C – L I E G E
Clean Last mile transport and logistics management

www.c-liege.eu

C-LIEGE - *Clean Last mile transport and logistics management for smart and efficient local Governments in Europe*

DELIVERABLE n. 7.2

ACTION PLAN TO IMPROVE ENERGY EFFICIENCY OF URBAN FREIGHT TRANSPORT IN EU MEMBER STATES

Dissemination level: PUBLIC

Workpackage n. 7

Version Final

Date of preparation 30/11/2013

Grant Agreement n. IEE/10/154/SI2.589407 – C-LIEGE

Co-funded by the Intelligent Energy Europe Programme of the European Union

Document Control Sheet

Project	C-LIEGE: Clean Last mile transport and logistics management for smart and efficient Local Governments in Europe
Grant Agreement n.	IEE/10/154/SI2.589407
Document Title	Deliverable 7.2 Action Plan to improve energy efficiency of urban freight transport in EU Member States
Nature	D : Deliverable
Available languages	E: English
Dissemination level	Pu: PUBLIC
Version	Final
Date	November 30th 2013
Number of pages	125 + Annexes
Archive name	D7.2_Action_Plan
Authors	Daniela Carvalho, Maria Rodrigues, Vasco Colaço (TIS)
Contributors	Paola Cossu, Luca Lucietti (FIT) Panayota Moraiti, Dimitrios Tsamboulas (NTUA) Ovidiu Romosan (IMPACT) ERRIN (Anett Ruszanov) Deyan Dimitrov; Daniela Genurova (MONTANA)
History	November 11th 2013 - first draft November 15th 2013 - second draft November 30th 2013 - final version
Keywords	Action Plan, energy efficiency, urban freight transport, roadmap, soft measures, urban mobility, policy statements, C-LIEGE Charter

TABLE OF CONTENT

1. INTRODUCTION AND STATE OF PLAY

1.1 Objective

C-LIEGE – Clean Last mile transport and logistics management – is conceived as a showcase for good practices and a helping hand for all European cities striving for cleaner and sustainable urban freight transportation. On the basis of good practices the project aims to set out an integrated framework for energy efficient Urban Freight Transport (UFT) management and planning.

A set of integrated solutions and "push-and-pull" demand-oriented measures were tested and shared in order to establish roadmaps for their implementation in European cities. Seven pilot experiments in six European countries assess the effectiveness of the C-LIEGE approach: Bulgaria, Italy, Poland, United Kingdom, Germany and Malta.

This document is a final output from C-LIEGE project and presents its Action Plan to improve energy efficiency of urban freight transport in EU Member States. The Action Plan is one component of a C-LIEGE final package that comprises the action plan itself, a toolbox of measures, a transferability methodology and the evaluation of impacts produced.

The purpose of Action Plan is to provide a clear development and presentation of the policy implications of the C-LIEGE Project, through the establishment of prioritised actions and their evaluation in terms of policy implications.

Throughout this document an overall consolidation of the roles and actions that could be promoted and carried out at each government level is provided. In particular this aims for a clear identification of the actions that could be undertaken at the EU level to facilitate and promote energy efficiency on urban freight distribution, having in mind the constraints derived from the limited role of EU on urban level. The results of this Action Plan are intended to provide a fundamental input for the energy efficiency dimension of urban logistics actions as foreseen in the Urban Mobility Action Plan and 2011 Transport White Paper, looking for the long-term impact of the project's findings across Europe.

C-LIEGE Action Plan recommends to the European Commission 15 measures where an EC action could turn urban freight transport demand more efficient, sustainable and professional.

A political statement - encouraging local authorities and private stakeholders to share C-LIEGE common goals of energy efficiency and sustainability of the UFT system and to

accept the five principles of the “C-LIEGE Charter for sustainable urban transport” was signed by 36 cities across Europe. These statements reinforce the commitment of European cities in relation to C-LIEGE actions and policies, suggesting EC to act at this level, namely promoting the role of City Logistic Manager and soft measures towards energy efficiency.

A set of policy implications of results and identification of actions and policies (and respective prioritisation and impacts) to be promoted along the different layers of government – local, regional, national and EU are finally presented in the document.

2. EU URBAN FREIGHT TRANSPORT POLICIES

2.1 Introduction

The role and impact of freight deliveries in urban areas has been gaining a considerable presence in the policy documents over the last years. However, majority of documents also recognise that urban freight issues have been neglected in the design of urban policies in favour of passenger transport. Consequently, significant new efforts have been put in place, almost everywhere, looking to minimise or circumvent this gap and new policy discussions, initiatives and studies promoted.

This chapter is targeted to provide an overview of the most recent developments promoted at the EU level. Its overall goal is to highlight the key findings and orientations that derive from most recent policy documents and how those impact and influence the different actions in the field, taking the Green Paper on urban mobility (2007) and the subsequent Action Plan (2009) as the turning point of perspective towards a new urban transport culture. All together, these initiatives provide the context for the different measures and pilots promoted in the course of C-LIEGE upon which this Action plan is designed.

In fact, while several policy documents[1] and projects[2] since the nineties aimed to promote that urban vision and largely contribute to create the ground for subsequent actions, the urban mobility green paper corresponds to the first policy fully oriented and adapted to the specificities that urban areas represent in the EU context, and in particular the first clear recognition of urban freight as a critical dimension of city mobility.

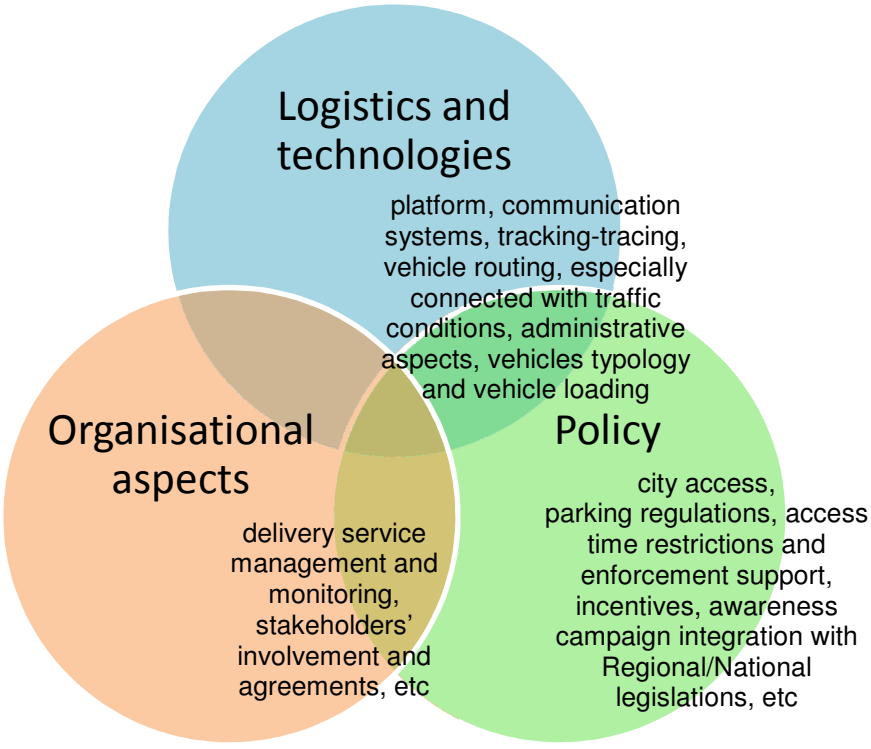
This is followed by the 2011 Transport White Paper and the specific actions targeting the urban fields, which up to a large extent derive from the above Green Paper and Action Plan. Then it flows towards the results of a dedicated study on urban freight in 2012 and concludes with the overview on the “Urban Mobility package”, an EU led initiative that acts as the umbrella for three specific urban measures presented in the Transport White Paper.

[1] e.g. Citizens Network Green Paper, 2001 Transport White Paper, , etc.
[2] e.g. BESTUFS, CIVITAS projects

2.2 Green Paper - "Towards a new culture for urban mobility"

European Union official and strategic papers recommended "local authorities need to consider all urban logistics related to passenger and freight transport together as a single logistics system". While this is known for some time, actions taken to tackle urban freight problems were largely limited to controlling and restricting road traffic and/ or in creating new infrastructure, particularly by building new roads. The scarcity of urban space in most cities, by one hand, and the environmental considerations/constraints more constantly present in urban areas, on the other, turn this last solution almost unfeasible, turning clear that problems need to be solved from the soft and management side.

Following this approach, the Green Paper suggests that sustainable urban logistics solutions should be analysed following an integrated and comprehensive analysis of interdependencies among passengers and freight transport domains, generating benefits for all stakeholders without depressing local economies. As such "Push & Pull" set of tools and measures, feasible and suitable for a specific context, and which gather solutions with larger critical success factors, will arrive from a mix of three main aspects:



PROBLEMS AND CONSTRAINTS ARE STILL PERSISTING ON URBAN AREAS

Few success stories and effective measurements of the impact have been achieved so far, and **limited concrete transferability of good practices and lessons learned has been achieved**, despite the different projects and initiatives aiming to achieve energy-efficiency by effective urban logistics solutions developed across Europe.

Urban transport is **usually approached from the people mobility perspective only and much less focused on freight transport efficiency**. Lack of viable approaches also implies possible barriers to implementation of EU directives.

The suggested integration between these two domains (freight and passengers) is still far from effective in generating benefits for the whole system. There is the **need to find suitable and effective approaches also evidencing that such integration has concrete impacts and value in terms of energy efficiency.**

The usual approach to city planning still **does always integrate demand mobility measures** - they are mainly related to reducing the need for motorised transport and promoting restrictive measures to the business freight operators while supply side (business operators, freight carriers, etc.) measures and improvements are mainly focused on improving vehicle standards and functionalities.

There is a need to know how effective consolidation deliveries are in reducing the number of freight vehicles circulating.

There is a need to **harmonise rules for truck access in cities** at European Level.

There is a need to **know how to tailor measures to discourage self-procurement**.

There is a need for **local government to take responsibilities to regulate the sector without altering market competitiveness.**

In order to find suitable solutions to lessen the "number of failed projects and experiments in urban freight transport", significant potential for improvement is felt to involve the application of the following measures:

- An integrated and energy-focussed planning of urban freight deliveries looking to enhance synergies (or extending functions) with mobility manager (passengers demand management);
- A better organisation and coordination of deliveries in urban areas (use of consolidation centres, technologies for vehicle routing, load factors optimization, etc.);
- A suitable mix of measures (push and pull) for all stakeholders: vehicle manufacturers want incentives for research (e.g. renewable fuels, driving systems, safety and security, wheels, etc.) but they also want to cooperate with local authorities to share regulations on accessibility involving a better standardisation of vehicle layout and fuels. Operators need incentives to convert the commercial fleets with eco-friendly engines (such as electric, methane, hybrid) but wants to share with local authorities what are the possible measures optimising deliveries in urban areas in a sustainable way without altering local economies and market competition;
- Learning from the experience and sharing good practices at an European level means starting from what has already been successfully implemented and learning from failed initiatives.

2.3 Action Plan on Urban Mobility

The document defines a programme of actions to support sustainable urban mobility. The actions proposed are centred on the six themes responding to the main messages that emerged from the Green Paper consultation. They will be implemented through existing EU programmes and instruments. The actions complement each other and with other EU initiatives.

About 20 measures were identified in the Action Plan of which the three below are directly related with C-LIEGE objectives.

Greening urban transport (theme 3)

Environmentally friendly policies have been introduced in many cities across the EU. Action at EU level can help to strengthen markets for **new, clean vehicle technologies and alternative fuels**. This will directly support EU industry, promote healthy environments and contribute to the recovery of the European economy. By making users pay for the **external costs** which they cause (environmental, congestion and other costs) according to the **polluter pays principle**, the internalisation of external costs can encourage transport users to switch over time to cleaner vehicles or transport modes, to use less congested infrastructure or to travel at different times. EC rules on the **charging of heavy goods vehicles** for the use of infrastructure do not prevent the **non-discriminatory application of regulatory charges in urban areas** to reduce traffic congestion and environmental impacts.

Optimising Urban Mobility (theme 6)

Effective integration, interoperability and interconnection between different transport networks are key features of an efficient transport system. This can facilitate modal shift towards **more environmentally friendly modes of transport and efficient freight logistics**.

Urban Freight Transport (action19)

The Commission intends to provide help on how to optimise urban logistics efficiency, including on improving the links between long-distance, inter-urban and urban freight transport, aiming to **ensure efficient 'last mile' delivery**. It will focus on **how to better incorporate freight transport in local policies and plans and how to better manage and monitor transport flows**. As part of its preparations, the Commission planned a conference on urban freight transport in 2010 to assess the implementation of the urban initiatives in the Freight Logistics Action Plan.

2.4 EU White Paper - Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system

Taking into account that the transport is global, effective actions also require strong international cooperation. Framed by that, the Commission delivers a vision, a strategy and a list of initiatives foreseen to complete the internal market for transport, where considerable bottlenecks and other barriers remain. Ambitious targets to 2030 and 2050 severely impacting on urban areas are established:

> *"The key numbers are **zero, 40, 50 and 60**:*
>
> *No more conventionally fuelled cars in our city centres by the middle of the century*
>
> *A 40% cut in shipping emissions. 40% use of low carbon fuels in aviation*
>
> *And a 50% shift in middle distance journeys by both passengers and freight from road to rail and other modes*
>
> *60% overall cut in carbon emissions, reduce Europe's dependence on oil and provide a major opportunity for Europe's transport manufactures to compete on world markets."*

How to better respond to the desire of our citizens to travel, and the needs of our economy to transport goods while anticipating resource and environmental constraints, are key issues to readdress for a competitive and sustainable transport system.

The White Paper clearly point that the challenge is to break the transport system's dependence on oil without sacrificing its efficiency and compromising mobility. In practice, transport has to use less and cleaner energy, better exploit a modern infrastructure and reduce its negative impact on the environment and key natural assets like water, land and ecosystems. New transport patterns must emerge, according to which larger volumes of freight and greater numbers of travellers are carried jointly to their destination by the most efficient (combination of) modes.

Future development must rely on a number of strands:

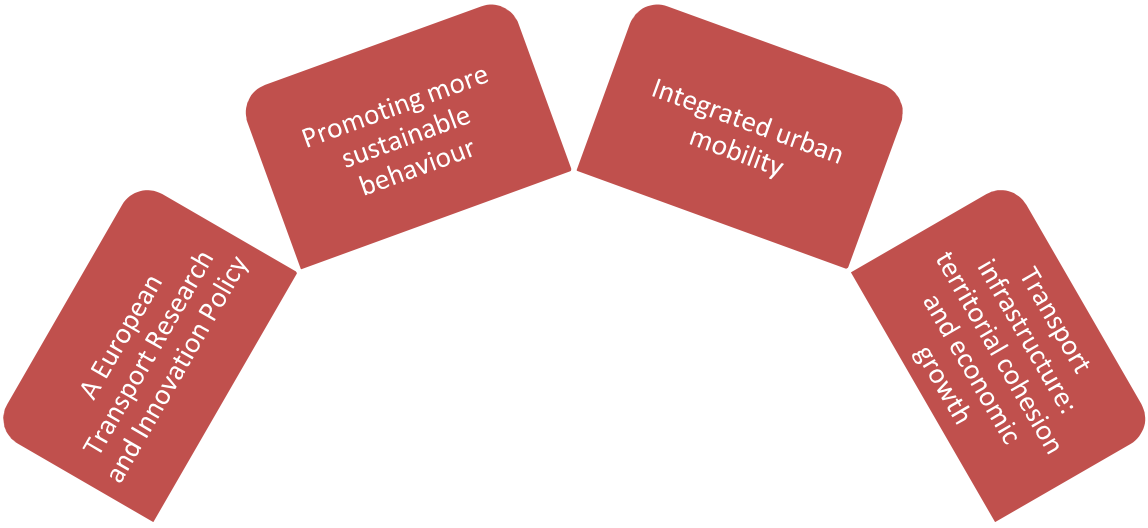
- Improving the energy efficiency performance of vehicles across all modes. Developing and deploying sustainable fuels and propulsion systems;
- Optimising the performance of multimodal logistic chains, including by making greater use of inherently more resource-efficient modes, where other technological innovations may be insufficient (e.g. long distance freight);

- Using transport and infrastructure more efficiently through use of improved traffic management and information systems, advanced logistic and market measures such as full development of an integrated European railway market, removal of restrictions on cabotage, abolition of barriers to short sea shipping, undistorted pricing etc.

The interface between long distance and last-mile freight transport should be organised more efficiently. The aim is to limit individual deliveries, the most 'inefficient' part of the journey, to the shortest possible route. The use of Intelligent Transport Systems contributes to real-time traffic management, reducing delivery times and congestion for last mile distribution. This could be performed with low-emission urban trucks.

The use of electric, hydrogen and hybrid technologies would not only reduce air emissions, but also noise, allowing a greater portion of freight transport within the urban areas to take place at night time. This would ease the problem of road congestion during morning and afternoon peak hours. The aim is to achieve essentially CO2-free city logistics in major urban centres by 2030 .

The list of initiatives with direct focus on urban freight transport referes to the following directions:



A European Transport Research and Innovation Policy

- Clean, safe and silent vehicles for all different modes of transport, from road vehicles, including new materials, new propulsion systems and the IT and management tools to manage and integrate complex transport systems;
- Potential new or unconventional transport systems and vehicles such as unconventional systems for goods distribution;
- A sustainable alternative fuels strategy including also the appropriate infrastructure;
- Integrated transport management and information systems, facilitating smart mobility services, traffic management for improved use of infrastructure and vehicles, and real-time information systems to track and trace freight and to manage freight flows; passenger/travel information, booking and payment systems;
- Intelligent infrastructure (both land and space-based) to ensure maximum monitoring and inter-operability of the different forms of transport and communication between infrastructure and vehicles;
- Innovations for sustainable urban mobility following up the CIVITAS programme and initiatives on urban road pricing and access restriction schemes.

The Deployment strategy will be based on:

- Smart mobility partnerships and demonstration projects for sustainable urban transport solutions (including demonstrators for road pricing schemes etc.);
- Appropriate standards for CO2 emissions of vehicles in all modes, where necessary supplemented by requirements on energy efficiency to address all types of propulsion systems;
- Vehicle standards for noise emission levels;
- Public procurement strategies to ensure rapid up take of new technologies; Guidelines and standards for refuelling infrastructures;
- Interface standards for infrastructure-to-infrastructure, vehicle-to-infrastructure, and vehicle-to-vehicle communications;
- Access conditions to transport data for safety and security purposes;
- Specifications and conditions for transport related smart charging and payment systems;
- Better implementation of existing rules and standards.

Promoting more sustainable behaviour

- Review the Labelling Directive to make it more effective. This will, inter alia, consider the extension of the scope to light commercial and L-category vehicles, and the harmonisation of the label and vehicles fuel efficiency classes throughout the Member States;
- Support the market take-up of fuel efficient, safe and low-noise tyres beyond the performance requirements set in type approval;
- Carbon footprint calculators;
- Encourage business-based GHG certification schemes and develop common EU standards in order to estimate the carbon footprint of each passenger and freight journey with versions adapted to different users such as companies and individuals. This will allow better choices and easier marketing of cleaner transport solutions;
- Eco-driving and Speed limits;
- Include eco-driving requirements in the future revisions of the driving licence directive and take steps to accelerate the deployment of ITS applications in support of eco-driving;
- Examine approaches to limit the maximum speed of light commercial road vehicles, in order to decrease energy consumption, to enhance road safety and to ensure a level playing field.

Integrated urban mobility (deployment of Sustainable Urban Mobility Plans)

In urban mobility plans is important to:

- Establish procedures and financial support mechanisms at European level for preparing Urban Mobility Audits, as well as Urban Mobility Plans, and set up a European Urban Mobility Scoreboard based on common targets. Examine the possibility of a mandatory approach for cities of a certain size, according to national standards based on EU guidelines;
- Link regional development and cohesion funds to cities and regions that have submitted a current, and independently validated Urban Mobility Performance and Sustainability Audit certificate;

- Examine the possibility of a European support framework for a progressive implementation of Urban Mobility Plans in European cities;
- Integrated urban mobility in a possible Smart Cities Innovation Partnership;
- Encourage large employers to develop Corporate/Mobility Management Plans.

An EU framework for urban road user charging shall develop a validated framework for urban road user charging and access restriction schemes and their applications, including a legal and validated operational and technical framework covering vehicle and infrastructure applications.

A Strategy for near 'zero-emission urban logistics' 2030 will:

- Produce best practice guidelines to better monitor and manage urban freight flows (e.g. consolidation centres, size of vehicles in old centres, regulatory limitations, delivery windows, unused potential of transport by river);
- Define a strategy for moving towards 'zero-emission urban logistics', bringing together aspects of land planning, rail and river access, business practices and information, charging and vehicle technology standards;
- Promote joint public procurement for low emission vehicles in commercial fleets (delivery vans, taxis, buses).

