increased use and impact of such information in the value chain. During the project, logistics related business issues have been selected as use cases to be researched at different Living Labs to validate and demonstrate the benefits of the platform. The **AEOLIX** Platform represents a critical step forward for supply chain visibility and interoperability through the decentralisation of information sharing.

Current TRL or TRL expected

TRL at the start: TRL 3 experimental proof of concept, TRL expected : TRL 5 technology validated in relevant, environment (industrially relevant environment in the case of key enabling technologies).

Exploitation of results

The **AEOLIX** platform should be a proof-of-concept at the end of the project, demonstrating the feasibility and functionality of features that support new ways of enhancing supply chain visibility and interoperability by implementing and delivering services. It is clear that an impact assessment cannot be easily realised for a platform and services that are being validated, and at a prototype stage or before larger scale exploitation, require a commercial state product and operation. First, it would be possible to analyse previous studies and project the potential (indirect) impact of the selected services and then how, through the platform, these can be enhanced. The overall impact of **AEOLIX** will depend on the set of future services provided by the platform and the penetration rate of the services. The capabilities of a platform such as **AEOLIX** can potentially enhance the impacts of different services and data.

Website

www.aeolix.eu

Impact of Project

CO-GISTICS is the first European project fully dedicated to the deployment of cooperative intelligent transport systems (C-ITS) focused on logistics with the following main objectives: pilot and deploy C-ITS in European logistics hubs; reduce fuel consumption and the equivalent CO₂ emissions; improve logistics activities efficiency in urban areas; harmonise testing and drive interoperability forward; cooperate with logistics and freight public/private bodies. **CO-GISTICS** consortium has 33 partners and services are deployed in 7 European logistics hubs: Arad (Romania), Bordeaux (France), Bilbao (Spain), Frankfurt (Germany), Thessaloniki (Greece), Trieste (Italy) and Vigo (Spain). **CO-GISTICS'** partners are working together for three years on the installation and running of cooperative services. Next month, on 8th-9th June will be the **CO-GISTICS** Final Event and Demonstration in Trieste for the first Cooperative ITS Deployment. It will be live demonstrations with demo trucks/buses in a protected area next to the conference location as well as a simulated indoor demonstration.

Current TRL or TRL expected

Start: TRL 3 experimental proof of concept

Expected: TRL 7 system prototype demonstration in operational environment

Exploitation of results

All C-ITS services developed in the **CO-GISTICS** project as follows:

- ▶ Cargo Transport Optimization
- ▶ Priority and Speed advice
- ▶ Intelligent parking and delivery areas
- ▶ CO₂ emission estimation and monitoring
- ▶ CO₂ eco drive support

are ready for the market.

Website

www.cogistics.eu

Impact of Project

The Major outcomes of the **CORE** project will be:

- ▶ Advanced Supply Chain Risk Management
 - Deployment of innovative control capabilities
 - Transition in 4T-portfolio from transfer/tolerate to treat
- ▶ Reduced trade compliance costs for legitimate and trusted traders
 - Adoption of supply chain driven supervision models
 - Boost mutual recognition of security programmes
 - Accelerate Coordinated Border Management
- ▶ Society better protected against supply chain security risks
 - Effective risk-based control and supervision
 - Boost collaboration B2B, B2G and G2G
 - Higher resilience

Exploitation of results

The **CORE** Demonstrators will validate the applicability and benefits of the **CORE** approach in representative operating scenarios characteristic of the global supply chain.

These scenarios cover

- ▶ All continents/Geographies
- ▶ Import/entry, export/exit, transit
- ▶ Entry/exit modes: Sea/Air/Road/Rail
- ▶ Hinterland interfaces: Road, Rail, IWT, Shortsea
- ▶ Product related compliance
- ▶ Veterinary / Phytosanitary
- ▶ Dangerous goods

Website

<http://www.coreproject.eu/>

Impact of Project

The impact expected after the project completion results from significant take-up of the iCargo approach and technologies in exploitation activities of logistics services and ICT providers, supported by public authorities' investments in cooperative infrastructure. On the one side, the new low-carbon logistics services and the cooperative approaches are expected to favour modal-shift thus reducing transport related CO₂ emissions. **iCARGO** achieved this by:

- ▶ Improving the cost and time effectiveness of intermodal freight transport, thus significantly increasing the modal shift from road to less polluting transport systems.
- ▶ Improving synchronization between urban and inter-urban freight flows, increasing the effectiveness of local distribution.

From social point of view two issues of **iCARGO** have impact on lives:

- ▶ Less congestion on roads through less number of trucks, due more filled trucks,
- ▶ Less CO₂ emissions due to full trucks meaning less trucks on the road

Current TRL or TRL expected

Target TRL: 5-9

Exploitation of results

Efficiency of Intermodal Transport: using dynamic publication of logistics services combined with dynamic chains for managing intermodal freight to reduce the manual communications of 30 FSI with LSP to five minutes and use the Proximity Network concept.

Reduction of freight services CO₂ emissions: LSP/Shipper collaboration was improved in two scenarios: (a) overall reduction in emissions for the services offered by Freight Forwarder to a shipper has a reduction in 50% due to an increased load factor from 44% to 67% approx. The shipper has reduced the number of vehicles such that more than 5M truck km have been removed from EU roads per year; (b) Carbon emission monitoring – cross chain: share information in real-time across business domains to calculate emissions automatically at order level. Shipment data is available within 1 week and calculation can be done as per immediate in the **iCARGO** CO₂ calculator.

Website

<http://i-cargo.eu/>

LogiCon project

Impact of Project

LOGICON developed simple and pragmatic targeted solutions for data exchange in trade and logistics that improve communication through digitisation of documents exchange. It aimed to enable SMEs collaboration with advanced platforms by providing them with solutions such as apps, communication platforms and market places, removing technological barriers and establishing partnerships with existing logistic platforms.

The project activities were carried out in four national Living Labs, each one with specific objectives, dealing with three main challenges:

- ▶ enabling connectivity for SMEs acting in logistics market,
- ▶ engaging communities, either cargo communities around port and inland terminals or business networks,
- ▶ preparing for cooperation in a global freight ecosystem.

Current TRL or TRL expected

Different TRL levels have been achieved in specific Living Labs:

- ▶ Polish LL – developed a communication platform for intermodal transport collaboration – TRL2 at the start, TRL7 achieved
- ▶ Dutch LL – created an infrastructure for sharing data – TRL4 at the start, TRL7 achieved
- ▶ Spanish LL – developed apps for web and smart devices for truck drivers – TRL3 at the start, TRL7 achieved
- ▶ Italian LL – delivered a web-based transport market place – TRL5 at the start, TRL7 achieved

Exploitation of results

Results achieved in four national Living Labs:

- ▶ The Polish LL implemented an innovative communication platform for intermodal transport collaboration at Baltic Container Terminal. It enables information sharing for the hinterland planning processes by all parties involved – Logistics Operators, Rail Carriers & Container Terminal. The functionality includes among others exchange of bookings for intermodal transport, allocation of bookings to rail wagons, exchange of loading and unloading plans and status, monitoring of execution.
- ▶ The Dutch LL created a light-weight, low-cost and flexible infrastructure for sharing data including dedicated apps and services enabling e.g. lock planning in inland waterway transport.
- ▶ The Spanish Living Lab developed apps for web and smart devices for truck drivers to support service information exchange, e.g. tracking of truck departure and arrival, creating and sending of transport orders and invoices.
- ▶ The Italian LL delivered a web-based transport market place at Interporto Bologna where SMEs could offer their transport services to potential customers engaging new business opportunities.

