



SETRIS PROJECT

DELIVERABLE REPORT

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No	Name	Short Name	Country
1	Newcastle University	UNEW	UK
2	European Conference of Transport Research Institutes	ECTRI	Belgium
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4	BMT Group Limited	BMT	United Kingdom
5	Centro Nacional de Competencia en Logistica Integral	CNC-LOGISTICA	Spain
6	The European Earth Friendly Logistics Association AISBL	CO-TREE	Belgium
7	Stichting Dutch Institute for Advanced Logistics	DINALOG	Netherlands
8	German Aerospace Center	DLR	Germany
9	Forum des Laboratoires Nationaux Europeens de Recherche Routiere	FEHRL	Belgium
10	Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.v	Fraunhofer IML	Germany
11	Instytut Logistyki i Magazynowania	ILiM	Poland
12	Promotion of Operational Links with Integrated Services	POLIS	Belgium
13	Ships & Maritime Equipment Association of Europe	SEA EU	Belgium
14	Union Internationale des Chemins de fer	UIC	France
15	Union Internationale des Transports Publics	UITP	Belgium
16	The Association of the European Rail Industry	UNIFE	Belgium
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EXECUTIVE SUMMARY

The purpose of the SETRIS project is to deliver a cohesive and coordinated approach to research and innovation strategies for all transport modes in Europe. SETRIS seeks to identify synergies between the transport European Technology Platforms' (ETPs) strategic research and innovation agendas (SRIAs) and between these and relevant national platforms. The 5 ETPs are:

- 1) ACARE (Advisory Council for Aviation Research and Innovation in Europe),
- 2) ALICE (Alliance for Logistics Innovation through Collaboration in Europe),
- 3) ERRAC (The European Rail Research Advisory Council),
- 4) ERTRAC (European Road Transport Research Advisory Council)
- 5) WATERBORNE (European Maritime Industries Advisory Research Forum).

SETRIS aims to develop a framework for long-term cooperation between actors from all transport modes, to facilitate the delivery of a truly integrated transport system.

This SETRIS Deliverable *D2.5 Benchmark research and innovation activities (II)* is an update of *D2.4 Benchmark research and innovation activities (I)*. This deliverable contains new recent projects and includes projects related to waterborne transport to the assessment of European initiatives in urban freight. Moreover, it explains how the research challenges and topics set in the 2014 ERTRAC-ALICE Urban Freight research roadmap are being implemented (implementation status). *Deliverable 2.5* propose new actions plans and recommendations to stakeholders related to topics proposed in deliverable 2.4 for the period 2018-2020. These recommended topics are:

- 1) Integrated data framework and big data analytics as opportunity for improving decision-making in urban freight transport
- 2) Exploring new opportunities for achieving effective integration of urban freight and personal mobility: services and networks
- 3) Improving the link between urban and long distance freight transport services and infrastructures
- 4) New collaborative business models of services based on sharing economy
- 5) Logistics in the full circular economy: new business models for horizontal and vertical collaboration
- 6) Bringing logistics into urban design
- 7) Interoperable standard modular urban loading units: autonomous deliveries
- 8) Safety and security in urban freight

INTRODUCTION

D2.5 Benchmark and innovation activities retrofits the results of the benchmark activities carried out within the SETRIS 2.2 Urban logistics task. This deliverable D2.5 updates deliverable 2.4 by monitoring on-going and new projects, refining topics and including concrete proposals for action for different stakeholders including public authorities (local, regional, national level), industry (manufacturing, IT), end-users and operators as well as potential investments in infrastructure.

As a result, this benchmarking exercise updates how recent European urban freight projects and initiatives covered the research challenges and topics set in the ERTRAC-ALICE Urban Freight Research Roadmap (implementation status) and fills out research topics for the 2018-2020-time frame considering new recommendations and actions to stakeholders.

BENCHMARKING METHODOLOGY

The European projects and activities list, the areas of intervention and the challenges identified within these in the 2014 ERTRAC and ALICE Urban Freight research roadmap were taken as a starting point for the SETRIS urban freight benchmark. New projects and initiatives were included by the SETRIS' partners involved in task 2.2 and an assessment was performed on how these cover the challenges (implementation status) from the previous roadmap and within specific supply chains as stated in the SETRIS technical annex. The complete list of projects and initiatives considered in this assessment can be found in annex I.

ERTRAC and ALICE experts from the urban mobility and urban freight groups respectively will be invited to comment on the first results of the benchmark updated.

In addition, the European Commission and ALICE organised a Workshop where many urban freight projects were explained. In this workshop were collected contributions to the roadmap monitoring.

Furthermore, Urban Mobility working group meeting was organised on the 24th of May 2017 by ALICE and ERTRAC platforms. In this event the projects analysed in the benchmark analysis were presented and analysed by working group experts.

After the event, ERTRAC and ALICE experts from the urban mobility and urban freight groups received the updated version of the benchmark, the challenges and research topics and stakeholders recommendations and they were invited to comment on the results of the benchmark.

The meeting agenda can be found in annex II. The areas of intervention and the details of the benchmark assessment can be found in the next section.

MONITORING OF ROADMAP IMPLEMENTATION

The five areas of intervention in the ERTRAC-ALICE 2014 Urban Freight Research Roadmap include:

1. Identifying and assessing opportunities in urban freight
2. Towards a more efficient integration of urban freight in the urban transport system
3. Business models and innovative services
4. Cleaner and more efficient vehicles (focus on trucks as 3.5 ton)
5. Safety and security in urban freight

The benchmark summary (see tables below) presents the research challenges in each of these intervention areas and the related European projects and initiatives. Relevant call topics of the 2016-2017 work programme were also included. Five different degrees of implementation (DOI) have been identified to mark the implementation status (from 1= less implemented to 5= well implemented):

- DOI #5: Sufficient evidences of implementation
- DOI #4: Experiences but not deployed a large scale
- DOI #3: Some research activities exist
- DOI #2: Potentially foreseen in forthcoming topics
- DOI #1: No clear evidences of implementation. Few cases

0. CURRENT STATUS IN COMPARISON TO DELIVERABLE 2.4

Challenges	Progress	Subchallenge improved	Projects contributed
Identifying and assessing opportunities in urban freight	YES	Assessing the potential of new services in last mile operations associated to available data (big data). Assessing the potential of new distribution schemes in urban areas (e.g. 3D printing, crowd-shipping)	<i>Transforming Transport (TT)</i> , <i>Franprix en Seine</i> , <i>Mobility4EU</i> , <i>Cities4people</i> , <i>PROSFET</i> , <i>SUNRISE</i> , <i>CROWD-USG</i>
Towards a more efficient integration and management of urban freight in the transport system of the city	YES	Optimising the use of the road infrastructure in space and time for urban freight activities Better understanding of the impact of land use on urban logistics activities Enabling a more efficient management of goods: ITS to better manage the movement of goods Improving the interaction between long distance freight transport and urban freight Better adapting the vehicles to innovative urban freight delivery systems	SUITS, Freight tail, Cargo hitching, PROSFET PORTIS, Distriseine. The river rubbish dump, The Zulus, Sulpiter, Vert chez Vous (Bestfact), STRAIGHTSOL, spider plus, transformer Vert chez Vous (Bestfact), The Zulus, NEWBITS, spider plus, Smartfreight, SELIS, MUV Medinkports, Vert chez Vous (Bestfact) CLUSTERS 2.0, LessThanWagonLoad, Modulushca
	YES	Reverse logistics and transport of waste and recycling material (also in SETRIS)	The river rubbish dump, AMS roboat, R2PI, BuyZet, PolyCE, PAPERCHAIN, PlastiCircle,

Business models and innovative services		Optimisation, modularization and standardization of packaging and load units. ICT tools to enable sharing and integration of data. Potential of Internet of Things (IoT) and Future Internet for logistics.	CIRC-PACK, ECOBULK, SYSTEMIC, ZERO BRINE, FiberEUse, CO-GISTICS 4FOLD, AEOLIX
Safety and security in urban freight	YES	Driver support and visibility equipment for a 360° safety around the vehicle when driving and manoeuvring. Include messages to vulnerable users, communication via lights, beeping sounds when backing up as in heavy duty vehicles, also when operating tail lifts...	<i>interACT</i>
Cleaner and more efficient vehicles	YES	Business and deployment models for alternative fuels	PORTIS, Future Radar, Civitas Eccentric, Medlinkports, Freigh Beer Boat, The river rubbish dump

GAPS IDENTIFIED PER CHALLENGE

In the URBAN MOBILITY WORKING GROUP MEETING, BRUSSELS 24 MAY 2017 (annex III).

The Urban mobility working group made an “Exchange of knowledge on the degree of implementation of the research priorities identified in the Urban Freight roadmap “. The activity was focus on get feedback from participants on MAIN GAPS in the implementation of the UF challenges. The main objective was answer the following question: Which aspects of the UF challenges have not researched or demonstrated sufficiently yet?

In the following tables in the last row, we can find the results obtained in this task.

1. IDENTIFYING AND ASSESSING OPPORTUNITIES IN URBAN FREIGHT

Nowadays, there is still no satisfactory and comprehensive qualitative and quantitative evaluation of the impact Urban Freight Transport (UFT) has on the life of cities. Recently, however, new trends are emerging as regards the identification and assessment of new opportunities for UFT. Collaborative transportation systems, for instance, have become an increasingly popular practice due to the crisis. However, the concept of cooperation and competition and data-sharing still requires further development. There is a strong need to acquire targeted consistent and homogeneous data in order to properly assess the problem and identify the most suitable solutions. It is expected that better data, knowledge and information will make it easier to identify opportunities for improvement. Although cities have proven to be almost unique and solutions very difficult to replicate, Key Performance Indicators (KPIs) can show the real impact of these new solutions and the extent to which they can be replicated in other cities.

DOI #5: Sufficient evidences of implementation		
Challenges	Specific contributions justifying DoI #5	GAPS IDENTIFIED
<p>Assessing urban logistics in cities: KPIs, benchmarking tools, governance models & identify urban freight actors.</p> <p>Framework data collection to analyse freight movements, impacts and identify opportunities.</p>	<p>Wide coverage through EU projects as such as CITYLAB, C-LIEGE, ECOSTARS, NOVELOG, FREVUE, LAMILO, MODULUSHCA, SMARTFUSION, SMILE, STRAIGHTSOL, SUCCESS, DOROTHY etc.</p> <p>PROSFET: The proposed project will be aimed at identifying local authority planning needs with regards to urban/city logistics activities and the necessary pre-requisites for inclusion of stakeholders in the process</p> <p>BuyZet: yes, in particular public procurement of zero emission deliveries</p> <p>In France, “National Urban Goods Movements Surveys” since the 90’s, and FRETURB software</p> <p>Other examples: Mines Paristech (FR), CIRRELT (Canada)</p>	<p>No additional gaps detected. However, it is important to review this topic from time to time so new KPIs are identified, as well as new opportunities for data collection and changes on current scenario/framework</p>
<p>Understanding the potential for stakeholder cooperation, stakeholders awareness and involvement</p> <p>- New collaboration formulas (cooperative decision-making and cooperative planning processes), financing and governance structures.</p> <p>- New methodological frameworks to support participatory policy making accounting for agent-specific preferences and their dynamic interactions</p>	<p>Wide coverage through EU projects as such as BESTFACT cases: Binnenstadservice, Cityporto Padova, Stadsleveransen in Gothenburg, Consolidation centre, LOGeco – eco-friendly logistics in Rome. C-LIEGE, CITYLAB, CIVITAS CYCLELOGISTICS, DOROTHY, ECOMPASS, ECOSTARS, LAMILO, MODULUSHCA, NOVELOG, SMARTFUSION, SMILE, STRAIGHTSOL, SPIDERPLUS, SUCCESS, TRAILBLAZER, U-TURN, CIVITAS SATELLITE etc.</p> <p>LEARN: Develop and involve a LEARN multi-stakeholder network to maximize business uptake of carbon accounting and reduction. Recommended priorities for government and industry on incorporating carbon footprinting into policy making</p>	<p>Not gaps identified.</p> <p>The subject is similar to the previous one, maybe need to be revisited from time to time as the framework conditions for this may change</p>

<p>- New policies and regulation measures that benefit public and private parties.</p> <p>- Assessing the impact of policy regulations and frameworks</p>	<p>SPICE: The project will invite stakeholders from industry and research community to join the Stakeholder Group. Their views on recommendations are essential for future procurement procedures. They will also be invited to join market consultations, innovative dialogues and definition of award criteria for forming common buyer groups.</p> <p>RESOLVE: identifying good practices that will improve these plans, studying them through Study Visits, importing them via special workshops and Regional Action Plans</p> <p>SULPITER: The project will enhance their capacity in urban freight mobility planning in order to develop and adopt sustainable urban logistics plans (SULPs).</p> <p>"Medlink+" provides the information of the cargo location on the distribution network and increases the productivity of the port.</p> <p>CO-GISTICS: new cooperative intelligent systems for logistics</p> <p>Mobility4EU: Identifying and assessing societal challenges and analysing the influence of societal drivers on transport demand and supply creating a sound understanding of behavioural and society factors. Developing an action plan and roadmap</p> <p>Cities4people: We incorporate collective awareness and open innovation to understand the real needs of EU citizens and co-create new mobility solutions with them, harnessing digital and social innovation</p> <p>SUNRISE: Utilisation of neighbourhood-specific opportunities. Co-creation of solutions, i.e. through strategic civic-public</p>	
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	<p>alliances. Socio-technical nature of solutions as combinations of services, social arrangements, rules, technologies or small infrastructures etc. New forms of synergies between bottom-up and top-down.</p> <p>CROWD-USG: the assessment of the most appropriate crowdsourcing processes for citizens, administrations and business to collaboratively produce an innovative USG model;</p> <p>PROSFET: The proposed project will be aimed at identifying local authority planning needs with regards to urban/city logistics activities and the necessary pre-requisites for inclusion of stakeholders in the process</p> <p>Forthcoming topics:</p> <p>MG-4.1-2017 Increasing the take up and scale-up of innovative solutions to achieve sustainable mobility in urban areas</p> <ul style="list-style-type: none"> New governance models for freight and passenger transport: better coordination and cooperation; synergies between passenger and freight transport; stakeholder engagement; public consultation and participation; education and training, policy transfer. 	
<p>DOI #4: Experiences but not deployed a large scale</p> <p><i>(No challenges in this category)</i></p>		
<p>DOI #3: Some research activities exist</p>		
Challenges	Specific contributions justifying DoI #3	GAPS IDENTIFIED
<p>Assessing the potential of new services in last mile operations associated</p>	<p>GALENA H2020 project: To adapt an existing logistics information system by taking into account the trusted PVT and authentication data.</p>	<p>3D printing is not relevant for this, however automated delivery systems as well as models arising from</p>

<p>to available data (big data).</p> <p>Assessing the potential of new distribution schemes in urban areas (e.g. 3D printing, crowd-shipping)</p>	<p>Franprix en Seine: Mapping and modelling port-city opportunities and integration of waterfreight solutions in urban and spatial planning covering assessment approaches, scenario evaluation, external costs, innovative tools and recommendations for SUMPs and public procurements of innovation (PPI) aiming at improving urban mobility.</p> <p>Transforming transport (TT): Realistic, measurable and replicable way the transformations that big data will bring to the mobility and logistics sector</p> <p>Forthcoming topics:</p> <p>MG-5.2-2017: Innovative ICT solutions for future logistics operations</p>	<p>sharing economy could be very relevant.</p>
<p>DOI #2: Potentially foreseen in forthcoming topics</p> <p><i>(No challenges in this category)</i></p>		
<p>DOI #1: No clear evidences of implementation. Few cases</p> <p><i>(No challenges in this category)</i></p>		

2. TOWARDS A MORE EFFICIENT INTEGRATION OF URBAN FREIGHT IN THE URBAN TRANSPORT SYSTEM

Achieving a cleaner and more efficient urban logistics system requires a better integration of urban freight in both the transport system and city. Other transport activities within the city transport system may have an influence and be influenced by UFT.

There is a relationship between the demand for passenger transport for certain type of activities, in particular commuting to work, and the demand for goods transport.

Waste is another fundamental part of city transport. Waste removal processes could be integrated with the delivery or, more likely, the return of certain product categories.

Additionally, it is important to consider the relationship between tourism and urban freight.

2.1 Optimising the use of the road infrastructure in space and time for urban freight activities

When it comes to the integration of different activities on the road infrastructure, research should aim to enable their integrated management at the strategic, tactical and real-time level. While work is required to enable this joint use of the infrastructure, it should be supported by activities to build support for this among stakeholders. It should therefore be supported by work on public acceptance and the involvement of the different actors, in particular the freight operators. The extent and conditions of some forms of public-private partnerships (PPPs) to enable this should be investigated.

Significant research is still needed to ensure that the best is made of the integration of urban freight in the urban mobility system, the development of tools and methods, including scenario planning and models, for fully taking urban freight into consideration at all stages of the sustainable urban mobility planning process. This should identify opportunities to also assess the potential for using other modes and infrastructures than road for improving the urban freight system.