Transport infrastructure: territorial cohesion and economic growth

- Ensure that EU-funded transport infrastructure takes into account energy efficiency needs and climate change challenges (climate resilience of the overall infrastructure, refuelling/recharging stations for clean vehicles and choice of construction materials);
- Introduce ex-ante project evaluation criteria ensuring that infrastructure projects duly demonstrate the EU added value or are based on 'services rendered' and generate sufficient revenue;
- Introduce PPP-screening to the ex-ante evaluation process to ensure that the option of PPP has been carefully analysed before a request for EU funding is being asked.

Regarding the Smart pricing and taxation two phases are foreseen.

In the **Phase I** (up to 2016), transport charges and taxes should be restructured. They should underpin transport's role in promoting European competitiveness, while the overall burden for the sector should reflect the total costs of transport in terms of infrastructure and external costs.

- Revise motor fuel taxation with clear identification of the energy and CO2 component;
- Phase in a mandatory infrastructure charge for heavy-duty vehicles. The scheme would introduce a common tariff structure and cost components such as the recovery of wear and tear, noise and local pollution costs to replace the existing user charges;
- Proceed with the internalisation of external costs for all modes of transport applying common principles while taking into account the specificity of each mode;
- Create a framework for earmarking revenues from transport for the development of an integrated and efficient transport system;
- Issue guidelines providing clarification concerning public funding to the different modes of transport and to transport infrastructure, where necessary;
- Reassess transport taxation where necessary, namely by linking vehicle taxation to environmental performance.

In the **Phase II** (2016 to 2020), building on Phase I, one proceed to the full and mandatory internalisation of external costs (including noise, local pollution and congestion on top of the mandatory recovery of wear and tear costs) for road (and rail) transport.

2.5 DG MOVE European Commission, Study on urban freight transport (April 2012)

The objective of the study is to contribute to regulate the national and European policies on urban freight.

Following the European Commission White Paper guidelines, DG-MOVE study list quite extensive individual measures that have been implemented or piloted in Europe, and classify them according to the following categories:

Regulatory (or "command and control") measures are essentially a package of rules and prohibitions, supported by a control/enforcement system, that are designed to control private activity for the wider benefit of society. They are easier to implement and also have a higher degree of acceptability among all stakeholders compared with, for example, market-based measures due to their more traditional nature and apparent equity, but they require an accurate enforcement system to prevent possible infractions.

In general these measures are not compulsory for freight traffic only but they apply to all traffic within a city (such as speed limits, parking restrictions, one-way streets, etc.). However, there are specific measures that directly relate to freight traffic, such as:

- Time-based, volume or weight restrictions on access for freight vehicles;
- Emissions-based restrictions on access for freight vehicles;
- Mandatory use of low or zero emission freight vehicles;
- Encouraging use of third party UFT services rather than using own account vehicles;
- Regulations for loading and unloading freight vehicles.

Market-based measures are essentially composed by fiscal measures such as taxes and tolls usually defined as "market-based" measures because their aim is to "modify" the market prices of the goods or services whose production generates negative effects (or external costs). Changes in prices usually have a direct impact on the behaviour of the freight industry because it is highly competitive and so the individual freight operators have to respond to changes in their costs in order to remain competitive.

Market-based measures can be sub-divided into:

- Direct measures that are applied directly to the external cost produced, such as emissions taxed by an emissions charge;
- Indirect measures that relate to the causes of the external costs, such as charging for access to urban areas.

The European Commission has listed the advantages of market based measures compared with regulatory measures due to their relative effectiveness and flexibility in implementation and their potential use by public authorities to raise funds. One of the key advantages of these measures is that, if they are carefully designed and effectively implemented, they provide effective price signals to private sector freight operators to adapt their behaviour and can be implemented independently of other measures. In this respect, a system of road pricing where external costs are internalized within the price of freight transport in urban areas (and beyond) on the basis of distance travelled, taking into account the type of road and the time of day is, in theory, the "perfect" measure to stimulate sustainable distribution in an urban context.

A disadvantage of this category of measure is that the schemes need to be correctly specified and they tend to encounter strong opposition from citizens and private operators that are affected. The main disadvantage with these schemes is that they require considerable courage on the part of politicians when the electorate is being required to pay an additional charge to use the road network. For these reasons, for every taxation policy levied by city authorities or other public authorities in the context of UFT need to be:

- **Justified by clear public policy objectives**, evidenced by quantified externalities generated by freight activities that are directly related to the objectives, in order to change behaviour.
- **Equitable** between freight vehicles and other users of urban transport infrastructure.
- **Economic to collect** so that, even where the objective of the charge is not to raise public funds, the charges at least cover all the costs of collection.
- **Convenient** to pay for the freight operators, so they do not incur significant additional costs in administering and paying charges.
- **Certain** in terms of the amount and frequency of the charge so that transport operators can adopt appropriate strategies to minimize the charges they would have to pay.

Improvements in technology to collect charges, administer schemes and enforce payment, while not requiring toll booths that impede traffic flows, have helped to make the implementation of these schemes more efficient and cost effective.

Land use planning measures. There is a two-way relationship between freight transport/logistics measures and land use planning measures where the latter relates to all interventions that change the use of space (at the local, regional or national level). In our opinion, the two types of measures should be integrated in order to maximise the overall benefits to society, although this can only be achieved with a consistent policy over a long period due to the time it takes to change existing land use patterns - which involves the change of land use and buildings in private ownership.

Infrastructure measures related to UFT, which are often integrated into land use planning measures, are the final category of measures usually implemented by public authorities. Due to the high cost of planning, implementing and maintaining transport infrastructure in urban areas and their perceived "public good" nature, the city authorities are often the only actors willing and able to fund their implementation. While infrastructure measures have a strong impact on UFT, they are more expensive to implement than market-based or command and control measures. Moreover they require time to reach a certain break-even point (particularly to achieve a critical mass of freight volume handled) in order to achieve the required results.

In relation to UFT infrastructure usually consists of:

- On-street loading and unloading spaces for freight vehicles;
- Facilities to secure modal shift from road to other modes (rail, underground, inland waterways).

Urban Consolidation Centres (UCCs) could also be considered to be infrastructure but, as they are usually based in private sector distribution buildings and their success or failure is generally based on commercial and management issues, they have been considered in more detail under Management and Other Measures. In addition, Intelligent Transport Systems (ITS) will become an increasingly important element of the infrastructure of urban areas, particularly to help UFT operators to manage their operations more efficiently.

While there are several **New technologies** that have the potential to be used to make urban mobility (for both passengers and freight) ultra-low or zero emission, four are being very actively investigated by automotive manufacturers:

- Electric;
- Hybrid electric-plug in;
- Hydrogen;
- Natural Gas.

Each of these technologies has advantages and disadvantages and has been in and out of fashion for several decades. Electric powered vehicles are the obvious choice and most car manufacturers are either producing or developing various types of electric powered vehicles (e.g. Nissan Leaf, Vauxhall/Opel Ampera). Besides being zero emission (at point of use), electric vehicles are able to use the existing electrical supply infrastructure even if special re-charging points are required to provide immediate access. As well as their environmental benefits, electric vehicles have lower running costs than diesel vehicles, due both to lower fuel costs and, as there are fewer moving parts, lower maintenance costs. In the UK some electric freight vehicles can be charged in 4 hours and the charging technology is gradually improving.

Management and other measures: This category of measures includes not only management measures directly implemented by private sector actors to secure sustainable urban distribution but also all measures, whether implemented by private or public actors, that do not involve regulation, fiscal measures, new infrastructure or technology or land use planning measures. These are usually “bottom-up” measures that are “softer” in nature, often requiring some kind of collaboration between actors in order to achieve more sustainable distribution in urban areas while reducing costs or adding value for freight transport operators and/or their customers. They include the key concepts of the consolidation of the supply of UFT (through Urban Consolidation Centres) and the consolidation of demand for UFT (through collaborative orders), which increases average load factors and reduces the number of deliveries.

2.6 Urban Mobility Package 2013

The recognition of mobility as a crucial aspect for the sustainable development and quality of life in cities and urban areas has been acknowledged by all levels of policy decision makers. The need to adopt holistic and multi-sectorial approaches to address urban problems is also recognised by the different decision makers. Indeed, "policy on paper" is quite clear and almost universally present, however **when moving from paper to practice**, differences are large, and despite huge efforts promoted both at the level of dissemination, awareness and training and implementation support, **a large scale change is still far from being achieved**.

Aware of such gap, the EC has launched in 2012 a wide consultation on 'The urban dimension of the EU transport policy', launching the process towards the so-called **"Urban Mobility Package"**, which frames and packages 3 initiatives from the 2011 White paper, namely:

- Initiative 31 Sustainable urban mobility plans
- Initiative 32 Framework for urban road user charging and access restriction zones
- Initiative 33 Zero-emission urban logistics – in major urban centres by 2030

Consultation starts from a key and pertinent question: "**Why take action at EU level on urban mobility?** The answer is clear and rightly pointed in the supporting document:

> *"Urban transport challenges are pressing. For instance, many urban areas are still plagued by congestion and by transport related air quality problems, with pollutant concentrations well above the limit values set by EU legislation for health protection. Urban transport is responsible for about 23% of total CO2 emissions from transport. This is still rising despite EU legislation to reduce greenhouse gas emissions by 2020. About 70% of CO2 emissions in urban transport come from passenger cars and 27% from goods transport vehicles. Traffic accidents on urban roads cause about 40% of all traffic accident fatalities in the EU. Equally, high noise levels, in urban areas often caused by transport, are detrimental to public health."*

The specific interest for C-LIEGE lies primarily into **initiatives 32 (EU framework for urban road user charging and access restriction schemes) and 33 (Strategy for 'near zero emission urban logistics' by 2030)**, though in the latest instance all these initiatives should be framed and included under the initiative 31 (Urban Mobility Plans).

Initiative 32

Calls for the establishment of an EU framework for urban road user charging. In particular the White Paper calls for the development of "a validated framework for urban road user charging and access restriction schemes and their applications, including a legal and validated operational and technical framework covering vehicle and infrastructure applications."

The Commission staff working paper[3] accompanying the Transport White Paper identifies some potential benefits of such charging and access restriction schemes and sketches some of the reasons why EU level intervention could be useful. In particular it points out that charges can be a useful source of finance in a time of scarce public funds and that a system of variable charges for access to urban roads can:

- ensure that scarce urban road capacity is allocated between competing users in the best way;
- encourage sustainable transport for example by encouraging greater use of public transport, or providing incentives for the use of more environmentally friendly vehicles; and
- potentially encourage the development and commercialisation of clean technologies, such as low emissions transport, by creating a quasi - guaranteed market for such products.

The Commission has already procured an extensive study of urban access restrictions in the EU.

[3]European Commission 2011, Staff working paper accompanying the Transport White Paper http://ec.europa.eu/transport/strategies/2011_white_paper_en.htm

Initiative 33

Urban logistics is central to the efficiency and economic vitality of cities however it is a much neglected area of urban transport planning. Passenger and freight transport are equally important, but the lack of integrated treatment causes many problems.

There is consensus amongst all actors on the need for action. Under the Action Plan on Urban Mobility, the Commission launched a study to explore the scope for action for fostering more efficient and sustainable urban freight logistics (see chapter 2.5 above).

The study recommended "a set of policy measures such as the internalisation of external costs in urban areas, research into the support of zero emission vehicles and the application of ITS, investigation of standards for low noise freight vehicles and the availability of TEN-T funding for urban freight transport." The study also recommended "that urban freight transport plans should be part of sustainable urban transport plans".

The 2011 Transport White Paper announced the Commission's intention to produce "best practice guidelines to better monitor and manage urban freight flows" and to put forward "a strategy for moving towards 'zero-emission urban logistics'."

Objectives underlying the Initiative 33 “A strategy for near zero-emission urban logistics by 2030” can be described as follows:

- Raise actors attention to the benefits of comprehensive approach to urban logistics and focus actors attention on the 2030 targets;
- Support other white paper objectives;
- Provide a clear lowest cost EU strategy to deliver near zero emission urban logistics in major urban centres by 2030;
- Provide recommendations for all relevant actors as public authorities, service and equipment providers, cargo owners, consignees, etc;
- Provide best practice guides for different actors on priority issues (i.e. how to better monitor and manage urban freight flows, consolidation centres, size of vehicles in old centres, access restrictions, delivery windows, packaging and its enforcement, the unused potential of transport by river, etc.);
- Enhanced dissemination of information and expert networks;

- Promotion of joint public procurement for low emission vehicles in commercial fleets (delivery vans, taxis, buses);
- Encourage co-ordinated national actions.

Moreover, it should be referred that almost in parallel with the public consultation, an impact assessment for the "urban mobility package" was launched. Results on the desired policy option to proceed with the implementation of the three initiatives of the urban mobility package are not yet known as the impact assessment is still ongoing.

Anyhow, consultation results are very positive in what concerns both urban logistic related measures. Stakeholders consider **urban freight logistics** a much neglected area of urban transport. Around 67% of respondents state that the current urban transport planning does not give sufficient consideration to urban freight logistics.

Concerning urban logistics, the three top priority policy actions at EU level are:

- The development and exchange of best practice;
- Support to R&D projects;
- The development of guidelines and recommendations.

Overall, the results of the public consultation show that there is a keen desire among stakeholders for an integrated urban mobility scheme and stronger EU commitment. The same can be said of Access Restriction Schemes (**ARS), EU financial support for urban transport projects and urban freight logistics.**

Most participants in the consultation consider Access Restriction Schemes a powerful instrument to address sustainability challenges. According to stakeholders, the three principal objectives of ARS are to improve air quality, improve liveability, leisure and recreation, and improve accessibility. Around 61% of respondents agree that "low emission zones" (LEZs) are an effective measure to improve air quality in urban areas while this is disputed by just over 30%. The so-called 'congestion charging zones' (CCZs) are seen as an effective way of improving accessibility in urban areas by some participants from the logistics sector stress that the following actions would improve urban logistics:

- Increasing number of safe and legal loading facilities;
- Developing network of pick-up and drop-off loading points;
- Setting up specific arrangements for out-of-peak hour deliveries;
- Allowing use of bus and taxi lanes for out of hour deliveries;
- Allowing freight transport to make use of bus lanes;
- Optimizing traffic light synchronization;

Creating safe and legal parking spaces for pick-up and delivery activities and coordinating utility/road works. Logistics companies also express concern that the legal obligation to have professional drivers for low-emission vans exceeding 3.5t due, for instance, to the battery hampers the deployment of low-emission vans. Therefore, this obligation should be removed at the national and/or EU level.

EU added value on urban mobility

The EU added value consists of ensuring a more effective and coordinated policy making by the European urban areas, by providing national authorities with a policy and governance framework for the development of integrated mobility approaches in urban areas, in full respect of subsidiarity. As a result, urban mobility policies should be implemented in a more effective way, achieving better impacts on the well-being of citizens and the effectiveness of businesses in urban areas, on top of meeting local, national and EU policy targets and comply with relevant EU legislation. The coordinated EU action will also be more effective at ensuring free flow of goods and people, a seamless mobility along the TEN-T and increasing the innovation potential of the EU.

Just few days before the releasing of this report, the urban Mobility Package was adopted by the EC. Announced on the 18th December 2013, the communication package4 reinforces that step changes are needed:

> *Communication aims to reinforce the support to European cities for tackling urban mobility challenges. A step-change in the approach to urban mobility is needed to ensure that Europe's urban areas develop along a more sustainable*

[4] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Together towards competitive and resource-efficient urban mobility, COM(2013) 913 final

path and that EU goals for a competitive and resource-efficient European transport system are met. It is also crucial to overcome fragmented approaches and develop the single market for innovative urban mobility solutions by addressing issues like common standards and specifications or joint procurement. The Communication sets out how the Commission will strengthen its actions on sustainable urban mobility in areas where there is EU added value. The Commission also encourages Member States to take more decisive and better coordinated action.

In particular, EC communication points to the need of coordinated actions by decision makers and competent authorities at all levels of government with stakeholders reaffirming the added value of EU-level support, namely to facilitate the exchange of experiences and best practices; to catalyse research and innovation and to provide financial support for urban transport projects, particularly in the less-developed regions. The importance of working together on specific topics like urban mobility planning, deployment of Intelligent Transport System (ITS) solutions or access regulations, and road safety is also highlighted.

A key concern expressed in the communication package is that to be effectively and broadly deployed, concepts and tools developed at the European level should be adapted to the particular circumstances of each Member State and then actively promoted at national and regional levels. This idea strongly reinforces that C-LIEGE approach to transferability[5] methodology is sound and of utmost relevance to promote and adapt to the local context and specificities, the measures and tools elsewhere identified.

[5] See C-LIEGE Deliverable 7.1

3. THE CURRENT URBAN FREIGHT TRANSPORT FRAMEWORK IN EU CITIES

3.1 Introduction

Urban freight transport in European cities has increased rapidly in the past decades, rendering urban transport systems integral elements of the European transport system. Accordingly, recent years have also marked the development of EU policies relevant to urban freight mobility, as described in previous chapters.

At the same time, city authorities and municipalities are trying to solve the problems and negative externalities caused by urban freight delivery operations by implementing different measures. Urban freight transport, however, involves many different stakeholders, and there is broad consensus that one of the key factors hindering the implementation and/or success of urban freight measures for sustainable delivery is that these tend to overlook the conflicts and complementarities among the objectives and interests pursued by these different actors.

In light of the above, this chapter presents the key elements shaping the current urban freight transport framework in EU cities, with a particular focus on the stakeholder interaction and the identification of the main barriers to the successful implementation of soft measures. Finally, a summary of the key standalone “push and pull” measures within the general EU UFT domains is presented, which were identified by C-LIEGE, based on an extensive review and evaluation of successful European applications.

3.2 Stakeholders analysis

The sustainable urban freight mobility planning process needs to be tailored to the local situation. This includes as a crucial step the definition of the geographical scope of the plan, which ideally should address the functional urban agglomeration.

Stakeholder cooperation and policy integration are other fields that need to be addressed already from the planning stages and should be materialised in an agreement on the work plan and management arrangements. The role of public actors in terms of merchandise transport and delivery is essential for facilitating a freight movement that should be in the same time fluent, effective and environmentally, economically and socially friendly.

Search for areas of integration & articulation

Potential areas of connectivity may be the local and regional transport strategy, economic development and regeneration strategy, the corporate strategies and business plans of freight logistics companies as well as air, rail and shipping freight operators within the regional/sub-regional context, route management strategies developed by the highways agency or local authority air quality action plan.

Look for a broad coverage of representative organisations

It is important to ensure representation from a broad range of organisations delivering to or operating within the selected area: Road hauliers/logistics companies/shippers; Retail; Manufacturing; Service providers, in particular the rapidly growing parcels sector; Rail operators and Network Rail; the local airport or port if appropriate. Other potential representatives include: Chambers of Commerce/Trade – can represent the interests of local businesses and can help with surveying the local business community; Police - can help with issues surrounding parking and enforcement; Environmental groups - can highlight particular local environmental concerns; Residents groups - can represent the concerns of local residents.

How to approach the stakeholder groups?

With many actors involved it is difficult to tell who is responsible for each problem. The urban distribution of goods is organised by private stakeholders (e.g. producers, carriers, retailers, wholesalers, etc.), operating in an environment, the urban space, which is managed by public authorities.

Freight transport operations are mostly private, which means that they are rather efficient from an internal cost point of view, but not concerned with the external costs that they often generate. Attempts to control negative impacts of UFT usually results in considerable costs, including: loss of logistics efficiency for operators, supply constraints for shippers or receivers, investment costs in new infrastructures or vehicles, new coordination costs or costs related to new services.

Which role for authorities?

Local authorities usually regulate essential areas of urban freight transport, mainly those referred with access restrictions (tonnage and size). By planning and implementing of measures as access restrictions, optimization of routes, urban logistic plans, innovative financing models, incentives and distribution plan-schemes, etc., local authorities can influence UFT planning and management towards a more sustainable governance model.

In order to achieve a good environment for residents, Local Authorities are becoming more actively involved in co-ordinating conflicts among residents, retailers and freight carriers. It is important for all involved stakeholders to build consensus. Difficult issues have to be solved and when several actors have a voice, one can face disputes.

The local authority has to be a “mediator” in these discussions and negotiations. This approach of negotiations differs from the majority rule decision making and everyone must agree on the final decision. Cooperation amongst all involved stakeholders should be part of an UFT policy (cooperation between public and private parties), particularly when public measures and policies are taken to influence UFT market towards sustainable models.