Website

www.logicon-project.eu

Impact of Project

- ▶ Swift deployment of Collaborative Logistics Models (CLMs), matching demand of Goods and available T&L resource, synchro-modality, stock optimisation) for efficient, green and secure supply chains through the build-in Collaboration Engine (CE). The CE enables the computer to process event based queries, generated automatically, and to invoke the necessary system components, including big data predictive analytics, and computational functions required for running CLMs.
- ▶ Intelligent connectivity to information sources used in a **SELIS** Community Node –SCN (interfacing to participants' info sources APIS/ Tools/ Dashboards/ IoT, other nodes) according to a CLM and associated 'collaboration agreement', incorporating fully configurable security services.
- ▶ Scalable intelligent SCN Delivery technology enabling logistics communities to build and deploy their own collaborative applications and services, respective to their business needs and business relationships, with a high level of automation.
- ▶ Trust-based collaboration methodology. **SELIS** will be a neutral and trusted "third party", ensuring transparent and open collaboration. Data tier is owned/managed exclusively by the client.

Current TRL or TRL expected

TRL at the start: 2/4. Target: Robust industry demonstrators, field tested with several industry leaders, to TRL 6/7 POC level.

Exploitation of results

SELIS will deliver a business plan, market analyses and feasibility study - end goal is to spin out a new EU SME to deploy, manage, scale and administer the **SELIS** platform for all of Europe, as well as provide specialist assistance in building business applications for SELIS businesses and clients.

SELIS will file minimum 4 EPO and USPTO Patents, end going to protect the innovation in Europe.

Website

www.selisproject.eu

Impact of Project

TRANSFORMINGTRANSPORT will have a profound impact with respect to Big Data adoption in the mobility and logistics sector. **TRANSFORMINGTRANSPORT** will demonstrate a measurable and replicable increase of productivity in seven mobility and logistics pilot domains on how Big Data will contribute to sector transformation, increasing its competitiveness and productivity. A unique characteristic of TT is that all transport modes, sectors and stakeholders together with their relevant data are covered in this project. This means **TRANSFORMINGTRANSPORT** will showcase the transformative nature across the whole mobility and logistics value chain, and not only for individual market segments. Thereby, **TRANSFORMINGTRANSPORT** will further strengthen and increase the innovation potential and market opportunities of EU companies in a sector where they are already strong. Overall, **TRANSFORMINGTRANSPORT** will deliver all impacts expressed in the work programme, and in particular will leverage additional target sector investments of at least 6 times the EC investment.

Current TRL or TRL expected

As a large scale pilot, **TRANSFORMINGTRANSPORT** will deliver results that range from TRL5 to TRL7

Exploitation of results

One key element of the **TRANSFORMINGTRANSPORT** methodology is to accompany the pilot activities with a rigorous regimen of measurement, testing and reporting so as to establish proof that the innovations developed in the pilot really work in actual operating conditions and are consistent with important business parameters such as reliability, accuracy, and cost structure. To this end, specific, targeted project-wide activities for knowledge transfer, exploitation and market impact will be performed and coordinated.

Website

<http://www.transformingtransport.eu/>

ANNEX 3

Projects 3rd Workshop

NAME OF PROJECTS	FRAMEWORK PROGRAMME	DURATION	TITLE
BUYZET	HORIZON2020	2016-2019	Procurement of innovative solutions for zero emission urban delivery of goods and services
CITYLAB	HORIZON2020	2015-2018	City Logistics in Living Laboratories
CIVITAS PORTIS	HORIZON2020	2016-2020	PORT-Cities: Integrating Sustainability
DESTINATIONS	H2020	2016-2020	CIVITAS Destinations
DOROTHY	FP7	2013-2016	Development Of RegiOnal clusTers for research and implementation of environmental friendly urban logistics
FREVUE	FP7	2013-2017	Validating freight electric vehicles in urban Europe
MOBILITY4EU	HORIZON2020	2016-2018	Action Plan for the future of Mobility in Europe
NOVELOG	HORIZON2020	2015-2018	New cooperative business models and guidance for sustainable city logistics
SMARTFREIGHT	FP7	2008-2011	Smart freight transport in urban areas
SMARTFUSION	FP7	2012-2015	Smart Urban Freight SolutiONs
SPICE	HORIZON2020	2016-2018	Support Procurements for Innovative transport and mobility solutions in City Environment
SPIDER PLUS	FP7	2012-2015	Sustainable Plan for Integrated Development through the European Rail network – Projecting Logistics & mobility for Urban Spatial design evolution
STRAIGHTSOL	FP7	2011-2014	STRAtegies and measures for smarter urban freIGHT SOLutions
SUCCESS	HORIZON2020	2015-2018	Sustainable Urban Consolidation CentRES for conStruction
SULPITER	INTERREG	2016-2019	Sustainable Urban Logistics Planning To Enhance Regional freight transport
U-TURN	HORIZON2020	2015-2018	Rethinking Urban Transportation through advanced tools and supply chain collaboration

BuyZET project

Project description, Targets & Partners

BUYZET aims to understand and optimise the impact of public procurement activities on transport patterns in cities – and to find innovative and sustainable delivery solutions for goods and services, which can help to address these challenges.

The **BUYZET** project is a partnership of cities aiming to achieve zero emission urban delivery of goods and services, by:

- ▶ understanding the transportation footprint of their different procurement activities;
- ▶ developing innovative procurement plans for two key procurement areas

The **BUYZET** project kicked off in November 2016 and will run until April 2019.

The three core project cities are Rotterdam, Oslo and Copenhagen. Southampton and the Brussels Capital Region are also participating as Observer Cities

The project is co-ordinated by ICLEI – Local Governments for Sustainability, with the support of Polis and TNO.

Cases, expected impacts and interim major results

Expected results and impacts:

- ▶ New procurement plans for each priority area in each city
- ▶ Methodology for mapping transportation footprint
- ▶ **BUYZET** Implementation Handbook
- ▶ Input into EU policy making and relevant working groups

Key outputs:

- ▶ New procurement plans for each priority area in each city
- ▶ Methodology for mapping transportation footprint
- ▶ **BUYZET** Implementation Handbook
- ▶ Input into EU policy making and relevant working groups

Collaboration opportunities

A group of Observer Cities will closely engage with the project, and to ensure a wider uptake of the project's results. Brussels Capital Region (BE) and Southampton (UK) are already on board as observer cities.