DOI #5: Sufficient evidences of implementation		
Challenges	Specific contributions justifying DOI #5	GAPS IDENTIFIED
Integration of urban freight with public transport on the infrastructure but also at the level of the vehicles and at public transport interchanges.	<p>Some cases regarding the use of vehicles for passengers and freight in combined way have been found.</p> <p>BESTFACT Case: Parcel and small cargo delivery using interurban coach system between Lithuanian urban areas</p> <p>BESTFACT Case: Combipakt – combined passenger and goods transport in Nijmegen, the Netherlands.</p> <p>Density project (Sweden, funded by Swedish VINNOVA) - cases in Gothenburg and Stockholm. Aim to address passenger and goods mobility for development and planning of dense cities with high demands on accessibility and sustainability.</p> <p>NOVELOG: Turin pilot: Flexible use of public infrastructure by ITS. Venice pilot: Using public transport for freight last mile deliveries</p> <p>SUITS: development of inclusive, integrated transport measures will be measured in the cities</p>	<p><i>Some of the cases identified in BESTFACT are not in operations at the moment so they may be reviewed</i></p>

	<p>PROSFET: The proposed project will be aimed at identifying local authority planning needs with regards to urban/city logistics activities and the necessary pre-requisites for inclusion of stakeholders in the process</p> <p>Freight tail: share knowledge, learn lessons - no knowledge creation</p> <p>Cargo Hitching: Combining passenger and freight flows</p>	
DOI #4: Experiences but not deployed a large scale		
Challenges	Specific contributions justifying DoI #4	GAPS IDENTIFIED
Dynamic use of dedicated lanes and lane prioritizing	<p>Some experiences:</p> <ul style="list-style-type: none"> BESTFACT Case: Multiuse lanes for freight distribution in Bilbao Also cases in Lyon, Barcelona, and Donastia San-Sebastian 	-
DOI #3: Some research activities exist		
Challenges	Specific contributions justifying DoI #3	
Development of tools and methods for fully taking urban freight into consideration at all stages of the sustainable urban mobility planning process	<p>C-LIEGE. Creation of the City Logistics Manager.</p> <p>ENCLOSE. Releasing a specific Sulp (Sustainable Urban Logistics Plan) and integrating it into the SUMP.</p> <p>NOVELOG: New Cooperative business models and guidance for sustainable City Logistics</p> <p>Density project (see above)</p> <p>SMARTFUSION developed the <i>Smart Urban Freight Designer</i> which is an interactive planning tool for clean urban logistics integrated with PTV routing tools.</p> <p>SMP ITC Software The tool integrates methods and calculations of the benefits of creating environmental zones, using low emission vehicles</p>	-

	for urban distribution, bundling of goods, night distribution, reducing road capacity, etc SUITS: development of inclusive, integrated transport measures will be measured in the cities	
DOI #2: Potentially foreseen in forthcoming topics		
Challenges	Specific contributions justifying DoI #2	GAPS IDENTIFIED
Assess how road infrastructure can be best used for freight activities.	Some experiences available: <ul style="list-style-type: none">• Extensive work in the SPECTRUM project on using suburban rail networks for urban freight deliveries.• The Monoprix service in Paris using RATP lines at night to deliver to stores. Forthcoming topics: MG-4.1-2017: Increasing the take up and scale-up of innovative solutions to achieve sustainable mobility in urban areas <ul style="list-style-type: none">• Optimizing the use of existing infrastructure and vehicles• Integration between urban freight and passengers transport networks within appropriate city and transport planning governance• Use of multi-modals hubs and terminals for passengers and freight• Multi-purpose use of space for vehicles• Synergies between passenger and freight transport	-
Differentiate the use of road space in time		
Explore the potential of private infrastructures. Public Private Partnerships (PPP) possibilities		
DOI #1: No clear evidences of implementation. Few cases (No challenges in this category)		

2.2 Better understanding of the impact of land use on urban logistics activities

Research and innovation on this topic should help to increase the knowledge related to spatial patterns and urban freight facilities. It should lead to tools for measuring the role, location and impacts of warehouse, freight terminals and urban logistics platforms in metropolitan areas. On this topic, it is also necessary to assess and map locational trends and the impacts of “logistics sprawl” on freight flows, CO₂, local pollutants and congestion.

The location of logistics activities may also have an impact on the social cohesion of the territory and should be better understood.

Finally, some research should be carried out on measuring the accessibility of networks and terminals for various types of actors.

DOI #5: Sufficient evidences of implementation (No challenges in this category)		
DOI #4: Experiences but not deployed a large scale		
Challenges	Specific contributions justifying DoI #4	GAPS IDENTIFIED
Knowledge related to spatial patterns, location and impacts of warehouse, freight terminals and urban logistics platforms in metropolitan areas	<p>CITYLAB: City Logistics in Living Laboratories</p> <p>PLUME: decision-making tool to estimate the best position of urban distribution platforms</p> <p>ANNOA and SILOGUES projects include work on location of warehouses</p>	<ul style="list-style-type: none"> - Impact on residents due to new consumer patterns - Better links between urban nodes and long distance (and BMs on Urban Consolidation – too much research but very few implementation) - Business Case - Knowledge on how to handle different classifications of goods for better last mile delivery
Assess and map locational trends and the impacts of «logistics sprawl» on freight flows, CO2, local pollutants and congestion	<p>CITYLAB: Paris pilot addressing logistic sprawl</p> <p>CITYFREIGHT: LUTP (land use and transport planning) project. Much land use and freight work was done in Brussels and Helsinki.</p> <p>LAMILO, SUCCESS</p> <p>Laetitia Dabanc's (IFSTTAR) work in this field is extensive:</p> <ul style="list-style-type: none"> • The impacts of logistics sprawl in Paris • Atlanta: a mega logistics center in the Piedmont Atlantic Megaregion (PAM) <p>How can we Bring Logistics Back into Cities? The Case of Paris Metropolitan Area</p>	

	<p>PORTIS: to enhance logistics and freight transport, improving the efficiency and coordination of city, port and regional freight movements.</p> <p>Distriseine: operates on time share dock principle (quay wall is open to public outside operation hours to allow multi-functional use)</p> <p>The Zulus: an answer to the traffic jams in places inland can get</p> <p>Vert chez Vous (Bestfact): Integration of a "soft" mode integrated in the trafic (bikes) improving the overall efficiency of the transport system by reducing the jams.</p> <p>STRAIGHTSOL: Malmo case study on urban-interurban connection</p> <p>SULPITER: Survey related to understand demand model generated by each local activity and impact on supply chain in each zone of the city. All metropolitan area is interested not only the city center. Is a DSS for local authorities to make city areas better served by logistics</p> <p>SPIDERPLUS: Urban planning is necessary to locate distribution centres and transshipment facilities in adequate, efficient places.</p>	
<p style="text-align: center;">DOI #3: Some research activities exist</p> <p style="text-align: center;"><i>(No challenges in this category)</i></p>		
<p style="text-align: center;">DOI #2: Potentially foreseen in forthcoming topics</p>		
Challenges	Specific contributions justifying DoI #2	GAPS IDENTIFIED
Measuring the impact of the location of freight activities, including the accessibility of networks and	Sulpiter: takes into consideration the functional transport and economic relations between inner urban centres and the surrounding urban territories.	<p>Knowledge on impacts assessment of each local activity (Sulpiter)</p> <p>Exploit solutions to fill empty spaces (technology/regulation)</p>

terminals, for various types of actors.	MG-7-2-2017: Optimisation of transport infrastructure including terminals	
DOI #1: No clear evidences of implementation. Few cases <i>(No challenges in this category)</i>		

2.3 Enabling a more efficient management of goods: ITS to better manage the movement of goods

ITS can be used to better manage the movement of goods. The key focus of any research is to identify appropriate business models for technology adoption and market deployment.

The integration of urban freight into urban network management can rely on new improved traffic management operations and a better use of data on urban freight. To support this approach, research work should be carried out on data definition/identification/collection/accessibility for planning and policy and urban freight plans.

The potential of e-Freight should be explored to accelerate this development towards a more efficient management of the network.

In-vehicle systems and connectivity should also be explored as means to enabling a more efficient management of goods. The limit of the scope of the roadmap towards vehicles is defined by the scope of the European Green Vehicles Initiative (EGVI).

DOI #5: Sufficient evidences of implementation		
Challenges	Specific contributions justifying DoI #5	GAPS IDENTIFIED
Management of loading and unloading areas.	<p>Some experiences on load/unload management system, but not deployed at large scale</p> <p>BESTFACT Case: i-Ladezone: Intelligent monitoring of loading bays in Vienna.</p> <p>BESTFACT Case: New loading/unloading regulation and parking meter/loading bay surveillance technology in Lisbon</p> <p>FREILOT project: Bilbao case</p> <p>CO-GISTICS project: Bilbao case</p>	<p>Effective regulation for slot allocation</p> <p>Guide from the depot to loading bays (technology)</p> <p>Multi-purpose and use of loading bays for resident during off delivery time (efficient use of urban network – land use)</p>

	<p>NOVELOG: Turin pilot and Pisa pilot</p> <p>ALF project</p> <p>The Zulus: The pallets are stored on deck stand, so they need to be taken during loading and unloading with not much effort from the hold of the ship.</p> <p>Vert chez Vous (Bestfact): Increase the adaptability of the delivery tanks to a better flexibility.</p>	
<p>DOI #4: Experiences but not deployed a large scale</p> <p><i>(No challenges in this category)</i></p>		
<p>DOI #3: Some research activities exist</p>		
Challenges	Specific contributions justifying DoI #3	GAPS IDENTIFIED
<p>Explore the potential of more exchange of data on urban freight</p> <p>Data definition, identification, collection, accessibility, for planning and policy and for urban freight plans.</p> <p>Models for data sharing and cost efficient data collection on urban freight.</p>	<p>GALENA project: To develop innovative and trusted PVT solutions with a hybrid system GALILEO / ZigBee enabling a seamless, robust and continuous handover indoor/outdoor localization of freight and enabling the various carrier operators to take over the liability of the goods they are responsible for.</p> <p>COMCIS: interoperability between e-freight systems that have been developed in previous EU projects as well as in commercial undertakings.</p> <p>SMARTIE project investigates and develops novel technologies to securely gather information from the real world e.g. from citizens, traffic control systems etc. and store it in the platform in a privacy-preserving way.</p> <p>Lindholmen Science Park: workshop series in Sweden as a basis for understanding the data need to better support freight planning in urban area.</p>	<p>Living labs</p> <p>Understanding on how big data can be adequately adopted for public use</p>

	<p>Spider plus: ITS are intensely used all the transport chains long, so as to integrate the elements into a coherent organisation.</p> <p>Smartfreight: The main aim of SMARTFREIGHT is therefore to specify, implement and evaluate Information and Communication Technology (ICT) solutions that integrate urban traffic management systems with the management of freight and logistics in urban areas</p> <p>SELIS: provides a 'lightweight ICT structure' to enable information sharing for collaborative sustainable logistics for all at strategic and operational levels.</p> <p>MUV: The solution will include a mobile app tracking users' daily routes and assigning points for sustainable behaviours and a network of sensing stations designed by the makers' community</p> <p>E-freight projects:</p> <ul style="list-style-type: none"> • Use of multi-modals hubs and terminals for passengers and freight • Freightwise • e-freight • the relevant ISO and GS1 standards <p>This has been well explored and the Common Framework covers operational work well.</p> <p>However, there is more to be done, pilots in urban freight are missing.</p>	
<p>Appropriate business models for technology adoption and market deployment e.g.:</p> <ul style="list-style-type: none"> - Access control and privileges granted to specific vehicles (low 	<p>ALF (ANR project): future generation delivery areas</p> <p>SMP ITC Software: The tool integrates methods and calculations of the benefits of creating environmental zones, using low emission vehicles for urban distribution,</p>	<p>Availability of pre-trip and real time data</p> <p>Encourage partnerships (e.g. PPP) and local agreements among relevant stakeholders</p>

<p>noise, low or zero emissions...)</p> <ul style="list-style-type: none"> - Dynamic routing - Lane sharing - Load index control - Information on other road users <p>Delivery spaces availability or information related to logistics</p>	<p>bundling of goods, night distribution, reducing road capacity, etc</p> <p>NEWBITS: New business models, awareness raising, support and incentives for the roll-out of ITS</p> <p>MG-5-2-2017: Innovative ICT solutions for future logistics operations</p>	<p>Better regulation</p>
DOI #2: Potentially foreseen in forthcoming topics		
Challenges	Specific contributions justifying DoI #2	GAPS IDENTIFIED
<p>Deployment of C-ITS, in particular V2I.</p>	<p>ECOMOVE: it developed core technologies and applications based on vehicle-to-vehicle and vehicle-to-infrastructure communication or so called “cooperative systems”.</p> <p>Compass4D: it focused on three services: The Energy Efficient Intersection (EEI), the Road Hazard Warning (RHW) and the Red Light Violation Warning (RLVW).</p> <p>MG-6.2-2016: <i>Large-scale demonstration(s) of cooperative ITS. Enable services based on appropriate access and sharing of data leveraging in-vehicle resources and 2-way V2V, V2I, I2I and vulnerable road users connectivity in complex urban environments</i> <i>The funded projects are not published yet, there are seven submitted projects to this topic</i></p> <p>Forthcoming topics:</p> <p>MG-5.2-2017: Innovative ICT solutions for future logistics operations</p>	<p>Availability of BMs</p>

	Need to match the increased need for real-time and open data to plan and track shared freight with guarantees that the exploitation of this data is both safe and secure	
Development of communication interface to manage all information related to vehicle operation, data exchange with infrastructure, data exchange with logistics operations, load management and mission profile.	<p>CO-GISTICS: Deploy cooperative ITS services for logistics:</p> <ul style="list-style-type: none"> • Intelligent parking and delivery areas • Eco-drive support • Priority and Speed advice <p>GET SERVICE: platform provides transportation planners with the means to plan transportation routes more efficiently and to respond quickly to unexpected events during transportation.</p> <p>OPTICITIES: ITS solutions to optimize urban logistics operations: urban traffic regulation tools and integration into traffic management systems; freight delivery optimisation tools and fleet management services</p> <p>ECO-FEV: Integration of the FEV in the cooperative transport infrastructure. Integrated IT platform that enables the connection and information exchanges between multiple infrastructure systems that are relevant to the FEV such as road IT infrastructure.</p> <p>SMARTIE project build the advanced and secure IoT platform to provide enhanced services to the citizens</p> <p>E-freight projects (see above): cover data exchange with logistics operations.</p> <p>MG-6.2-2016: <i>Large-scale demonstration(s) of cooperative ITS Enable services based on appropriate access and</i></p>	Standard data format Privacy issues

	<p><i>sharing of data leveraging in-vehicle resources and 2-way V2V, V2I, I2I and vulnerable road users connectivity in complex urban environments</i></p> <p><i>The funded projects are not published yet, there are seven submitted projects to this topic</i></p> <p>Forthcoming topics:</p> <p>MG-5.2-2017: Innovative ICT solutions for future logistics operations</p>	
<p>DOI #1: No clear evidences of implementation. Few cases</p> <p><i>(No challenges in this category)</i></p>		

2.4 Improving the interaction between long distance freight transport and urban freight

This challenge should address the interface and interactions with long distance freight transport services and infrastructures, and other modes (airports, seaports, intermodal terminals, dry ports, logistics platforms, etc.).

A major issue is the coordination of very different trends in long distance freight transport (increase efficiency by vehicle scale increases) and city distribution (increase efficiency by downscaling of transport modes used for urban deliveries).

The Physical Internet concept, in which logistics and supply chain networks are open and integrated, including warehouses and hubs, should be further investigated, to enable the proper consolidation of freight transport in the last mile delivery in urban areas. The design of freight corridors in cities/regions should be improved, to provide a better management of long distance freight transport through the urban transport network (urban nodes).

<p>DOI #5: Sufficient evidences of implementation</p> <p><i>(No challenges in this category)</i></p>		
<p>DOI #4: Experiences but not deployed a large scale</p> <p><i>(No challenges in this category)</i></p>		
<p>DOI #3: Some research activities exist</p> <p><i>(No challenges in this category)</i></p>		
<p>DOI #2: Potentially foreseen in forthcoming topics</p>		
Challenges	Specific contributions justifying DoI #2	GAPS IDENTIFIED

<p>Studies on land use and freight transport/logistic operations interaction, and the impact of the multiplicity of logistics hubs and networks</p> <p>Design of freight corridors in cities.</p>	<p>STRAIGHTSOL: One of the case studies deals with the link between long distance transport and urban freight: how will a more reliable management of long distance haulage help improving final delivery?</p> <p>SMARTFUSION freight corridor pilot in Berlin to assess how to meet the needs in terms of air quality.</p> <p>Medlinkports: Integration of the main ports all along the Rhone valley, combining the urban scale with the long distance context and link to the rest of Europe.</p> <p>Vert chez Vous (Bestfact): Integration with the inland waterways</p> <p>Land use and transport planning (see above).</p> <p>Forthcoming calls:</p> <p>MG-4.3-2017: Innovative approaches for integrating urban nodes in the TEN-T core network corridors: Approaches for linking long-distance with last-mile freight delivery in urban areas.</p> <p>Connecting Europe Facility (CEF) urban nodes calls: Actions implementing transport infrastructure in nodes of the core network, including urban nodes.</p>	<p>-Check CIVITAS for financial feasibility results</p> <p>-Amsterdam example towards lightrail</p> <p>-Main driver access regulations for hubs</p> <p>-Last mile versus hubs and connecting them</p> <p>-Business cases for all the involves parties</p> <p>-Expertise within cities is caching understanding</p> <p>-Step-up from pilots which stop in the end to continue including finding funding by cities</p>
<p>DOI #1: No clear evidences of implementation. Few cases</p> <p><i>(No challenges in this category)</i></p>		

2.5 Better adapting the vehicles to innovative urban freight delivery systems

The better integration of urban freight activities in the urban transport system requires the development of innovative vehicle solutions that are better fitted to innovative urban freight delivery systems, due to flexibility and modularity. There needs to be a decrease in the unwanted miles driven,

unnecessary stops and time wasted in order to improve the overall efficiency of the system and decrease its impact on congestion.