By engaging relevant stakeholders, Local Authorities can identify problems perceived by those related to goods delivery in their cities, elaborate appropriate policies to resolve such problems and select effective measures to promote a cleaner, cost-efficient and energy saving UFT in cities.

Working together results in...

Many examples exist of cases where freight operators have achieved benefits of open dialogue and working together with Public Authority towards shared solutions and approaches. There are cities, for instance, that have developed regulations on access restrictions (e.g. time windows, pricing, etc.), but impose less strict restrictions to operators, if they use the consolidation centres to meet the load fill target and use environmental-friendly vehicles for good deliveries in city.

A local authority can reach consensus through round tables to harmonize different views of the players involved in UFT and find a way for a common strategy to achieve best practices in environmentally sensitive, economic, safe and efficient UFT. Regular round tables involving all relevant stakeholders are very effective in discussing problems and

implementing city logistics initiatives in cities. Establishing such platforms for discussing urban freight and relevant problems is crucial for successful UFT models. After all key players have agreed on shared policies and measures, the next step is the implementation. Consensus building and conflict resolution will benefit all parts involved.

Freight Quality Partnerships (FQP) can provide Local Authorities with a means to formalise the consultation and the development of the work undertaken through round tables. The format of FQP should be appropriate to the scale and type of perceived problems during round tables discussion, from region-wide to a partnership with an individual authority.

The objective of improving the efficiency of UFT can be reached when Public Administration (PA) is able to activate and coordinate a **Permanent Concertation Table**, with the main task of identifying and agreeing on measures and policies to be taken in order to effectively reorganize urban goods distribution.

Starting from members of the Permanent Concertation Table, it is appropriate that Local Administration promotes a medium-term agreement or memorandum of understanding among the parties (e.g. FQP). The Member States and European experience confirms the usefulness of formalizing and signing such an agreement in which the parties commit to take all initiatives and actions aimed at supporting the process of reorganizing the system of distribution of goods. This agreement has the aim, among others, to establish the time and ways for gradual renewal of more polluting freight vehicles, and also to establish a series of progressive time restrictions for such vehicles, including that of specific time slots for loading and unloading of goods.

In order to support the continuous concertation, a new post namely **City Logistics Manager (CLM)** is recommended to urban policy makers by the C-LIEGE project. This new function has been successfully implemented and evaluated in several pilot cities. Involving stakeholders in a continuous process of designing and implementing a Local Freight Development Plan, the City Logistics Manager has the main task of rationalizing and optimizing goods distribution and collection in urban areas, in order to help reduce traffic congestion and air pollution levels making an efficient and effective UFT, with environmental, energy, social and economic advantages. The C-LIEGE Toolbox for City Logistics Manager offers a complete set of push, pull and push-and-pull freight transport demand-oriented measures for energy-efficient and environmental-friendly UFT, together with the definition,

description and policy design of each measure, involved stakeholders, identification of possible barriers and drivers for success, timescale, innovativeness, and transferability potential of the measure.

Moreover, the project developed a tested **Stakeholder Engagement Manual** that offers a methodology on how to involve all different types of stakeholders throughout the planning process, addressing their specific requirements. This helps to legitimise the plan and enhance its quality. Stakeholder involvement supports the development of a more effective and (cost) efficient plan. A dedicated strategy is required for the involvement of stakeholders, drawing on different formats and techniques, when dealing with authorities, private businesses, civil society organisations, or all of them together.

The CLM has a facilitator role in discussing the measures of intervention with key stakeholders in local meetings during Concertation Tables, with a view to agree on concerted actions and shared policies and avoid potential conflicts between the main key players directly or indirectly involved in the goods distribution process in urban areas. The measures to be taken to enhance local UFT efficiency in economic, social and environmental terms, must be measures of a political-administrative and operational-logistics character. Political-administrative interventions (traffic regulations) lead to the definition of regulations in the access of freight vehicles in the selected urban areas, as well as to the definition of economic regulations that can be translated, for example, into the introduction of access charge (road pricing). Operative-logistics interventions lead to promoting a more efficient goods distribution model through the creation of a more sustainable UFT governance model.

It is important that Local Authorities conduct an evaluation. This should occur before and after the implementation of policies and initiatives, in order to determine if objectives have been met and whether UFT is more sustainable. In practice, one should conduct problem identification with all stakeholders, then collect information about the problem at hand and, lastly, seek solutions in order to overcome the problem. Once the planning is complete, the CLM has to verify and monitor the effectiveness of implemented measures. Every single process described must be accompanied by a communication phase and consultation with the stakeholders.

3.3 Main barriers in Urban Freight Transport soft measures implementation

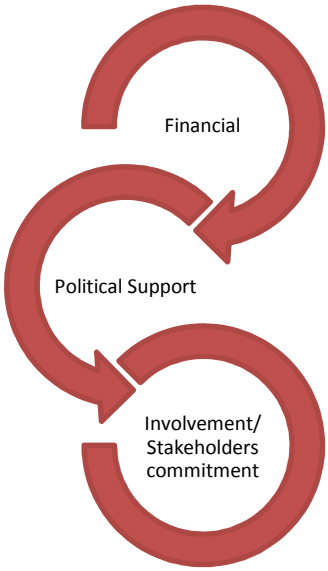
One of the main barriers in urban freight transport soft measures implementation is the political one, as urban logistics is not integrated in the policy agenda of the different levels of governments. In general, one hindering factor to the implementation of policies is the lack of information and awareness. Many assertions and contestations are made on the basis of "I guess that…". For example, freight distribution measures should be combined with urban mobility measures and the lack of that combination is still a barrier that leads to failure cases.

Political and financial barriers are probably the most relevant barriers to remove in urban logistics measures, as the lack of political will can jeopardise the implementation of a measure or package of measures. Several experiences in urban logistics have been funded by European funds and when the fund is over, most of the cities and/or private parties don't have the money to invest further in those solutions.

One of the main lessons learnt during the delivery phase of the pilots implementation and roll out is that the process of securing political approval and budget allocations takes time. In a few cases, measures have had to be re-aligned or substituted, due to political or implementation difficulties with the original measure. This was to be expected as not every putative measure proves to be viable in terms of actual delivery.

The combination of a policy–mix, restrictive and incentive-based measures, requires less public financial commitment and achieves greater acceptance by the stakeholders involved. A common barrier found is the adoption of only restrictive or incentive based measures instead of the combination of push and pull measures.

In any case, without political support, it will be difficult to secure financial support. Without financial support, operators and other stakeholders may see little purpose in giving up their time to become involved.



Although feedback is often specific to the particular measures adopted in the C-LIEGE pilot sites (as one would expect), three common themes do emerge which represent barriers to the introduction of either 'vertical' or 'horizontal' measures. These are financial, political support and stakeholders' commitment.

The above barriers are interlinked: without political support, it will be difficult to secure financing; without financing, operators and other stakeholders may see little purpose in giving up their time to become involved.

Even the political support does not guarantee the availability of funding. Local authorities in many parts of Europe are facing intense financial pressures resulting in the need to cut spending on a range of services. It cannot be expected that freight will be exempt from this process. It should also be noted that, despite its economic importance, freight may not be regarded by local residents as a high priority for investment, when compared to other sectors, such public transport, schools or old people's care, for example.

3.4 The C-LIEGE toolbox of push and pull measures in the EU UFT domain

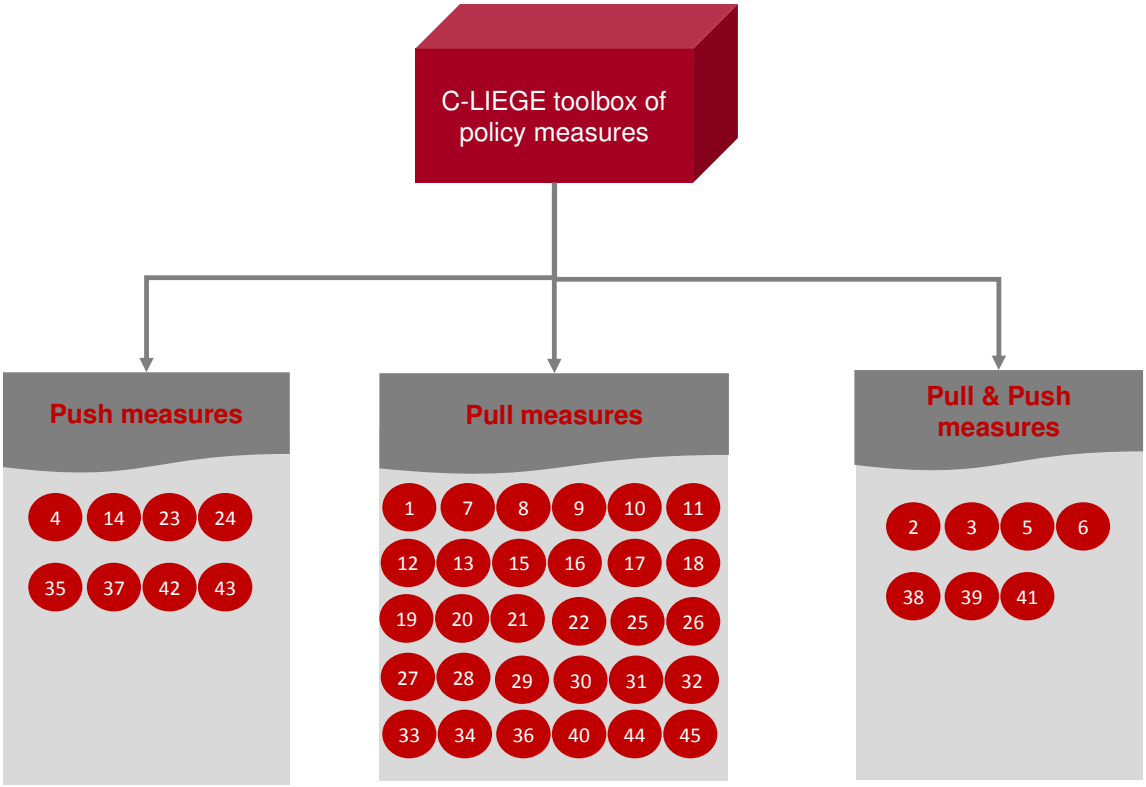
A substantial part of the activities of C-LIEGE included the overview, identification, assessment and further generalization and standardization of energy efficient UFT measures, as outcomes of previous experiences and lessons learned by European, national and/or local initiatives as well as projects already implemented in the UFT domain. To this end, a number of general and stand-alone "push and pull" soft measures have been defined, with an increased potential of transferability to other urban establishments.

The C-LIEGE toolbox includes a total of 45 measures, out of which 8 are "push" measures, 30 are "pull" measures, and 7 are both "push and pull".

"Push" measures are the ones imposed to freight operators with the purpose of influencing delivery and/or operational practices, while "Pull" measures are designed to encourage more sustainable and energy-efficient UFT by offering added-value services, facilities or incentives

to operators and/or shippers. “Push-and-pull” measures involve a combination of the above two types, aimed at providing incentives for good practices, whilst simultaneously using fiscal or technical disincentives to deter bad ones.

A brief description of each measure is presented below.



Transferability Potential

Expected Impacts

- environnent (air and noise pollution) ;
- energy (energy consumption)
- economy (retailers, manufactures, residents)
- transport efficiency (optimization and costs efficiencies)
- safety and security (drivers and vulnerable road users)
- land use and urban planning(city administrations)

1 **Local Freight Development Plans (LFDPs)** are a "pull" measure and constitute co-ordinated plans designed to rationalize freight movements and deliveries. The plans can cover a wide range of measures, depending on the unique characteristics of each town/city. They have a high transferability level, since they are applicable to all municipalities, while they are expected to have a direct impact on all related fields, including the environment, energy efficiency, economy, transport efficiency, safety and security and land use and urban planning.

2 **Inclusion of Freight in Urban Mobility Plans** is a "push and pull" measure aiming at developing common European quality standards and processes for implementing and evaluating sustainable urban mobility plans, whilst also including clear performance indicators of the reduction of energy use and CO_2 emissions, through the involvement of various selected and experienced mobility management experts and cities all over Europe under a collaborative research approach. The measure is expected to affect directly the environment, energy efficiency, economy, transport efficiency, safety and security and land use and urban planning.

3 **Construction of Logistics Plans** is a "push and pull" measure that includes the combination of travel planning with a Good Neighbour Policy, and other measures such as Fleet Recognition, rendering traffic and delivery management to new construction sites more efficient, while at the same time benefiting the economy, transport efficiency, safety and security, land use and urban planning and mitigating the social and environmental impact of major construction works.

4 **Distribution Plans to reduce frequency of deliveries in public procurement** are a "push" measure and can be used to streamline deliveries of stationery and other goods to large public bodies that require large volumes of goods. By rationalising and consolidating the delivery process, energy saving and environmental benefits can be achieved, while the measure is also expected to have a direct impact on land use and urban planning. Moreover, it could be transferrable to several other public bodies, with regard to deliveries of less bulky goods.

5 **Charging for distribution operations in central areas** is a "push and pull" measure that relates to the development of distribution schemes, which intervene on an administrative level rather than on logistic or technical levels, with the scope to reduce the negative effects of goods distribution in city centres. This includes the application of varying costs for entering the city centre depending on different types of vehicles and distribution needs. The measure is mostly applicable to larger municipalities, where congestion and air quality are a problem, and resources are available to implement such a charging scheme. It is expected to have a direct impact on the environment, as well as on energy efficiency.

6 **Delivery and Servicing Plans**, is a "push and pull" measure that involves local municipalities working with organisations across each city in developing and implementing DSP frameworks, with the scope to enable businesses to achieve efficiencies in deliveries. The measure is could be transferable to any location, and is expected to have a direct impact on the environment, economy and energy and transport efficiency.

7 **Free-to-use loading bays,** is a "pull" measure that offers free access to loading bays to operators, who meet certain criteria set by the city administration, as well as an incentive towards the use of "cleaner" vehicles. It has a direct impact on the environment, economy and energy efficiency.

8 **Free access to public transport lanes**, is a "pull" measure, whereby freight vehicles are allowed free access to public transport priority lanes. In some cases, they must meet certain criteria set by the city administration to qualify for access, offering also an incentive towards cleaner vehicles. It could be transferrable to any town/city, where priority lanes are in place and is expected to have a direct impact on the environment, economy and energy efficiency.

9 **Changing traffic regulations to improve freight access** is a "pull" measure concerning traffic regulations, such as one-way streets, which are modified to ensure easier access and routing for freight vehicles, enabling, thus, more efficient planning of distribution routes. In some cases, they must meet certain criteria set by the city administration to qualify for access, offering also an incentive towards the use of "cleaner" vehicles. The measure could be transferrable to any town/city, where it is feasible to change

traffic regulations accordingly and is expected to have a direct impact on the environment, economy and energy efficiency.

10 **Financial support for fleet conversion** is a "pull" measure involving the provision of financial support to accelerate the renewal of commercial and non-commercial fleets through a new incentive campaign targeting the acquisition of CNG, bio diesel and other low impact vehicles. Agreements can be signed with trade associations for their own fleet replacement and large scale promotion campaigns to encourage fleet renewal. It could be transferrable to any town/city, where it is desirable to encourage a faster rate of vehicle replacement. It is also expected to have a direct impact on the environment and energy efficiency.

11 **Enactment of access "time windows"** is a "pull" measure involving the use of access "time windows" aimed at making freight flows more efficient and reducing the impact on city centre traffic movements. In some cases, access may be restricted to certain types of vehicles, as an incentive to encourage clean, light and environmental-friendly vehicles. The measure could be transferred to any town/city, where it is desirable to encourage the uptake of clean, light and environmental friendly vehicles. It is also expected to have a direct impact on the environment and energy efficiency.

12 **Allocation of additional freight parking spaces** isa "pull" measure that involves the allocation of additional freight parking spaces aimed at making freight flows more efficient and reducing the impact on city centre traffic movements. In some cases, access may be restricted to certain types of vehicle, as an incentive to encourage clean, light and environmental friendly vehicles. Could be transferrable to any town/city, where it is desirable to encourage the uptake of clean, light and environmental friendly vehicles, the measure is expected to have a direct impact on the environment and energy efficiency.

13 **Ad-hoc routes for freight distribution** is a "pull" measure that involves the introduction of ad-hoc routes for freight distribution aimed at making freight flows more efficient and reducing the impact on city centre traffic movements. In some cases, access may be restricted to certain types of vehicles, as an incentive to encourage clean, light and environmental friendly vehicles. Could be transferrable to any town/city, where it is

desirable to encourage the uptake of clean, light and environmental friendly vehicles, the measure is expected to have a direct impact on the environment and energy efficiency.

14 **Time window restrictions** is a "push" measure involving the use of time window restrictions to confine freight deliveries to certain hours, typically early in the day, in order to address congestion, traffic related air pollution and vehicle conflict in loading areas. This is particularly relevant in pedestrian areas, where unrestricted access for deliveries can degrade the pedestrian environment. The use of time windows can also provide an incentive to use freight consolidation schemes. Could be transferrable to any city, where it is desirable to restrict deliveries to certain time windows in order to reduce the impact of UFT in city centres, the measure is expected to have a direct impact on the environment and energy efficiency.

15 **Optimising leasing models for clean freight vehicles** is a "pull" measure which involves the development of leasing models that re-finance the higher investment costs for CNG vehicles by lower operating costs and relevant promotion programmes. This measure is in theory transferrable, but may be more applicable to larger towns/cities, where the necessary supporting infrastructure is already in place. It is expected to have a direct impact on the environment and energy efficiency.

16 **Real-time loading space booking** is a "pull" measure by which the driver is offered the opportunity to book a delivery space before reaching the delivery point, with the scope to increase the number of stops made in delivery areas, and decrease the level of double parking and its associated negative impacts, reduce driver stress, optimise delivery time operations, and significantly improve drivers' working conditions. Depending on local preferences, access to the booking system could be restricted to operators who meet certain criteria – e.g. truck fleets who implement speed limiters and provide eco-driving support to their drivers, or operators who are members of fleet recognition schemes. This measure could be transferrable to any town/city, where delivery vehicles are having difficulty accessing parking spaces, and is foreseen to have a direct impact on the environment, safety and security and transport efficiency.

17 **Priority for lorries at selected junction**, a "pull" measure that will optimise the traffic control system to reduce heavy vehicle fuel consumption. The general idea is that cities will implement priority for trucks at certain junctions (on certain roads and/or certain times of day) and provide this priority as incentive to those truck fleets, which comply with certain criteria, such as fitting of speed limiters, provision of eco-driving support to drivers, or membership of fleet recognition schemes. This measure could is transferrable to any town or city, where the traffic control systems are capable of being adjusted to give priority to freight vehicles, and is expected to have a direct impact on the environment, as well as the energy efficiency.

18 **ICT support for eco driving** is a "pull" measure providing direct technological support for an economic and environmentally friendly driving style altering fuel consumption. It could be applicable to all municipalities and is foreseen to have a direct impact on the environment, economy, and energy and transport efficiency.

19 **Van sharing** is a "pull" measure and constitutes the rationalisation of vehicle use by traders through the introduction of a van-sharing service. It is intended to address high levels of congestion and pollution generated by freight distribution (especially in historic city centres with limited road space) by optimising collection and delivery services. It could be applicable to all municipalities and is foreseen to have a direct impact on the environment, economy, and energy and transport efficiency.

20 **Collect point** is "pull" measure, whereby collect points are located in convenience stores in order to offer an alternative to home delivery, primarily for Internet shoppers. The main benefit of the service is the reduction in failed deliveries and the subsequent return of goods by couriers and postal services. The measure could be transferable to all municipalities and is expected to have a direct impact on the environment, economy, and energy and transport efficiency.

21 **Pack station** is an innovative "pull" measure, beneficial to both customers and online stores, aimed at providing a convenient delivery alternative for internet shoppers, avoiding at the same time failed home deliveries by conventional delivery practices. It could be applicable to all municipalities, and can be expected to have a direct impact on the environment, economy, safety and security, and energy and transport efficiency.

22 **Freight exchange** is a "pull" measure features an online system designed to reduce back-loading, by matching up freight vehicles due to make return journeys to a destination empty, with goods to be carried to that particular destination. The measure could be transferrable to any municipality, where there is sufficient volume of traffic to justify the cost of the scheme. It is expected to have a direct impact on the environment, economy, safety and security, and energy and transport efficiency.

23 **Mobility credits** is a highly innovative "push" measure that involves the introduction of a pricing scheme based on a mobility credits model in order to reduce high levels of congestion and pollution in busy city centres (especially historic centres with limited access and road space). It could be transferable to all municipalities, but mostly applicable to historic centres, where access and road space is limited. Its foreseen direct impacts are on the environment, economy, safety and security, and energy and transport efficiency.