Observer Cities will have access to:

- ▶ Capacity building and knowledge transfer through peer exchange and close participation to **BUYZET** activities
- ▶ Exclusive opportunities to participate in study visits and expert meetings
- ▶ Financial support for the city engagement in the project
- ▶ Regular updates on the project's implementation and results
- ▶ Support in implementing step by step the project's activities

Website

www.buyzet.eu





Impact of Project

Goods, waste and service trips in urban areas impose negative traffic and environmental impacts, and there is a need for cost-effective and sustainable solutions. The **CITYLAB** objective is to develop knowledge and solutions that result in up-scaling and roll-out of strategies, measures and tools for emission-free city logistics in urban centres by 2030. The project focuses on four axes for intervention:

- ▶ Highly fragmented last-mile deliveries in city centres
- ▶ Large freight attractors and public administrations
- ▶ Urban waste, return trips and recycling
- ▶ Logistics facilities and warehouses

CITYLAB will demonstrate the potential impacts of actions in these four areas through a series of linked implementations across seven living labs. **CITYLAB** will also improve the knowledge on effectiveness of partnerships and stakeholder engagement practices in specific settings, and contribute to policy frameworks that allow sustainable business models for urban logistics solutions to be taken up and successfully adopted by businesses and authorities.

Current TRL or TRL expected

Start TRL: 3-7

Target TRL: 8

Exploitation of results

CITYLAB will explore the feasibility of replication of the implementations tested to other living labs that are part of **CITYLAB**. Scalability of the tested solutions will achieve the ultimate goal of CITYLAB: Promoting roll-out and transferability of cost-effective solutions for improved environmental and financial performance within the four axes for intervention.

Website

www.citylab-project.eu

Civitas Portis project



Impact of Project

CIVITAS PORTIS implements innovative mobility and accessibility measures to increase the functional and social cohesion between city and port in a fully sustainable way. In this project 5 European port cities (Antwerp, Aberdeen, Klaipeda, Constanta and Trieste) work together and share experience. One of the thematic areas in which the **PORTIS** partners cooperate is urban freight logistics.

The Port of Antwerp develops and implements a truck guiding system in the port. This truck guiding system is an innovative project because of the integration of different functionalities into one system. Its aim is to be a single point of information for every truck driver who will travel to, from or is in the port of Antwerp area. Every necessary information for an efficient travel to and through the port will be provided. Besides an information point, it is also the aim of the system to guide truck traffic through the port in case of congestion, accidents or peak moments. As a result, it would be possible to keep traffic away from congested areas, avoid rush hours, ... in order to prevent more traffic and problems. The whole system will attribute to the innovative image of the port of Antwerp and will contribute to a port who stays accessible and economically strong.

Current TRL or TRL expected

At this point the basics principles are determined and the next phases of the technology concept is started. At the end of the project a full operational system will be put in place.

Exploitation of results

The data gathered within this application on for example travel times, travel routes, waiting times, congestion, ... will hold a treasure on information about mobility in the Port of Antwerp. This can be used to improve the truck guiding system, but also hold information for studies such as origin-destination matrices and route plans.

Website

www.civitas.eu/portis

Civitas Destinations project

Project description, Targets & Partners

CIVITAS DESTINATIONS will develop an innovative holistic approach to building sustainable urban mobility systems for both residents and tourists. The project impacts will make a positive contribution to demonstrating how this can achieve growth and therefore provide a benchmark for other EU tourist cities. **DESTINATIONS** will demonstrate and evaluate the effectiveness of innovative sustainable mobility solutions in 6 tourist cities with different characteristics but sharing common challenges.

The competitive market for tourism means that cities have to provide the high quality, sustainable environments desired by tourists, while providing local sustainable employment opportunities that overcome the seasonal and sometimes informal nature of tourist economies.

Achieving sustainable mobility is a vital part of the growth equation for Europe's tourist cities.

The project will address:

- ▶ Sustainable Urban Mobility Planning for residents and visitors
- ▶ Safe, attractive and accessible public spaces for all generations
- ▶ Shared mobility and e-infrastructures towards zero emissions transport
- ▶ Smart & clean urban freight logistics at tourist destinations
- ▶ Mobility management & awareness for sustainable mobility
- ▶ Attractive, clean, accessible and efficient public transport

The project will test innovative solutions in six European insular cities: Madeira (Portugal), Las Palmas de Gran Canaria (Spain), Valletta (Malta), Limassol (Cyprus), Isola d'Elba, Rethymno (Crete, Grece) together with consultants and the Technical University of Beijing (China).

Cases, expected impacts and interim major results

Regarding Urban Logistics the project will:

- ▶ develop, in the six **DESTINATIONS** sites the Sustainable Urban Logistics Plan (SULP), following the well consolidated ENCLOSE methodology to be integrated in the Sustainable Urban Mobility Plans-SUMPs
- ▶ design, implement and demonstrate specific freight distribution measures and services Reducing the environmental impacts and optimizing the existing resources and relieve the constraints of tourist destinationsto

- ▶ adapt the logistic offer to the mobility demand by the development of smart platforms, aiming to manage goods delivery in urban areas and historic city centres
- ▶ promote the use of clean vehicles, clean fuels and eco-driving for last mile delivery, in order to reduce the whole environmental impacts
- ▶ promote cross-site between sites with similar measures to increase learning potential and improve results;
- ▶ adopt stakeholders engagement strategies to support the demo set up and operation of the defined logistics services ;
- ▶ carry out data collection and the evaluation (ex-ante, process, ex- post) of the implemented logistics measures
- ▶ derive cross-site evidences and conclusions in terms of business and replication/transferability potential

Collaboration opportunities

Cross-fertilisation of knowledge and best practices will be undertaken both at consortium level and beyond and the dissemination strategy will be implemented at local, national, euro-regional and international levels. The cross fertilization will be boost by a specific platform for followers to support the integration of these activities.

The innovations demonstrated within the project will provide a clear guidance to tourist cities throughout Europe, as to how achieving sustainable mobility can enrich the lives of residents and local business, improve the competitive position within the tourist market and make a positive and measurable contribution to economic growth.

- ▶ Topics of possible cooperation with other projects:
- ▶ Urban logistics in touristic cities
- ▶ Integration between urban mobility planning and urban logistics tools
- ▶ New technologies for logistics control
- ▶ ITC and stakeholder participation including touristic related actors

Website

civitas.eu/destinations

CLUSTERING AROUND INNOVATION

The Dorothy's clusters represent the means to gather innovations and solutions for a Joint Action Plan in order to implement smart specialisation on a regional scale.



Frevue project



Impact of Project

FREVUE is a 4.5-year FP7-funded project due to be finalised in September 2017. Over eighty electric freight vehicles have been exposed to the day to day rigors of the urban logistics environment and prove that the current generation of electric vans and trucks can offer a viable alternative to diesel vehicles; particularly when combined with state of the art urban logistics applications, innovative logistics management software and well-designed local policy.

In-depth analysis based on data gathered from these vehicles provides fleet managers, public authorities, vehicle suppliers and electricity network operators with the necessary evidence base to drive and support the increased uptake of this highly innovative and clean mode of freight transport.

Current TRL or TRL expected

TRL: 6

Exploitation of results

The **FREVUE** analysis proves that electric freight vehicles are indeed suitable for many if not most inner city freight operations. Key barriers to further uptake remain, such as high procurement costs as well as limited vehicle availability. **FREVUE** provides fleet operators, policy makers, vehicle manufacturers and energy network operators with important findings to address these barriers and support a future uptake of electric freight vehicles in the UK.