DOI #5: Sufficient evidences of implementation		
Challenges	Specific contributions justifying DoI #5	GAPS IDENTIFIED
Develop technologies to transfer loads between vehicles (large and small) as well as with other transport modes (architecture of vehicles, load units...) to allow a decoupling of the delivery processes between mass transport and last mile operations.	<p>Some solutions have been already introduced in the market.</p> <p>I.LOG City Logistics system, for integrating intermodal transport with the “last mile” with micro-swap bodies.</p> <p>Extensive work in transshipment: see SPECTRUM and INHOTRA for rail-road-sea systems. See also CITYLOG.</p> <p>BESTFACT Case: Electric freight vehicle with trailers: Cargohopper in Utrecht: multi-trailer, 16-metre long but narrow road train. It is powered by a solar & battery-electric motor</p> <p>BESTFACT Case: Citylog EMF (efficient, modular, flexibel) – Electro-Multifunction-Transportation vehicle: modular built vehicle, series of ‘self-driven’ vehicles and ‘trailers’ that can be coupled to a train, and un-coupled for loading and unloading operations</p> <p>CITY MOVE: Optimisation of the vehicle capacity and vehicle weight ratio. The vehicle responds to an urban and modular architecture, so it contributes to modular logistics units for a better load factor.</p> <p>CITYLAB: Amsterdam case: floating depot and clean vehicles</p>	<p>-The business case is an issue</p> <p>-OEM’s don’t jump in on the vehicle side</p> <p>-Scalability is an issue</p> <p>-Combination: regulation and standardization</p>

	<p>STRAIGHTSOL: Mobile depot TNT</p> <p>VANECK GROUP: Solution of several boxes on trailer ready for urban distribution.</p> <p>MODHULUSCA project</p> <p>Other projects on containers for urban logistics as PART, URBANCITY BOX</p> <p>Transformer: Develop and demonstrate Hybrid-on-Demand Driveline for Truck-trailer Combination, develop innovative complete vehicle aerodynamic measures and develop innovative loading efficiency measures</p>	
DOI #4: Experiences but not deployed a large scale		
Challenges	Specific contributions justifying DoI #4	GAPS IDENTIFIED
Lowering the noise related to handling, loading and unloading of the goods to enable night deliveries	<p>PIEK project: funded by the Dutch government. It published a handbook on how to silence almost every part of loading, unloading and driving in cities at night.</p> <p>No recent examples from European research projects. National projects and tests in several countries (e.g. UK, Belgium, France, etc.)</p> <p>CERTIBRUIT standard: takes into account global noise from a delivery, from truck to shop material, including delivery operations</p>	<p>-Infrastructure/pavement can be an issue</p> <p>-Plenty of research out of Europe</p> <p>-Complete chain regarding night delivery (the potential exists)</p> <p>-Look cities: (Open and Lock workshop)</p>
DOI #3: Some research activities exist		
Challenges	Specific contributions justifying DoI #3	GAPS IDENTIFIED
Define future optimal urban freight vehicle sizes and architectures	FURBOT: it proposed novel concept architectures of light-duty, full-electrical vehicles for efficient sustainable UFT and	<p>-Standardization here is a key</p> <p>-Scalability needs to be solve</p>

from multi-stakeholder perspective.	developed FURBOT, a vehicle prototype, to factually demonstrate the performances expected. V-FEATHER: it presented a complete electric vehicle architecture vision on how urban light duty vehicles will be designed, built and run in the near future.	
Develop standardized and modular logistics units (compatible with regular containers) for a better load factor and interoperability among different transport systems and modes	MODULUSHCA TELLISYS: modular set of volume-optimised and traceable MegaSwapBoxes (MSB) CLUSTERS 2.0: Increase the engagement, performance and coordination of terminals and hubs at cluster level targeting, one objective is Develop prototypes of New Modular Load Units LessThanWagonLoad: Development of 'Less than Wagon Load' transport solutions in the Antwerp Chemical cluster	-Unitise at a smaller level (blue) -Next step and standardization and acceptance -Not much more on technology itself
DOI #2: Potentially foreseen in forthcoming topics (No challenges in this category)		
DOI #1: No clear evidences of implementation. Few cases		
Challenges	Specific contributions justifying DoI #1	GAPS IDENTIFIED
Develop loading rate measurement systems (weight, volume...), to be linked with overall city access control and network management.	No clear evidence it has been addressed	-Include new sensors -Link with smart cities -Open technologies

3. BUSINESS MODELS AND INNOVATIVE SERVICES

Research and development on new business models associated to the smart urban logistics needs to tackle economic, environmental and social aspects that allow growth, and industry to run businesses, and at the same time guarantee well-being for citizens.

Traditionally, the last mile delivery has been outsourced to specialised companies (mail or express companies, local agents, etc.), and somehow the direct control of the physical operations gets lost or at least handed over to someone else. The shift in consumer trends towards e-commerce and the current demand for better environmental conditions in cities call for a closer look into this part of the supply chain.

E-commerce is becoming the new paradigm in retailing. Beyond being a new channel of sales for retailers, the internet gives the consumer new powers to influence what is sold and how. The problem with e-commerce is that it multiplies the number of deliveries, since trips saved by consumers have to be done by the commercial vehicles.

Reverse logistics focuses on the analysis of niches and opportunities to integrate direct and reverse flows, in order to increase the global efficiency. Reverse logistics associated to e-commerce also have to be considered for this potential flow integration.

Finally, there is a need to better understanding how to best build and manage infrastructures dedicated to freight delivery in the urban environment.

DOI #5: Sufficient evidences of implementation (No challenges in this category)		
DOI #4: Experiences but not deployed a large scale		
Challenges	Specific contributions justifying DoI #4	GAPS IDENTIFIED
Business models for consolidation schemes, including fleet and freight sharing and pooling. New concepts for distribution centres, optimal utilization of infrastructure	<p>LAMILO: LBCC in London, Freight Cycle in Nijmegen and Consolidation Centre in Brussels.</p> <p>NOVELOG: develop the NOVELOG “Guidance” tool for facilitating stakeholders to implement the Strategy and enhance their SUMP, and enable developing their own Business Model.</p> <p>SMARTFUSION: Newcastle University working on consolidation scheme.</p> <p>SMILE: Valencia and Barcelona pilots</p> <p>SUCCESS: living labs to identify new business models</p>	<p>-Neighborhood hubs for e-commerce</p> <p>-Night deliveries for smaller shops</p> <p>-Horizontal collaboration for urban deliveries</p> <p>-Combination of fits-all solutions. For example: Deliver goods by autonomous passenger vehicles</p>

<p>Collaboration models for small businesses, e.g. out-of-office hour deliveries to retail and for specific logistics chains such as Hotel/Restaurant/Café (HORECA)</p>	<p>CITYLAB: Brussels case: Increasing vehicle loading by utilising spare capacity</p> <p>Other examples: Bubble post Ben Hubble, Barcelona</p>	<p>-Behavioural aspects and supply chain thinking: loading it from the whole chain and also from lack actor's perspective</p> <p>-Policy measures to incentives study the impact</p>
<p>Packaging in last mile distribution for fresh, refrigerated and frozen goods.</p> <p>Optimisation, modularization and standardization of packaging and load units.</p>	<p><i>Refer also to sub-challenge 'better adapting the vehicles to innovative urban freight delivery services'-develop standardized & modular logistics units'</i></p> <p>4FOLD-Reduction of the International Transport of Empty Containers by Folding</p>	<p>-Refrigerated delivery boxes for private cars</p> <p>-CLUSTER 2.0: New project on modular units for aviation/trucks</p>
<p>DOI #3: Some research activities exist</p>		
<p>E-commerce implications</p> <p>- Assessing the impact of e-commerce on urban freight delivery and the urban transport system.</p> <p>- Logistics for home deliveries. Decoupling delivery and reception. Service quality (requirements, perception, traceability)</p> <p>- Integration of click-and-mortar distribution channels</p>	<p>CITYLAB: The Observatory of Strategic Developments Impacting Urban Logistics provides data and analyses on E-commerce, for a better understanding of these challenges and trends.</p> <p>EU non-binding guidance documents on urban logistics: European Commission's DG MOVE has launched a study to facilitate the preparation of non-binding guidance documents (NBGD) on six specific aspects of urban logistics policies. Topic #4 is Logistic schemes for e-commerce.</p> <p>Franprix en Seine: linking e-commerce deliveries to sustainability: digitalisation and reliability</p> <p>Other examples:</p> <p>WS 5.2 Mines Paristech: The idea is to use taxis, as an available under-utilised transport capacities, to bring back unwanted products</p>	<p>-Impact on parking places/urban planning</p> <p>-Bundling of last mile at different points in the chain: policy measures and gain sharing for all actors. Should be involved</p>

	(bought through e-commerce) from the customer to the shop. Taxi drivers would receive an additional revenue, while congestion as well as energy consumption and emissions would diminish.	
<p>Reverse logistics and transport of waste and recycling material</p> <p>- Direct and reverse volume trends: waste, recycling and e-commerce. Current vs. new paradigms and business models of direct and reverse flows (recycling and returns)</p> <p>- Direct and reverse logistics models, integration and cargo pooling</p> <p>Beyond reverse logistics: urban freight for circular economy and service functionality economy</p>	<p>FREVUE Stockholm case study</p> <p>CITYLAB Rome case</p> <p>SUCCESS: reverse logistics aim to collect construction waste, demolition debris, packaging waste, etc., recycle and sort material; to organize and perform unused and unsuitable material exit and return to sub-contractor or supplier.</p> <p>R2PI: Circular Economy Business Models (CEBM), by tackling both market failure (business, consumers) and policy failure (conflicts, assumptions, unintended consequence)</p> <p>BuyZet</p> <p>The river rubbish dump: providing a rubbish dump service to the inhabitants from dense urban areas without consuming the rare and costly land resource. Increase the waste management of the City by reducing the land consumption</p> <p>AMS Roboat: Use Roboats to rid the canals from floating waste and find a more efficient way to handle the 12,000 bicycles that end up in the city's canals each year in Amsterdam.</p> <p>PolyCE - Post-Consumer High-tech Recycled Polymers for a Circular Economy</p>	<p>-Circular economy: linking with logistics</p> <p>-Business models / societal models to collect waste and recycling items from individuals</p>

	<p>PAPERCHAIN - New market niches for the Pulp and Paper Industry waste based on circular economy approaches</p> <p>PlastiCircle - Improvement of the plastic packaging waste chain from a circular economy approach</p> <p>CIRC-PACK - Towards circular economy in the plastic packaging value chain</p> <p>ECOBULK - Circular Process for Eco-Designed Bulky Products and Internal Car Parts</p> <p>SYSTEMIC - Systemic large scale eco-innovation to advance circular economy and mineral recovery from organic waste in Europe</p> <p>ZERO BRINE - Re-designing the value and supply chain of water and minerals: a circular economy approach for the recovery of resources from saline impaired effluent (brine) generated by process industries</p> <p>FiberEUse - Large scale demonstration of new circular economy value-chains based on the reuse of end-of-life fiber reinforced composites.</p> <p>Forthcoming calls:</p> <p>CIRC-01-2017: Systemic, eco-innovative approaches for the circular economy: large-scale demonstration</p>	
Challenges	Specific contributions justifying DoI #2	GAPS IDENTIFIED
<p>ICT tools to enable sharing and integration of data. Potential of Internet of Things (IoT) and Future Internet for logistics.</p> <p>Better integration of urban freight in main traffic models. C-ITS as support system.</p>	<p>CO-GISTICS: Eco-driving</p> <p><i>Refer also to sub-challenge 'enabling a more efficient management of goods: ITS to better manage movement the movements of goods'</i></p> <p>AEOLIX-Architecture for EurOpean Logistics Information eXchange</p> <p>MG-5.2-2017: Innovative ICT solutions for future logistics operations</p>	-

DOI #1: No clear evidences of implementation. Few cases		
Challenges	Specific contributions justifying DoI #1	GAPS IDENTIFIED
<p>Designing and operating urban freight delivery infrastructures</p> <p>- Design and building of dedicated infrastructure, including vertical exploitation of space (storage and transport). Integration of infrastructure into other types of infrastructure and building</p> <p>- Financing the operation of dedicated infrastructure</p>	<p>Chapelle International project from SOGARIS mixing a rail-connected urban distribution center with, offices, a data center, restaurant, urban gardens.</p> <p>AMS Boat: The fleet of autonomous boats may be used as dynamic and temporary floating infrastructure like on-demand bridges and stages, that can be assembled or disassembled in a matter of hours.</p> <p>Future radar</p> <p>Connecting Europe Facility (CEF) urban nodes calls: Actions implementing transport infrastructure in nodes of the core network, including urban nodes.</p>	-
<p>Implication of Physical Internet on the first and last mile: infrastructure, governance and business model</p>	<p>MG-5.4-2017. Potential of the Physical Internet</p>	

4. CLEANER AND MORE EFFICIENT VEHICLES

More efficient organisation can lead to a decrease in the number of kilometers driven. But cleaner and more efficient vehicles can further enhance the positive trend to fuel consumption reduction and an improved urban environment. Besides air pollutants, the reduction of vehicle noise is an important research priority. The reduction of vehicle noise is also a condition for shifting deliveries to off-hours.

DOI #5: Sufficient evidences of implementation		
Challenges	Specific contributions justifying DoI #5	GAPS IDENTIFIED
<p>Reduction of vehicle noise</p> <p>-Definition of a EU standard methodology for noise measurement for the overall delivery process</p> <p>-Development of 'affordable' low noise solutions, including full vehicle equipment</p>	<p>PIEK standard</p> <p>GREEN POST. (IEE, 2008-2010) Studying the reduction of noise and air pollution emissions produced in the urban environment by the proposed vehicles.</p> <p>FUTURE RADAR</p> <p>The river rubbish dump: the barge works with electricity and hydrogen from renewable source</p> <p>Vert chez Vous (Bestfact): bike transport without noise</p>	<p>-Missing link between noise reduction and other policy objectives (and the positive/negative impacts on other areas)</p> <p>-Need to focus on loading/unloading operations (not only on vehicles-related aspects)</p> <p>-Exchange on international experiences, beyond the EU borders – often you can learn about new and different approaches</p> <p>-Definition of a EU regulatory framework, harmonized at EU lever, for what concerns level of noise/timing of deliveries in urban areas</p>
<p>Business and deployment models for alternative fuels</p> <p>-Develop alternative fuel proposals (including electricity). Residual value of vehicles. Integrate management of vehicle auxiliaries for a wider scope of implementation. Develop alternative fuel</p>	<p>SMARTFUSION, SMARTSET and FREVIEW pilots</p> <p>FURBOT, FUTURE RADAR</p> <p>PORTIS: Transport system: to strengthen the efficiency of road traffic management to/from the port and through the city, and foster the use of clean vehicles</p> <p>CIVITAS ECCENTRIC: ECCENTRIC will test clean vehicles and fuels</p>	<p>-Need to establish a strong link with the power supply system, especially for the commercial use of alternatively fuelled freight vehicles.</p> <p>-Need to find smart grids solutions to ensure an effective/efficient</p>

<p>proposals for autonomous body modules (e.g. refrigerated units). Reduction of particulates from brakes and tyres.</p> <p>-Address fuel availability and distribution, including the deployment of charging infrastructure for electric freight vehicles.</p> <p>-Address the potential choice determinants for alternative fuels fleet composition.</p>	<p>MEDLINKPORTS: "Medlink Co²" is a tool delivering the CO² emission by comparing the road and inland waterways modes.</p> <p>Freight Beer boat: Electrification for small ships feasible</p> <p>The river rubbish dump: the barge works with electricity and hydrogen from renewable source</p> <p>DETINATIONS: Shared mobility and e-infrastructures towards zero emissions transport</p> <p>Forthcoming calls:</p> <p>GV-08-2017: Electrified urban commercial vehicles integration with fast charging infrastructure.</p>	<p>recharge process for Freight Electric Vehicles, which must be particularly reliable because of their daily delivery operations.</p> <p>-Biofuels / hydrogen continues to be a big question mark to be addressed at EU research level.</p>
DOI #4: Experiences but not deployed a large scale		
Challenges	Specific contributions justifying DoI #4	GAPS IDENTIFIED
Definition of a common European standard, based on existing ones, and a common, shared framework for evaluating and changing the standard	<p>Italian national project on "Active control devices for noise reduction of diesel shunting locomotives" carried out by CIRIAF and TRENITALIA.</p> <p>FUTURE RADAR</p>	NONE
<p>DOI #3: Some research activities exist</p> <p>(No challenges in this category)</p>		
<p>DOI #2: Potentially foreseen in forthcoming topics</p> <p>(No challenges in this category)</p>		
<p>DOI #1: No clear evidences of implementation. Few cases</p> <p>(No challenges in this category)</p>		

5. SAFETY AND SECURITY IN URBAN FREIGHT

A significant amount of goods are lost following security breaches. It is important to identify solutions to guarantee a safe urban delivery system which minimises the risk for the freight operators, in order to achieve the objective of reducing the amount of goods lost or stolen by 90%.

The delivery of goods in cities may lead to safety concerns for both Vulnerable Road Users (VRUs) and the drivers. There is indeed a high share of accidents of VRUs involving commercial vehicles in the urban environment. This is due, among other things, to the lack of visibility of VRUs in the urban environment when driving and maneuvering. Moreover, it is risky for the driver to leave the vehicle and manipulate packages and pallets close to heavy traffic.

DOI #5: Sufficient evidences of implementation		
Challenges	Specific contributions justifying DoI #5	GAPS IDENTIFIED
Locks and seals to guarantee vehicle integrity.	There exist commercial solutions in place	-Need to find innovative solutions to ensure the safety of the UF infrastructure and the overall delivery process
Secure and reliable automated parcels lockers and delivery units.	<p>There exist lots of commercial solutions (e.g. DHL packstations), e.g. lockers for residential buildings, integrated with traditional post-boxes.</p> <p>BESTFACT Case: Urban distribution of small parcels using self-service terminals in Lithuanian towns and cities (LP EXPRESS 24). In market.</p> <p>BESTFACT Case: Post Receiving Box by Austrian Post AG. The “receiving box” has proved successful and proceeded to a roll-out-phase – it is available and has been implemented in all major urban areas in Austria: Vienna, St. Pölten, Graz, Linz, Salzburg, Klagenfurt, Villach, Innsbruck, Bregenz, Dornbirn, Feldkirch and rural areas bordering these cities</p>	<p>-Extend and specify the concept of “vehicle”: is it just traditional ones, or also drones, automated boxes</p> <p>-Need to enhance the overall security (e.g. diminishing thefts) of delivery operations</p>
DOI #4: Experiences but not deployed a large scale		
Challenges	Specific contributions justifying DoI #4	GAPS IDENTIFIED

Increasing integrity of goods (perishable, electronic, high value).	More explicit challenges are required here	<p>-Explore technological solutions to detect the integrity of the goods to be distributed, before they reach the “last mile” stage: avoid useless trips.</p> <p>-Investigate the impacts of growing e-grocery urban distribution (instant deliveries)</p>
DOI #3: Some research activities exist		
Challenges	Specific contributions justifying DOI #2	GAPS IDENTIFIED
<p>Driver support and visibility equipment for a 360° safety around the vehicle when driving and manoeuvring.</p> <p>Include messages to vulnerable users, communication via lights, beeping sounds when backing up as in heavy duty vehicles, also when operating tail lifts...</p>	<p>SMARTFUSION: The first two are commercially available, fitted to trucks in the project trials. We just rung up and ordered them.</p> <p>interACT: Designing cooperative interaction of automated vehicles with other road users in mixed traffic environments</p> <p>SENIORS - Safety-ENhancing Innovations for Older Road users</p> <p>InDeV - Depth understanding of accident causation for Vulnerable road users</p> <p>PROSPECT - PROactive Safety for PEdestrians and CyclisTs</p> <p>XCYLE- Advanced measures to reduce cyclists' fatalities and increase comfort in the interaction with motorised vehicles</p> <p>SafetyCube - Safety CaUsation, Benefits and Efficiency</p>	<p>Improve loading/unloading infrastructure to ensure safety (including Vulnerable Road Users) of UF operations</p>
DOI #2: Potentially foreseen in forthcoming topics		
<i>(No challenges in this category)</i>		
DOI #1: No clear evidences of implementation. Few cases		
<i>(No challenges in this category)</i>		

PROPOSAL OF IMPLEMENTATION PLAN

Taking into account the implementation status and the research gaps from the EU projects and initiatives benchmark, new challenges and topics have been identified for the period 2018-2018. A proposal for an implementation plan is presented for eight intervention areas. Recommendations and possible activities for the different type of stakeholders have also included.