24 **Electronic access control** is a "push" measure that involves the introduction of a pricing scheme based on electronic access controls, in order to monitor and control traffic flows in city centres (e.g. historic centres with limited access and road space). It could be applicable to all municipalities, but mostly to those that have historic centres, where access and road space is limited. Its direct impacts expected are on the environment, economy, safety and security, and energy and transport efficiency.

25 **Freight map for appropriate routes and vehicular restrictions** is a "pull" measure aimed at reducing congestion and environmental impact of urban freight transport by better freight traffic routing information that will include details of height/weight restrictions. It could be applicable to all municipalities, it is expected to have a direct impact on the environment, economy, safety and security, and energy and transport efficiency.

26 **Web based market place** is a "pull" measure involving online promotion of sustainable logistics, in conjunction with an integrated online rooting tool and is applicable to all municipalities. It is expected to have a direct impact on the environment, economy, safety and security, and energy and transport efficiency.

27 **Computer simulation demonstrating efficient distribution of goods** is a "pull" measure involves the use of computer simulations to promote sustainable freight logistics and show stakeholders the benefits and positive impacts that would result from

measures related to freight consolidation, if these were implemented. The measure itself will have no demonstrable impacts, as it is only a computer simulation. If the proposed measures were actually implemented, there would be direct impacts on the environment, economy and energy and transport efficiency. The measure is applicable to all municipalities.

28 **Online rooting tool** is a “pull” measure that involves the use of intelligent routing tools to produce online calculations of optimal routes into city centre and optimal paths in pedestrian zones. It could beapplicable to all municipalities, where there is adequate budget to introduce the online routing tools and to publicise these to operators. The measure is expected to have a direct impact on the environment, economy and energy and transport efficiency.

29 **Web promotion of sustainable city logistics** is a “pull” measure involving online promotion of sustainable logistics, in conjunction with an integrated online rooting tool. It could be applicable to all municipalities, where there is adequate budget to develop and promote the web portal. The measure is expected to have a direct impact on the environment, economy and energy and transport efficiency.

30 **Virtual distribution center** is an innovative “pull” measure constituted by an internet portal containing on-line information on the goods to be delivered to customers (address, nature of cargo volume, type of packaging, etc.), as well as on the transport company delivering the goods and the availability of vehicles and their characteristics (the cargo compartment, etc.). It could be transferrable to all municipalities and is expected to have a direct impact on the environment, economy, safety and security, and energy and transport efficiency.

31 **Web service to manage preferred delivery location and times** is a“pull” measure involving the use of an on-line database to manage preferred delivery locations for recipients of freight consignments. Customers upload information about delivery locations, delivery profiles and time windows to the database, which serves as an information hub for delivering data, accessed by private customers and logistics service providers. The measure could be transferrable to all municipalities and is foreseen to have direct impacts on the environment, economy, and energy and transport efficiency.

32 **Algorithm to plan deliveries when unexpected events take place** is an innovative "pull" measure that involves the use of an algorithm to plan delivery schedules for a vehicle fleet when there are sudden changes in traffic conditions. It could be transferrable to all municipalities and is expected to have a direct impact on the environment, economy, safety and security, and energy and transport efficiency.

33 **Systems for assessment on UFT impacts** is a "pull" measure, which involves the development of a transport planning model, so that the social costs of freight traffic (such as noise emissions) are identified more precisely and a monetary value is applied. It is applicable to all municipalities with expected direct impacts on the environment.

34 **Signposting freight routes** is a "pull" measure that relates to the improved signposting of freight routes, rendering, thus, freight movements more efficient with reductions in congestion, pollution and noise. It is transferable and exists in many cities, with direct impacts on the environment, economy, safety and security, and energy and transport efficiency.

35 **Environmental Zones** is a "push" measure involving the restriction of access to city centres for the heaviest and most polluting heavy goods vehicles, in order to reduce noise, congestion and other negative environmental impacts, and thus enhance quality of life. It could be applicable to all municipalities but, in practice, it is most relevant to large cities where there are significant air quality concerns. Its expected direct impacts are on the environment, economy, safety and security, and energy and transport efficiency.

36 **Freight Quality Partnership (FQP)** is a "pull" measure that brings together a wide range of freight stakeholders on a regular basis, including operators, administrators, retailers, city councils, freight shippers, trade associations, environmental groups and researchers, with the scope to discuss and analyse relevant urban freight issues and challenges and develop necessary action plans. This measure could be transferrable to any town or city and its expected impacts are on all related fields.

37 **Freight noise mapping** is a "push" measure intended to identify areas where the noise burden caused by freight transport exceeds EU regulations. The measure could be replicated in any town/city, where freight vehicle noise constitutes a problem, and it is expected to have a direct impact on the environment.

38 **Mobility Master Plans** (MMPs) or SUMPs (sustainable urban mobility plans) constitute a "push and pull" measure and are intended to represent the global transport policy of a large municipality, including urban goods movements. MMPs aim at improving the air quality and public health, promoting accessibility and social justice, making, thus, cities more pleasant, while increasing economic performance. The measure could be replicated in any town/city with direct impacts foreseen on all related fields.

39 **Technical guidelines for delivery spaces**, are a "push and pull" measure consisting of guidelines drafted to facilitate on-street deliveries, by giving specific metrics and rules in the design of on-street delivery bays (i.e. avoiding piecemeal implementation, responding to individual shopkeepers' requests). The rules can be integrated into a software programme in order to have an automatic calculation of the required number and size of on-street delivery bays. The measure could be replicated in any town/city, where such issues are prevalent. It is also expected to have a direct impact on the environment and the economy.

40 **Freight Operators Recognition Schemes (FORS)**, is another "pull" measure. Fleet Recognition schemes are voluntary schemes (usually with free membership), designed to provide recognition, guidance and advice to road transport operators. An assessment of a fleet's overall road transport operation is carried out, in order to recognise levels of legal compliance, operational and environmental performance. Those complying with the required standards are branded accordingly. FORS schemes exist as a mechanism to drive up standards in the freight sector, and operate in a number of cities, but are probably more applicable to larger ones. They are expected to bring about direct impacts on the environment, economy, safety and security and energy efficiency.

41 **Multi-user Lanes** is an example of a "push and pull" measure, whose scope is to optimise the use of available street space, by introducing multifunctional lanes. Using VMS (Variable Message Sign System) technology, lanes can be designated for varying types of traffic and/or parking at various times of the day, including a "slot" for goods deliveries. The measure is replicable, but requires investment in VMS systems, signage and sufficient enforcement staff. It is expected to impact on the environment, energy, transport efficiency and land use and urban planning.

42 **Night deliveries is** a "push" measure which objective is to reduce daytime congestion by allowing night deliveries in city centre areas, using "silent" trucks confirming to noise legislation. It is applicable to all municipalities, and its expected impacts are on the environment, economy, and energy and transport efficiency.

43 **Using building code regulations for off-street delivery areas** is a "push" measure involving the use of building code regulations to ensure that new business premises provide adequate space for goods handling and storage. By ensuring that they have suitable off-street delivery areas or storage zones, this should reduce the number of on-street loading/unloading activities, which can cause congestion and obstruction, generating a high number of delivery trucks and a heavy burden on public streets. Markets, bars and restaurants might be particularly appropriate for this measure, as they generate very frequent deliveries. The measure could be transferrable to countries, where it is legally possible to oblige new commercial buildings to accommodate off street delivery areas within their premises. The expected impacts relate to all related fields.

44 **Eco-driver training** is a "pull" measure which involves a series of training sessions for drivers, including presentations, vehicle checks, driver debriefs, demo drives, initial and assessed drives, knowledge tests and final debrief. The progress of the participants is recorded and each driver receives a written driver assessment and certificate on course completion. The measure could be transferrable to any municipality and its expected impacts are with regard to the environment, economy, safety and security, and transport and energy efficiency.

45 **Access restrictions for polluting freight vehicles** is a "pull" measure involving the introduction of access restrictions to town/city centres for the most polluting freight vehicles. The measure is applicable to all municipalities with direct impacts foreseen on the environment, economy, safety and security, and energy efficiency.

.

4. THE C-LIEGE PROGRAMME OF ACTIONS TO SUPPORT EU ENERGY EFFICIENT UFT - ACTION PLAN

4.1 Introduction

The European Commission is making an effort to discover how local authorities can better support freight delivery in cities and what should be the ideal breakdown of tasks between the different governance levels. It is clear that local authorities need a clearer view on their roles. For example, what should be the balance between financial support and know-how?

In these challenging times for local and regional economies, providing financial support is becoming more and more difficult and more pressure may fall on the private sector to financially contribute to projects. The role of local authorities may be to create favourable legislative environments and set up opportunities for stakeholder consultation and discussion. For an efficient exchange, counterparts should learn from each other, like administration from administration, operators from operators, etc.

The urban distribution of goods is organised by private stakeholders (producers, carriers, retailers, final consumers), operating in an environment, the urban space, which is managed by public authorities. Local Authorities usually deal with private actors and deliberate decisions of market players. Local Authorities have several ways to influence UFT planning and management: setting framework conditions, moderate the process, getting involved as a player themselves. By involving relevant stakeholders, Administrations can identify problems perceived by those relating to the goods delivery in city, identify measures to resolve such problems and identify good practice measures and principles for action by local government and industry to promote economic, economical and efficient delivery of goods in the city.

UFT is a matter of municipalities normally but not all are prepared to answer to those challenges. Some of the questions framing C-LIEGE program of actions are oriented to identify upper mechanisms to support municipalities: “What can the European Commission do for municipalities (under the limits imposed by the subsidiarity principle)? What can be done at European level reflecting on local level? “.

UFT is a complex system that cannot be managed in the same way as passenger transport.

A lot of particular interests are in conflict. It is not only a matter of interaction between the public authority and citizens, as in the latter but more stakeholders are involved.

Therefore, it implies a certain reconciliation of conflicts and concertation actions for shared solutions and policies. In the current economic crisis, public authorities have no budget to put into city logistics when policy makers put social costs and benefits on balance.

UFT can support urban economy and can support environment, but the costs of negative effects cannot be paid by operators. Authorities should balance the positive and negative effects and the various needs of citizens/consumers and operators.

Regulations are very important for not door to door services but at local level because it is more efficient for a better management of the whole supply chain. Instead of indirect subsidies granted to freight operators, authorities should support them to become more efficient. Land use is fundamental, for instance zoning some commercial activities that generate UFT activity, including logistics activity, off-street loading/unloading facilities for freight vehicles, safeguard sites in urban areas that can be used on a commercial basis for rail and waterborne freight transfer. Efficient, reasonable and smart regulation requires advanced expertise at public authorities' side that develop plans and guidelines for cities.

During the C-LIEGE 2nd Knowledge sharing workshop held in Brussels on 1st March 2012, 15 Good Practices (GPs) were selected from about 100 European good practices, and about the strengths and weaknesses of different European good practices related to urban freight transport. Out of the collected good practices, fifteen most "interesting" were selected that are a significant representation of the existing best practices.

Four relevant European-level stakeholder groups (European Associations) were invited to discuss main reasons they picked up 5 out of 15 and what their motivation was to select those five. Only European associations/networks were approached, to ensure a wider European point of view and avoid a biased opinion. The objective of this panel discussion, which constituted a core part of the event, was to know more about the stakeholder groups' position and needs on UFT policies and measures, validating the 15 European GPs and finally selecting the best ones.

The results are provided as follows:

- POLIS: Delivery and Serving Plans (Sutton), Regulation incentives and restrictions (Parma), Freight Distribution Plan (Bologna), Tyne & wear Freight Partnership (UK).

- EAA: Delivery and Servicing Plans (Sutton), Driver training (Bristol), Night delivery (Barcelona), incentives and access restrictions (Gothenburg).
- EuroCommerce: Driver training (Bristol), Delivery in off peak hours (Night delivery), Regulation incentives and restrictions (Parma), Local freight network (Gothenburg).
- Confcommercio International: Night delivery (Barcelona), Regulation incentives and restrictions (Parma), Local freight network (Gothenburg).

The main question persons in charge at the administration should take into consideration is current needs and constraints. Then turn to the private sector and ask for their support to achieve the objectives. They can help to interpret these needs identified and bring in innovation. Many solutions are easily implemented at low costs but they are not necessarily innovative. Night time delivery does not suit “everyone” but certain groups (big business) and certain cities yes. For all measures, it should be taken into account when, in what situations, for which businesses, in which cities can it be applied.

Local Authorities usually deal with private actors and deliberate decisions of market players.

Local Authorities have several ways to influence UFT planning and management:

- Setting framework conditions;
- Moderate a process;
- Getting involved as a player themselves.

Local Authorities through their work set framework conditions all the time, with explicit reference to UFT or not. They can make these conditions more explicit, reflect about the influence of each condition on UFT, and then deliberately shape conditions with regard to UFT. That should result in an explicit UFT plan. When it comes to direct involvement of the Local Authorities, there are risks related to knowledge, cooperation with the private sectors, short-term political decision making etc.

Regulating activities should also be a task for the local authorities. Public local administrations usually regulate essential areas of urban freight transport, mainly those referred with access restrictions (tonnage and size). By regulating implemented measures as access restrictions, optimization of routes, urban logistic plans, innovative financing models, incentives and distribution plan-scheme etc., one can identify, differentiate and reserve strategic plans/issues.

C-LIEGE had the overall objective of developing an Action Plan recommending to the European Commission at least 15 measures to make the urban freight transport demand more efficient, sustainable and professional.

The selection of "most promising" and effective soft measures was based upon the Multi-Criteria Analysis (MCA), a typical method for the appraisal of transport measures, particularly in the cases whereby other impacts, not directly quantifiable, such as environmental and social impacts, transferability, level of cooperation, etc., are taken into account.

The description of the MCA carried out together with the application is presented in Annex I.

The results of the evaluation are presented in the Table below.

Ranking number	Soft Measure	Total Score
1	Loading bays	91%
2	Differentiated fees for loading/unloading	82%
3	Environmental zones	81%
4	Multi-user lane	78%
5	Access and time windows restrictions	77%
6	Night deliveries	71%
7	Driver training	69%
8	Delivery and servicing plans	66%
9	Freight map	60%
10	Local Freight Development Plans (LFDP)	59%
11	Harmonisation of regulations	58%
12	Use of Intelligent Traffic Management	57%
13	Pack Station	56%
14	FORS Scheme	55%
15	Freight Quality Partnerships	55%

The set of the 15 most promising and effective soft measures, resulting from the analysis and MCA were categorised along seven main groups:

A brief presentation of the measure (i.e. type, category, main stakeholders) is provided allowing readers to select and focus on the most relevant for its purposes, followed by an overview of the measure and its policy objectives.

A **roadmap of key actions that could be undertaken at each governance level (Local, National and EU**) to promote and enhance UFT energy efficiency and sustainability is given.

The main aim is to make UFT demand more efficient, sustainable and professional. The expected time frame and main barriers & drivers are provided. Throughout these factsheets, stakeholders can recap the most relevant findings and learning's on steps towards UFT.

MEASURE 1: ACCESS AND TIME WINDOWS RESTRICTIONS

Type of measure: "Push" measure (disincentive)

Measure Category: Organisational

Policy design of the measure: Initiated/supported by public administrations

Involved and key supporting target group(s) stakeholders: Freight carriers

What is this measure about?

This measure involves the use of restrictions both in time windows and road access, to confine freight deliveries to certain hours and areas.

Measure description & Policy Objectives

Access restrictions for UFT is one of the key soft measures with regard to traffic optimisation, considered as the dominant instrument for authorities to influence UFT demand. Access restrictions are widespread in Europe. Due to the diversity in terms of layout and access parameters creating the basis for each individual city access scheme, these are usually based on an analysis of goods deliveries in the city centre that ultimately determine time, type, tonnage and other relevant restriction parameters, the spatial extension of the restricted access area, and the most suitable intelligent control mechanisms. These restrictions are expected to stimulate the use of clean and energy-efficient vehicles, to decrease delivery times, energy use and pollution, reduce the amount of freight traffic in town/city centres.

Currently applied restrictions fall under the following types: a) regulations related to the type of transport means, and most commonly to vehicle emissions, weights and sizes; b) regulations related to the access time to specified areas; c) regulations related to preferred truck routes and designated lanes; d) regulations related to loading and unloading zones; e) regulations based on licences. This measure is particularly popular in historic city centres, which are typically characterised by narrow streets and specific demands on the mobility of the area.

Time windows for freight deliveries are likely to be required for smaller heritage urban areas and pedestrian zones in order to avoid conflicts between sensitive urban environments and residents and freight traffic. Weight and vehicle size restrictions are essential to avoid the circulation of freight vehicles over a certain size or weight where they will cause damage on road infrastructure, damage on buildings or where freight vehicles will struggle to manoeuvre effectively and therefore cause road

congestion. They also have the advantage of being relatively easy to understand for freight transport operators and easy to enforce.

Typically time windows are early in the day, in order to address congestion, traffic related air pollution and vehicle conflict in loading areas. This is particularly relevant in pedestrianized areas, where unrestricted access for deliveries can degrade the pedestrian environment. The use of time windows can also provide an incentive to use freight consolidation schemes. This type of measure is mostly used in order to ease traffic problems in particular part and/or 'protect' particularly sensitive population groups or facilities, like e.g. schools, hospitals or day care centres. Therefore the measure typically starts from a particular and geographically based problem and then utilises appropriate traffic control tools to solve or ameliorate this problem. While quite effective from the point of view of the protected group or area, the measure is often perceived as quite drastic by vehicle drivers. And most often the traffic problems like congestion, noise and pollution are only shifted to other areas.

The overall aim is to promote energy-efficient urban freight traffic, greater use of cleaner and energy saving vehicles for goods deliveries, a shift towards the use of the energy saving vehicles at unvaried road freight volumes.

This type of measure could be used in combination with measure 24 "Electronic access control" and 35 "Environmental zones" of the C-LIEGE database. Access and Time windows restriction measures are already been implemented in a large number of cities and particularly in those with a historical vocation and narrow streets.

Benefits

Economic	Social	Environmental
▪ Reach shorten journey times and improve journey time reliability making the scheme more attractive to both stakeholders and retailers. ▪ Harmonization of time windows with neighbour municipalities in order to reduce distribution costs and be more sustainable. ▪ Enhance the attractiveness	▪ Reduce conflicts between delivery vehicles and other road users. ▪ Improve the situation for pedestrians and cyclists in the city centres. ▪ Improvement of the quality of life with creation of new pedestrian areas.	▪ Reduce congestion and pollutant emissions from urban freight traffic vehicles into the city centre. ▪ Change attitudes and behaviour of delivery companies and increasing public awareness about the benefits of a sustainable urban freight transportation system. ▪ Reduce congestion and

Economic	Social	Environmental
of the consolidation scheme to retailers.		negative environmental effects also due to time windows moves deliveries to the off peak and early morning.

Roadmap

Local level

- Develop and implement regulatory measures in terms of restriction in accessing urban areas for freight vehicles (e.g. restrictions on the time slots to access the city center, limiting times for goods loading/unloading, limiting access to specific freight vehicles categories identified on the basis of the relative emission factors and/or weight, access permissions, etc.), based upon strategies and policies shared with relevant local key stakeholder representatives and associations.
- Develop and implement interventions related to urban freight transport able to ensure the delivery of goods to commercial and retailer's activities of the area subject to restrictive measures, allowing free competition among freight operators without imposing a monopoly system to benefit some private companies.
- Set-up and managing a Permanent Local Concertation Table aimed at defining agreed actions and shared policies in UFT, avoiding potential conflicts between main key players involved in the freight distribution process in urban areas.
- Develop and implement interventions able to move portion of freight traffic flows generated by own account freight operators (self-procurement operations) to third parties (professional operators), promoting and encouraging the outsourcing of the last mile delivery through a gradual but progressive restriction of accesses (e.g. based on emissions, weight of vehicles, load factors, etc.).
- Design and put in force a municipal ordinance (for the principle of subsidiarity) to regulate transit and parking of freight vehicles within the area(s) of intervention.

National level

- Promote and support (funding) local initiatives (including local round tables) and UFT planning documents (LFDP, Urban Transport Plan) able to properly design and implement harmonised access and time windows restrictions schemes.
- Define overall guidelines and recommendations for the harmonisation of regulations (access and time windows restrictions) of freight vehicles in urban areas in order to facilitate the harmonization of regulations among the different cities and regions allowing to reach efficient, sustainable and professional UFT.
- Design and promote a harmonised and homogeneous recognition scheme, allowing operators to perform goods delivery services in urban area in competitive and regulated market if they meet environmental, logistics and safety standards.