Website

www.frevue.eu

Mobility4EU project

Project description, Targets & Partners

The project **MOBILITY4EU** is working on developing a vision for a user-centered and cross-modal European transport system in 2030 and an action plan including a roadmap to implement that vision. All modes of transport for passengers and freight as well as a multitude of societal drivers are being taken into account. The vision and action plan is being developed interactively with stakeholders representing demand and supply side in passenger and freight transport. Specifically, terminal operators, shippers and freight service operators are being engaged as key stakeholders to incorporate the logistics perspective into **MOBILITY4EU** vision and action plan. The final action plan will detail measures regarding policy, regulation, standardization, forms of governance, user acceptance, technology development and other implementation related issues. Furthermore, a “European Transport and Mobility Forum” that continues the work beyond the project duration and works on implementing the action plan is being initiated within the project.

Trends, drivers and solutions shaping transport in 2030

The context map (next double page) shows trends, stakeholders’ needs, political and economic factors impacting the 2030 scenario. The most relevant technologies that will enable the changes towards the future transport system are listed. The opportunity map (on the right for freight) gathers innovative novel and recent solutions in all transport modes and with cross-modal focus.

Collaboration opportunities

Based on solutions from the opportunity map, scenarios for the development of future transport in Europe have been created and ranked within the Multi-Actor Multi-Criteria Analysis (MAMCA). A further prioritization of solutions will be done through an adapted Failure Modes and Effects Analysis (FMEA). The solutions coming out of these rankings will be taken into a creative process leading to the Vision for Transport in Europe in 2030 which will concentrate on interactions, combinations and interfaces between prioritized solutions. Finally, an action plan with the required measures to implement that vision will be drafted. All these steps are taken within a participatory and interactive process with stakeholders coming from all fields of transport. **MOBILITY4EU** aims for lasting collaborations that will then be carried over to the “European Transport and Mobility Forum”.

Website

www.mobility4eu.eu

MOBILITY4EU OPPORTUNITY MAP

TRANSPORT MODE FREIGHT

MATRIX 5 OF 7



OVERVIEW

NOVEL AND INNOVATIVE SOLUTIONS FOR

FREIGHT / 13 IDEAS

USER NEEDS

#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15
Efficient transport flows & networks	Enable intermodal travel flow	Real-time travel info & services	Easy-to-use and comfortable travel	Interoperable seamless journeys	Effective and sustainable threat prevention	Inclusion, accessible, affordable	Data security, privacy & transparency	Protecting climate, environment, and health	Democratic, participative planning	Realised urban design	Safety	Empower new players & innovation	Efficient infrastructure maintenance	Personalized mobility offers & shared models

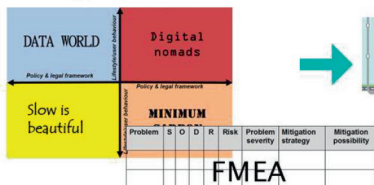
MOBILITY SOLUTIONS

CONNECTING TRANSPORT OF PEOPLE AND GOODS
 GHG-EMISSION CALCULATOR
 LEGAL HARMONIZATION WITHIN REGIONS
 LOGISTICS AS A SERVICE
 NOVEL MULTI-MODAL, CLIENT-ORIENTED BUSINESS MODELS FOR RAIL FREIGHT
 PLATFORMING OF HEAVY DUTY VEHICLES
 URBAN FREIGHT CONSOLIDATION HUBS
 PHYSICAL INTERNET
 SHARED CARRIER PLATFORMS
 SUPPLY CHAIN VISIBILITY
 URBAN GOODS DELIVERY THROUGH DRONES
 URBAN CROSS-MODAL LOGISTICS
 URBAN PARKING MANAGEMENT FOR FREIGHT VEHICLES

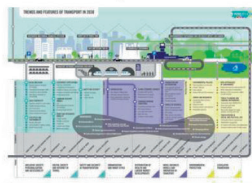
Pool of solutions Opportunity Map



Ranking of solutions MAMCA & FMEA



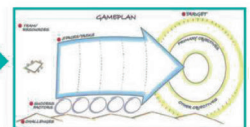
Initial ideas for transport system in 2030 Context Map



Vision for Transport 2030



Action Plan



TOWARDS TRANSPORT IN 2030

TRENDS, DRIVERS, TECHNOLOGIES

INTEGRATED, MULTIMODAL, SEAMLESS, EFFICIENT, AND ACCESSIBLE

TRANSPORT NETWORKS ANSWERING USER NEEDS

ECONOMICAL

SAFE AND SECURE FOR ALL

TECHNOLOGY

ROBOTICS

ADVANCED ALTERNATIVE FUELS

HYPERLOOP

SMART SYSTEMS

INTELLIGENT TRANSPORT SYSTEMS

SMART ENERGY FLOWS

ARTIFICIAL INTELLIGENCE

INTEROPERABILITY

BIG DATA

POSITION BASED INFORMATION

E-TICKET

DRONES

SMART ENERGY

STAKEHOLDERS' NEEDS

SOCIAL INCLUSION

- Mobility solutions designed for everyone (e.g. older population)
- Promotion of passengers rights
- Increase in cultural diversity
- Definition of standards on accessibility

USER CENTRICITY

- Solutions adapted to users needs
- Flexible transport services
- Less travel plans
- Customised travel options
- Citizen centred use of space

LIFESTYLES AND SUSTAINABILITY

- Healthy lifestyles
- Active mobility: walking, cycling
- Growing leisure traffic

CUSTOMERS' EXPECTATIONS

- Real time information
- Accessibility of information
- Usability of devices and services
- Permanent connection and tracking
- Fill the digital divide

CHANGING DELIVERY MODELS

- 24/7
- Decentralisation of sources and solutions
- Growing freight volumes

SMART AND INTEGRATED MOBILITY

- Shared mobility
- Mobility on demand
- Pay per use
- Compare and choose
- Multimodal solution

SAFETY AND SECURITY

- Resilient by design
- Cyber-security
- Data privacy
- Ethical considerations on safety and security systems
- Data security in transport and sharing services

UNCERTAINTY FACTORS

Rebound effects

Users acceptance of technology

Cultural homologation or cultural differences

ECONOMIC CLIMATE

URBANISATION

- City-Regions & Megacities
- Extending transport networks
- Smart applications connecting mobility and energy networks