SUMMARY TABLE TOPICS AND STAKEHOLDER RECOMMENDATIONS:

1. Integrated data framework and big data analytics as opportunity for improving decision-making in urban freight transport	
STAKEHOLDERS	RECOMMENDATIONS
Operators	Operators and other mobility service companies should find motivation ways and incentives to share data from their business activities coming from vehicles, social networks, etc. Recommended actions: Engage operators and other mobility services companies in pilot projects with cities partners to test new incentive schemes and business models based on public-private partnership
Local, regional or national authority	Develop a better knowledge by city planners on management of big amount of data and analytics coming from traffic and logistics activities. Recommended actions: boost the engagement of city planners on collaborative projects with other cities and industry stakeholders, create and share a repository of good practices and develop a training program for big data analysis for city planners.
Vehicle manufacturer	-
IT Industry	IT suppliers should provide open data platforms for the purpose of planning activities while ensuring integrity and confidentiality of sensible data (business or personal data). Regulatory and legal recommendations should be formulated and tested in pilot environments.
End users	-
Infrastructure	-
2.Exploring new opportunities for achieving effective integration of urban freight and personal mobility: services and networks	
STAKEHOLDERS	RECOMMENDATIONS
Operators	Operators and other mobility services companies should identify new opportunities and new business models for collaborative services between passenger and freight transport (public and private). Develop pilot demonstrators in different cities to evaluate the different impacts by research institutions
Local, regional or national authority	Authorities should be aware that freight transport is a social issue. They should know the new collaborations between passengers and freight and new business models. Promote these collaborations with incentives and new measures, including them in mobility plans trying to minimize congestion and pollution in cities.
Vehicle manufacturer	Innovative and sustainable vehicles which could transport goods and passengers.

IT Industry	IT partners should develop new tools and technologies contributing the integration of passengers and freight flows and its prediction, data visualization for different traffic to avoid congestion and connect good and passenger.
End users	-
Infrastructure	Share the infrastructure to integrate good and passengers. Optimize their architecture to support new business models.
3.Improving the link between urban and long distance freight transport services and infrastructures	
STAKEHOLDERS	RECOMMENDATIONS
Operators	Operators should promote the use of Urban Consolidation Centers (UCCs). Avoid mistrust and share their transport with other operators promoting horizontal and vertical collaborations. Use sustainable vehicles in urban zones for logistic services. Pilot new distribution models in different cities and coordinate the different existing flows
Local, regional or national authority	Authorities should let and decide where locate UCCs. Incentive the use of collaborative delivery models and promote using sustainable vehicles. Pilot new governance models, measures and strategies.
Vehicle manufacturer	-
IT Industry	IT suppliers should provide open data flows to planning new delivery models between long distance transport and last mile delivery.
End users	-
Infrastructure	Need to improve the infrastructure and develop new sharing platforms. Actions: research on the feasibility of the optimal architectural design and integration between long and urban transport.
4.New business models for Logistics services based on sharing economy	
STAKEHOLDERS	RECOMMENDATIONS
Operators	Operators and LSPs (Logistic service providers) should explore new business models for logistic services, which are environmentally and financially sustainable at the same time. They should engage in cross-sectorial cooperation among competing services. Recommended actions: Engage operators and LSPs in pilot projects with cities and research partners to test new incentive schemes and business models based on public-private partnerships, stressing the accent on the viability of the business model after the end of the funded pilot(s).
Local, regional or national authority	Urban logistics is a key area for the transition towards the sharing economy. Both public initiative as private initiative see the benefit of making better use of urban transport assets. Public authorities should constantly be aware of new trends and business models set up at local level. They should not ban these new services, but a fair regulation is necessary to make them possible without undercutting the larger economic sector of which they are part. Local politicians should be better included in research projects, to raise awareness and consensus on urban freight new solutions. Recommended actions: encourage the engagement of city planners on collaborative (research) projects with other cities and industry stakeholders; set up a constant dialogue with the (local) business actors, both the traditional and the newcomers, to better understand

	their needs; share information with other authorities to anticipate and understand new trends.
Vehicle manufacturer	-
IT Industry	IT suppliers should take advantage of the favourable context and develop smart services for supporting the new business models of the sharing economy. Regulatory and legal recommendations should be formulated and tested in pilot environments.
End users	End users should be sensitised, in particular by local authorities, about the benefits and the risks of utilising these new services: they optimise the use of urban transport assets, but some risk associated to hidden external costs (e.g. wrong perception of free deliveries). This applies for B2B, B2C, B2G. Recommended actions: involve customers (B2B)/consumers (B2C) associations in stakeholder platforms at local level.
Infrastructure	Need for integration and sharing of infrastructure, logistic platforms and node networks, among different competing operators and different users (passenger and freight). Recommended actions: research on the feasibility of the optimal architectural design and integration of logistic facilities in urban areas, and the supporting business models, through strategic scenarios modelling and visualisation.
5. Logistics in the full circular economy: New business models for horizontal and vertical collaboration	
STAKEHOLDERS	RECOMMENDATIONS
Operators	Operators and LSPs should explore new business models for logistic services, which are environmentally and financially sustainable at the same time. Recommended actions: Engage operators and LSPs in pilot projects with cities and research partners to test new business models for horizontal and vertical collaboration, considering the different types of reverse flows and stressing the accent on the viability of the business model after the end of the funded pilot(s)
Local, regional or national authority	Recommended actions: local authorities should act in a multi-governance perspective, closely cooperating with the relevant regional and national authorities. It is essential to develop a harmonised and consistent framework setting common standards and regulations for a full vertical integration of the supply cycle. City planners should engage in collaborative projects with other cities and industry players, to understand who are the right actors and their roles in the chain, and to establish a dialogue with them.
Vehicle manufacturer	-

IT Industry	IT suppliers should enable the visibility of flow data for all actors involved in the supply chain. This will support the evaluation of the performance of different solutions in terms of cost efficiency and environmental impacts. Regulatory and legal recommendations should be formulated and tested in pilot environments.
End users	-
Infrastructure	<p>Need for integration and sharing of infrastructure, logistic platforms and node networks, among different competing operators and different users (passenger and freight).</p> <p>Recommended actions: research on the feasibility of the optimal architectural design and integration of logistic facilities in urban areas, and the supporting business models, through strategic scenarios modelling and visualisation.</p>
6. Bringing logistics into urban Planning	
STAKEHOLDERS	RECOMMENDATIONS
Operators	<p>Operators and LSPs support in the planning process is essential to understand the needs of the market and to avoid to implement measures having undesired effects on the logistics flows.</p> <p>Recommended actions: Engage operators and LSPs in pilot projects with cities and research partners to test new collaborative business models, to facilitate and guide multi-stakeholder cooperation for improved policy making.</p>
Local, regional or national authority	<p>Local authorities should look into long-term strategies to tackle challenges and planning for and implementing appropriate mitigation measures for the increasing demand of delivery trips in cities.</p> <p>Challenges include:</p> <ul style="list-style-type: none"> - Lack of integration and coordination of transport policies and institutions - Wide range of actors, needs and solutions - Lack of data, consistency and robust evaluation - Clear role to be defined, limited resources, allocation of dedicated staff <p>Local politicians should be directly involved in research projects, to raise awareness and consensus on urban freight solutions. In this regard, data collection and interpretation is essential for city planners to persuade decision-makers about the effectiveness and need of specific solutions. However, data is not always necessary, it should be considered a means to an end, not an end in itself.</p> <p>SULPs, or systematic integration of freight in SUMPs, should be enhanced.</p> <p>Recommended actions: city planners from the mobility department as well as from other sector-related departments should be involved in 1) large-scale demonstrators on logistics planning showing the impact of concepts, tools and innovations; 2) best practices exchange activities, to learn more from other initiatives in Europe; and 3) capacity building activities</p>

Vehicle manufacturer	Light commercial vehicles are often the most suitable solution for urban deliveries, in terms of road occupancy, emissions and safety. Vehicle manufacturers should establish a dialogue with national/local authorities for agreeing on the implementation of interoperable and transparent vehicle access regulations based on common standards, and consequently with the fuel supply industry to identify the available alternative fuel sources. This could also address the objective of reducing noise pollution by policy-makers
IT Industry	IT industry can provide local authorities with ITS systems to facilitate a more effective planning process. These can include Mobility as a service (MaaS), Cooperative ITS, data collection/understanding, Decision Supporting Systems (DSS). Recommended actions: set up pilot test environment to facilitate the mutual understanding: 1) from the IT providers perspective, of the needs of the cities, and 2) from the local authorities perspective, of the possibilities offered by the technology available.
End users	End users should be actively involved in the planning process from the beginning by local authorities. Retailers should be able to express their needs and problems, so that the local authority can consider them when setting the framework for urban freight operations. Recommended actions: involve customers/consumers associations in stakeholder platforms at local level.
Infrastructure	From the point of view of the local authority, the transport infrastructure network should be planned to guarantee the inter/multi-modality transport system is open also to the logistics sector. Alternative fuels charging points should ensure the possibility for OEMs and operators to respectively produce and utilise alternatively fuelled vehicles. As for EVs, the development of a smart energy grid is necessary not only for public charging points: regulation and incentives should support operators to install private charging points. Regulation should be implemented, and best practices shared, on the requirements for freight attractors (especially buildings) for proper loading/unloading facilities. The position and the structure of urban consolidation centers should also be addressed. All the above mentioned topics can be considered in large research projects, to investigate the most suitable and effective solutions and to encourage the definition and uptake of common standards and approaches.
7. Interoperable standard modular urban loading units: autonomous deliveries	
STAKEHOLDERS	RECOMMENDATIONS
Operators	Operators Engage operators in pilot projects with cities and research partners to test new modular urban load units and autonomous operations to make recommendations.
Local, regional or national authority	Authorities should develop a standard process for implement modular urban load units and autonomous operations. Publish best practices and recommendations.
Vehicle manufacturer	Vehicle manufacturer are in charge of develop new vehicle structures and sizes compatibles to these new unit loads

IT Industry	IT industry should apply for safe and security in autonomous operations and develop technologies to improve connectivity and transfer data to city for access control and rate measurement to improve vehicle planning, tracking and tracing
End users	-
Infrastructure	Improve connectivity between vehicle to infrastructure for get a better share data in autonomous operations
8.Safety and security in urban freight	
STAKEHOLDERS	RECOMMENDATIONS
Operators	Using smaller light duty vehicles in combination with UCCs could reduce fatalities in cities. LOs should test new business models investigating the feasibility of this operational solution. Joining large-scale research and demonstration projects, operators and LSPs should cooperate with vehicle manufacturers, for supporting the development of safer - but functioning and cost-effective - trucks. Training for truck drivers is essential. Eco-driving can improve efficiency and reduce CO2; operators should encourage their drivers to join professional truck driver training programmes, to keep their fleet safe.
Local, regional or national authority	Freight vehicles are a safety concern in urban areas, especially for vulnerable road users such as pedestrians and cyclists. As for security, a significant amount of goods gets lost following security breaches. Cities should lead the shift towards safer trucks, defining a (as much as possible) harmonised regulatory framework based on access regulation, recognition schemes, minimum safety and security standards. Recommended actions: city planners should learn more from best practices, statistics, research results and new technologies. They should participate in research projects, together with other cities and the industry sector, to develop a common approach and shared solutions, and join specific trainings on the topic.
Vehicle manufacturer	Vehicle manufacturers are responsible for placing on the market new safer trucks. Recommended actions: they should participate in research projects, together with cities and the industry sector (IT industry, logistic operators), to develop a common approach and shared solutions, especially for reliable safe vehicle standards, minimising blind spots, and addressing the problem of silent EVs.
IT Industry	IT industry should drive its research towards new solutions for tracking and tracing consignments in order to avoid loss and damage of goods, and for minimising the amount of undelivered goods. Recommended actions: engage in research projects, teaming up especially with the vehicle manufacturers and the logistic operators, to develop new innovative, efficient and integrated solutions.
End users	-
Infrastructure	Local and national authorities should guarantee the realisation and maintenance of a safe intermodal network. Regulation and new technology should ensure that buildings and freight facilities are secure (theft protection) and safe (fire-resistant, etc.). Public authorities should make sure that, when encouraging the shift to light vehicles (e.g. cargobikes), strategies are in place to mitigate the potential risk of more accidents.

1. INTEGRATED DATA FRAMEWORK AND BIG DATA ANALYTICS AS OPPORTUNITY FOR IMPROVING DECISION-MAKING IN URBAN FREIGHT TRANSPORT

Challenge:

Smarter and holistic data collection and management need to be taken in proper consideration according two perspectives jointly affecting decision-making and overall efficiency of the urban transport system: business outlook and freight mobility planning / network management. Big data analytics will offer greater opportunities to link freight operator's decision making with city planners decision making (e.g. urban network planning) in order to achieve resilient, optimised, sustainable and cost-effective governance of the city and more competitive position of business actors.

Outcome:

- Structured knowledge base on current applications of Big Data in urban freight transport. Identification of good practices of value added applications of Big Data management and linked KPIs to elicit the potential and value of these application for improved decision making in urban freight transport (both private and public sectors);
- Developing and testing of evidence-based business cases, achieving positive impacts on energy use, environment and resilience of cities in facing megatrends impacts (e.g. sharing economy – crowd-sourcing; social and demographic evolutions; e-commerce, etc.).
- Roadmap of research to mitigate gaps between private & public decision-making and improve the adoption of suitable methods. Incentive schemes will be supporting optimal and integrated use of big data in freight transport decision making for both private and public sectors.

Impacts & Targets:

- Better use of predictive analysis to achieve economies of scale in accessing data (accessibility of public sector to private data - lower cost than 20% - 30% and lower time);
- Faster development of big data program and regulation frameworks in public sector and reduced procurement time frame for the use of private big data;
- Resilient use of city transport network (optimal network capacity with increased use of 15-20%);
- Engage with the public sector to profit from potential collaboration / dialogue with private sector.

Motivation/Challenge:

The impact of mega trends, such as e-commerce, sharing economy, fast demographic transformation of society and digital economy (connectivity everywhere, GALILEO, Social media, etc.) generate a disruptive evolution of changes in data availability (smartphones, GPS, Social Networks,) requirements and opportunities leaving huge amount of unstructured data and information to process.

Better knowledge on how to manage data assets for holistic and seamless interactions between city transport planning and business sector can lead to unbiased forecast (better decision planning), higher production factors, stronger competitive position of operators (better routing, asset management, operational capacity, etc.).

Behavioural foundations (e.g. reluctance on data sharing), clear and seamless regulation, demand management and planning are the impact domains that could benefit from integrated urban freight data collection framework using big data. It will strongly support policy-making and concretely lead to new generation of decision making in urban areas.

Relations with the following initiatives should be established: MG 6.3-2016 Pan European logistics solutions, Urban Mobility KPIs identification (tender launched by DG MOVE in 2015), Digital Transport and Logistics Forum.

Scope and Content:

The following aspects have to be addressed by integrated Big Data management for private and public sectors:

- Structured knowledge base on current applications of Big Data in urban freight transport. Identification of good practices of value added applications of Big Data management and linked KPIs to elicit the potential and added value of such applications to improve decision making in urban freight transport (both private and public sectors); Develop and testing of meaningful use cases at different scales and market purposes (private and public) on: connectivity, procurement, pooling of assets, vehicles and fleet management, etc. These should have a positive impact (e.g. socio-economic, congestion, environment). Different data sources have to be identified, such as vehicles / fleets, private cars, open data platforms, crowdsourcing, social networks, etc. When looking at motivations to share the data and incentive schemes, new possible collaborative models could be investigated (e.g. PPP) and which market opportunities to match (e.g. sharing economy, e-commerce, circular economy – i.e. waste management and recycling). This will evidence main barriers, prospects and emerging requirements for resource-effective use of Big Data in urban freight.
- Roadmap for wide-scale deployment of R&I solutions for integrated knowledge and adoption of Big Data management in urban freight. They will be pathways towards “New generation” of Big Data management (intended as new business models on how to adopt freight Big Data not in silos). They need to improve: 1) freight demand management and overall efficiency of sustainable urban transport system (networks capacity, vehicles’ / fleets optimisation); 2) value creation of companies’ assets and new business opportunities generated by better decisions as lever for increasing competitive advantage; and 3) regulatory framework facilitating economies of scale in procurement and accessibility to big data at lower cost and time.

Expected Impacts:

- Better use of predictive analysis to achieve economies of scale in accessing data (accessibility of public sector to private data - lower cost than 20% - 30% and lower time);
- Faster development of big data program and regulation frameworks in public sector and reduced procurement time frame for the use of private big data;
- Resilient use of city transport network (optimal network capacity with increased use of 15-20%);
- Engage with the public sector to profit from potential collaboration / dialogue with private sector.

Type of Actions:

Select the type(s): Coordination and support Actions

Possible activities and recommendations to stakeholders:

- Operators and other mobility service companies should find motivation ways and incentives to share data from their business activities coming from vehicles, social networks, etc. Recommended actions: Engage operators and other mobility services companies in pilot projects with cities partners to test new incentive schemes and business models based on public-private partnership
- Local, regional and/or national authorities would develop a better knowledge by city planners on management of big amount of data and analytics coming from traffic and logistics activities. Recommended actions: boost the engagement of city planners on collaborative projects with other cities and industry stakeholders, create and share a repository of good practices and develop a training program for big data analysis for city planners.
- IT suppliers should provide open data platforms for the purpose of planning activities while ensuring integrity and confidentiality of sensible data (business or personal data). Regulatory and legal recommendations should be formulated and tested in pilot environments.

2. EXPLORING NEW OPPORTUNITIES FOR ACHIEVING EFFECTIVE INTEGRATION OF URBAN FREIGHT AND PERSONAL MOBILITY: SERVICES AND NETWORKS

Challenge:

Further exploitation of the potential of integration between urban freight and passenger transport systems and networks is needed to optimize the use of road, rail and inland waterways infrastructures in space and time, contribution to get healthier cities in terms of less traffic and congestion. This requires a change of paradigm towards a freight/passenger integrated mobility planning and explore more opportunities and new business models for integration of urban freight with private or public transport at infrastructure and transport vehicle levels.