EU-level

- Promote and support the exchange of experiences in UFT among European cities and key stakeholder associations, disseminating best and good practices in UFT based upon achieved results and impacts in terms of energy saving, traffic emissions reductions, vehicle-kilometres reduction, operation costs reduction.
- Promote and support national and local cooperative initiatives, concertation and consensus building activities among Local Authorities, Regional, National and State administrations, relevant Associations and intermediaries, business associations, relevant private actors in order to define harmonized and shared policy framework and regulations for freight transport in urban areas.
- Promote and support Local Authorities in developing and deployment of Urban Logistics Plan/Local Freight Development Plan as an integrated part of Urban Transport Plan and/or Sustainable Urban Mobility Plans to properly address the EU Transport Policy Green Paper key statement, namely “Local Authorities need to consider all urban logistics related to passenger and freight transport together as a single logistics system.”
- Promote and funding initiatives and R&D addressed to the “CO2-free City Logistics in major urban centres by 2030”, including road pricing schemes based on the internalisation of the external costs in urban areas.

Time frame

- Average time for the policy design, sharing and operation start-up of the measure: More than 36 months

Barriers & Drivers

- Adequate budget to carry out signage and enforcement
- Funding necessary to develop, sign and enforce the restricted area

Where to find more information:

- C-LIEGE Project D 2.1 “Elicitation of the Good Practices on Urban freight Transport ”

MEASURE 2: ENVIRONMENTAL ZONES

Type of measure: "Push" measure (disincentive)

Measure Category: Organisational

Policy design of the measure: Initiated/supported by public administrations

Involved and key supporting target group(s) stakeholders: Freight carriers

What is this measure about?

This measure involves restricting the access to city centres for the heaviest and most polluting goods vehicles, in order to reduce noise, congestion, air pollution and thus enhance the quality of life.

Measure description & Policy Objectives

Generally, this zone includes the city centre or a particular zone with special characteristics that should be maintained. Freight vehicles are the major contributor of the deterioration of the quality of the city both for environmental and visual pollution. Local Administration, to fix this problem and make the cities more attractive, has started the creation of Environmental Zone.

The measures take different formats: a) Zones closed for most polluting vehicles; b) Zones closed for all vehicles; c) Zones closed in certain time windows.

The most effective and radical comprise the restriction for all vehicles, Local Administrator can create a pedestrian zone for tourist and to increase shopping and walking of people.

The most recent trends used by Local Administration are to restrict the access to those vehicles that are not compliant with specific and defined environmental (Euro emissions) standards. This measure is not specific to commercial vehicles. These zones apply freight vehicles access restrictions based on environmental criteria: only recent trucks, are allowed to enter in the city centre. Introducing environmental standards within local truck access regulations is a simple way of reducing urban freight negative impacts, by replacing old trucks and vans in city streets with newer types of vehicles. The environmental benefits are high, as old trucks and vans emit a large amount of current cities' air pollutants.

This measure is aimed to establish a "low emission zone" or a "no emission zone" in the city centre and/or in other relevant areas of the city. It is mainly addressed to reduce carbon emissions, avoid congestion and improve quality of life.

This measure, often, include access restrictions for certain types of freight vehicles and/or certain time window. Because of the political nature of such restrictions, the municipality later decided to take a cautious approach and not rush any restrictive policies and risk the opposition of retailers and freight operators.

This would be achieved, for example, by giving operators who work within the city centre with cleaner vehicles, priority in using loading bays but also to let them use the bus lanes of the major arterial roads leading into and out of the city centre.

This measure could be used in combination with access and time windows restriction: Measures n° 14 “Time window restrictions”, 24 “Electronic access control” and 45 “Access restrictions for polluting freight vehicles”.

Benefits

Economic	Social	Environmental
▪ Set parameters to delivery time windows in the city centre. ▪ Change attitudes and behaviour of delivery companies and increasing public awareness about the benefits of a sustainable urban freight transportation system. ▪ Lorry queuing during access time windows.	▪ Protect the historical city centre and/or other “sensible” areas. ▪ Create better conditions for a free flowing traffic. ▪ Create pedestrian zones, increasing quality of life for citizens. ▪ Make city more attractive both for tourism and for citizens. ▪ Combination of freight previously delivered throughout the day. ▪ Reduce conflicts between delivery vehicles and other road users. ▪ Increase the commercial speed of urban public transport system.	▪ Improve the air quality reducing freight traffic polluting emissions. ▪ Reductions in fuel, energy, pollutants, number of freight trip, freight trip kilometres and also operating costs for logistics operators. ▪ Only temporal shifting of freight trips. ▪ Improve the situation for pedestrians and cyclists in the city centres. ▪ Reduce congestion and negative environmental effects also due to time windows moves deliveries to the off peak and early morning.

Roadmap

Local level

- Set-up and managing a Permanent Local Concertation Table aimed at defining agreed actions and shared policies in UFT, avoiding potential conflicts between main key players involved in the freight distribution process in urban areas.
- Consultations with all stakeholders on the specifics of environmental zone regulations.
- Feasibility study to generate baseline data and explore different options was commissioned.
- Discussions in the Freight Quality Partnership conducted in order to build support from traders, businesses, freight operators, residents and environmental groups.
- Location and design of the Environmental Zones (including relevant feasibility studies).
- Design and put in force a municipal ordinance (for the principle of subsidiarity) to regulate transit and parking of freight vehicles within the Environmental zones.
- Develop and implement "regulative" measures in terms of restriction in accessing urban areas for freight vehicles (e.g. restrictions on the time slots to access the city center, limiting times for goods loading/unloading, limiting access to specific freight vehicles categories identified on the basis of the relative emission factors and/or weight, access permissions, etc.), based upon strategies and policies shared with relevant local key stakeholder representatives and associations.
- Develop and implement interventions related to urban freight transport able to ensure the delivery of goods to commercial and retailer's activities of the area subject to restrictive measures, allowing free competition among freight operators without imposing a monopoly system to benefit some private companies.
- Set-up and managing a Permanent Local Concertation Table aimed at defining agreed actions and shared policies in UFT, avoiding potential conflicts between main key players involved in the freight distribution process in urban areas.
- Develop and implement interventions able to move portion of freight traffic flows generated by own account freight operators (self-procurement operations) to third parties (professional operators), promoting and encouraging the outsourcing of the last mile delivery through a gradual but progressive restriction of accesses (e.g. based on emissions, weight of vehicles, load factors, etc.).
- Design and put in force a municipal ordinance (for the principle of subsidiarity) to regulate transit and parking of freight vehicles within the area(s) of intervention.

National level

- Creation of a concertation table between the main stakeholders at national level, Administrator of the main Metropolitan Areas and with the small cities.

- Overcome constrains due to bureaucratic regulatory approval processes making it more simple and quickly for approval.
- Finding easiest strong political support and even national funding for implementing measures.
- Promote and support (funding) local initiatives (including local round tables) and UFT planning documents (LFDP, Urban Transport Plan) able to properly design and implement harmonised access and time windows restrictions schemes.
- Define overall guidelines and recommendations for the harmonisation of regulations (access and time windows restrictions) of freight vehicles in urban areas in order to facilitate the harmonization of regulations among the different cities and regions allowing to reach efficient, sustainable and professional UFT.
- Design and promote a harmonised and homogeneous recognition scheme, allowing operators to perform goods delivery services in urban area in competitive and regulated market if they meet environmental, logistics and safety standards.

EU-level

- Promote and support the exchange of experiences in UFT among European cities and key stakeholder associations, disseminating best and good practices in UFT based upon achieved results and impacts in terms of energy saving, traffic emissions reductions, vehicle-kilometres reduction, operation costs reduction.
- Promote and support national and local cooperative initiatives, concertation and consensus building activities among Local Authorities, Regional, National and State administrations, relevant Associations and intermediaries, business associations, relevant private actors in order to define harmonized and shared policy framework and regulations for freight transport in urban areas.

Time frame

- Average time for the measure design and operation: 6 to 36 months.

Barriers & Drivers

- Possible barriers/Possible political obstacles: Local politicians may not support a measure which could prove to be controversial and unpopular. Possible concertation and cooperation obstacles: likely to be opposed by some freight operators, especially those with the oldest fleets. Possible financial obstacles: such a scheme may be expensive to introduce, for both the municipality and for operators. Possible timeline obstacles: due to the degree of consultation and preparation necessary to introduce such a measure, it is unlikely to be deliverable within a short-medium timeline.

- Driver for success:
  - Strong political support as the measure may prove to be unpopular for some freight operators,
  - Sufficient budget to carry out the necessary signage and enforcement work, and (in some cases) to help funding vehicle replacement.

Where to find more information

- C-LIEGE Project D 2.1 “Elicitation of the Good Practices on Urban freight Transport ”
- The measure been applied in several cities such as Utrecht, Lisbon, Aalborg, Burgos, London, Bremen, etc.

MEASURE 3: LOADING BAYS

Type of measure: Pull (Incentive)
Measure Category: Urban Planning
Policy design of the measure: Initiated/supported by public administrations
Involved and key supporting target group(s) stakeholders: Freight carriers

What is this measure about?

Operators who meet certain criteria set by the city administration are offered free access to loading bays, offering an incentive towards the use of "cleaner" vehicles. This measure involves the allocation of additional freight parking spaces aimed at making freight flows more efficient and reducing the impact on city centre traffic movements. In some cases, access may be restricted to certain types of vehicle, as an incentive to encourage clean, light and environmental friendly vehicles.

Measure description & Policy Objectives

This measure aimed at reducing traffic congestion on busy city streets of the city often created by freight vehicles parking directly in the street for loading or unloading goods for shops or make home deliveries.

By designating special parking bays for freight vehicles traffic would be able to flow again and thus avoid the extra energy and fuel consumption, pollution, time and costs that traffic jams typically create.

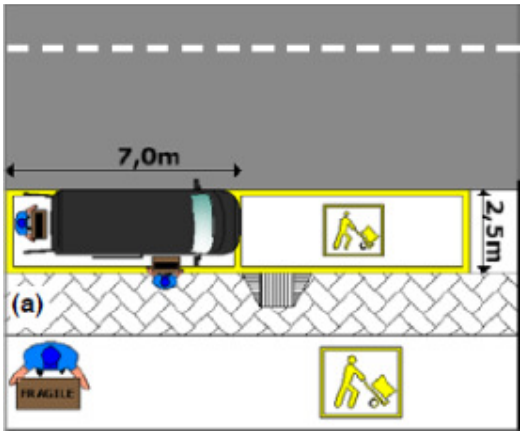
UFT, particularly in the historical cities because of the narrow streets, needs dedicated urban spaces, such as loading and unloading areas for goods deliveries. Insufficient delivery spaces transfer delivery operations on traffic lanes or sidewalks, cause inefficiencies for supply chain and lead to congestion and traffic accidents in urban areas.

In this case, congestion is often created by freight vehicles parking directly in the street (often in second line parking) during the loading or unloading operations

Loading bays could be used in combination with measure n°6 of the C-LIEGE database "Delivery and Servicing Plans (DSPs)".

Combined with other measures, addressed to the traffic governance, loading/unloading bays contributes to reduce vehicles movements. This can be very effective in answering the growing market

of internet buyers. The optimal choice for the location of loading bays cannot be separated from the evaluation of the accessibility to the stalls themselves positioned in the street. One of the criteria to use for the creation of loading bays, should meet the criterion of minimization of the transfer paths entering and leaving the zone and between the stalls located on the same. It is, in fact, linked to the issue of externalities produced by vehicles circulating understood as a contribution to congestion and emissions pollutants. It is understood that any choice made, must be based on the principle of maintaining the security conditions, the quality of circulation and, last but not least important, the rules of the Road Transport Code.



The first step to be considered for the implementation loading bays is represented by the optimization of the size of the individual stall. The types of commercial vehicles commonly used to transport goods in urban areas are vans (mass <3.5 t), the vans (mass 3.5 to 7.5 t) and more rarely trucks (mass> 7.5 t). The suggested size for the stall must be such as to allow the operator a proper and easy execution of the manoeuvres of parking and loading and/or unloading of goods.

The optimal size attributable to stall for type van, according to the mentioned above, it appears therefore to be characterized by an overall length of up to 7.0 m and a width of 2.5 m.

The second step to be considered for the implementation of loading bays is represented by the optimization of the number of stalls within a certain area. The optimization process must provide for the estimation of the number of stalls needed to stop for loading/unloading of all commercial vehicles present in the area under examination, taking care of the other measures implemented i.e. time windows restriction. The estimated number of stalls depends in principle by the demand for parking correlated to trade flows in/out of the area.

The third and final step to be considered for the loading bays within the considered area is represented by the optimization of the location of the stalls, in order to maximize the businesses served and to minimize vehicle journeys in the area. The process of location of the bays needed by the area is based on an analysis of the commercial density unit that can be served at the same time

by the stop in the bays, implementing displacements of length within the maximum distance practicable (about 100-150m) starting from the bays to perform an operation of delivery and/or pickup.

Benefits

Economic	Social	Environmental
▪ Facilitate goods delivery operation and transport ▪ Increase commercial speed of public transport ▪ Increase the speed of the loading and unloading operation ▪ Enhance safety and security of operators that shouldn't work directly on the ground travelled by other vehicles/pedestrian	▪ Benefits due to less congestion from the operation of loading and unloading in front of the shopping facilities; ▪ Less queuing of passenger and freight vehicles in the streets ▪ Enhance safety and security both for citizen and freight operators ▪ Create better conditions for a free flowing road traffic	▪ Less pollution due to congestion and searching free slots for loading/unloading ▪ Reduction in fuel and energy consumption consequently reduction of pollutant emissions and operation cost for operators

Roadmap

Local level

- Develop and implement measures in terms of localization of freight vehicles, based upon strategies and policies shared with relevant local key stakeholder (freight carriers and shippers association representatives and associations).
- Develop and implement interventions related to urban freight transport able to ensure the delivery of goods to commercial and retailer's activities of the area, allowing free competition among freight operators without imposing a monopoly system to benefit some private companies.
- Set-up and managing a Permanent Local Concertation Table aimed at defining agreed actions and shared policies in UFT, avoiding potential conflicts between main key players involved in the freight distribution process in urban areas.
- Develop and implement interventions able to move portion of freight traffic flows generated by own account freight operators (self-procurement operations) to third parties (professional operators),

promoting and encouraging the outsourcing of the last mile delivery through a gradual but progressive restriction of accesses (e.g. based on emissions, weight of vehicles, load factors, etc.).

- Design and put in force a municipal ordinance (for the principle of subsidiarity) to regulate transit and parking of freight vehicles within the area(s) of intervention.
- Survey and analysis of retailers, number of parking spaces and number of deliveries in selected streets.
- Proposal for the location of loading bays dedicated to freight deliveries submitted to political decision-making bodies.
- Implementation of a loading bays scheme together with freight carriers and shippers association, including position of the loading bays and criteria for a correct and shared use.
- Installation of street signs and markings on pavement for pilot loading bays on one major inner city street.

National level

- Development of a loading/unloading schemes in all the cities or metropolitan areas, involves the agreement of all the municipalities and the association at national level.
- Development of a uniform legislation to allow the complete functionality of the scheme.
- Creation of a concertation table between the main stakeholders at national level, Administrator of the main Metropolitan Areas and with the small cities.
- Overcome constrains due to bureaucratic regulatory approval processes making it more simple and quickly for approval.
- Finding easiest strong political support and even national funding for implementing measures.
- Define overall guidelines and recommendations for the harmonisation of regulations (implementation of a loading bays scheme) of freight vehicles in urban areas in order to facilitate the harmonization of regulations among the different cities and regions allowing to reach efficient, sustainable and professional UFT.
- Promote and support (funding) local initiatives (including local round tables) and UFT planning documents (LFDP, Urban Transport Plan) able to properly design and implement loading bays schemes.

EU-level

- Promote and support the exchange of experiences in UFT among European cities and key stakeholder associations, disseminating best and good practices in UFT based upon achieved results and impacts in terms of energy saving, traffic emissions reductions, vehicle-kilometres reduction, operation costs reduction.

- Promote and support national and local cooperative initiatives, concertation and consensus building activities among Local Authorities, Regional, National and State administrations, relevant Associations and intermediaries, business associations, relevant private actors in order to define harmonized and shared policy framework and regulations for freight transport in urban areas.

Time frame

- Average time for the measure design and operation: 6 to 36 months. The variability of the timing depends on the number of bays and the location of these.

Barriers & Drivers

- Driver for success: Active input and participation from all stakeholders

Where to find more information

- C-LIEGE Project D 2.1 “Elicitation of the Good Practices on Urban freight Transport ”

MEASURE 4: MULTI-USER LANE

Type of measure: Push & Pull

Measure Category: Urban planning

Policy design of the measure: Initiated/supported by public administrations

Involved and key supporting target group(s) stakeholders: Administrations, Freight carriers, Shippers, Residents

What is this measure about?

This measure involves the optimization of the use of available street space by introducing multifunctional lanes, throughout the use of ITS to obtain and control the right mix of vehicles in bus lanes.

Measure description & Policy Objectives

The measure uses the existing bus lanes and extend the user group to trucks vans using bus lanes (so called become combined lanes).

The measure is recommended to cities with a relatively compact urban area with a radial pattern of main road corridors that have a high number of freight vehicles on those roads that have bus lanes and a low number of buses within the time frame 6.00 to 18.00 (not to interfere with the bus system) and a pressure to act because of the high impact on knots in the peak hours.

Using VMS (Variable Message Sign System) technology, lanes can be designated for different types of traffic and/or parking at various times of the day, including a “slot” for goods deliveries.

In general, the aim of using VMS is to provide drivers with mandatory and/or advisory information at the roadside. VMS can be used for many different purposes with the potential benefits of reducing car drivers’ stress, travel time and increasing traffic safety. VMS may ask drivers to change travel speed, change lanes, divert to a different route, direct to the available parking space, or simply to be aware of a change in current or future traffic conditions by providing information. The information is intended to assist drivers in selecting appropriate routes avoiding congestion and to reduce drivers’ anxiety. In particular, there are various supporting technologies for ITS aimed at support, monitor, control and to the enforcement of the transport activities on the road lanes designated for lorry use could help to reduce delay and improve journey time reliability.

Key issues to be considerd when using freight vehicles in multi user lanes:

- Dedicated lorry lanes are often used on hills and to direct lorries to industrial areas avoiding sensitive areas.
- “No-car” lanes can provide a viable alternative to a bus lane in situations where bus usage is insufficient to justify an exclusive bus lane.
- Lanes available to all goods vehicles are easier to enforce, compared with those available to selected types or sizes of vehicles, but may result in too many vehicles using the lane to improve journey times and reliability.
- In designing lanes that permit a mix of vehicles to use them, urban planners need to establish how well these vehicles will interact with each other on the section of proposed road.

The broad objective of the measure is to improve urban air quality and create a sustainable, safe and flexible traffic system.

Combination opportunity with other measures consists in linking it with other measures like 9 “Changing traffic regulations to improve freight access”, 17 ”Priority for lorries at selected junction”, 45 “Access restrictions for polluting freight vehicles”.

The potential difficulty of identifying those vehicles that meet the emission standards as there is no external indication of whether a goods vehicle is permitted to use a bus lane, may be avoided by putting distinctive liveries on vehicles. This allows greater control over the number and behaviour of goods vehicles using the bus lanes and made the measure easier to enforce. Consolidation centre vehicle drivers may be given training on how and when to drive in the combined lane.

Benefits

The main outcomes of the measure are travel time savings that could be an incentive for the carriers/operators to use cleaner vehicles.

Economic	Social	Environmental
▪ To harmonize time windows with neighbour municipalities in order to reduce fuel consumption, distribution costs and be more sustainable.	▪ To reach shorten journey times and improve journey time reliability making the scheme more attractive to both stakeholders and retailers. ▪ To change attitudes and behaviour of delivery	▪ To reduce congestion and pollutant emissions from urban freight traffic vehicles into the city centre.

Economic	Social	Environmental
	companies and increasing public awareness about the benefits of a sustainable urban freight transportation system.	

Roadmap

Local level

- Develop and implement measures in terms of localization of the freight vehicles, based upon strategies and policies shared with relevant local key stakeholder (freight carriers and shipper's association representatives and associations).
- Design and put in force a municipal ordinance (for the principle of subsidiarity) to regulate transit and parking of freight vehicles within the area(s) of intervention.

National level

- Development of multi-user lane schemes in all the cities or metropolitan areas, involves the agreement of all the municipalities and the association at national level.
- Development of a uniform legislation to permit the complete functionality of the scheme. The development of a national or regional common approach on cleaner vehicles. A common approach of "privileges" for (cleaner) freight vehicles gives more pressure and urgency for companies to purchase cleaner vehicles.
- Promote and support (funding) local initiatives (including local round tables) and UFT planning documents (LFDP, Urban Transport Plan) able to properly design and implement loading bays schemes.

EU level

- Promote and support the exchange of experiences in UFT among European cities and key stakeholder associations, disseminating best and good practices in UFT based upon achieved results and impacts in terms of energy saving, traffic emissions reductions, vehicle-kilometres reduction, operation costs reduction.