Shift of global economic centre towards Asia/

Global migration patterns

Impact

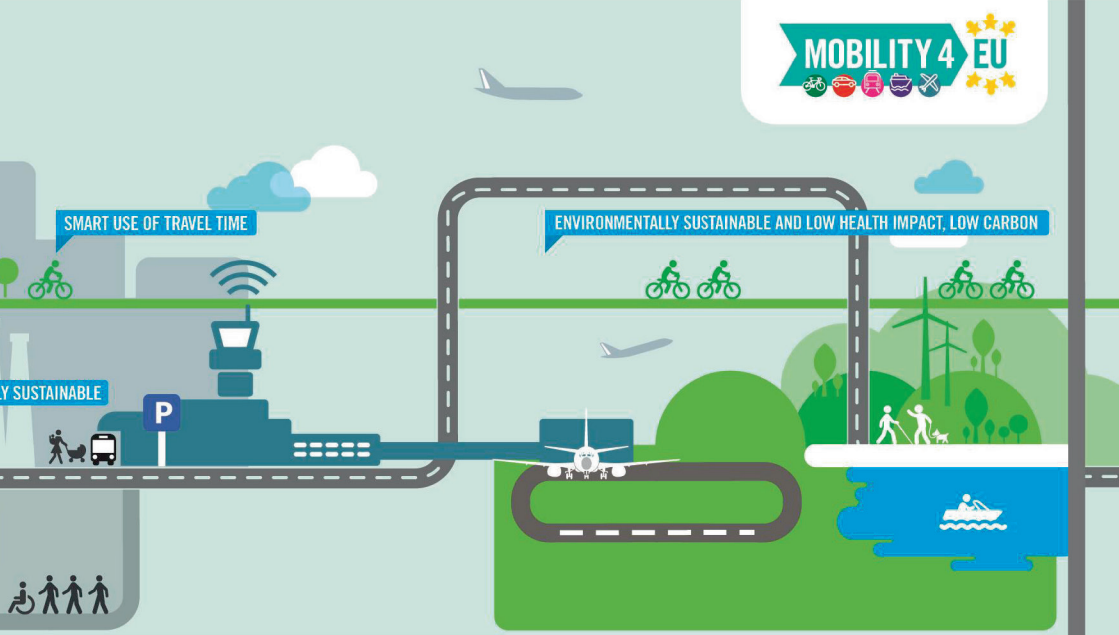
TRENDS

INCLUSIVE SOCIETY, PERSONALISATION AND ACCESSIBILITY

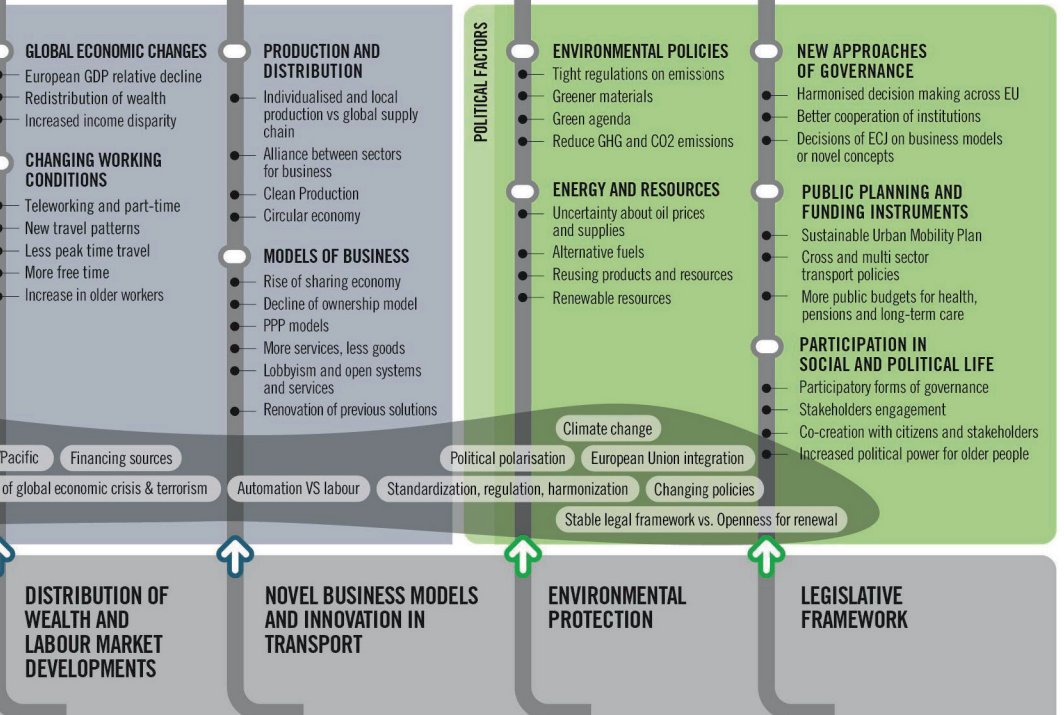
DIGITAL SOCIETY AND INTERNET OF THINGS

SAFETY AND SECURITY IN TRANSPORT

URBANISATION AND SMART CITIES



- GENERATION AND STORAGE
- CHARGING E-VEHICLES WHILE DRIVING
- AUTOMATION
- SOLAR ENERGY
- STORE AND GIVE ENERGY TO THE NETWORK
- LIGHT PERSONAL VEHICLES
- LIGHT MATERIALS
- MEGA AIRCRAFT
- 3D PRINTING
- BIO FUEL
- BATTERY TECHNOLOGIES
- ELECTRIFICATION



Novelog project



Impact of Project

The **NOVELOG** project aims to increase knowledge and provide guidance on the implementation of sustainable city logistics measures and the development of Sustainable Urban Logistics Plans. The project will achieve this impact through a series of activities that focus on acquiring data and knowledge on the Urban Freight Transport environment, building local communities of stakeholders (public and private) to discuss and plan future strategies and policies on 'win-win' scenarios, providing guidance on identification of appropriate city logistics measures and interventions, developing Tools and methodologies for assessing measures, providing guidance on the best business models to be adopted for implementation of measures and development of strategies and roadmaps for SULP development. All the above are validated through 12 city pilots and case studies and interaction with society through presentation of results in open workshops and external events.

Current TRL or TRL expected

The project does not focus on any one technology or develop new technologies for Urban Freight Transport; instead it focuses on helping cities improve their knowledge and understanding of their UFT environment through cooperation with the local stakeholders in order to better plan for the future of UFT in the city and identify the most sustainable (for all stakeholders) measures and interventions for implementation.

Exploitation of results

The **NOVELOG** project will develop 4 Tools in its lifetime to help cities identify the most suitable measure for implementation. These are the "Understanding Cities", the "Toolkit", the "Evaluation" and the "Guidance" Tools. Of these, the first three are already completed and available for use. **NOVELOG** aims to use its cooperation with other projects and initiatives to increase the uptake of these Tools and improve the result by providing more added value data to the cities.

Website

www.novelog.eu

Project description, Targets & Partners

The main aim of **SMARTFREIGHT** was to specify, implement and evaluate information and communication solutions that were able to integrate traffic management systems with the management of freight and logistics in urban areas.

The solutions were based on the CALM standard for communication and the CVIS framework for deployment of C-ITS solutions. The solutions were specified and tested by means of a desktop study in Dublin, simulations in Winchester and Bologna and a practical test site in Trondheim.

The partners were SINTEF, The Norwegian Public Roads Administration, University of Southampton, Chalmers, NTA, ADL, ETRA, Q-Free, Comune di Bologna and POLIS.

Cases, expected impacts and interim major results

SMARTFREIGHT demonstrated how new traffic management measures towards individual freight vehicles could support the objectives of the traffic management function (safe, environmental friendly and efficient transport) and the commercial freight and logistic service provision.

This was done by assigning service levels to individual freight vehicles based on their environmental profile, type of goods on-board and the destination.