Outcome:

- Tools, methods and data sources to identify opportunities of flows integration and support the development of integrated mobility plans.
- Evaluation of different measures for freight and passenger integration and define resilient governance models and incentives/enforcement system. Evaluation in terms of environmental and social impact, level of traffic decongestion, job creation, economic impacts, through pilot testing at different type and size of cities is needed
- New concepts and technologies contributing to a better integration of freight and passenger flows including: IT, vehicle architecture, containers and logistics unit design and operation, transshipment and handling technologies.

- Development of business models offering mobility as a service (MaaS) to connect people and goods movements.

Impacts & Targets:

- Increased use of assets and infrastructures by 10%
- Reduction of congestion and CO2 emissions by 15% through use of public transport network for freight deliveries

Motivation/Challenge:

Urban mobility planning should take into proportioned consideration passenger and freight (deliveries and servicing plans) transport. Freight activity needs to be considered for as a part of the overall transport system in a city, but is often neglected or diminished. Freight is sometimes looked up only as a pure business (private) problem and not a social one. However, the increased number of (parcel) deliveries is more and more impacting transport in cities. It is thus necessary to change paradigm towards integrated planning between mobility management and logistics management. Although some experiences have been implemented in some EU cities (e.g. multipurpose lanes for freight distribution), there is still room for potentially more integration between urban freight and passengers transport networks optimizing the use of the road, rail and inland waterways infrastructures in space and time, contribution to get healthier cities in terms of less traffic and congestion. This requires to explore more opportunities and new business models for integration of urban freight with private or public transport at infrastructure and transport vehicle level (private cars, taxi, bus, rail, tramp, etc.).

Scope and Content:

- Tools methods and data sources to identify opportunities of flows integration and support the development of integrated mobility plans. This tools should:
 - Identify potential network capacity and technological / non technological constraints / enablers to multipurpose use for freight and passengers
 - Adopt probabilistic models to match demand and supply
 - Identify new methods for data visualization for different nature of traffic (e.g. services, goods, parcel, shopping trips)
 - Find effective stakeholders engagement (multi-actor) approach for accepted governance and mutual benefits
 - Design simulation tools to evaluate the potentialities of integration and prediction.
- Evaluate different measures for freight and passenger integration and define resilient governance models and incentives/enforcement system. Evaluation in terms of environmental and social impact, level of traffic decongestion achieved, job creation, economic impacts, through pilot testing at different type and size of cities. Legal, security, privacy, and societal aspects should also be evaluated. Measures should involve solution at terminals or junction points between goods and people (e.g. locks in metro or bus stations), links with neighbourhoods and districts, control / monitoring systems of urban spaces, etc. New concepts and technologies contributing to a better

integration of freight and passenger flows including: IT, vehicle architecture, containers and logistics unit design, transshipment and handling technologies.

- Development of business models offering mobility as a service (MaaS) to connect people and goods movements.

Expected Impacts:

- Increased the use of assets and infrastructures by 15%
- Reduction of congestion and CO2 emissions by 15% through use of public transport network for freight deliveries

Type of Actions:

Research and Innovation actions

Possible activities and recommendations to stakeholders:

- Operators and other mobility services companies should identify new opportunities and new business models for collaborative services between passenger and freight transport (public and private). Develop pilot demonstrators in different cities to evaluate the different impacts by research institutions
- Authorities should be aware that freight transport is a social issue. They should know the new collaborations between passengers and freight and new business models. Promote these collaborations with incentives and new measures, including them in mobility plans trying to minimize congestion and pollution in cities.
- Vehicle manufacturer: Innovative and sustainable vehicles which could transport goods and passengers.
- IT partners should develop new tools and technologies contributing the integration of passengers and freight flows and its prediction, data visualization for different traffic to avoid congestion and connect good and passenger.
- Share the infrastructure to integrate good and passengers. Optimize their architecture to support new business models.

3. IMPROVING THE LINK BETWEEN URBAN AND LONG DISTANCE FREIGHT TRANSPORT SERVICES AND INFRASTRUCTURES

Challenge:

A major challenge to reduce freight transport movements, congestion and to increase the load factor in urban areas is the optimization of the links between urban and long distance transport. This suggest the exploration of new delivery models where connected hubs at different levels are shared by different retailers/suppliers to enter the city, and green vehicles are used for the last mile. A number

of soft barriers including business models and collaboration need to be tackled to achieve a full realization.

Outcome:

- Analytics models and tools for urban planners to decide on optimal location and size of connected hubs and transport means taking into consideration current and future flow demand, demography, etc. for different city segments and scenarios.
- Pilot solutions for optimising the use of UCCs and micro platforms exploiting horizontal and vertical collaboration and supported by IT solutions, enabling visibility of flow data for all actors.
- Pilot and evaluate different business and governance models by defining roles and responsibilities for all actors, rules for hubs, ownership of the services and interactions between actors.

Impacts & Targets:

- Increased use of assets and infrastructures by 30%
- Reduction of congestion and CO2 emissions by 30% through optimization of traffic between hubs and urban areas, improvement of load factor and use of green vehicles

Motivation/Challenge:

A major challenge to reduce freight transport movements, congestion and to increase the load factor in urban areas is the optimization of the links between urban and long distance freight transport services and infrastructures (airports, seaports, intermodal terminals, dry ports, logistics platforms, etc.). A major challenge is the coordination and efficient link of two opposite flows towards and from the city. This suggests the exploration of new delivery models where facilities, transport means and logistic services to consolidate freight at different levels can be shared by different retailers or suppliers to enter the city. For example, linking hubs or logistics platform (which are connected to core network of transport) to urban consolidation centers (UCCs) through heavy/middle trucks. These UCCs could organize directly the final delivery or link to other urban micro platforms at district or neighbourhood level from where final delivery is made preferable with green vehicles i.e. small electric vans, e-bikes or by walking. A number of soft barriers including business models and collaboration need to be tackled to achieve a full realization.

Scope and Content:

- Analytics models and tools for urban planners to assess bottlenecks, existing infrastructures and constraints for optimal location and size of connected hubs taking into consideration current and future flow demand, demography, etc. for different city segments and scenarios. Studies on land use and assessment of the impact of the multiplicity of logistics hubs and networks should be required
- Pilot solutions for optimising the use of UCCs and micro platforms exploiting horizontal and vertical collaboration and supported by IT solutions enabling visibility of flow data for all actors with emphasis on the use of green vehicles for the last mile. Define measurement methods and KPIs to evaluate the performance of different solutions in terms of cost efficiency and environmental

impacts Guides for decision on appropriate type of vehicles, vehicle architectures, sizes and weights limits to optimize efficiency and sustainability depending on different cases and characteristics of city/district/area and logistics traffic. New design concepts for containers, boxes, modular units and handling solutions to ease transshipment operations between long distance and last mile legs and both flows directions

- Pilot and evaluate different business and governance models by defining roles and responsibilities for all actors, rules for hubs, ownership of the services and interactions between actors.
- Measures for public involvement and procurement strategies

Expected Impacts:

- Increased use of assets and infrastructures by 30%
- Reduction of congestion and CO2 emissions by 30% through optimization of traffic between hubs and urban areas, improvement of load factor and use of green vehicles
- Reduced transshipment and handling costs/times in hubs

Type of Actions:

Research and Innovation actions

Possible activities and recommendations to stakeholders:

- Operators should promote the use of Urban Consolidation Centers (UCCs). Avoid mistrust and share their transport with other operators promoting horizontal and vertical collaborations. Use sustainable vehicles in urban zones for logistic services. Pilot new distribution models in different cities and coordinate the different existing flows
- Authorities should let and decide where locate UCCs. Incentive the use of collaborative delivery models and promote using sustainable vehicles. Pilot new governance models, measures and strategies.
- IT suppliers should provide open data flows to planning new delivery models between long distance transport and last mile delivery.
- Need to improve the infrastructure and develop new sharing platforms.
Actions: research on the feasibility of the optimal architectural design and integration between long and urban transport.

4. NEW BUSINESS MODELS FOR LOGISTICS SERVICES BASED ON SHARING ECONOMY

Challenge:

Consumers and other stakeholders are showing a strong interest in the sharing-based economy. Re-thinking the value of “ownership” favoring the one of “use” is the new disruption, especially in urban logistics. There is the need to find new approaches to find unexplored potentials or emerging peer-to-peer (P2P) business / business – to – consumers (B2C) opportunities in freight market, making them attractive and widely accepted. This lead to find solutions to increase reliability, trust in transactions,

higher investments and assets / payoffs sharing, in order to find new multi-stakeholders metrics for urban logistics sector sustainability.

Outcome:

- Truly, innovative, sustainable and long lasting forms of cooperation, business and social models for urban logistics services (vehicles and fleet sharing and pooling, infrastructures and networks sharing) that are adequate to new market evolutions and trends.
- New multi-actor assessment framework able to evaluate safety, economic and financial sustainability, societal acceptance, operational efficiency, level of innovation, labour and environmental impacts.
- New governance models and related marketplace rules of the game - affecting all stakeholders – enabling a win-win collaboration able to remove barriers and eliminate any possible conflicts but rather encouraging cross-sectorial cooperation among competing services and capitalise all underutilized assets.
- Business-led roadmaps ensuring a seamless and significant market take up and roll out of collaborative meta-business models in different frameworks with measures and incentives.

Impacts & Targets:

- Increased load factors (20%)
- Operational cost reduction (10-15%)
- Reduction of lead-time (5-10%)
- better infrastructures capacity use (better capacity 20%)
- new jobs creation
- Increased customer satisfaction

Motivation/Challenge:

European cities are growing and evolving and the dynamics of distribution of goods and service has led in the very recent years to an increasing interest for sharing assets (including infrastructure) towards cost-effective and sustainable logistics processes in urban areas. Consumers and other stakeholders are showing a strong interest in the sharing-based economy. The evolution of people lifestyles – i.e. new social and economic trends – will change significantly urban freight mobility patterns. Factors such as teleworking, ageing population, and especially the significant growth of e-commerce have a direct impact on mobility in cities. Re-thinking the value of “ownership” favouring the one of “use” is a consolidated trend. Shared mobility is definitely an economic mega-trend: public transport is no more the only collective transport mode but vehicles and infrastructures are now shared in urban context following peer-to-peer (P2P) and business to consumer (B2C) models.

To be sustainable, business models need to be adequately developed and tested in different market conditions and urban contexts. European cities to properly face mobility challenges and need to

implement new collaborative systems and develop new mobility concepts with a proper involvement of all stakeholders.

Scope and Content:

Proposals should cover the development and integration of all the following issues:

- Truly, innovative, sustainable and long lasting forms of cooperation business and social models (e.g. public-public, public-private, customer-customer, private-private and private-customer) for urban logistics services that are adequate to new market evolutions and trends.
- Truly, innovative, sustainable and long lasting business models for vehicles and fleet sharing and pooling, infrastructures and networks sharing
- New multi-actor assessment framework able to evaluate safety, economic and financial sustainability, societal acceptance, operational efficiency, level of innovation, labour and environmental impacts. It will evidence implications on business and society, regulatory aspects/legal, reliability, security, insurance aspects and ethical issues.
- New governance models and related marketplace rules of the game - affecting all stakeholders – enabling a win-win collaboration able to remove barriers and eliminate any possible conflicts but rather encouraging cross-sectorial cooperation among competing services and capitalise all underutilized assets. Development of profit sharing and compensation / incentives schemes and tools to measure the effectiveness and sustainability of models. Governance models indicates priorities and accessibility conditions for sharing of public infrastructures.
- Business-led roadmaps ensuring a seamless and significant market take up and roll out of collaborative meta-business models in different frameworks with measures and incentives (especially for early adopters). Roadmaps may include communication action and participation to the public about the potential of business models in improving sustainability and foster the acceptance of the stakeholders across Europe

Expected Impacts (for reference):

- Increased sustainability of the overall supply chain including cost-efficiency, policy and aspects
- Increased loading factors and operational efficiency,
- Reduction of lead time and congestion,
- Better asset management and infrastructures use,
- New jobs creation and better working condition,
- Increased trust and higher level of investments
- Resilient use of available financial resources
- Increased customer satisfaction

Type of Actions:

Research and Innovation actions

Possible activities and recommendations to stakeholders:

- Operators and LSPs (Logistic service providers) should explore new business models for logistic services, which are environmentally and financially sustainable at the same time. They should engage in cross-sectorial cooperation among competing services.
Recommended actions: Engage operators and LSPs in pilot projects with cities and research partners to test new incentive schemes and business models based on public-private partnerships, stressing the accent on the viability of the business model after the end of the funded pilot(s).
- Urban logistics is a key area for the transition towards the sharing economy. Both public initiative as private initiative see the benefit of making better use of urban transport assets. Public authorities should constantly be aware of new trends and business models set up at local level. They should not ban these new services, but a fair regulation is necessary to make them possible without undercutting the larger economic sector of which they are part. Local politicians should be better included in research projects, to raise awareness and consensus on urban freight new solutions.
Recommended actions: encourage the engagement of city planners on collaborative (research) projects with other cities and industry stakeholders; set up a constant dialogue with the (local) business actors, both the traditional and the newcomers, to better understand their needs; share information with other authorities to anticipate and understand new trends.
- IT suppliers should take advantage of the favourable context and develop smart services for supporting the new business models of the sharing economy. Regulatory and legal recommendations should be formulated and tested in pilot environments
- End users should be sensitised, in particular by local authorities, about the benefits and the risks of utilising these new services: they optimise the use of urban transport assets, but some risk associated to hidden external costs (e.g. wrong perception of free deliveries). This applies for B2B, B2C, B2G.
Recommended actions: involve customers (B2B)/consumers (B2C) associations in stakeholder platforms at local level.
- Need for integration and sharing of infrastructure, logistic platforms and node networks, among different competing operators and different users (passenger and freight).
Recommended actions: research on the feasibility of the optimal architectural design and integration of logistic facilities in urban areas, and the supporting business models, through strategic scenarios modelling and visualisation.

5. LOGISTICS IN THE FULL CIRCULAR ECONOMY: NEW BUSINESS MODELS FOR HORIZONTAL AND VERTICAL COLLABORATION

Challenge:

Logistics is a key enabler to ensure sustainability of circular economy by providing smart and sustainable logistics networks and services. This requires to develop new business models, including bundled services, after-market and reverse supply chains, addressed with an integral approach not only in the geographical sense (urban versus rural and combined) but also integration of end-to-end supply chain processes addressing scarce resources management. The challenge is to

integrate supply networks, including the reverse part of the chains, to make full utilization of resources within and across supply chains. Cities, as major consumption areas are key to further develop circular economy, specially by smart combining direct and reverse flows

Outcome:

- New (business) models and cases demonstrating a substantial increase of supply network efficiency and sustainability of direct and reverse flows management, that currently are operated separately but could be integrated seamlessly. Determine costs and economic values of such integration and collaboration.
- Overcome regulation barriers and definition of incentive schemes for sustainable businesses cases in the circular economy.
- Demonstrators of hub operations, transport, packaging systems containerization, handling technologies management, monitoring and tracing of resources throughout supply cycles for direct and reverse flows integration.
- Better understanding of relationships within and across sectorial supply chains, identification of material flows, and barriers and opportunities for synergies in the circular economy paradigm.
- Measure the impact of logistics in the sustainability of circular economy in supply cycles. Measuring and modelling the logistics performance of different circular economy value chains. Building on existing research on indicators, this requires new sets of widely supported KPI's especially addressing rebound effects, and recognised labelling and certification in value chains.

Impacts & Targets:

- Energy efficiency gains by 20%
- Reduction of environmental impact and continuous reintegration of resources by 20%
- Reduction of logistics costs thanks to opportunities of synergic flows by 20%
- Saving resources and materials thanks to reusing and recycling strategies by 30%
- Increase asset availability and quality. Upscaling of existing circular economy approaches by providing standardised logistics systems
- (real time) transparency on freight flows and demand
- Increasing customer and market acceptance of more circular business models

Motivation/Challenge:

Economy is slowly moving to be circular, i.e. that the raw materials in products at the end of life or that by-products and or residuals in manufacturing processes are used again and keeping all resources into

a new value chain¹. This includes the use of water, energy, biotics and abiotics used within scope of supply cycles.

The circular economy allows making a better (re-)use of resources. In order to bring these resources back in the loop, reverse logistics is often seen as a not directly pertinent and separate part of the supply chain. The challenge is on how to integrate the concept of circular economy in the supply chain (including the reverse part of the chain) and how to stimulate and improve vertical collaboration between all actors to facilitate this integration. The aim is to realise the paradigm shift: “From supply chain management to supply cycle management”.

Logistics structures for the re-circulation of end of life products (container systems, information flows, organisational structures) are often incompatible with the supply logistics of manufacturing companies as they are not designed to meet SCM requirements. But to improve the utilisation rate of secondary materials (coming from industry or from final consumers), the necessary prerequisites must be created both in terms of processing technology and of logistics structures.

This topic focuses on the analysis of supply chains and their opportunities of integrating direct and reverse flows going from a supply chain management to a supply cycle management.

Scope and Content:

This research starts from the need to identify and build models that increase the global efficiency of supply chains and understand how flows, that currently operate separately, could be made seamless. This research applies to waste streams from producers to recycling, as well as repairs, returns, garbage, recycling waste from final consumers such private households or businesses.

A proper understanding of relationships within sectorial supply chains and opportunities for synergies between supply chains for the same or for different sectors should be part of this research, and new models to integrate direct and reverse logistics.