Time frame

- Average time for the policy design, sharing and operation start-up of the measure: 6 to 36 months.

Barriers & Drivers

- Barriers/Obstacles: The main barriers to success are represented by negative public perception, the negative width of bus lanes and the dangerous effects of HGVs on other users, mainly cyclists. Some local authorities were reluctant as they feared public transport delays.
- Drivers for success: Availability of necessary infrastructure. A legal basis must exist or can be adopted for designation of multi-user lanes. Effective enforcement is critical so that the measures are respected by all users, especially at the beginning.

Where to find more information

- BESTUF II project (“Best Urban Freight Solutions II“),
- C-LIEGE Project D 2.1 “Elicitation of the the Good Practices on Urban freight Transport ”
- Utrecht, Norfolk, Norwhich.

MEASURE 5: NIGHT DELIVERIES

Type of measure: Push measure (disincentive)

Measure Category: Organisational

Policy design of the measure: Initiated/supported by public administrations

Involved and key supporting target group(s) stakeholders: Freight carriers, shippers, retailers/shop owners

What is this measure about?

The measure involves night deliveries in city centre areas, using "silent" trucks to be in line with the noise legislation and standards

Measure description & Policy Objectives

The night time delivery policy allows for the distribution of goods during the night and off hours by specially-designed vehicles that accomplish to the noise standards set by relevant regulation. Typical delivery times are between 22:00 and 06:00. Allowing the access of heavy freight vehicles to the city center at night, rather than daytime, implies more capacity load and, consequently, less journeys. Also, night time on-street parking spaces are transformed into loading and unloading zones during low-traffic hours at daytime.

Two types of regulations for night-time could be introduced:

- Time regulations on deliveries and collections to and from a particular facility;
- Regulations on goods vehicle movement in a part or the entire city centre/ urban area.

In order to minimize noise and avoid resident complaints, it is necessary to incorporate "silent" equipment, such as electric lifts, insulating carpet, plastified roll-containers, adapted refrigeration equipment, etc. The measure is more appropriate for certain type of deliveries/trips, such as deliveries to large supermarkets in the city centre.

Night delivery is not a particularly innovative measure, as it

is mature good practice in several European cities. It is, however, a simple and cost effective organisational soft measure and many successful experiences have been recorded, whereby a high number of vehicles operating during day time have been replaced by fewer vehicles operating during night time. The measure is combined with the measures access restrictions and time windows. The only disadvantages associated with this particular measure are the higher costs for acquiring silent freight vehicles, as well as the increased personal costs from receiving deliveries at night time.

Benefits

Economic	Social	Environmental
▪ Reduces delays for the logistic service providers ▪ Increases logistics efficiency in terms of deployment of manpower ▪ Reduces journey times ▪ Yields good return on investment (1,5 – 3 years) ▪ Supermarket operators have interest in supplying fresh foodstuffs ready for when the stores open	▪ Enhances road safety ▪ Optimizes the use of public space (time and space sharing) ▪ Avoid fines for parking To reach shorten journey times and improve journey time reliability making the scheme more attractive to both stakeholders and retailers;	▪ Reduces emissions and energy consumption, due to less congestion during night time and direct access to shops

Roadmap

Local level

- Develop and implement “regulative” measures in terms of restricting access to urban areas only during night hours for specific freight vehicles categories (identified on the basis of the relative emission factors and/or weight) based upon strategies and policies shared with relevant local key stakeholder representatives and associations.
- Design and put in force a municipal ordinance (for the principle of subsidiarity) to regulate transit and parking of freight vehicles within the area(s) of intervention during night time.

- Set-up and realise local public consultation events aimed at sharing night time delivery policies with local residents to avoid avoiding potential conflicts.

National level

- Promote and support (funding) local initiatives able to design and implement night time freight delivery schemes.
- Define noise standards for night time operations (could bring significant benefits to local residents increasing the acceptance of night time transport operations).
- Focus night time delivery regulations mainly on noise issues.
- Define overall guidelines and recommendations for the harmonisation of regulations on night time delivery of freight vehicles in urban areas, in order to facilitate the harmonization of regulations among the different cities and regions.

EU-level

- Support the development of common noise standards for urban freight delivery operations.
- Support the development of labelling systems for quiet trucks.
- Support research into mechanical, architectural and management/ organisational solutions to attenuate noise and better (improved) technology to minimise night time disturbance from goods delivery, e.g. develop acoustic materials for trucks, ancillaries and logistic sites.
- Implement research programme for estimating the benefits and costs for the inclusion of standards of low noise equipment in manufacturing for freight vehicles and associated loading and unloading equipment, so that future generations of vehicles and other equipment are more likely to be suitable for night-time deliveries without additional capital investment.

Time frame

- Average time for the policy design, sharing and operation start-up of the measure: 6-36 months

Barriers & Drivers

- Drivers for success: Adequate budget to acquire and operate silent freight vehicles and equipment, funding necessary to develop, sign and enforce the restricted time windows area, good communications with local residents, active input and participation from all stakeholders

Where to find more information

- C-LIEGE Project D 2.1 “Elicitation of the Good Practices on Urban freight Transport ”

MEASURE 6: DELIVERY AND SERVICING PLANS

Type of measure: Pull (incentive)

Measure Category: Organisational

Policy design of the measure: Initiated/supported by public administrations

Involved and key supporting target group(s) stakeholders: Freight carriers, public institutions, other organisations

What is this measure about?

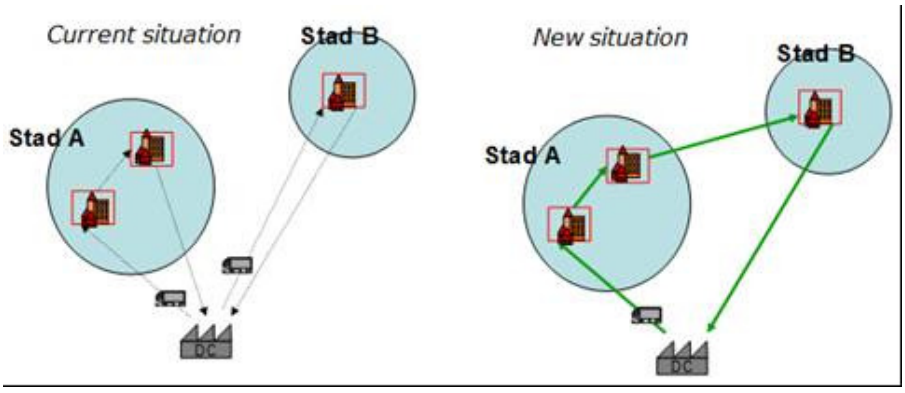
Delivery and Servicing Plans (DSPs) involve local municipalities working with organisations across the city in question to develop and implement DSP frameworks to enable businesses to achieve efficiencies in deliveries.

Measure description & Policy Objectives

Delivery and Servicing Plans (DSPs) involve local municipalities working with organisations across the city in question to develop and implement DSP frameworks to enable businesses to achieve efficiencies in deliveries. This measure is mainly addressed to those cities with important traffic and problems and narrow streets. Involving all freight vehicles is possible to reach the maximum impact on road congestion or double line parking. For the implementation of this measure, technically does not exist any barriers.

DSPs is an institutional process combining together individuals and organizations of logistics operators from different backgrounds that nevertheless share a particular interest in urban freight transport issues. Generally the plans where created on voluntary base with the sponsorship of a politician or a Local Administration. This measure, is addressed to reduce negative impact of freight traffic such as air and visual emission, traffic congestion in peak hour and inappropriate stop of vehicles.

Delivery and Servicing Plans are important strategic documents aimed to define how a public or private organization generates freight transport efficiently, safely and in a sustainable way.



Thought DSPs freight organization and local administration can increase the efficiency of the freight transport systems in urban areas. The DSPs give the possibility to manage goods and commercial vehicle activity to and from and existing operating sites. Certainly, the DSPs constitute a starting point for freight management, aimed to the implementation of measures and initiatives addressed to the reduction, retiming rerouting the number of deliveries. It constitute an opportunity to redefine operations and ensuring procurement activity also accounts for vehicle movement and emissions. A DSP has an organic impact on reducing CO2 emissions, congestion and improving air quality.

The DSP concept is scalable, so DSPs can be developed for a variety of levels. The scope of adoption of different DSPs depends on the specific size of the organisation, on how many destinations are involved or on how many DSP measures are adopted.

Created on voluntary participation, DSPs, may help the association to the awareness of the freight operation both for environmental and social responsibilities.

DSPs measure could be combined with measure 40 “Freight Operator Recognition scheme”.

Benefits

Economic	Social	Environmental
▪ Improve efficiency of the operation both on the road and in reserved spaces ▪ Improve the stakeholder relations with Local Administrator and among them. ▪ Less damage to the highways infrastructure due to reduced or more appropriate use by vehicles ▪ Increased compliance with parking, loading and unloading policies and legislation. ▪ Cost savings and operational efficiency improvements for operators ▪ Opportunity to reduce	▪ Improved road network performance in terms of free flowing traffic ▪ Conservative use of the public space (road network) ▪ Less congestion on local roads ▪ Fewer goods vehicle journeys, so lowering the risk of collisions ▪ Improved quality-of-life for local residents through reduced noise and intrusion and lower risk of accidents ▪ Reduced congestion ▪ Less noise produced by delivery and servicing activity ▪ Improved road safety	▪ Reduction of emissions, accidents and congestion ▪ An improved urban environment and enhanced quality of life for residents ▪ Improved air quality with reductions in pollution and CO2 generation ▪ Reduced noise, vibration and nuisance generated by freight movements ▪ Reduced carbon emissions ▪ Improved air quality (NOx, PM10) ▪ Use of more sustainable modes where possible, so contributing towards CO2 reduction targets ▪ Fuel savings through

parking enforcement activity costs as more deliveries will use legal loading facilities	▪ Lower risk of accidents involving freight vehicles ▪ Better public health	reduced, re-timed or consolidated deliveries

Other benefits

- Actively increasing the efficiency of the freight transport systems in urban areas.
- A starting point for freight management, which directs the implementation of measures and initiatives aimed at:
- Reducing and retiming deliveries
- Redefining building operations
- Ensuring procurement activities also account for vehicle movement and emissions
- Educating staff on the consequences of their procurement activity (Procurement is the root of all freight transport).
- Efficient use of vehicles as delivery reliability will assist planning deliveries
- More certainty over delivery times, therefore increased customer satisfaction
- Fewer journeys at less congested times will reduce the risk of collisions
- Legal loading areas mean less risk of them receiving penalty charge notices
- The production of a Delivery and Servicing Plan encourages greater communication between businesses and operators at an operational level. This is an important link that may not currently exist and lead to improvements in the 'last mile' of delivery.

Roadmap

Local level

- Develop and implement interventions related to urban freight transport able to ensure the delivery of goods to commercial and retailer's activities of the area subject to restrictive measures, allowing free competition among freight operators without imposing a monopoly system to benefit some private companies.
- Set-up and managing a Permanent Local Concertation Table aimed at defining agreed actions and shared policies in UFT, avoiding potential conflicts between main key players involved in the freight distribution process in urban areas.
- Develop and implement interventions able to move portion of freight traffic flows generated by own account freight operators (self-procurement operations) to third parties (professional operators).

National level

- Promote and support (funding) local initiatives (including local round tables) and UFT planning documents (LFDP, Urban Transport Plan) able to properly design and implement harmonised access in the zone of intervention.
- Define overall guidelines and recommendations for the harmonisation of regulations (access and time windows restrictions) of freight vehicles in urban areas in order to facilitate the harmonization of regulations among the different cities and regions allowing reaching efficient, sustainable and professional UFT.
- Design and promote a harmonised and homogeneous recognition scheme, allowing operators to perform goods delivery services in urban area in competitive and regulated market if they meet environmental, logistics and safety standards.

EU-level

- Promote and support the exchange of experiences in UFT among European cities and key stakeholder associations, disseminating best and good practices in UFT based upon achieved results and impacts in terms of energy saving, traffic emissions reductions, vehicle-kilometres reduction, operation costs reduction.
- Promote and support national and local cooperative initiatives, concertation and consensus building activities among Local Authorities, Regional, National and State administrations, relevant Associations and intermediaries, business associations, relevant private actors in order to define harmonized and shared policy framework and regulations for freight transport in urban areas.

Time frame

- Average time for the measure design and operation: 6 to 36 months.

Barriers & Drivers

- Driver for success: Active input and participation from all stakeholders.

Where to find more information

- C-LIEGE Project D 2.1 “Elicitation of the Good Practices on Urban freight Transport ”

MEASURE 7: LOCAL FREIGHT DEVELOPMENT PLANS - LFDPS

Type of measure: Push & Pull

Measure Category: Urban planning

Policy design of the measure: initiated/supported by public administrations

Involved and key supporting target group(s) stakeholders: Administrations, Freight carriers, Shippers, Residents.

What is this measure about?

This measure involves the introduction of LFDPs that are co-ordinated plans designed to rationalise freight movements and deliveries.

Measure description & Policy Objectives

Used as such, or included in Urban Mobility Plan, the Local Freight Development Plan can cover a wide range of measures, and all categories of hoods vehicles, depending on the unique characteristics of each town/city. In case of the inclusion of Freight in Urban Mobility Plan, a special focus is made on the development of common European quality standards and processes for implementing and evaluating sustainable urban mobility plans, whilst also including clear performance indicators of the reduction of energy use and CO2 emissions.

LFDPs aim to assist local authorities in developing and implementing an effective and successful Freight Strategy as a component of their local transport plans in order to achieve balancing between efficiency of freight, save energy, and minimise transport externalities. This will allow a better use of both spaces and times slots planning of cities in different timescale for both passengers and freight transport. The approach supports the effort of creating efficient urban logistics, by rethinking goods transport, and contributing to recent initiatives dedicate to generate a new culture in the field.

The set-up of the plan usually comprises some relevant stages.

- Theoretically, the measure (in fact a system of measures) may be applied in all cities having a certain level of goods transport and as consequence significant issues to be approached. At the beginning of the sustainable urban freight planning process, it is necessary to determine the potential to elaborate a successful UFT plan, by conducting an initial self-assessment, identifying urban freight mobility stakeholders and understanding their potential role and position in the process, making wider connections with areas of policy connectivity.
- The status analysis is crucial in helping to define appropriate policies, provide the necessary baseline against which progress can be measured, set-up of a dedicated strategy needed for the involvement of stakeholders, mainly by Freight Quality Partnerships (FQPs).
- The identification of the measures is an important milestone in the development of LFDPs. Taking into account that such a plan is a combination of different measures in itself, these measures should be considered in “packages” rather than in isolation, so as to take into account potential synergies. Moreover, alternative solutions should be provided. As an example, the access restrictions of freight vehicles in certain areas may be accompanied by offering alternative routes.
- Closely connected to the selection of (packages of) measures, is the determination of clear responsibilities and the elaboration of an action and budget plan.

As the UFT plan is a strategic document, it provides a sound framework for the activities, but it does not specify in detail how a measure will be implemented. It needs to be stressed that the implementation process also needs to follow a structured approach to refine targets and to plan, detail, manage, communicate and monitor and evaluate the implementation of the measures. Moreover, the lessons learnt should be reflected taking into account the new challenges ahead for urban freight transport and mobility. The enforcement activities should be detailed and planned for each measure (package of measures).

As a vertical measure, LFDP is in fact an integrated package of measures that could be successfully combined within the LFDP.

Benefits

The general outcome of the measure is to generate coherence between freight and passenger mobility vision, strategies and measures at the urban (and regional) scale.

Economic	Social	Environmental
▪ To elaborate a methodology to optimise the development of goods distribution based on	▪ To reduce congestion and pollutant emissions from urban freight traffic vehicles into the city centre;	▪ Significant reduction of energy use and CO2 emissions ay urban

Economic	Social	Environmental
acquired knowledge, and reduce operating costs. ▪ To enhance the attractiveness of the consolidation scheme to retailers.	▪ Improvement of the quality of life with creation of new pedestrian areas	(regional) scale.

Roadmap

Local level

- Through the implementation of their freight strategies, local authorities have an important role to play in the promotion of best practice, raising standards, promoting new technologies and efficient operating practices.
- Establish working relationships between the public and private sector to address LFDP issues focused on improving efficiency and reliability of freight transport, while reducing the negative environmental impacts.
- Managing the elaboration of a successful LFDP by conducting self-assessment, making wider connections, identifying relevant major actors (stakeholders), performing freight mobility diagnosis, developing scenarios, setting-up FQP, developing effective packages of measures, funding and adopting of LFDP, implementing, monitoring and evaluating it.

National level

- Promote and support (funding) local initiatives (including local round tables) and UFT planning documents (LFDP, Urban Transport Plan) able to properly design and implement harmonised access and time windows restrictions schemes.
- In combination with all other authority areas the local network forms part of a national network that provides and maintains transport infrastructure and services important also to other localities and other regions. This means that one can see a cumulative effect of local initiatives (measures) across a number of Local Transport Plans (LTPs), and each LTP has wider responsibilities.

EU level

- Promote and support Local Authorities in developing and deployment of Urban Logistics Plan/Local Freight Development Plan as an integrated part of Urban Transport Plan and/or Sustainable Urban Mobility Plans to properly address the EU Transport Policy Green Paper key

statement, namely “Local Authorities need to consider all urban logistics related to passenger and freight transport together as a single logistics system.

- According to the EU Action Plan on Urban Mobility, the Commission will provide help on how to optimise urban logistics efficiency, including on improving the links between long-distance, inter-urban and urban freight transport, aiming to ensure efficient „last mile” delivery. It focuses on how to better incorporate freight transport in local policies and plans and how to better manage and monitor transport flows.

Time frame

- Average time for the policy design, sharing and operation start-up of the measure: 12 to 36 months.

Barriers & Drivers

- Barriers/Obstacles: Implementation barriers will vary depending on the extent of the local LFDP, the cost and nature of the measures.
- Drivers for success: Active input and participation from all stakeholders. Adequate budget to deliver plan measures.

Where to find more information

- C-LIEGE Project D 4.1 “Guidelines for the Development of Urban freight Mobility Plans”
- Success Cases: London, Paris
- Innovative case: Bologna’s use of an algorithm assigning to every pull-in area a “preference coefficient”

MEASURE 8: DRIVER TRAINING

Type of measure: Pull measure (incentive)

Measure Category: Promotion / Awareness

Policy design of the measure: Initiated/supported by public administrations

Involved and key supporting target group(s) stakeholders: Freight carriers

What is this measure about?

The measure involves a series of training sessions for drivers with the scope to introduce them to eco-driving.

Measure description & Policy Objectives

Eco-driving training is implemented as part of the management of operations to reduce mileage and increase load factor. The measure addresses the importance of the driver's behaviour in an energy efficient urban freight management system and is recognised as a tool that delivers significant savings on fuel consumption, reducing emissions and costs in the UFT sector. Via a Driver Training scheme, one can expect significant amount of energy to be saved, at the same time improving the safety of people living in cities.

The training encourages the improvement of the efficiency of lorry fleets embracing the vehicle (operation and maintenance considerations), the driver (safe and efficient driver training) and the management of operations to reduce mileage and increase load factors. The course is a combination of in-class theory and on-road practical demonstration and coaching.

This is an innovative awareness raising measure targeted at the most fuel-efficient drivers all types of urban environments, encouraging these to use gears properly, to switch off the engine when the vehicle is stationary, and to avoid heavy acceleration. Typical eco-driver training schemes include presentations, vehicle checks, driver debriefs, demo drives, initial and assessed drives, knowledge

test and final debrief. The progress of participants is recorded and each driver receives a written driver assessment and certificate on course completion.

The measure could be successfully combined with ITS Systems providing eco-driving support, which could also offer the service of advance delivery booking. Finally, one of the key barriers to its implementation is that operators with smaller fleets may be reluctant to take drivers off the road for this type of training.

Benefits

Economic	Social	Environmental
▪ Improves the efficiency of freight fleets ▪ Reduces wear, tear and need for repairs	▪ Increased comfort and a relaxed atmosphere in vehicle ride ▪ Improves road safety	▪ Reduces air and noise pollution ▪ Eco drivers use 8 to 13% less fuel than drivers without ECO Driver Training experience ▪ Climate protection

Roadmap

Local level

- Set up and realise eco-driving training modules or specific training programs (lectures, on-the-road training, simulators, etc.) together with local chambers of commerce, professional organisations or third party vendors.
- Launch a driver incentive program (e.g. provide drivers with monetary rewards) to encourage participation and an “eco-driving culture” .
- Launch supervisor-level performance measurement system including a dashboard with overall progress and fuel efficiency information down to the vehicle level.
- Launch dissemination and promotional campaigns to market eco-driving to transport operators (effective distribution channels are important, so seek partnerships with appropriate organisations and the industry: government, environmental or transport organisations, regulators, fuel companies, tyre companies or a major retailer that is prepared to distribute the materials in-store, driving schools, the media, etc.).