The lessons learned can be applied for cities considering deployment of C-ITS, national and public roads authorities, commercial freight operators and third party service providers.

Collaboration opportunities

ITS and C-ITS must be understood by the cities. To be able to support the **SMARTFREIGHT** concepts from the infrastructure side one has to invest. The investments must be aligned with the actual technologies on-board the freight vehicles. There is a need to work further on business models for individual freight vehicle management – the technology is available.

Website

<http://cordis.europa.eu/project/rcn/85574-eu.html>

SMARTFUSION project

Project description, Targets & Partners

SMARTFUSION was an FP7 funded research project that looked into public-private partnership (PPP) which built upon the existing urban freight development strategies of three demonstration city-regions: Newcastle (UK), Berlin (Germany) and Lombardy region (Italy)



Targets:

- ▶ European Green Car Initiative
Last mile solutions;
- ▶ Innovative technology for urban freight planning, vehicles and urban-interurban transshipment;
- ▶ Transferable impact assessment.



Cases, expected impacts and interim major results

Innovative Urban Freight Stakeholder engagement process

Successful organisation of key stakeholders in a participatory approach to address local urban freight

Source:

- Zunder et al (2016) Engaging city stakeholders to achieve efficient and environmentally friendly urban freight movements. Towards Innovative Freight and Logistics Volume 2: 275-287. John Wiley & Sons, Inc.
- Oesterle et al (2015) The role of a structured stakeholder consultation process within the establishment of a sustainable urban supply chain. Supply Chain Management: An International Journal 20(3):284-299.

Innovative City Logistics' Receiver-Led Solutions addressing sustainability

Multiple city logistics' interventions led to smooth changes in city logistics operation addressing sustainability issues



Source:

- Zunder et al (2014) Developing a local research strategy for city logistics on an academic campus. *International Journal of Urban Sciences* 18(2): 73-79.
- Aditjandra et al (2016) Evaluating the impacts of urban freight traffic: application of micro-simulation at a large establishment. *European Journal of Transport and Infrastructure Research* 16(1):4-22.

Increasing urban freight efficiency with innovative logistics concept

In Newcastle and Como, 100% EV deployed with 81% consolidation in UK. In Berlin, a hybrid 32t Volvo truck with geofencing IT routing system was piloted

Source:

- Leonardi et al (2014) Increase urban freight efficiency with delivery and servicing plan. *Research in Transportation Business and Management* 12: 73-79.

Collaboration opportunities

SMARTFUSION keywords:

- Urban freight transport
- Hybrid/electric truck deployment
- Geofencing IT routing system
- Participatory engagement process
- Sustainability

Room for new research:

- Case studies beyond the three cities
- Receiver-led city logistics
- Delivery and servicing plans
- Urban freight planning
- Added value city logistics

New data collection

Dissemination invitation

New partnership/collaboration

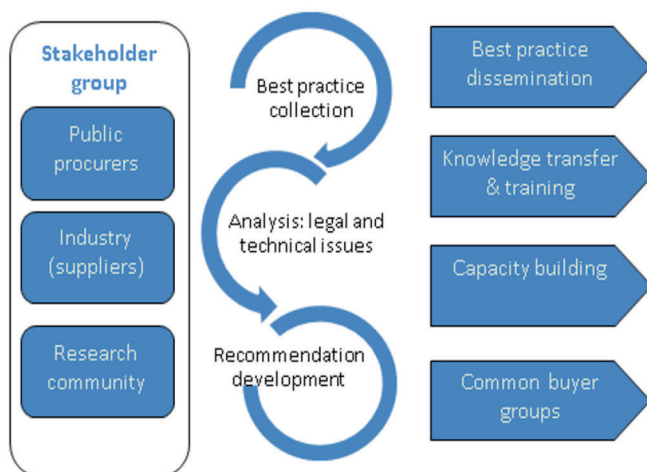
Joint writing articles

Website

www.smartfusion.eu

SPICE project

Project description



Project Partners

- City of Copenhagen
- ERTICO – ITS Europe
- North Denmark region
- City of Tampere, AustriaTech
- Rijkswaterstaat
- Forum Virium Helsinki Oy
- Hamburg
- Northamptonshire County Council

Cases, expected impacts and interim major results

The **SPICE** project focuses on:

- Alternatively fuelled vehicles and infrastructure;
- Intelligent Transport Systems (ITS);
- Mobility services (e.g. transport services for elderly people or council workers) ;
- Other sustainable transport services (e.g. Intelligent Street Lightning).

The project will:

- ▶ Acquire a deep understanding of state-of-the-art of public procurements for sustainable and innovative transport and mobility projects in Europe
- ▶ Raise awareness of using public procurement as an instrument to facilitate sustainable and innovative transport and mobility solutions
- ▶ Enhance public authorities' technical and legal knowledge on advanced procurement
- ▶ Facilitate joint, cross-border procurements for sustainable and innovative transport and mobility projects.

Collaboration opportunities

The **SPICE** project will recruit public authorities (procurers) and suppliers (industry and research organisations) to join its stakeholder group to share their experiences, to participate in capacity building and training programmes and to form common buyer groups.

Website

www.spice-project.eu

LinkedIn

www.linkedin.com/groups/12003657

Spider Plus project



Impact of Project

SPIDER PLUS aims at developing a passenger/freight mobility vision for 2050 encompassing seamless transportation where electrified rail has a central role. Within the “White Paper on Transport” the European Commission targets a massive traffic shift to rail with a market share of more than 50% in the long-term. The project consortium composed of 13 European companies and institutions provided cross-modal expertise creating a realistic mobility vision for the year 2050. A roadmap for competitive and sustainable rail transport including digital networking, more efficient transport means and optimised use of infrastructure is the central component of **SPIDER PLUS**.

SPIDER PLUS project, co-financed under the EU FP7 program, encompasses a new visionary approach combining TIME with SPACE. The latter is becoming more and more relevant. **SPIDER PLUS** is totally integrating the above concepts into a wider perspective where the available resources are optimized at their best for a more sustainable mobility.

Current TRL or TRL expected

Start TRL: 3

Exploitation of results

The most important project outcome is the interactive “Guidebook” containing the 2050 **SPIDERPLUS** MOBILITY VISION and the ROAD MAP for its full implementation, with timing indications in the DECISION MAKING TOOL.

The Guidebook, available on project website, contributes to the harmonisation/integration processes between modes optimising the existing resources in a co-modal approach.