The research should cover all the following issues:

- Understanding of the streams and links between subsequent actors in the same supply chain, considering the different types of reverse flows: repairs, returns, garbage, recycling waste.
- Develop new approaches to eventually reintegrate goods (and waste) into the circular loop (e.g. waste recycling, reverse logistics) and effective after-market supply chains that ensure prolonged ‘life-time’ of products in-use.
- Understand who are the right actors and the possible interrelations among their roles in the chain. Trust issues and possible actions to unlock barriers and change behaviour. Determine and give full visibility of real costs for manufacturers, retailers, distributors

1

<https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-ind-ce-2016-17.html#c,topics=callIdentifier/t/H2020-IND-CE-2016-17/1/1/1/default-group&callStatus/t/Forthcoming/1/1/0/default-group&callStatus/t/Open/1/1/0/default-group&callStatus/t/Closed/1/1/0/default-group&+identifier/desc>

- Address legal issues and restrictions, e.g. restrictions when mixing different cargo (food with non-food)
- Develop meta business models associated to the efficiency gains thanks to integration of existing separated flows and determine costs and economic values of collaboration. Define incentive schemes for sustainable businesses cases
- Demonstrators of design of hub operations, transport, packaging systems and handling technologies to efficiently integrate direct and reverse flows specially addressing food supply chain in cities.
- Recommendations for standards and certification schemes for circular logistics

Expected Impacts:

- Energy efficiency gains by 20%
- Reduction of environmental impact and continuous reintegration of resources by 20%
- Reduction of logistics costs thanks to opportunities of synergic flows by 20%
- Saving resources and materials thanks to reusing and recycling strategies by 30%
- Increase asset availability and quality
- (real time) transparency on freight flows and demand
- Increasing customer and market acceptance of more circular business models

Type of Actions:

Research and Innovation actions

Possible activities and recommendations to stakeholders:

- Operators and LSPs should explore new business models for logistic services, which are environmentally and financially sustainable at the same time. Recommended actions: Engage operators and LSPs in pilot projects with cities and research partners to test new business models for horizontal and vertical collaboration, considering the different types of reverse flows and stressing the accent on the viability of the business model after the end of the funded pilot(s)
- Local authorities should act in a multi-governance perspective, closely cooperating with the relevant regional and national authorities. It is essential to develop a harmonised and consistent framework setting common standards and regulations for a full vertical integration of the supply cycle. City planners should engage in collaborative projects with other cities and industry players, to understand who are the right actors and their roles in the chain, and to establish a dialogue with them.
- IT suppliers should enable the visibility of flow data for all actors involved in the supply chain This will support the evaluation of the performance of different solutions in terms of cost efficiency and environmental impacts. Regulatory and legal recommendations should be formulated and tested in pilot environments.

- Need for integration and sharing of infrastructure, logistic platforms and node networks, among different competing operators and different users (passenger and freight).

Recommended actions: research on the feasibility of the optimal architectural design and integration of logistic facilities in urban areas, and the supporting business models, through strategic scenarios modelling and visualisation.

6. **BRINGING LOGISTICS INTO URBAN PLANNING**

Challenge:

Today, a general transport infrastructure plan for both people and logistics is missing in the city plan. It is necessary to define conditions towards proper consideration of urban logistics infrastructure needs and urban design aspects in Sustainable Urban Logistics Plans. The involvement of all key stakeholders: business actors, local administration and local politicians is crucial to achieve awareness and consensus on urban design decisions. Business models for building and operating facilities, how to get financial support and how to get greater efficiency in the management of the infrastructure are the main challenges of this topic.

Outcome:

- Recommendations on architectural design and integration of logistic facilities in urban areas, as well as the business models supporting them. This means understanding of how to best build and manage – in an optimal and resilient way – logistics city infrastructures (loading/unloading areas, consolidation centres, pick up points, warehouses, etc.) and urban design adequate to (evolving) dynamics of urban delivery services.
- Analytical economic models to support stakeholder analysis, balancing logistic efficiency and life quality.
- Large-scale demonstrators on logistics planning for urban city planners showing the impact of concepts, tools and innovations.

Impacts & Targets:

- Increased use of assets and infrastructures by 20%
- Reduction of congestion and CO2 emissions by 20% through optimization of traffic and better vehicle utilisation

Motivation/Challenge:

Currently, consideration of urban logistics dynamics is neglected in urban planning (e.g. in SUMPs), as evidenced in the Urban Mobility Package. It is necessary to define conditions towards proper consideration of urban logistics infrastructure needs and urban design aspects in Sustainable Urban Logistics Plans, taking into account: traffic and emissions reduction objectives, citizens behaviour, modular design, waste collection services, reuse of existing facilities, sharing infrastructure between people and goods, how to make logistics invisible. This topic includes research activities on risk assessment, procurement, business models for building and operating facilities and how to get

financial support and the research for greater efficiency in the management of the infrastructure, for different purposes, different logistics chains, at different times of the day.

Specific challenges to be addressed include:

- Involvement of all key stakeholders: business actors, local administration and citizens. Political representatives are particularly important to achieve awareness and consensus on urban design topics; so far they have not been involved in city logistics projects.
- Design of the infrastructure, including the distribution nodes network and logistic platforms serving the city and business models to make the infrastructure economically sustainable. Design should be based on strategic scenarios modelling and visualization, to demonstrate and test different scenarios and to help understand what is already being done well (best practices). Scenario evaluation criteria should include: use of infrastructure 24h a day, understanding total demand (in/outs), taking out what can be done outside the city, development of new infrastructure vs. use of existing infrastructure.

Scope and Content:

- Recommendations on architectural design and integration of logistic facilities in urban areas, as well as the business models supporting them. This means understanding of how to best build and manage – in an optimal and resilient way – logistics city infrastructures (loading/unloading areas, consolidation centres, pick up points, warehouses, etc.) and urban design adequate to (evolving) dynamics of urban delivery services. This involves:
 - Research on use of brown fields for urban freight deliveries, or the architectural design and integration of logistic facilities in urban areas, as well as the business models supporting them.
 - Research on the vertical exploitation of space for goods storage and transport.
 - Development of an adequate tool for simulating impacts / benchmarking and set use cases.
 - Good practices handbook for decision makers, to allow understanding what has already been done well, for different typologies of cities, as there are very different urban situations.
- Analytical economic models to support stakeholder analysis, balancing logistic efficiency and life quality.
- Large-scale demonstrators on logistics planning for urban city planners showing the impact of concepts, tools and innovations. Providing the blueprint for optimal standardised developments (Best Practices) applied as case-by-case solutions to current planning problems of cities, demonstrating logistics planning importance for urban cities.

Expected Impacts:

- Increased use of assets and infrastructures by 20%

- Reduction of congestion and CO2 emissions by 20% through optimization of traffic and better vehicle utilisation

Type of Actions:

Research and Innovation actions

Possible activities and recommendations to stakeholders:

- Operators and LSPs support in the planning process is essential to understand the needs of the market and to avoid to implement measures having undesired effects on the logistics flows. Recommended actions: Engage operators and LSPs in pilot projects with cities and research partners to test new collaborative business models, to facilitate and guide multi-stakeholder cooperation for improved policy making.
- Local authorities should look into long-term strategies to tackle challenges and planning for and implementing appropriate mitigation measures for the increasing demand of delivery trips in cities.

Challenges include:

- Lack of integration and coordination of transport policies and institutions
- Wide range of actors, needs and solutions
- Lack of data, consistency and robust evaluation
- Clear role to be defined, limited resources, allocation of dedicated staff

Local politicians should be directly involved in research projects, to raise awareness and consensus on urban freight solutions. In this regard, data collection and interpretation is essential for city planners to persuade decision-makers about the effectiveness and need of specific solutions. However, data is not always necessary, it should be considered a means to an end, not an end in itself.

SULPs, or systematic integration of freight in SUMPs, should be enhanced.

Recommended actions: city planners from the mobility department as well as from other sector-related departments should be involved in 1) large-scale demonstrators on logistics planning showing the impact of concepts, tools and innovations; 2) best practices exchange activities, to learn more from other initiatives in Europe; and 3) capacity building activities

- Light commercial vehicles are often the most suitable solution for urban deliveries, in terms of road occupancy, emissions and safety.

Vehicle manufacturers should establish a dialogue with national/local authorities for agreeing on the implementation of interoperable and transparent vehicle access regulations based on common standards, and consequently with the fuel supply industry to identify the available alternative fuel sources. This could also address the objective of reducing noise pollution by policy-makers

- IT industry can provide local authorities with ITS systems to facilitate a more effective planning process. These can include Mobility as a service (MaaS), Cooperative ITS, data collection/understanding, Decision Supporting Systems (DSS).

Recommended actions: set up pilot test environment to facilitate the mutual understanding: 1) from the IT providers perspective, of the needs of the cities, and 2) from the local authorities perspective, of the possibilities offered by the technology available.

- End users should be actively involved in the planning process from the beginning by local authorities. Retailers should be able to express their needs and problems, so that the local authority can consider them when setting the framework for urban freight operations. Recommended actions: involve customers/consumers associations in stakeholder platforms at local level.
- From the point of view of the local authority, the transport infrastructure network should be planned to guarantee the inter/multi-modality transport system is open also to the logistics sector. Alternative fuels charging points should ensure the possibility for OEMs and operators to respectively produce and utilise alternatively fuelled vehicles. As for EVs, the development of a smart energy grid is necessary not only for public charging points: regulation and incentives should support operators to install private charging points. Regulation should be implemented, and best practices shared, on the requirements for freight attractors (especially buildings) for proper loading/unloading facilities. The position and the structure of urban consolidation centers should also be addressed. All the above mentioned topics can be considered in large research projects, to investigate the most suitable and effective solutions and to encourage the definition and uptake of common standards and approaches.

7. INTEROPERABLE STANDARD MODULAR URBAN LOADING UNITS: AUTONOMOUS DELIVERIES

Challenge:

Modularization of logistic (smaller) units suggests similar benefits at urban level to those ISO-container has already demonstrated in maritime transport: improved load factor and interoperability among different transport systems and modes, less logistics costs and handling times, more secure and safe cargo, etc. Modular loading units used in the urban context will seek for interconnectivity, optimization and last mile cost efficiency: (semi)autonomous deliveries. However, these units need to be designed and tested for different urban scenarios and demonstrate the full advantages to industry and society. Additionally, it is necessary to pave the way towards a global standardisation to realize full benefits.

Outcome:

- Development of modular urban load unit compatible with regular containers and vehicles, as well as, new proposal for vehicle architectures and sizes compatible to urban load units (i.e. small van with capacity optimized for multiple or submultiple of palet-size/modular box).
- Development of technologies to transfer standard loads between vehicles (large and small) as well as with other transport modes. Enabling distributed self-control of objects through networks, as well as, cooperation and consolidation among various LSP and LSC.
- Large scale pilot project (including various business cases), together with an impact assessment (economical and environmental) will be demonstrated on autonomous operations using modular logistics units

Impacts & Targets:

- Improvement of load factors and vehicle utilization by 15%
- Reduction of CO2 emission thanks to traffic reduction by 15%
- Reduction of handling costs and time in last mile operations thanks to standardization of load units and interoperability by 30%
- Increase safety and security of cargo by 30%

Motivation/Challenge:

The use of modularization of logistic units together with (semi) autonomous transport at urban level suggests similar benefits to those ISO-container has already demonstrated: improved load factor and interoperability among different transport systems and modes, less logistics costs and handling times, more secure and safe cargo, etc. Modular urban loading units will seek for interconnectivity, optimization and last mile cost efficiency. However, these logistics units, starting from the experience undertaken in the past research projects such as MODULUSHCA for fast moving consumer goods, need to be designed and tested for different urban scenarios and demonstrate the full advantages to industry and society. Additionally, it is necessary to pave the way towards a global standardisation to realize full benefits.

Scope and Content:

- Development of modular urban load unit compatible with regular containers and vehicles, as well as, new proposal for vehicle architectures and sizes compatible to urban load units (i.e. small van with capacity optimized for multiple or submultiple of palet-size/modular boxes). The scope of the research has to also cover market acceptance of modular urban load unit and the whole urban logistics system including aspect and develop tools and techniques for awareness rising. Recommendations for standardised modular urban load units will be developed together with standardisation implementation process.
- Develop technologies to transfer loads between vehicles (large and small) as well as with other transport modes (architecture of vehicles, load units...), to allow decoupling of the delivery processes between mass transport and last mile operations, and technologies for vehicle C-ITS connectivity.
- Technologies, algorithms and tools that allow better planning, tracking and tracing of embedded materials and components, which reduce costs and consequently increases the margin for recycling materials at the end of their current use.
- Develop loading rate measurement systems (weight, volume...), to be connected with city access control, and network management.
- Enabling distributed self-control of objects through networks, independently of the way they are actually transported (and generally handled) as well as, cooperation and consolidation among various LSP and LSC are considered important features for the development of interconnected networks using iso-modular units.

- Large scale pilot project (including various business cases), together with an impact assessment (economical and environmental) will be demonstrated. Developed modular urban load units need to be easily adapted and accepted by all actors in the urban logistics, including postal companies. There should be no significant increase on complexity or cost for the market players in order to ensure the success on the deployment of developed modular urban load units.

Expected Impacts (for reference):

- Improvement of load factors and vehicle utilization by 15%
- Reduction of CO2 emission thanks to traffic reduction by 15%
- Reduction of handling costs and time in last mile operations thanks to standardization of load units and interoperability by 30%
- Increase safety and security of cargo by 30%

Type of Actions:

Research and Innovation actions

Possible activities and recommendations to stakeholders:

- Operators Engage operators in pilot projects with cities and research partners to test new modular urban load units and autonomous operations to make recommendations.
- Authorities should develop a standard process for implement modular urban load units and autonomous operations. Publish best practices and recommendations.
- Vehicle manufacturers are in charge of develop new vehicle structures and sizes compatibles to these new unit loads
- IT industry should apply for safe and security in autonomous operations and develop technologies to improve connectivity and transfer data to city for access control and rate measurement to improve vehicle planning, tracking and tracing
- Improve connectivity between vehicle to infrastructure for get a better share data in autonomous operations

8. SAFETY AND SECURITY IN URBAN FREIGHT

Challenge:

A significant amount of goods gets lost following security breaches. It is therefore important to identify solutions to guarantee a safe urban delivery system minimizing the risk for freight operators and ensuring peoples' privacy at the same time. Research efforts should be extended to systems enabling the decoupling of the delivery and the collection of the goods with efficient, reliable and safe solutions. Logistics service providers, carriers and receivers need to work together in order to improve the security (mainly data and information, loss or damage of goods), the safety for workers (health) and the environment (dangerous goods) by introducing state-of-the-art technologies and further developments.

Outcome:

- Efficient, reliable and safe solutions enabling the decoupling of the delivery and the collection of the goods.
- Solutions to improve security and safety by assessing the potentials of improvements of human machine interfaces, policies, vehicles and information and ICT.
- Innovative solutions to ensure the resiliency and robustness of urban freight systems.
- Impact assessment and roadmap with mitigation measures to ensure safer and more secure urban mobility and logistics

Impacts & Targets:

- Increased customer satisfaction by 30%
- Reductions of failed deliveries by 30%
- Reduction of cargo loss due to theft or damage by 30%
- Improvement of resilience and robustness of urban freight systems by 30%

Motivation/Challenge:

The security of goods and freight operations in urban environments in terms of crime and terrorism remains a challenge. A significant amount of goods gets lost following security breaches. It is therefore important to identify solutions to guarantee a safe urban delivery system minimizing the risk for freight operators and ensuring peoples' privacy and convenience at the same time.

The first obvious challenge is to put even more effort in tracking and tracing consignments throughout the delivery process in order to avoid loss and damage of goods.

A second challenge is the high number of failed deliveries tempting the logistics service providers to leave consignments with neighbours or on doorsteps. From that time, the consignment is no longer tracked and traced but the final consignee does not have the parcel in his hands yet. Research efforts should focus on systems allowing that time of delivery does not necessarily has to coincide with the moment the consignee lays hold of his goods, e.g. deliveries in pack stations or in vehicles, autonomous vehicle deliveries, drone deliveries or other similar systems that will be developed in the near future. These systems will only deliver their full potential if they are proven as safe and reliable and are perceived like that by citizens.

Other challenges are health issues for people working in urban distribution and environmental risks linked to the transport of dangerous goods in cities. Introducing state-of-the-art technologies and further developing them can be an answer to that.

A final challenge is the resilience and robustness of urban freight systems under normal conditions and in times of disaster (natural and anthroposophical disasters, terrorist attacks, etc.) to guarantee the supply of goods to urban areas.

Scope and Content:

- Efficient, reliable and safe solutions enabling the decoupling of the delivery and the collection of the goods.
- Research on technological, societal and ecological impact of failures in supply chains and development of solutions to improve security and safety by assessing the potentials of improvements of human machine interfaces, policies, vehicles and information and communication technologies.
- Innovative solutions to ensure the resiliency and robustness of urban freight systems. Induced traffic, by using smaller light duty vehicles in combination with UCCs (urban consolidation centres), can be expected.
- An impact assessment is needed to understand existing safety and security issues related to urban logistics today and tomorrow, followed by the roadmap with mitigation measures to ensure safer and more secure urban mobility.

Expected Impacts:

- Increased customer satisfaction by 30%
- Reductions of failed deliveries by 30%
- Reduction of cargo loss due to theft or damage by 30%
- Improvement of resilience and robustness of urban freight systems by 30%

Type of Actions:

Research and Innovation actions

Possible activities and recommendations to stakeholders:

- Using smaller light duty vehicles in combination with UCCs could reduce fatalities in cities. LOs should test new business models investigating the feasibility of this operational solution. Joining large-scale research and demonstration projects, operators and LSPs should cooperate with vehicle manufacturers, for supporting the development of safer - but functioning and cost-effective - trucks.

Training for truck drivers is essential. Eco-driving can improve efficiency and reduce CO₂; operators should encourage their drivers to join professional truck driver training programmes, to keep their fleet safe.

- Freight vehicles are a safety concern in urban areas, especially for vulnerable road users such as pedestrians and cyclists. As for security, a significant amount of goods gets lost following security breaches.

Cities should lead the shift towards safer trucks, defining a (as much as possible) harmonised regulatory framework based on access regulation, recognition schemes, minimum safety and security standards.

Recommended actions: city planners should learn more from best practices, statistics, research results and new technologies. They should participate in research projects, together with other

cities and the industry sector, to develop a common approach and shared solutions, and join specific trainings on the topic.

- Vehicle manufacturers are responsible for placing on the market new safer trucks.
Recommended actions: they should participate in research projects, together with cities and the industry sector (IT industry, logistic operators), to develop a common approach and shared solutions, especially for reliable safe vehicle standards, minimising blind spots, and addressing the problem of silent EVs.
- IT industry should drive its research towards new solutions for tracking and tracing consignments in order to avoid loss and damage of goods, and for minimising the amount of undelivered goods.
Recommended actions: engage in research projects, teaming up especially with the vehicle manufacturers and the logistic operators, to develop new innovative, efficient and integrated solutions.
- Local and national authorities should guarantee the realisation and maintenance of a safe intermodal network.
Regulation and new technology should ensure that buildings and freight facilities are secure (theft protection) and safe (fire-resistant, etc.).
Public authorities should make sure that, when encouraging the shift to light vehicles (e.g. cargo bikes), strategies are in place to mitigate the potential risk of more accidents.