- Liaise with training providers operating in city to ensure their course content addresses eco-driving.

National level

- Promote and support (finance) local eco-driving training initiatives.
- Define overall guidelines and recommendations for regulations for integrating eco-driving into professional driver qualification and certification.
- Integrate eco-driving as a compulsory topic into traditional training curricula for driving instructors and for new and licensed drivers (training and examinations).

EU-level

- Run more European campaigns to promote the notion of “eco-driving”.
- Lobby for a mandatory element to the EU Driver Certificate of Professional Competence (DCPC) to be introduced to include training on eco-driving.
- Support research to increase understanding of more effective approaches to educating the public about eco-driving techniques and about the role of vehicle technology and ITS.

Time frame

- Average time for the policy design, sharing and operation start-up of the measure: 6-36 months

Barriers & Drivers

- Drivers for success: Adequate funding to implement the eco-driving programme, support and buy-in from the freight sector, backing by road safety organisations

Where to find more information

- C-LIEGE Project D 2.1 “Elicitation of the Good Practices on Urban freight Transport ”

MEASURE 9: PACK STATION

Type of measure: Pull measure (incentive)

Measure Category: Urban Planning

Policy design of the measure: initiated/supported by private sector

Involved and key supporting target group(s) stakeholders: shippers, residents

What is this measure about?

Pack stations involves an unattended delivery location, with the aim to provide a convenient delivery alternative for internet shoppers and avoid failed home deliveries by conventional delivery practices.

Measure description & Policy Objectives

Pack stations is an unattended delivery location at particular sites, used to receive packages 24 hours a day, 7 days a week. After ordering a package for the Pack station, internet shoppers receive a short message containing a code for collection. Within 2 business days, the parcel will be delivered to the pack station. If a package is not collected within 3 days, it will be transported to the nearest branch of InPost.

The measure constitutes an innovative solution for any type of city, beneficial to both customers and online stores. Its aim is to reduce the number of failed deliveries and the subsequent return of goods by couriers and postal services, cutting down on unnecessary vehicle mileage with associated energy use and congestion impacts. Its implementation requires the support of local residents, courier/delivery companies and the outlets where pack stations are located, as well as buy-in from a significant number of local residents to make the scheme viable. Local authorities must be involved in the first stage with regard to the permission and the selection of sites. Also, internet retailers need to be willing to deliver goods to a location, which does not match the address of the purchaser. Another barrier to its success is the fact that the final leg of the journey must be made from the customer.

Finally, the measure could be combined with other measures, such as the use of environmentally friendly vehicles, and the location of pack stations within environmental zones or areas with access restrictions.

Benefits

Economic	Social	Environmental
▪ Improves the efficiency of freight fleets ▪ Customers have the possibility to access to their packages 7 days per week and 24 hours per day (provides more alternatives for private individuals). ▪ Low delivery costs ▪ Efficiency gains for logistic providers	▪ Increases road safety ▪ Improvement of quality of living	▪ Reduction of freight transport trip km in comparison with attended delivery, thereby reduction of emissions, noise and energy consumption

Roadmap

Local level

- Initiate and promote the set up and installation of pack station points based upon strategies and policies shared with relevant local key stakeholder representatives and associations.
- Provide planning and building permission for pack station installations.
- Rent out public space for the installation of pack stations.
- Support pack stations by an efficient transport planning and fleet monitoring system.

National level

- Promote support local initiatives for installing pack stations, as well as similar alternative delivery systems.

EU-level

- Support research on alternative delivery systems as innovative approaches to city logistics.

Time frame

- Average time for the policy design, sharing and operation start-up of the measure: 6-36 months

Barriers & Drivers

- Drivers for success: Support and participation from the general public, delivery companies and online retailers, adequate budget to install receiving points

Where to find more information

- C-LIEGE Project D 2.1 “Elicitation of the Good Practices on Urban freight Transport ”

MEASURE 10: FREIGHT QUALITY PARTNERSHIPS (FQP)

Type of measure: Pull measure

Measure Category: Organisational

Policy design of the measure: Initiated/supported by public administrations

Involved and key supporting target group(s) stakeholders: Administrations, Freight carriers, Shippers, NGOs.

What is this measure about?

The measure involves bringing together a wide range of freight stakeholders on a regular basis, in order to analyse relevant urban freight issues and challenges and agree action plans.

Measure description & Policy Objectives

Freight Quality Partnerships (FQPs) are the most usual instruments to achieve an active engagement of stakeholders from the public and private sectors. FQPs are partnerships between the freight industry, local government, local businesses, the local community, environmental groups and other interested stakeholders. Citizens are a special sub-group of stakeholders. Involving them in planning is a requirement stipulated by EU directives and international conventions and a fundamental duty of local authorities to ensure the legitimacy and quality of decision making. The measure is recommended to any city that intends to implement at least one measure planned to improve energy efficiency of urban freight transport and may enclose all categories of vehicles.

The C-LIEGE project produced a Stakeholder Engagement Manual, proposing a methodology outlining how the stakeholders may mainly be engaged in order to do the work of the Round Tables, start the Pilot Projects, work out the regional Goods Transport Strategy and prepare its implementation. The identification of suitable milestones and tools for involving stakeholders and citizens should be followed by a process of developing a communication plan that includes an

engagement strategy and timeline as well as an overall strategy for PR activities (including media involvement).

The vision for a FQP should be to promote environmentally sensitive, efficient, economic and safe freight transport to best serve the needs of business and the wider community. The objectives of each FQP should, in general, reflect this vision but should be as specific as possible. A whole range of actions may be used to deliver the benefits of the FQP: sharing of information and experiences, joint analysis of UFT problems, initiation of new UFT measures, coordination & support of new and existing measures, increasing (political) visibility of UFT issues.

More detailed elements on the suitable content of a FQP may be found in different good practices as “Tyne and Wear Freight toolkit for the North East advice for local authorities developing freight strategies”. The toolkit expresses how to obtain the actors ‘commitment, create a proactive leadership, develop the work programme and deliver the outcomes. The measure can address the following challenge: determine a designated point of contact for those outside the authority, in other words a “Freight Champion” that can take forward the FQP issues on a day to day basis. Moreover, the authorities need to have the ability to provide appropriate funding for both the process and the solutions.

A FQP is an important initiator and promoter of other measures: preferred goods vehicle routes and networks with revisions to signage from key routes to local destinations; allow increased out-of-hours and night time deliveries where this can be shown to be acceptable to local communities – taking advantage of the great improvements in the design of goods vehicles in reducing noise and reducing harmful emissions; review of goods vehicle access restrictions to ensure adequate access arrangements are available to companies, especially in urban locations; review goods vehicle priority on congested urban routes and consider merits of allowing goods vehicles to share bus lanes; effective enforcement of parking restrictions to avoid delays for goods vehicles where delivery access is required; land use planning policy separating residential developments from freight operators for the sake of increased efficiency and reduced disturbance; early consultation with affected freight operators over the development of traffic management schemes.

The actions above are examples only, alternative actions can often be agreed or the actions listed could be applied more generally or to a specific location. The potential benefits of FQPs are numerous. However, establishing an FQP is not an end in itself and cannot be considered successful until tangible progress has been made by implementing the adequate measures towards the objectives of the sustainable distribution strategy.

As a vertical measure, FQP may have synergies with almost all vertical measures.

Benefits

Economic	Social	Environmental
▪ Reduce congestion and improve journey times; ▪ Improve connectivity and access; ▪ Better maintain transport assets; ▪ Reduce fuel consumption	▪ Listen to the concerns and needs of local businesses and freight users; ▪ Improve safety, security and health and quality of life	▪ Save energy; ▪ Improve air quality ▪ Reduce noise

Roadmap

Local level

- Elaborating toolkits in cooperation with regional authorities in order to advice local authorities developing freight strategies on how to obtain the actors 'commitment, create a proactive leadership, develop the workprogramme and deliver the outcomes.

National level

- Promote best FQP practices generating environmentally sensitive, efficient, economic and safe freight transport to best serve the needs of business and the wider community.

EU level

- Promote and support national and local cooperative initiatives, concertation and consensus building activities among Local Authorities, Regional, National and State administrations, relevant Associations and intermediaries, business associations, relevant private actors in order to define harmonized and shared policy framework and regulations for freight transport in urban areas.
- Promote and support Local Authorities in developing and in the deployment of Urban Logistics Plan/LFDP as an integrated part of Urban Transport Plan and/or Sustainable Urban Mobility Plans to properly address the EU Transport Policy Green Paper key statement, namely "Local Authorities need to consider all urban logistics related to passenger and freight transport together as a single logistics system."

Time frame

- Average time for the policy design, sharing and operation start-up of the measure: 6 to 36 months.

Barriers & Drivers

- Barriers/Obstacles: Adequate funding is essential so that the Partnership can deliver tangible outcomes; without this, freight operators may lose interest in taking part.
- Drivers for success: Active input and participation from all stakeholders; Sufficient funding to introduce the proposed measures.

Where to find more information

- C-LIEGE Project D 2.1 “Elicitation of the Good Practices on urban Freight Transport”
- Success cases: Newcastle, Leicester

MEASURE 11: USE OF INTELLIGENT TRAFFIC MANAGEMENT

Type of measure: "Push" measure (disincentive)

Measure Category: Technical

Policy design of the measure: initiated/supported by public sector

Involved and key supporting target group(s) stakeholders: Freight carriers

What is this measure about?

This measure involves the use of an Intelligent Traffic Management system for access control and route guidance.

Measure description & Policy Objectives

Intelligent Transport Systems constitute an innovative measure to optimize urban freight distribution. ITS can be divided in Freight transport management systems (e.g. fleet management systems and tracking and tracing systems), and Traffic management systems (e.g. access control systems, traffic management and information systems). Goods delivery companies often introduce ITM because they can optimise trips with the combination of global positioning system (GPS) technologies and existing logistics programmes. The measure, is, therefore successfully combined with access restriction and optimisation of routes measures. Accordingly, ITM could be employed to recognize clean freight vehicles, to recognize vehicles involved in the consolidation scheme and provide the best routes for freight vehicles in consideration of information about the actually traffic situation.

Typical ITM systems include the development of a web portal with an online routing tool for deliveries in the city centre, whereby online calculations of optimal routes assist delivery companies to perform more optimal deliveries. Other intelligent traffic management systems offer eco-driving support, acceleration limiter, speed limiter, intersection control, and delivery space booking aiming at reducing fuel and energy consumption. Moreover, ITM systems use Automatic Number Plate Recognition

cameras to identify Heavy Goods Vehicles (HGV) breaching weight restrictions in a city, sanctioning the vehicle without access permission. The key barrier to its implementation is the high operating cost for the city.

Benefits

Economic	Social	Environmental
▪ More efficient goods distribution system ▪ Reduce illegal parking by loading / unloading vehicles ▪ Efficiency gains to equipped vehicles	▪ Improve road safety	▪ Reduce fuel consumption and pollution

Roadmap

Local level

- Develop and implement measures of setting up Intelligent Traffic Management systems for urban freight delivery based upon strategies and policies shared with relevant local key stakeholder representatives and associations.
- Set up and put in place administrative processes to procure the necessary ITM services.
- Seek the active and productive participation of all relevant organisations for an effective multi agency co-operation in devising an ITM service and broaden political acceptance (traffic and transport authorities and administrations, police and enforcement institutions, public transport enterprises, public and private traveller information service providers, etc.).
- Structure projects and channel resources that are bespoke to individual end users.

National level

- Promote and support (funding) local initiatives of implementing ITM systems and services.
- Define harmonized technical standards (available or required) beneficial for ITM system implementation (technical requirements).
- Develop an National Action Plan for the deployment of ITM systems in accordance with requirements and obligations laid down in EC's Directive 2010/40/EU (Action Plan for the

Deployment of Intelligent Transport Systems in Europe) and within the framework of the six main priority areas of Directive 2010/40/EU

- Set up nationally binding rules, procedures or format or updating of traffic management-related specifications regarding the provision and quality of urban freight road data.

EU-level

- Integrate urban freight management in the adoption of specifications for the six priority actions laid down by Directive 2010/40/EU, more specifically identify ITS services to be deployed in support of freight transport (e-Freight) and development of appropriate measures to progress from concept to realisation.
- Support the development of standard framework for urban freight information exchange covering all transport modes and all stakeholders.
- Support research into integrating traffic management and freight transport management, defining a technological baseline of ITM on the operational level, and improving interoperability of the systems.

Time frame

- Average time for the policy design, sharing and operation start-up of the measure: 6 to 36 months.

Barriers & Drivers

- Drivers for success: Adequate budget to install and operate technology, low-cost technology

Where to find more information

- C-LIEGE Project D 2.1 “Elicitation of the Good Practices on Urban freight Transport ”

MEASURE 12: FREIGHT OPERATION RECOGNITION SCHEMES (FORS)

Type of measure: "Pull" measure

Measure Category: Organisational

Policy design of the measure: Initiated/supported by public administrations

Involved and key supporting target group(s) stakeholders: Administrations, Freight carriers, Shippers

What is this measure about?

This measure involves the introduction of a funded, voluntary certification scheme aimed at ensuring that fleet operators work lawfully and to best practice by meeting the Freight Operation Recognition Schemes standards.

Measure description & Policy Objectives

Fleet operators recognition schemes are voluntary schemes, usually free to join, designed to provide recognition, guidance and advice to road transport operators. An assessment is carried out of a fleet's overall road transport operation to recognize levels of legal compliance, operational and environmental performance and those complying with the required standards are branded accordingly. They exist as a mechanism to drive up standards in the freight sector. The FORS scheme requires determined and sustained persuasion of both freight operators and customers to become part of the scheme. FORS schemes, or similar, operate in a number of locations but are probably more applicable to larger cities.

FORS provides a quality and performance benchmark for van, lorry (but also for mini-bus, coach and bus) operators and allows access to a range of exclusive accreditation benefits. Accreditation of FORS can provide the tools to help the partners become safer, greener and more efficient. It is an appreciated way to prove to existing and potential clients the operators' credentials as a high performing operator who adheres to high quality standards. FORS accredited companies have access to a range of pragmatic instruments for managing and monitoring fuel usage, managing the work related road risk, limiting the impact penalty charge notices have on operator's business, support

for managing the move through the FORS accreditation levels, offering best practice advice direct from leading industry experts, helping drivers become safer, greener and more efficient by E-learning, performing drivers license checking. Just as example, in order to support the management and monitoring fuel usage to keep cost and emissions low (that is a challenge faced by all vehicle operators accredited companies that can gain vital competitive advantage by reducing their fuel bills), a range of exclusive resources are deployed, such as the FORS fuel use tracker, FORS benchmarking, online driver training and FORS fuel saving calculator.

A possible weakness of the measure is that despite its "voluntary nature", there are in fact audit requirements that operators have to subject themselves in order to gain and maintain FORS accreditation. These audit requirements may be seen as an infringement in their entrepreneurial freedom or simply as an additional 'unnecessary' activity that involves extra efforts. The FORS scheme is not self-sustaining e.g. through fees collected from its members. Thus the scheme relies on public funding to continue to operate.

The most comprehensive and systematic implementation of a fleet operator recognition scheme has been carried out in London, Dundee and Newcastle (UK). In London the scheme's main partners includes the Metropolitan Police Service (MPS), Health and Safety Executive (HSE), Vehicle and Operator Services Agency (VOSA), Learning and Skills Council (LSC), London Development Agency (LDA) and Skills for Logistics. Support is also provided by the Department for Transport, Freight Transport Association (FTA) and Road Haulage Association (RHA).

There are many opportunities to combine FORS measure with other measures e.g.: 3 "Construction of logistic plans", 4 "Distribution Plans to reduce frequency of deliveries in public procurement", 6 "Delivery and servicing plans", 7 "Free-to-use loading bays", 8 "Free access to public transport lanes", 10 "Financial support for fleet conversion", 14 "Time window restrictions", 18 " ICT support for eco-driving", 23 " Mobility credits", 30 "Virtual distribution centers", 35 "Environmental zones".

If the FORS scheme can be embedded e.g. in public procurement procedures or development plans (that would e.g. make it mandatory for developers to use FORS accredited freight operators at least during the construction period), then participation in the FORS scheme would give freight operators a competitive advantage

Benefits

Economic	Social	Environmental
▪ Support economic activity; ▪ Improve the efficiency of	▪ Balance the needs of freight & servicing with other transport users and	▪ Improve air quality in urban environment by reducing emissions of local air

Economic	Social	Environmental
freight distribution & servicing within the city; ▪ Reduce fuel consumption means and operating costs	demands for city's resources	pollutants and CO2 caused by freight & servicing; ▪ Improve quality of life by minimising impact of noise & vibration ▪ Improve health & safety by reducing number of deaths & injuries associated with freight movement and servicing

Roadmap

Local level

- If the local authorities support FORS scheme to be embedded e.g. in public procurement procedures or development plans (that would e.g. make it mandatory for developers to use FORS accredited freight operators at least during the construction period), then participation in the FORS scheme would give freight operators a competitive advantage.

National level

- The overall framework of the recognition scheme should be preferably defined by National or Regional governments in order to establish harmonized and homogeneous parameters for operator's certification/recognition. This approach should be allowed to define standard rules and parameters at national or regional level (as "general concept"), allowing Local governments (Municipalities) to finally define and established appropriated and tailored parameters (standards) fine-tuned on own territorial's peculiarities and requirements.

EU level

- Promote and support the exchange of experiences in FQP among European cities and key stakeholder associations, disseminating best and good practices based upon achieved results and impacts in terms of energy saving, traffic emissions reductions, vehicle-kilometres reduction, operation costs reduction.

Time frame

- Average time for the policy design, sharing and operation start-up of the measure: 6 to 36 months.

Barriers & Drivers

- Barriers/Obstacles: Possible concertation and cooperation obstacles: operators and trade associations may be doubtful of the benefits of taking part, especially if the scheme operates on a voluntary basis with no compulsion to join. Possible financial obstacles: if audits are carried out to assess whether operators are compliant, funding must be found to carry out the audits.
- Drivers for success: The concept of "certified" operator should be made clear, through the definition of rules and parameters shared. The scheme is more successful as the number of registered companies participating in the scheme and FORS accredited vehicles increases.

Where to find more information

- C-LIEGE Project D 2.1 "Elicitation of the Good Practices on Urban Freight Transport"
- Success cases: London, Dundee, Newcastle

MEASURE 13: HARMONISATION OF REGULATIONS AT REGIONAL LEVEL

Type of measure: "Pull" measure

Measure Category: Administrative / Technical

Policy design of the measure: Initiated by regional/city authorities

Involved and key supporting target group(s) stakeholders: Regional Government, Local authorities, freight operators

What is this measure about?

The harmonisation of regulation at regional level, is a measure, generally sponsored by the Regional Government, created to simplify operation for logistics, or generally, freight operators, Local Administration, business unit and citizen and residents.

Measure description & Policy Objectives

Regulations for freight vehicles should be harmonized at least at Regional level to create an advantage for operators and for Regional government. This measure, will guarantee that investments made by companies and local administration, will assure the development of economies of scale for individual operators, which in turn will lead to greater logistical efficiency. These investments permit to logistic operators and Regional government the creation of a plan that can be used in the entire Region saving money and time and addressing this resource to other problems.

The measure involves an important collaboration action made by Local and Regional Government with the logistic operator and citizen association.