Website

www.spiderplus-project.eu

STRAIGHTSOL project

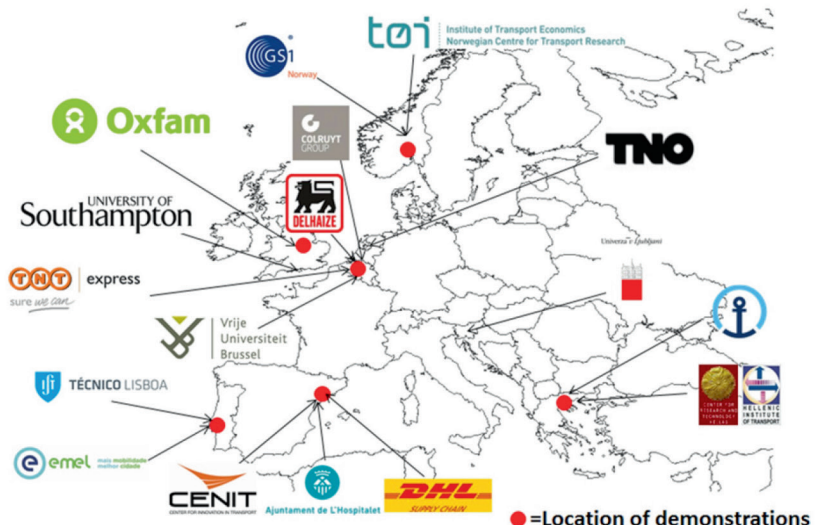
Project description, Targets & Partners

The **STRAIGHTSOL** project, Strategies and measures for smarter urban freight solutions, was launched to:

- ▶ develop a new impact assessment framework for measures applied to urban- interurban freight transport interfaces;
- ▶ support a set of innovative field demonstrations, effectively showcasing improved urban-interurban freight operations in Europe; and
- ▶ apply the impact assessment framework to the live demonstrations and developing specific recommendations for future freight policies and measures.

In the past, many innovative city distribution concepts have failed because not all stakeholders were taken into account. That is why, within **STRAIGHTSOL**, these actors and their objectives are considered as the primary focus of the evaluation framework.

Important concepts in the evaluation framework are (i) the identification of the alternatives, (ii) the identification of the stakeholders, (iii) their objectives/criteria and the importance they attach to these objectives (weights), and (iv) the indicators that were used to operationalise the criteria.

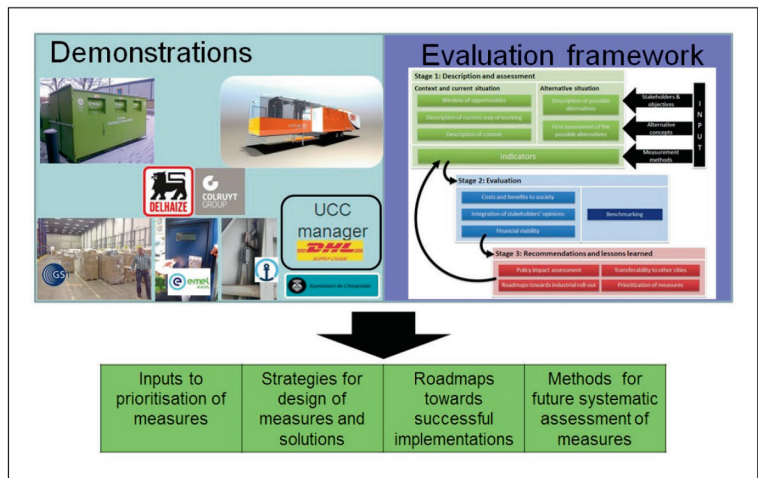


STRAIGHTSOL project

Achievements & Impacts

STRAIGHTSOL supported seven innovative field demonstrations showcasing increased efficiency and sustainability of urban freight transport and improved connections between urban and interurban freight transport. The demonstrations were:

- ▶ urban consolidation centre in L'Hospitalet de Llobregat (Barcelona, ES), by DHL;
- ▶ city logistics mobile depot in Brussels (BE) by TNT Express;
- ▶ remote 'bring-site' monitoring near London (UK) by Oxfam;
- ▶ rail tracking and warehouse management in Thessaloniki (GR) by Kuehne+Nagel;
- ▶ retail supply management and last mile distribution in Oslo (NO) by GS1 Norway;
- ▶ loading/unloading operations management and regulations in Lisbon (PT) by EMEL;
- ▶ night-time deliveries in Brussels (BE) by Colruyt and Delhaize.



Follow up & Lessons learnt

Overall, the evaluations show that there is a big role to play by the (local) governments. All concepts are beneficial to society, especially when they are scaled. They require, however, too much initial investment of a private partner or cannot be operated in a profitable way. In that sense, the local government can play a crucial role in the take-up of these concepts when they use their regulation power to support sustainable concepts.

For several individual **STRAIGHTSOL** solutions it is possible to see specific public policies that would strengthen the profitability for the private operators. For instance, both the mobile depot solution of TNT Express and the alternative delivery times demonstrated by Colruyt & Delhaize would benefit from congestion charging. A low emission zone would probably also benefit the use of electric tricycles in the TNT case. The consolidation centre demonstrated by DHL Supply Chain in L'Hospitalet de Llobregat could also have benefited from similar policies. In this latter case, it is also apparent that a stronger involvement from local authorities could have improved the viability of the concept, for instance if more deliveries bound for municipal buildings were routed through the consolidation centre.

Several demonstrations were successful and have led to new initiatives within the companies involved and in succeeding European projects like CITYLAB.

The transferability of the demonstrated solutions to other contexts across EU was also analysed. Transferability is defined as the ability to transfer and adopt successful measures from one city (donor city) to another (target or receptor city) achieving comparable results in the latter. Analysing the transferability of a measure or a policy requires a dedicated methodology. In the project the methodology that was followed was created based on the 10-step methodology used in the TURBLOG project. From these results a roadmap to help decision makers to decide which measures to apply and when to apply them was developed.

The new evaluation framework was developed to allow a thorough evaluation of the **STRAIGHTSOL** demonstrations, but it is general and can be used for any measures in last mile distribution or urban-interurban freight transport interfaces. Any actor who is confronted with a problematic urban delivery situation and thinks of several solutions to deal with it can turn to the **STRAIGHTSOL** framework for structural and comprehensive support in the decision on which solution to choose. The framework can be applied in different stages of this decision making process, before or after measures are tested or implemented.

Website

www.straightsol.eu

SULPiTER project

Project description, Targets

SULPiTER (Sustainable Urban Logistics Planning to Enhance Regional freight transport) aims at improving the capacities of Central European authorities to design policies for freight urban mobility planning in **Functional Urban Areas (FUAs)**.

Partners will build FUAs local policies based on local business needs, integrating cross-sectorial perspectives (environmental protection, urban and spatial planning, energy saving, transport operations and ICT) into **urban freight mobility planning**.

In each FUA, **Freight Quality Partnerships (FQP)** will be established to define urban freight solutions together by

identifying possible conflicts between stakeholders. **SULPiTER** started in June 2016 and will end in May 2019. Project Partners:

Partners

- Institute for Transport and Logistics (Lead Partner)
- Municipality of 18th District of Budapest
- University of Maribor
- Regional Union of the Chamber of Commerce of Veneto
- Central European Initiative
- City of Brescia
- Institute of Logistics and Warehousing
- City of Poznan
- Metropolitan City of Bologna
- Stuttgart Region Economic Development Corporation
- City of Vecsés
- City of Rijeka
- KLOK Logistics Cooperation Centre
- City of Maribor

Cases, expected impacts and interim major results

- ▶ **7 Sustainable Urban Logistic Plans (SULPs) at FUA level**, as part of the Sustainable Urban Mobility Plans, will be developed in the FUA of: Stuttgart (DE), Rijeka (HR), Maribor (SI), Budapest (HU), Poznan (PL), Bologna and Brescia (IT),
- ▶ **Transnational and transferable analytical tool**, transferable to all Central Europe FUAs to understand freight transport and logistic impact in Functional Urban Areas. Policy makers will therefore be able to identify and solve critical issues in their urban mobility planning. The tool will be matched with several EU and global best practices in urban freight transport, that will be illustrated during **open trainings for policy makers outside the partnership** to foster the tool application in other Central Europe FUAs.
- ▶ **Enlarged Transfer Programme (ETP)** for policy makers will be launched. The intention is to build a direct dialogue with 20 non-partner authorities competent for freight transport and logistics, willing to establish FUA freight mobility planning policies. Special **training** will be provided to develop skills and capacities of authorities in developing urban freight mobility policies.