ANNEX I: LIST OF RESEARCH AND INNOVATION ACTIVITIES ASSESSED

Benchmark research & innovation activities	General description activity
EUROPEAN PROJECTS/CASES DOCUMENTED IN EU PROJECTS	
BESTFACT case: Binnenstadservice http://www.bestfact.net	Binnenstadservice is based on a new business model introducing a "last mile as a service" concept in which the shopkeeper has to pay for the final delivery service. Binnenstadservice is organised as a franchise service that allows for a scalability and transferability of the concept. Public benefits are achieved due to a bundling of shipment at city limits and the consolidated delivery on demand of the shopkeeper. .
BESTFACT case: Cityporto Padova http://www.bestfact.net	City Port Padova is a successful example for a commercial viable Urban Consolidation Centres (UCC) starting with public money in the startup phase and becoming financial self-sustainable after a 3 year period. Planning aspects such as geographical location as well as accompanying support measures are success factors for this UCC. Padova is operated by a neutral management and uses low emission LNG vehicles.
BESTFACT case: Stadsleveransen in Gothenburg http://www.bestfact.net	The Gothenburg City logistics Initiative aims to establish a micro-consolidation centre in combination with delivery using electric vehicles. Therefore, the Gothenburg case is an approach which is tested in similar layouts in different other cities in Europe, such as Brussels, Berlin. Here the initiative is working in different directions establishing a non-profit based public private partnership or transfer to a private service provider.
BESTFACT Case: Use of battery-electric tricycles and vans for retail distribution in London: Gnewt Cargo http://www.bestfact.net	Electrically-assisted cargo tricycles and electric vans are used to deliver parcels from a small urban consolidation centre to customers in the centre of London.
BESTFACT Case: Distripolis: Urban Consolidation Centres and battery-electric vehicles for last-mile deliveries http://www.bestfact.net	In order to replace the use of standard diesel trucks, GEODIS, a large road transport operator, is testing UCCs and electric vehicles in a large scale trial in France. In the project (called Distripolis) new, small UCCs are located in the city centre of Paris, and receive goods from a central depot by Euro 5, Hybrid or CNG trucks. From these UCCs, the final deliveries are performed with low emission vehicles (battery powered - electric vans and tricycles) on short distance trips.
BESTFACT Case: Supermarket stores deliveries using waterways in Paris http://www.bestfact.net	Franprix supermarket stores in Paris are being supplied through a new multi-modal and urban transport chain solution. In this innovation, the last transport leg between regional distribution centre and retail shop occurs via waterways. The shipment is transported in a special container, sent from the warehouse to a river port in the periphery by truck, then by barge to the centre of Paris, from there another truck transports the containers to the shop on a very short trip.
BESTFACT Case: Multiuse lanes for freight distribution in Bilbao http://www.bestfact.net	'Multiuse lanes' is one of the initiatives developed in Bilbao by the local authority and local stakeholders to improve goods distribution in the city. This initiative consists of the more efficient use of lanes in the city centre streets. In this approach, one of the road lanes will be provided for the loading and unloading of goods at certain time slots, and used for other vehicle activities during the rest of the day.
BESTFACT Case: New loading/unloading regulation and parking meter/loading bay surveillance technology in Lisbon http://www.bestfact.net	The Lisbon Transport Authority (known as EMEL) has developed a new solution that helps mitigate specific traffic problems. The solution consists in the development and implementation of two technology based schemes: a) Adapted Parking Meters that issue special tickets for 30 minutes of unloading/loading operations; b) Detection sensors that detect the presence of a vehicle in the loading bay and send a message to the control centre of the Transport Authority.

BESTFACT Case: Electric freight vehicle with trailers: Cargohopper in Utrecht http://www.bestfact.net	Cargohopper is a dedicated inner city delivery service using clean freight vehicles in Utrecht, Netherlands. The service was introduced in 1996 in order to efficiently perform last mile operations for local businesses, especially for tourist venues, restaurants and catering facilities. Currently, an electric powered road train is running on the streets of Utrecht for parcels deliveries using the Cargohopper name. Other innovative vehicles are also used or under development as part of Cargohopper.
BESTFACT Case: Zero-Emission Beer Boat in Utrecht http://www.bestfact.net	The beer boat concept was introduced in Utrecht in 1996 in order to perform efficient last mile operations in the delivery of beer to catering and drinking establishments, thereby preserving the historical city centre, relieving the pressure on road traffic and complying to labour laws. In 2010, the City of Utrecht updated the beer boat with an environmentally-friendly electric boat and in 2012 another zero-emission boat was introduced for use in carrying other products including waste
BESTFACT Case: Urban distribution network of four major grocery retailers in Lithuania http://www.bestfact.net	Four chains operate most of the supermarkets across the country, from small to large scale stores, which are located in every town and city. All these supermarkets are serviced from strategically located logistics centres, at which goods are loaded as consolidated shipments onto large vehicles, thus reducing the number of trips made to supply each shop and by using optimised routes.
BESTFACT Case: Citylog EMF (efficient, modular, flexible) – Electro-Multifunction-Transportation vehicle http://www.bestfact.net	Citylog EMF is a new type of electric freight vehicle developed in Austria by a consortium led by HET. The electric motor propulsion is fuel-cell based, and the vehicle concept consists of a series of ‘self-driven’ vehicles and ‘trailers’ that can be coupled to a train, and un-coupled for loading and unloading operations. The trials in Klagenfurt follow the prototype phase in which the technical feasibility has been demonstrated
BESTFACT Case: ILOS - Intelligent Freight Logistics in Urban Areas: Freight Routing Optimisation in Vienna http://www.bestfact.net	The objective of ILOS is the development and definition of indicators to describe the saving potential of transport journeys in urban areas using traffic information obtained through floating car data, as well as the development of appropriate quantification methods to determine these indicators from route analyses in order to achieve a possible saving potential in terms of time or distance. This in turn leads to savings in fuel, emissions and operating costs.
BESTFACT Case: i-Ladezone: Intelligent monitoring of loading bays in Vienna	The project i-Ladezone focuses on two major topics: a) development of management methods in order to open delivery opportunities through the efficient and effective monitoring of the occupancy of loading bays and b) the development of a management system for keeping the loading bays at maximum availability and reducing impacts on traffic caused by the loading activities. An intelligent routing application for mobile use by the drivers of the goods vehicles was also developed.
BESTFACT Case: Urban distribution of small parcels using self-service terminals in Lithuanian towns and cities (LP EXPRESS 24) http://www.bestfact.net	LP EXPRESS, a branch of the state-owned enterprise AB “Lietuvos paštas”, adopted an innovative urban distribution system of self-service terminals. This self-service system, referred to as “LP EXPRESS”, is the latest addition to the company’s service offer, providing terminals that are available 24/7, located in 41 cities and town in Lithuania.
BESTFACT Case: Marleenkookt meal deliveries in Amsterdam http://www.bestfact.net	MarleenKookt cooks meals for those who are short of time or have other reasons not to cook for themselves. People have to order their meals on a website. The meals are then delivered to the consumers by e-cargobikes. The operating area is limited to the centre of Amsterdam. Most customers are private individuals; only about 10% of deliveries are made to companies.
BESTFACT Case: Post Receiving Box by Austrian Post AG http://www.bestfact.net	The “receiving box” allows the deposit of registered mail at the customer’s residence. If a shipment cannot be delivered the postman deposits it in the receiving box and notifies the recipient with an RFID-Card in the letter box. The recipient removes the notification card from the letter box and uses it to open the receiving box.

BESTFACT Case: Parcel and small cargo delivery using interurban coach system between Lithuanian urban areas http://www.bestfact.net	This system is provided by the private bus operator Kautra. Parcels and small cargo are delivered using interurban bus services. Most of the parcels and cargo are delivered the same day or however long the bus journey takes between origin and destination. Parcels may be taken by customers to designated terminals, or given directly to the bus driver if there is no terminal in the city. The parcels can be collected by customers either from the terminal or directly from the bus driver.
BESTFACT Case: Combipakt – combined passenger and goods transport in Nijmegen, the Netherlands http://www.bestfact.net	Combipakt combines school transport and patient transport with supplying medicine and agricultural products. A taxi company for special target groups and patient transport delivers medicines from the city of Nijmegen to rural areas. On the return trip they pick up agricultural products from small farms and transport these to the city. The service also intends to implement a switch from diesel to electric vehicles.
BESTFACT Case: LOGeco – eco-friendly logistics in Rome, Italy http://www.bestfact.net	The LOGeco project deals with design and validation of a new model for urban logistics solutions that entails innovative and sustainable actions. The innovative aspect relies on the adoption of an unconventional public-private decision making process towards city logistics solutions. The aim is to reduce the impact of freight entering the historical area of city of Rome without penalizing economic activities, but rather creating business opportunities for companies in the area.
BESTFACT Case: PLANZER operating and E-FORCE truck http://www.bestfact.net	Transport and logistics service provider PLANZER in Switzerland ordered and E_FORCE truck from Swiss manufacturer. The daily tour of the E-FORCE truck averages about 125 km. The yearly mileage around 30,000km. The trucks does 15-20 stops per tour.
BESTFACT Case: Verhuis elektrisch http://www.bestfact.net	Aad de Wit, a removals company, uses two fully electric trucks for its removals operations. The electricity used by the trucks is 100% green energy (solar and wind sources).
BESTFACT Case: Vert chez vous http://www.bestfact.net	Vert chez vous has a fleet of vehicles for the next-day distribution of food in the cities of Paris and Toulouse, operating only on electrical power or NGV. A river shuttle ('Vokoli' barge) provides multimodal distribution for packages via the Seine.
BESTFACT Case: Operation of GreenWay electric fleet at a distributor of pharmaceutical and medical materials - Med-art http://www.bestfact.net	GreenWay transforms expensive and somehow complicated technology into a convenient and affordable services. It offers their vehicles in the category of vans up to 3.5t (converted Citroen jumper). They are available for a comprehensive rental service package, not for sale.
BuyZet www.buyzet.eu	"The BuyZET project will develop innovative procurement plans to help the participating cities achieve their goals of zero emission urban delivery of goods and services. The core cities in the project will identify which goods and service procurement areas have the highest "transportation footprint". Based on this each city will select two procurement areas to focus on for the project."
PROEBIKE www.pro-e-bike.org	Use of e-cargo bikes to deliver fresh food at home from municipal market.

CITY MOVE http://cordis.europa.eu/result/rcn/59248_en.html	Innovative integrated vehicle solution fitting with the integrated city transport solution approach for a secure, flexible, reliable, clean, energy efficient and safe road transportation of goods across European cities. CITY MOVE has - among others - as key objectives the optimisation of the vehicle capacity and vehicle weight ratio.
CITYLAB http://www.citylab-project.eu/	City Logistics in Living Laboratories: The objectives are: improve basic knowledge and understanding on areas of freight distribution and service trips in urban areas that have received little attention to date; test and implement seven innovative solutions that are promising in terms of impact on traffic, externalities and business profitability and have a high potential for future growth; provide a platform for replication and spreading supported solutions.
CITYLOG http://www.city-log.eu/	The CITYLOG main objective is to increase the sustainability and the efficiency of urban delivery of goods through an adaptive and integrated mission management and innovative vehicle and transport solutions.
CIVITAS: Urban freight logistics and clean fuels and vehicles thematic groups. http://www.civitas-initiative.org	Support cities to introduce ambitious transport measures and policies towards sustainable urban mobility.
CIVITAS: Optimising freight deliveries at construction sites http://www.civitas.eu/content/optimising-freight-deliveries-construction-sites	A logistics centre was established to reduce the number of deliveries to target sites, reducing congestion and improving quality of life
CIVITAS: Malmö http://www.civitas.eu/content/sustainable-logistics-food-industry	A web-based coordinated logistics system optimally linking 40 to 50 food producers in the region with five purchasers in Malmö and using vehicles running on cleaner fuels. The website allows purchasers to see the availability of different fresh products planned throughout the season, and producers are able to identify market demand. Coordinated orders are fed into the system so that deliveries can be made maximising vehicle capacity.
CIVITAS: Utrecht http://www.civitas.eu/content/distribution-centres-fresh-and-perishable-goods	The concept is based on bundling fresh and perishable goods in an Urban Distribution Centre (UDC) and using cleaner freight transport vehicles for the distribution to catering businesses. The overall objective of the measure was to contribute to reduce freight traffic and therefore to improve air quality in the inner-city of Utrecht.
CIVITAS ECCENTRIC http://cordis.europa.eu/project/rcn/204474_en.html	The cities of Madrid, Stockholm, Munich, Turku and Ruse have formed the CIVITAS ECCENTRIC consortium to tackle the challenges of mobility in suburban districts and clean, silent and CO2 free city logistics. In many cities, these two important areas have received less attention in urban mobility policies.
CIVITAS SATELLITE http://cordis.europa.eu/project/rcn/204560_en.html	The project enhances the direct exchange and cooperation between the public and private sector, offering a dedicated online marketplace for urban transport innovations

C-LIEGE www.c-liege.eu	C-LIEGE will promote cleaner and energy efficient freight movements in urban areas. A novel set of integrated solutions and "push-and-pull" demand-oriented measures will be tested and shared in roadmaps for the implementation in European cities.
Cluster 2.0 http://lot4.cordis.europa.eu/project/rcn/209715_en.html	"If we want to reach the EU objective on modal shift for all transportation beyond 300 km and attract and strengthen competitiveness of local industries at the same time, we need to drive the development of a network of hyper connected logistics multimodal clusters and their influence areas"
CO-GISTICS http://www.cogistics.eu	CO-GISTICS will deploy cooperative ITS services for logistics, deploying 5 services: · Intelligent parking and delivery areas · Eco-drive support · Priority and Speed advice · Multimodal cargo CO2 emission estimation and monitoring
Compass4D http://cordis.europa.eu/project/rcn/191947_en.html	Seven European cities have joined forces with the objectives of substantially improving road safety, increasing energy efficiency and reducing level of congestions for road transport
CYCLELOGISTICS www.cyclelogistics.eu	CycleLogistics aims to reduce energy used in urban freight transport by replacing unnecessary motorised vehicles with cargo bikes for intra-urban delivery and goods transport in Europe.
DESTINATIONS http://cordis.europa.eu/project/rcn/204144_en.html	<ul style="list-style-type: none"> • Shared mobility and e-infrastructures towards zero emissions transport • Smart & clean urban freight logistics at tourist destinations
ECOMOVE http://www.ecomove-project.eu/	eCoMove will develop core technologies and applications based on vehicle-to-vehicle and vehicle-to-infrastructure communication or so called "cooperative systems", where vehicle eco-relevant data can be shared real time with other vehicles and traffic controllers as a basis for fuel-efficient driving support and traffic management
DOROTHY: Development Of RegiOnal clusTers for research and implementation of environmental friendly urban logistics http://www.clusterdorothy.com/	DOROTHY has the mission to enhance the distribution process of urban goods by reducing the number of vehicles and enhancing environmental standards, the project will help to improve the quality of life in European cities. By using the approach of clustering around innovation DOROTHY project aims to develop the potential of innovation and research in urban logistics across the European regions of Tuscany (Italy), Valencia (Spain), Lisbon & Tagus Valley (Portugal) and Oltenia (Romania)
ECOMPASS http://www.ecompass-project.eu/	eCOMPASS introduces new mobility concepts and establishes a methodological framework for route planning optimization following a holistic approach in addressing the environmental impact of urban mobility. eCOMPASS aims at delivering a comprehensive set of tools and services for end users to enable eco-awareness in urban multi-modal transportations.

ECOSTARS http://www.ecostars-europe.eu/en/	ECOSTARS is setting different fleet schemes that rate vehicles and operating practices using star rating criteria, to recognise levels of environmental and energy savings performance. Operators will then receive tailor-made support to ensure the fleet is running as efficiently and economically as possible.
ENCLOSE www.enclose.eu	ENCLOSE main objective of raising awareness about the challenges of energy efficient and sustainable urban logistics in European Small-/Mid-size Historic Towns.
Freight TAILS http://urbact.eu/freight-tails	Freight TAILS is a project pulling together 10 cities from across Europe all with an interest in reducing the impact of urban freight movements. Each partner city will locally work with their urban freight stakeholders (in an 'URBACT Local Group') to develop an Integrated Action Plan together. Transnationally, partners will meet every 3 months to share knowledge, learn lessons and consider the relationship between urban freight and the six transnational themes of: stakeholders, data, integration, regulation & enforcement, voluntary behaviour change, procurement.
FREVUE www.frevue.eu	Will provide evidence for electric vehicles' day-to-day reliability and suitability across a wide range of urban freight schemes. Pilots include: Amsterdam/Rotterdam (Heavy duty trucks for beer distribution), parcel services and expansion UCC; Lisbon EFV for parking and post companies; London introduction EFV into existing CC, expansion CC and conversion UPS fleet); Madrid 'UCC' for EFVs; Milan EFVs pharmaceutical chain; Oslo EFVs for parcel/post services; Stockholm CCC and UCC.
FURBOT: Freight Urban RoBotic vehicle http://www.furbot.eu/	Novel concept architectures of light-duty, full-electrical vehicles for efficient sustainable urban freight transport and will develop FURBOT, a vehicle prototype, to factually demonstrate the performances expected.
FUTURE RADAR http://cordis.europa.eu/project/rcn/205814_en.html	FUTURE-RADAR will provide the consensus-based plans and roadmaps addressing the key societal, environmental, economic and technological challenges in areas such as road transport safety, urban mobility, long distance freight transport, automated road transport, global competitiveness and all issues related to energy and environment. FUTURE-RADAR will also facilitate exchange between cities in Europa, Asia and Latin America on urban electric mobility solutions.
GALENA http://www.galenaproject.eu/en/project-objectives	Cross supply chain orchestration of stakeholders in freight pooling and indoor and outdoor localisation of freight.
GET SERVICE http://getservice-project.eu/	The GET Service platform provides transportation planners with the means to plan transportation routes more efficiently and to respond quickly to unexpected events during transportation. To this end, it connects to existing transportation management systems and improves on their performance by enabling sharing of selected information between transportation partners, logistics service providers and authorities.
INSTANT MOBILITY http://www.instant-mobility.eu/	In the Instant Mobility vision, every journey and every transport movement is part of a fully connected and self-optimising ecosystem. Whatever the traveller's situation (office, home, on-trip...) Instant Mobility will deliver useful Future Internet enabled information and services

interACT http://lot4.cordis.europa.eu/project/rcn/209718_en.html	There is currently a high desire by manufacturers to introduce Automated Vehicles (AVs), SAE level 3 and above, to the market. As AVs are likely to be deployed in mixed traffic, they need to interact safely and efficiently with other (non-equipped) users, including manually driven vehicles, cyclists and pedestrians.
Lamilo: Brussels city http://www.lamiloproject.eu/smart-city-logistics/	The Brussels case: a public sector run consolidation centre pilot in Brussels that is managing retailers' goods for consolidated delivery using low emission vehicles and demonstrating how both private and public sector organisations can work together towards efficient and sustainable urban logistics.
Lamilo: Netherlands Case http://www.lamiloproject.eu/smart-city-logistics/	Working with Binnenstadservice, LaMiLo partner Eco2City is undertaking a B2C (business to consumer) pilot in two Dutch cities. This will allow customers who order goods online to select a city logistics service hub as the delivery address. Logistics operators then transport the goods by bike to the city hub. In the same roundtrip, the bike courier takes back waste for resource recovery.
Lamilo: Paris The green link http://www.lamiloproject.eu/smart-city-logistics/	The Green Link, a Paris based organisation which delivers goods using electric bikes and vans, is trialling innovative solutions to improve the efficiency of last mile logistics. The first work stream involves testing a new ICT system that maps both road and cycle routes. The second work stream pilot involves using temperature controlled cargo bikes to deliver food in the city of Paris.
LEARN http://cordis.europa.eu/project/rcn/205950_en.html	Businesses that measure their emissions have the opportunity to make informed decisions that lead to improved efficiency and reduced emissions. The Logistics Emissions Accounting and Reduction Network project (LEARN) empowers business to reduce their carbon footprint across their global logistics supply chains.
LessthanWagonLoad http://lot4.cordis.europa.eu/project/rcn/209714_en.html	Project has the objective to develop a smart specialized logistics cluster for the chemical industry in the Port of Antwerp in order to shift transport volumes from road to rail freight
Mobility4EU http://cordis.europa.eu/project/rcn/199915_en.html	"The MOBILITY4EU project will develop such a plan taking into account all modes of transport as well as a multitude of societal drivers encompassing health, environment and climate protection, public safety and security, demographic change, urbanisation and globalisation, economic development, digitalisation and smart system integration. "
MODULUSHCA http://www.modulushca.eu/	"The objective of Modulushca is to achieve the first genuine contribution to the development of interconnected logistics at the European level, in close coordination with North American partners and the international Physical Internet Initiative.
NEWBITS http://cordis.europa.eu/project/rcn/205765_en.html	The overall objective of the NEWBITS project is to provide with a deep understanding of the changing conditions and dynamics that affect and/or influence C-ITS innovations. New KPIs will be designed to feed reactive and network oriented value creation propositions that improve the collaborative decision-making process across the various stakeholders. This improved value definition must minimize the failures inherent to (C-) ITS innovation diffusion, evolve present business models, and identify effective incentives to accelerate (C-) ITS deployment.

NOVELOG http://novelog.eu/	New cooperative business models and guidance for sustainable city logistics: enabling of knowledge and understanding of freight distribution and service trips by providing guidance for implementing effective and sustainable policies and measures. This guidance will support the choice of the most optimal and applicable solutions for urban freight and service transport and will facilitate stakeholder collaboration and the development, field testing and transfer of best governance and business models.
OPTICITIES http://www.opticities.com/	OPTICITIES is aiming high, intending to develop and test interoperable ITS solutions in six different cities in order to provide urban citizens with the best possible journey conditions and to optimize urban logistics operations.
PORTIS http://cordis.europa.eu/project/rcn/204150_en.html	"Port Cities can be seen as multidimensional laboratories where challenges connected with urban mobility are more complex due to the dual system of gravity centre: the city, the port, not to mention their shared hinterland. These peculiarities are at once a challenge and an opportunity, as they provide scope for planning, researching and implementing integrated mobility solutions in distinctively complex urban contexts. Civitas PORTIS designs, demonstrates and evaluates integrated sets of sustainable mobility measures in 5 major port cities"
R2PI http://cordis.europa.eu/project/rcn/206221_en.html	"R2PI examines the shift from the broad concept of a Circular Economy (CE) to one of a Circular Economy Business Models (CEBM), by tackling both market failure (business, consumers) and policy failure (conflicts, assumptions, unintended consequence). Its innovation lies in having a strong business-focus, examining stimuli beyond environmental goals (including ICT and eco-innovation), and in examining the role of policy innovation
RESOLVE http://www.interregeurope.eu/resolve/	The project's objective is to reduce carbon emissions created by retail related traffic in town and city centres while also supporting jobs and growth in the local retail economy. We will improve regional policies through innovative new projects and by improving governance so that the different stakeholders can agree common solutions
SELECT http://www.select-project.eu	The project aims to identify potential for electromobility in commercial transport and investigates how electric vehicles could contribute to an environmentally sustainable alternative to current patterns of urban commercial transport.
SMARTFUSION http://www.smartfusion.eu/	A public-private partnership aims to evaluate the technical and logistical feasibility of introducing fully electric vehicles and the second generation of hybrid truck technology in last mile operations and the related urban/inter-urban shipment processes. Part of the Green Cars Initiative. Test-sites: Como, Berlin and Newcastle
SMARTIE: Secure and sMArter ciTies data management www.smartie-project.eu	The SMARTIE project works on security, privacy and trust for data exchange between IoT devices and consumers of their information. Results are demonstrated in smart cities in Germany, Serbia and Spain. Further partners are from Portugal and the UK.
Smartfreighth: Smart freight transport in urban areas http://www.smartfreight.info/	The SMARTFREIGHT project wants to make urban freight transport more efficient, environmentally friendly and safe by answering to challenges related to traffic management, freight distribution management

SMARTSET http://smartset-project.eu/	SMARTSET is structured around three core aspects for creating successful and attractive terminals: Market based business models, energy efficient vehicles, Incentives and regulations.
SMILE Valencia pilot http://smile-urbanlogistics.eu/	A new system for the distribution of goods by using electric tricycles and through the creation of a micro-distribution platform for the loading and unloading operation, and for the loading and parking of the tricycles. Four private shippers (ASM, TNT, SEUR and DHL) accepted to participate to the pilot, and to pool their deliveries within two electric tricycles.
SMILE Rijeka pilot http://smile-urbanlogistics.eu/	The city of Rijeka has set up a wide pilot project aiming at installing automatic rising bollards at the entering points of the pedestrian zone, and integrate them into an IT traffic management system which enable data collection on deliveries of goods in the pedestrian zone. Thanks to these information, city of Rijeka wished to better organize the system of deliveries and improve the traffic situation in the old city centre.
SMILE Bologna city http://smile-urbanlogistics.eu/	The pilot tested an optimized IT-supported planning methodology for waste collection. This new system for planning the waste collection is organized in three steps: first, the demand analysis (encompassing a forecast of the waste production foreseen), then a strategic planning, with the generation of alternative zones of collections' scenarios, and eventually, the definition of optimal routes for the waste collection, which can be generated on a daily basis, by a specific software.
SMILE Citygoods model http://smile-urbanlogistics.eu/	The Citygoods model has been initially developed within the City Ports project, an European Project led by the Emilia-Romagna Region (observer in SMILE). Within SMILE the model has been updated and upgraded by the Institute for Transport and Logistics (ITL) in order to address Public Administrations (Municipality, Province and Region) to design and assess City Logistics Actions (Infrastructures, Policies and regulations). Technically Citygoods analyses the urban freight demand of an urban area by analysing separately different supply chains in different traffic zones of the city.
SMP: The sustainable mobility planner http://cordis.europa.eu/project/rcn/196168_en.html	The Sustainable Mobility Planner (SMP) is a specialized innovative IT software (tool) that enables environmental, financial and social impact assessments of sustainable transport initiatives taken in an urban environment
SPIDERPLUS http://www.spiderplus-project.eu	SPIDER PLUS aims to deliver a passenger & freight mobility Vision by 2050 encompassing seamless transportation where electrified High Speed Rail has a central role. Such Vision incorporates the envisaged technological innovations, the needs of an evolved European Society where environmental sustainability, energy saving, safety and security, noise abatement and life-quality are fundamental values.
SPICE http://cordis.europa.eu/project/rcn/205677_en.html	"SPICE will acquire a deep understanding of state-of-the-art of public procurements for sustainable and innovative transport and mobility projects in Europe. The project will raise awareness of using public procurement as an instrument to facilitate sustainable and innovative transport ad mobility solutions. "
STRAIGHTSOL http://www.strightsol.eu	Develop an impact assessment framework for measures applied to urban-interurban freight transport interfaces. Part of the European Green Cars Initiative. Pilots related to ITS supply chain/last mile, loading/unloading policies, night deliveries, mobile depot.

<p>SUCCESS http://www.success-urbanlogistics.eu/</p>	<p>The project addresses the different requirements for transferability of supply chain optimization concepts as well as CCCs and new ways of working between supply chain stakeholders. The approach is to identify an integrated collaborative approach and business model among construction supply chain actors.</p>
<p>SUITS http://cordis.europa.eu/project/rcn/206442_en.html</p>	<p>SUITS takes a sociotechnical approach to capacity building in Local Authorities and transport stakeholder organisations with special emphasis on the transfer of learning to smaller sized cities, making them more effective and resilient to change in the judicious implementation of sustainable transport measures</p>
<p>Sulpiter http://www.interreg-central.eu/Content.Node/SULPiTER.html</p>	<p>Urban freight issues need to be tackled in the perspective of functional urban areas (FUAs), taking into consideration the functional transport and economic relations between inner urban centres and the surrounding urban territories. SULPITER will support policy makers in improving their understanding of FUAs freight phenomena in an energy and environmental perspective. The project will enhance their capacity in urban freight mobility planning in order to develop and adopt sustainable urban logistics plans (SULPs).</p>
<p>TRAILBLAZER www.trailblazer.eu</p>	<p>TRAILBLAZER aims to showcase existing good practices and promote public sector policy interventions which can bring about a reduction in energy used in urban freight transport. This will be achieved by municipalities, in partnership with their suppliers and the private sector through the implementation of Delivery and Servicing Plans (DSPs).</p>
<p>Transforming transport http://www.transformingtransport.eu/</p>	<p>The Transforming Transport project will demonstrate, in a realistic, measurable, and replicable way the transformations that Big Data will bring to the mobility and logistics market. To this end, Transforming Transport, validates the technical and economic viability of Big Data to reshape transport processes and services to significantly increase operational efficiency, deliver improved customer experience, and foster new business models</p>
<p>U-TURN http://www.u-turn-project.eu/</p>	<p>The U-TURN project aims at addressing freight urban distribution, focusing on food logistics. The project will contribute to our understanding of freight distribution in urban areas, especially addressing the special requirements and needs of food transportation, and will suggest innovative collaboration practices and tools towards achieving more efficient operations from both an environmental and cost perspective.</p>

EXAMPLES NON-EU FUNDED INITIATIVES	
AMS Roboat http://www.ams-institute.org/roboat/	Fleet autonomous boat
CARGO HITCHING http://www.dinalog.nl/en/projects/r_d_projects/cargo_hitching_/	Combining people and freight flows creates attractive business opportunities because the same transportation needs can be met with fewer vehicles and drivers.
CERTIBRUIT standard http://www.certibruit.fr	This standard takes into account global noise from a delivery, from truck to shop material including delivery operations.
CONCOORD http://www.dinalog.nl/en/projects/international/conCOORD/	CONCOORD investigates an integrated urban freight simulation environment, a unique measurement framework for the environmental footprint of transport and logistics, and the performance measurement of new innovative urban transport and logistics concepts. Its results, simulation tools, and insights are, among others, disseminated via an important CONCOORD deliverable: the European Urban Transportation Experience Lab.
Distri Seine http://www.cft.fr/5-1-1-29-pix-fr/cft-Actu_Distri-Seine-COP21.html	Deliver by inland waterway freight in Paris with innovative boat: roll in/roll out with trucks and lift on board
Franprix en Seine http://promotionparisdurable.fr/lapromotion/franprix-entre-en-seine	Deliver by inland waterways one hundred of food products in the heart of Paris and Boulogne Billancourt
Freight beer boat https://www.utrecht.nl/wonen-en-leven/verkeer/goederenvervoer/bierboot/	Deliver by inland waterways one food products in cities (canals of Utrecht, NL); Electrification in 2010 and transport of refrigerated/frozen products
GREEN FREIGHT EUROPE http://www.greenfreighteurope.eu/	Group directed at measuring CO2 and sharing best practices. Representatives of the European Parliament and the European commission recently welcomed the industry-driven approach to establish a pan-European standard system for collecting, analyzing and monitoring CO2 emissions from road freight operations. The initiators of the programme, HEINEKEN, The Dow Chemical Company, DHL and TNT informed key European officials about the progress made towards a uniquely European version of the comparable SmartWay Partnership programme in the US.

iLOG City Logistics http://www.ilog.it/index.php/en/solutions/i-log-city-logistics	Integrating intermodal transport with the 'last mile' with micro-swap bodies
Lindholmen Science Park http://www.lindholmen.se	Workshop series organised in Sweden as a basis for understanding data needs to better support freight planning in urban area.
Medlinkports http://www.medlinkports.fr/	9 Multimodal platforms located in 4 French regions from Mediterranean coast (14 million people) and serving the European hinterland
Mines Paristech http://www.researchgate.net/publication/273127980_A_crowdsourcing_solution_to_collect_e-commerce_reverse_flows_in_metropolitan_areas	Presented an interesting simulation study of use of crowdsourcing for returns using drop-off shops and taxi fleet.
PIEK http://www.piek-international.com/	Certification scheme for vehicles and equipment operating under 60dB(A) which will be suitable for use in night time deliveries without causing noise disturbance.
Research company CIRRELT https://www.cirrelt.ca/DocumentsTravail/CIRRELT-2011-03.pdf https://www.cirrelt.ca/DocumentsTravail/CIRRELT-2015-13.pdf	Research activity regarding "share economy", and an empirical model to analyze impacts of share economy in physical internet.
SILOGUES http://tra2014.traconference.eu/papers/pdfs/TRA2014_Fom_29508.pdf	French National Research Program on Land Transport (Predit) project which aims to provide a decision support framework to simulate the impacts of urban policies on goods transport. The physical scope is that of the entire urban area, and the stakeholders targeted in priority public authorities and technical services.
The river rubbish dump http://www.sita.fr/dechetterie-fluviale/ http://acteursdeleconomie.latribune.fr/strategie/logistique/2016-12-02/economie-circulaire-une-dechetterie-fluviale-va-s-amarrer-a-lyon.html	rubbish dump, set up by SUEZ company, which moors for one day at the river quay
VANECK GROUP https://www.vaneckgroup.com/en/make-choice/save-costs-toll-fuel-environment/eckstreme-twin-deck-box/	A solution of several boxes on trailer ready for urban distribution. Mentioned other projects on containers for urban logistics as PART, URBANCITY BOX or Transformer.

Zulus
<http://www.maritiemnederland.com/techniek-innovatie/vlaamse-zulu-s-komen-ook-naar-nederland/item1647>

Pallet Shuttle Barges with catamarans: the catamaran can carry on one layer 300 tones or 198 pallets.

ANNEX II: 3RD LOGISTICS WORKSHOP: CITY LOGISTICS, BRUSSELS 23 MAY 2017



10:00 – 10:15

Welcome and Introduction - Robert Missen – EC DG MOVE

Karen Vancluysen - POLIS

10:15 – 12:30

Morning sessions:

1. Reducing congestion

Presentation of the projects:

- a. Dorothy (tbc)
- b. Success

2. Reducing emissions

Presentation of the projects:

- a. Frevue
- b. Furbot (tbc)

3. Increasing cooperation

Presentation of the projects:

- a. Citylab
- b. Novelog

4. Enhancing land use and planning

Presentation of the projects:

- a. Civitas Portis (tbc)
- b. Spider Plus (tbc)

QUESTIONS & ANSWERS

12:30 – 13:30

LUNCH &

Posters session:

Projects invited:

- Citylog
- Smartfreight
- Co-Gistics
- Modulushca
- E-Compass
- U-Turn
- Opticities
- Smartfusion
- BuyZET
- SPICE
- STRAIGHTSOL
- Destination
- Eccentric
- Mobility4EU

13:30 – 15:00

Afternoon sessions:

3 parallel breakout sessions

1. **SULP** (Sustainable Urban Logistics Plans): Are they needed? How to include regional connections?
Moderator: Giuseppe Luppino (SULPITER project) Tbc
2. **Private and Public collaboration; new procurement strategies.**
Moderator: Simon Clement (BuyZET project) Tbc
3. **New Consumption patterns:** Technology-driven or responding to social demand?
Moderator: Eleni Zampou (U-TURN project) Tbc

15:00 – 15:30

COFFEE BREAK

15:30 – 16:00

Wrap up of parallel sessions

Plenary discussion

Final remarks and conclusions

ANNEX III: URBAN MOBILITY WORKING GROUP MEETING, BRUSSELS 24 MAY 2017

The workshop is organised by ALICE, ERRAC and ERTRAC



Brussels, 24 May 2017

- | | |
|--------------|---|
| 09:30 | Welcome coffee & networking |
| 09:45 | Welcome & introduction round |
| 10:00 | ETP update on strategic priorities <ul style="list-style-type: none"> • ERTRAC Vision 2050 and SRA update, <i>Xavier Aertsens - ERTRAC</i> • <i>Fernando Liesa – ALICE</i> • <i>Yves Amsler – ERRAC</i> |
| 10:30 | Policy & Research Update: Mobility Package & H2020 Work Programme 2018-2020
<i>DG MOVE/DG R&I</i> |
| 11:00 | Analysis of H2020 Work Programme 2018-2020 versus recommended urban mobility topics
<i>Polis-UPM/ALICE</i> |
| 11:30 | Coffee Break |
| 11:50 | Exchange of knowledge on the degree of implementation of the research priorities identified in the Urban Freight roadmap
<i>ALICE/All</i> |
| 13:15 | Lunch |
| 14:15 | Exchange of knowledge on the degree of implementation of research priorities in the field of urban passenger mobility, including synergies and integration with freight
<i>Polis-UPM/All</i> |
| 15:30 | Discussion on core areas of interest for Urban Mobility WG – looking beyond 2020
<i>All</i> |
| 16:15 | FUTURE-RADAR (new ERTRAC/EGVI support action) links with Urban Mobility WG
<i>Karen Vancluysen, Polis; Oliver Lah, Wuppertal Institute</i> |
| 17:00 | Any other business |
| 17:15 | End of the meeting |