Collaboration opportunities

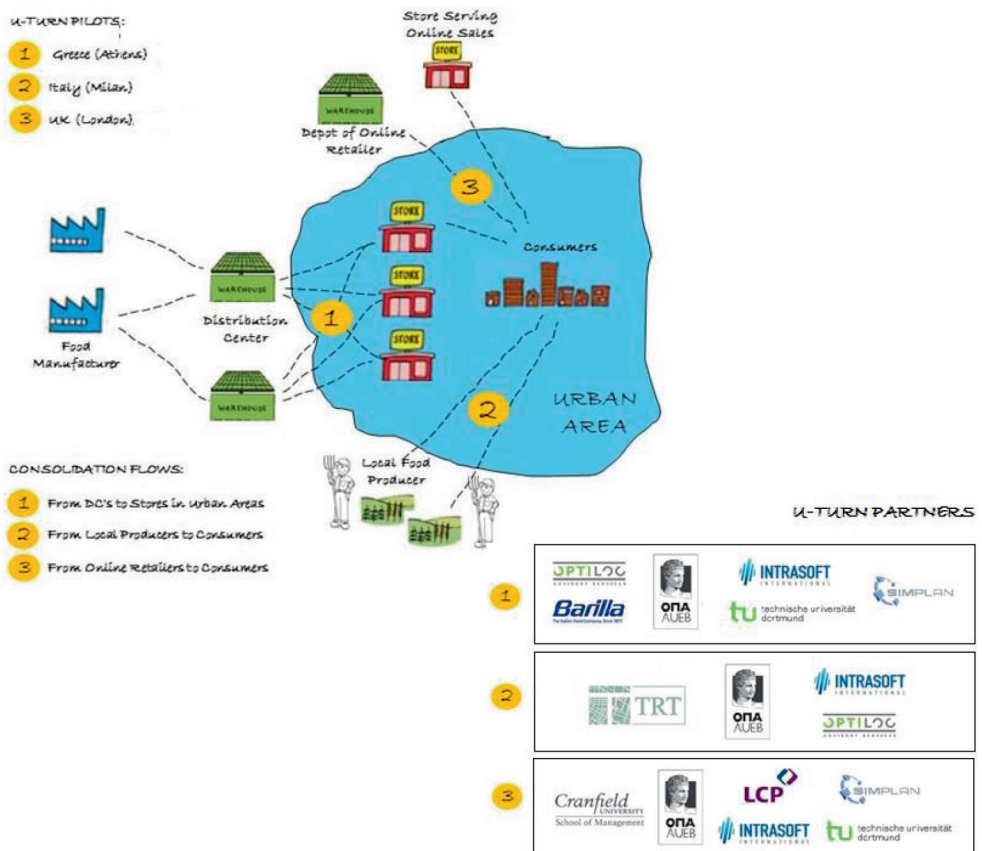
- ▶ Transnational Open **Trainings** and **webinars** given by experts in urban freight logistics for institutions and policy markers. More information on upcoming webinars: <http://www.interreg-central.eu/SULPiTER>
- ▶ Possibility for policy makers to be involved in the **Enlarged Transfer Programme**: the call will be launched in the second half of 2017
- ▶ An analytical tool to support Sulp development
- ▶ Public events in different locations (final conference, workshop, award ceremony): April 2019

Website

www.interreg-central.eu/Content.Node/SULPiTER.html

Project description

Population growth, congestion and environmental damage alongside increased use of convenience stores and the home delivery of Internet purchased groceries are challenging the traditional methods of food logistics. **U-TURN** is a 3 year project running until May 2018 that will investigate & identify new models for urban food transportation to deliver environmental and societal benefits. Involving nine European partners the project focuses on research and solutions to urban logistics in Athens, Milan and London.



Cases, expected impacts and interim major results

The Partners in Greece have been working with 3PL businesses involved in the transportation of food and drink as well as some grocery suppliers and retailers, to identify transport sharing opportunities for customer deliveries to businesses in Athens. In Italy the work is with a group of farmers located to the South and West of Milan. Using an online survey and series of structured interviews a detailed assessment has been made of the farmers' business characteristics in terms of products, sales channels, temperature range, delivery route and delivery point requirements. The partners in England have been undertaking a very detailed assessment of the home delivery market place in London, including retailer market share, store and logistics infrastructure, methods and parameters of fulfilment, last mile delivery cost modelling and current and future customer preferences. This has been done using a mixture of online surveys, business interviews and analysis of primary data sources from retailers. A series of common KPI's have been identified related to economic, societal and environmental issues and it is anticipated that transport collaboration solutions will be identified that show significant progress on these KPI's. Early results in the Athens pilot show the potential to increase loading factor by 11-25% and reduce travelled distance by 44%. In the London pilot mathematical modelling shows the potential to reduce the costs of transportation by 5%.

Collaboration opportunities

U-TURN is collaborating with other relevant EU projects particularly by sharing information. These include the other Urban Freight Projects funded by the Horizon 2020 programme. This activity will become increasingly important as the final results are generated over the next 12 months, and we would welcome the sharing of data information from other projects to enhance our results. We have held a successful dissemination event in London in March 2017 and will hold 2 more (in Milan and Athens) later this year. The invitation is open to all organisations with an interest in urban transport; policy makers, academic organisations, and industry bodies and commercial businesses.

Website

www.u-turn-project.com

Success project



Impact of Project

At month 24/36 the project has:

- ▶ Identified a number of KPIs and a methodology to compare the results from four construction sites (in Luxembourg City, Paris, Valencia and Verona) and to estimate the potential for improvement in these and in future construction works.
- ▶ Delivered a comprehensive eight-month long data collection effort across the four sites to analyse the current situation and prepare the ground for optimization in future construction works.
- ▶ Developed new models to quantify the costs and benefits of alternative services and operations compared to the baseline situation and to suggest some improvement strategies.
- ▶ Identified reusable ICT tools for the collaboration and the coordination of the various activities between the partners of the Construction Logistics Supply Chain.
- ▶ Analysed a number of international best practices in the EU and the US that could be reused in future construction works.

Current TRL or TRL expected

Start TRL: 3

Target TRL: 5

Exploitation of results

SUCCESS will deliver two main results:

- ▶ Un/sustainable business models for consolidation centres
- ▶ Other solutions to improve urban construction logistics in any city

Local authorities and businesses (mainly construction companies and transport / logistics companies) will be able to apply them in real cases through the help of an interactive web-based service.

Website

www.success-urbanlogistics.eu