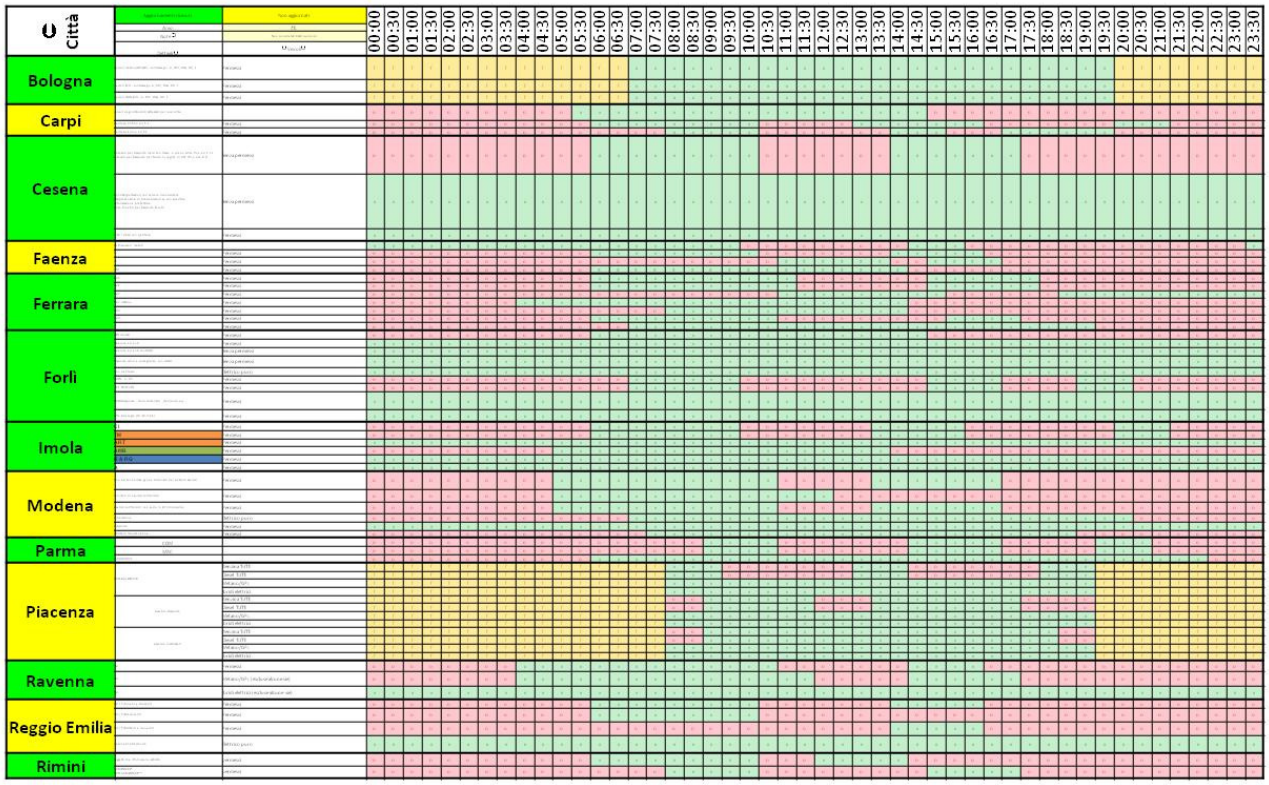
Also the traffic, generated by freight transport, could become cleaner because of time saving by the logistic operators in delivery and pick up operations.

Regional authorities should seek to harmonise regulations of all kinds that affect UFT at a regional or national level, in order to assist road freight transport operators to maximise the use of their vehicles and to adopt appropriate fleet procurement strategies for the future.

The investments could be made in electric or other low emission vehicles, in platform, technological device or anything else.

The key point in this context is that the issue of harmonization of access to Limited traffic zone is a tool to in the end influence freight operators to shift their vehicle fleet towards more energy-efficient and cleaner freight vehicles. Administrative simplifications of access regulations is important for operators that operate on a wider territorial scale, as these operators can now deal with a set harmonized rules on a regional scale.

This measure aimed to harmonize freight transport restrictions/permissions across all the main municipalities of a Region. This measure can include the measure described above. The overall aim is to promote energy-efficient urban freight traffic, reduce congestion both for freight and public traffic, reduce cost for operator and improve social benefit to citizen. That is also consistent with the fact that administrative measures in city logistics usually do not impact on the quantity of goods transported (unless there is a complete ban of entering a specific zone of the city) but influence the types of vehicles entering the city.



Different time windows restriction applied in Emilia Romagna Region, Italy

The main objectives from the adoption of an "harmonization of regulation" are referred both for logistics operators and for Local Authorities. They are:

a) Accesses and routes management, infrastructure regulation and optimization by the introduction of time windows, specific lanes, loading/unloading areas, optimized routes and any other measure for each type of freight vehicles;
b) Cargo consolidation measures, in order to make freight transport more efficient and reduce the number of vehicles entering the city centre (regulatory and reorganizational measures, urban distribution platforms, control rooms), the number of trip for each vehicles;

c) Vehicle emissions reduction by vehicle replacement or improvement, if the incentives are handed out for replacement, optimization of these at the regional level.

As specified above, the harmonization of regulation could be used in combination with measure 9 "Changing traffic regulations to improve freight access", 11 "Enactment of access time windows", 14 "Time window restrictions", 35 "Environmental zones", 40 "Freight Operator Recognition Schemes (FORS)"and 45 "Access restrictions for polluting freight vehicles" of the C-LIEGE database.

Benefits

Economic	Social	Environmental
▪ Reduction of costs from investments divided from every city (specially for large group or low distance cities) ▪ Harmonised measures across the region ▪ Simpler trip schedule for lorry drivers ▪ Enhanced security for investments made by operator and Local Administration ▪ Better improvement of operations at central level ▪ Standardisation of operation and investment at central level	▪ Benefits in social sector at regional level ▪ Flow traffic improvements	▪ Reductions of pollution, fuel consumption and operating costs

Roadmap

Local level

- Harmonisation of regulations must be created together with the stakeholders of the entire Region. This can prevent legal proceedings and the risk of non-effective investments.
- Develop and implement "regulative" measures in terms of restriction in accessing urban areas for freight vehicles, based upon regional strategies and policies shared with relevant regional and municipality key stakeholder representatives and associations.
- Develop and implement interventions related to urban freight transport able to ensure the delivery of goods to commercial and retailer's activities of the area subject to restrictive measures, allowing free competition among freight operators without imposing a monopoly system to benefit some private companies.
- Set-up and managing a Permanent Local Concertation Table aimed at defining agreed actions and shared policies in UFT, avoiding potential conflicts between main key players involved in the freight distribution process in urban areas.
- Develop and implement interventions able to move portion of freight traffic flows generated by own account freight operators (self-procurement operations) to third parties (professional operators).
- Design and put in force a municipal ordinance (for the principle of subsidiarity) to regulate transit and parking of freight vehicles within the area(s) of intervention.

National level

- Promote and support (funding) local initiatives (including local round tables) and UFT planning documents (LFDP, Urban Transport Plan) able to properly design and implement harmonised access and time windows restrictions schemes.
- Define overall guidelines and recommendations for the harmonisation of regulations (access and time windows restrictions) of freight vehicles in urban areas in order to facilitate the harmonization of regulations among the different cities and regions allowing to reach efficient, sustainable and professional UFT.
- Design and promote an harmonised and homogeneous recognition scheme, allowing operators to perform goods delivery services in urban area in competitive and regulated market if they meet environmental, logistics and safety standards.

EU-level

- Promote and support the exchange of experiences in UFT among European cities and key stakeholder associations, disseminating best and good practices in UFT based upon achieved

results and impacts in terms of energy saving, traffic emissions reductions, vehicle-kilometres reduction, operation costs reduction.

- Promote and support national and local cooperative initiatives, concertation and consensus building activities among Local Authorities, Regional, National and State administrations, relevant Associations and intermediaries, business associations, relevant private actors in order to define harmonized and shared policy framework and regulations for freight transport in urban areas.
- Support the development of common noise standards for urban freight delivery operations

Time frame

Time frame for a live introduction of harmonized rules depends by the single Municipalities and the local political timing. The overall recommended step by step process for the harmonisation of regulations at regional level is provide as follows:

- First Step – Identify the Issues: reports the importance of intra-regional freight flows which are of particular relevance for city logistics. List the specific peculiarity of every municipality, Metropolitan Area or wide territories.
- Second Step – Liaise with Stakeholders: The stakeholder involvement is linked to the strategic mission of the activities with the aim to harmonise the regional scale of city logistics policies. To reach this objective, the stakeholder target is represented also by the main Municipalities of the Region. The harmonisation represents a significant challenge and, for this reason, the public-public cooperation will be chose as the first level in the city in which city logistics rules harmonisation is primarily discussed. The further stakeholders to involve are logistic and business associations with reference to transport operators. This public-private cooperation is relevant in order to understand the impact of public actions on operators' activities and economic performances.
- Third step – Definition of Goals and Measures: The main tangible objective is to reach a harmonised plan of city logistics regulations on a regional scale, matching environmental protection and the economic competitiveness of the logistics sector. In fact, it took into account the need to identify more homogeneous rules that will improve the efficiency of freight distribution and that will also allow greater simplification and decreasing of administrative burdens.
- Fourth Step – Linkages with Existing Plans: the harmonized regulation for the whole regions must be linked with the existing plans at all level (Regional and Municipal). This because of the characterizations of every single City, generally different dimensions or for the existence of a university etc. At regional level, this activity can't be accomplished, it must be necessary a collaboration with the local administration, citizen association and stakeholders.

- Fifth Step – Secure Official Endorsement or Adoption of the Plan: The Regional Government must approve the Agreement with the list of the adopted measures. Following the approval, every single Municipality and stakeholder organizations must sing the Agreement.

Barriers & Drivers

- The main barrier is to achieve political agreements between the local authorities

Where to find more information

- C-LIEGE Project D 2.1 “Elicitation of the Good Practices on Urban freight Transport ”

MEASURE 14: DIFFERENTIATED FEES FOR LOADING/UNLOADING

Type of measure: "Push &Pull" measure

Measure Category: Administrative

Policy design of the measure: initiated/supported by public sector

Involved and key supporting target group(s) stakeholders: Administration, freight carriers, shippers, residents

What is this measure about?

The measure involves the introduction of varying costs to enter the city centre depending on the different types of vehicles and distribution needs, encouraging more sustainable and energy-efficient freight movement.

Measure description & Policy Objectives

This soft measure aims at intervening on an administrative level rather than on a logistical or technical level by introducing differentiated fees for loading and unloading, according to vehicle size and emission characteristic, as well as time of day. The measure combines two interrelated soft measures, namely time-based access restrictions to the city centre and related loading permission fees. It could also be combined with a mobility credit scheme and also form part of the Local Freight Distribution Plan.

There are a number of charging schemes in place in Europe, mostly related to passenger transport. To this end, the concept of varying costs to enter the city centre depending on the different types of vehicles and distribution needs is innovative. The measure is, however, most applicable to larger municipalities, whereby congestion and poor air quality are an issue, and resources are available to implement this particular charging scheme. To this end, the key barrier to its implementation is the cost of setting up the charging infrastructure together with the necessary enforcement. Other barriers could be related to operators of older vehicles opposing the measure, due to increased costs.

Benefits

Economic	Social	Environmental
▪ Reduces conflicts between delivery vehicles and other road users	▪ Improves safety	▪ Reduces congestion and pollutant emissions from urban freight traffic vehicles into the city centre

Roadmap

Local level

- Plan for 'differentiated fees' for loading and unloading specifying area, times, vehicle size, emission characteristic and related restrictions.
- Discuss and agree on planned regulations regarding 'differentiated fees' with relevant local key stakeholder representatives and associations.
- Design and put in force a municipal ordinance to regulate access of freight vehicles within the area(s) of intervention in accordance with the charging regime.

National level

- Promote and support (funding) local initiatives able to design and implement 'differentiated fees' for loading and unloading.
- Define overall guidelines and recommendations for regulations on imposing fees for loading and unloading for freight vehicles in urban areas, and facilitate the harmonization of regulations among the different cities and regions.

EU-level

- Implement research programme on the different charging systems for the different types vehicles, emissions and times across the EU in order to improve knowledge on how the different systems work in practice.
- Development and promotion of standards for differentiated fees for loading and unloading (enabling cross-border recognition of vehicle type, emissions and Euro standards).

Time frame

- Average time for the policy design, sharing and operation start-up of the measure: 6-36 months

Barriers & Drivers

- Drivers for success: funding necessary to develop, enforce and operate the differentiated charging regime, active input and participation from all stakeholders

Where to find more information

- C-LIEGE Project D 2.1 “Elicitation of the Good Practices on Urban freight Transport ”

MEASURE 15: FREIGHT MAP FOR APPROPRIATE ROUTES AND VEHICULAR RESTRICTIONS

Type of measure: "Pull" measure

Measure Category: Technical

Policy design of the measure: Initiated/supported by public administrations

Involved and key supporting target group(s) stakeholders: Freight carriers

What is this measure about?

This measure involves reducing congestion and environmental impact of urban freight transport by better freight traffic routing information including details of height/weight restrictions

Measure description & Policy Objectives

Trucks use of inappropriate roads is a problem faced by many local authorities. The problems caused include congestion, use of weak bridges and environmental intrusion. The drivers generally wish to use the highest standard of road available. Provision of mapping or route guidance can encourage drivers to use the most suitable routes. Information provided can include not only preferred routes but also vehicle height and weight restrictions – even locations of vehicle driver and parking facilities.

This information can be communicated in many formats, from a simple printed map to an Internet based routing information service or exported directly in routing and scheduling software. In West Yorkshire, local authorities are using electronic mapping technology to develop HGV driver routing.

The measure is recommended mainly to large cities and HGV vehicles.

An useful mapping system has been produced in consultation with the Leicester and Leicestershire Freight Quality Partnership (FQP) aiming to make the distribution of goods more efficient, make better use of the existing infrastructure, minimise pollution and reduce greenhouse gas emissions and reduce noise and disturbance from freight movements, reduce accidents & cases of ill health associated with freight movements, improve public awareness of freight issues.

\Works on a 3G network or higher, mobile device is preferable, tablets can be used that can access local hotspots, useful for map reference but will be unable to use the other features. Alternatively the maps can be printed as paper copies, the benefit to a standard being they are tailored to the user's HGV dimensions. Installed using the freeware, Google Earth from the app stores (Apple, Android, Google Play). Following a successful load of the map with vehicle appropriate dimensions, the layer will be ready to use. The location marker will find the location of the mobile device on the map, that can be used as a reference point on a green line (driving on an approved HGV route) or on a red line (the HGV dimensions are not suitable for the chosen route). Other benefits of this map include the location of lay bays and parking areas suitable for HGV's. Also the names of the larger Industrial estates are labelled on the map. One can also search for the location of particular warehouses and companies using the Google search bar in the app, similar to the use of Google Maps on a Desktop Computer or Laptop.

The weakness is that in order for the app to be free, it has to provide basic functions only. Size and downloading capacity are challenging, and it requires internet connection to access the map. Furthermore, most lorry drivers already use commercial satellite navigation systems installed in their vehicles, making the use of a separate navigation application on a smart phone for only one particular city not very attractive. Lastly, routes pointed out by the application may sometimes be longer, which may, however, partly be offset by avoided detours due to access restriction information (e.g. low bridges).

There are several opportunities to combine the measure with other measures e.g.: 1 "Local Freight Development Plans", 2 "Inclusion of Freight in Urban Mobility Plans", 5 "Charging for distribution operations in central areas", 7 "Free-to-use loading bays", 8 "Free access to public transport lanes", 11 "Enactment of access time windows", 13 "Ad-hoc routes for freight distribution", 14 "Time window restrictions", 16 "Real-time loading space booking", 17 "Priority for lorries at selected junction", 19 "Van sharing", 24 "Electronic access control", 26 "Web based market place", 27 "Computer simulation demonstrating efficient distribution of goods", 30 "Virtual distribution center", 36 "Freight Operators Recognition Schemes".)

Benefits

Economic	Social	Environmental
▪ Reduce of freight vehicles entering the city; ▪ Reduce of kilometres/month of freight	▪ Improve safety, security and health and quality of life	▪ Reduce of fossil fuel consumption from urban freight transport; Reduce of pollutant emissions from

Economic	Social	Environmental
trips; ▪ Reduce of operating costs for freight transport operators		urban freight transport

Roadmap

Local level

- Develop and implement measures of setting up Intelligent Traffic Transport Systems for urban freight delivery based upon strategies and policies shared with relevant local key stakeholder representatives and associations.

National level

- Promote and support (funding) local initiatives of implementing I.T.S. systems and services, including Computerised vehicle routing and scheduling, GPS-based Route navigation systems and Real-time traffic information.
- Set up nationally binding rules, procedures or format or updating of traffic management-related specifications regarding the provision and quality of urban freight road mapping data.

EU level

- Integrate urban freight management in the adoption of specifications for the six priority actions laid down by Directive 2010/40/EU, more specifically identify ITS services to be deployed in support of freight transport (e-Freight) and development of appropriate measures to progress from concept to realisation.
- Promote and support national and local cooperative initiatives, concertation and consensus building activities among Local Authorities, Regional, National and State administrations, relevant Associations and intermediaries, business associations, relevant private actors in order to define harmonized information and communication technology, and telematics solutions that have an important influence in making last mile processes more efficient.

Time frame

- Average time for the policy design, sharing and operation start-up of the measure: 6 to 36 months

Barriers & Drivers

- Barriers/obstacles: Possible technical obstacles: The mapping is advisory so operators may not necessarily follow the suggested routes.
- Drivers for success: Active support from operators. Adequate budget.

Where to find more information

- C-LIEGE Project D 2.1 “Elicitation of the Good practices on Urban Freight Transport”
- Success cases: Leicester, Newcastle, Winchester

5. HOW THE C-LIEGE ACTIONS COME INTO PLACE: EU POLICY RECOMMENDATIONS

Over the last decade, several EU programmes and sub programmes funded different EU research projects and demonstrations (i.e. FP4[6], FP5[7], FP6[8] and FP7[9] research projects, CIVITAS projects and demonstrations[10], Intelligent Energy Europe[11]) focusing particularly in testing innovative policy and technological solutions on urban freight transport and logistics have been supported, generating substantial practices and case studies to learnt from.

Despite such emphasis, the practice, as previously analysed, shows that attention devoted to urban freight still represents a minor effort in the management of urban mobility and efforts still need to be envisaged to influence and shift the mobility policy in place.

Throughout its pilots, the C-LIEGE project had showed that stakeholders' concertation and consensus building activities throughout the promotion of round tables and local joint strategic exercise represent an important step towards the establishment of a city vision for energy efficient UFT, with relevant results and outputs generated.

Over this report, a set of measures considered as the "most promising" and effective soft measures to make the urban freight transport demand more efficient, sustainable and professional have been identified and steps to be promoted at local, national and EU level established as roadmaps. The potential for transferability of those measures and respective processes have been detailed and present in a dedicate project's deliverables[12].

This last chapter and final output of C-LIEGE builds on its findings and results and it aims to propose a set of actions falling into the EC sphere orientated towards better energy efficiency in urban freight deliveries, facilitating that C-LIEGE actions come into place.

---

[6] FP4 - Strategies for changing modal split (including transport means, organisation and operation) – projects such as UTOPIA; FP4 – "Transport RTD Programme" – projects such as IDIOMA
[7] FP5 – IST, KA 1 "Systems and Services for the Citizen" (KA 1, Cluster 1 "Mobility and Intelligent Infrastructure for Transport") – projects such as GIFTS, MOSCA and eDRUL; FP5 – Growth, KA 2 "Sustainable Mobility and Intermodality" – projects such as BESTUFS and D2D;
[8] FP6 – project such as BESTLOG, NICHES, BESTUFS
[9] FP7 – Projects such as TURBLOG_ww, SMARTHFREIGHT, CityLog, City Move, SUGAR, FREILOT, STRAIGHTSOL
[10] Demonstration projects within the CIVITAS I Initiative such as VIVALDI, TELLUS and MIRACLES; projects within the CIVITAS II Initiative such as CARAVEL, MOBILIS, SMILE and SUCCESS
[11] Projects such as TRAILBLAZER, INTERACTION, ENCLOSE, CYCLELOGISTICS
[12] C-LIEGE, Deliverable 7.1

The C-LIEGE proposed actions for EC are grouped under **four main priority axis**:

- **Research to support policy implementation;**
- **Research to support dissemination /exploitation / testing;**
- **Research to support training / capacity building**
- **Research to support close to market solutions (i.e. harmonisation / standardisation)**

The table below highlights the main aspects under each of the priority axis and how those impact in the C-LIEGE measures.

Major influence on C-LIEGE measures

EC Priority Axis	Access and time windows restrictions	Environmental zones	Loading bays	Multi-user lane	Night deliveries	Delivery and servicing plans	Local Freight Development Plans	Driver training	Pack Station	Freight Quality Partnerships (FQP)	Use of Intelligent Traffic Management	Harmonisation of regulations	Differentiated fees for loading/unloading	FORS Scheme	Freight map
Research to support policy implementation															
Promote and support national and local cooperative initiatives, **concertation and consensus building activities** among Local Authorities, Regional, National & State administrations, relevant Associations and intermediaries, business associations, relevant private actors in order to define harmonized and shared policy framework and regulations for freight transport in urban areas / define harmonized information and communication technology, and telematics solutions that have an important influence in making last mile processes more efficient	●	●	●			●				●	●	●			●
Promote and **support Local Authorities in developing and in the deployment of Urban Logistics Plan**/LFDP as an integrated part of Urban Transport Plan and/or Sustainable Urban Mobility Plans to properly address the EU Transport Policy Green Paper key statement, namely "Local Authorities need to consider all urban logistics related to passenger and freight transport together as a single logistics system."	●					●	●			●	●				

Major influence on C-LIEGE measures

EC Priority Axis	Access and time windows restrictions	Environmental zones	Loading bays	Multi-user lane	Night deliveries	Delivery and servicing plans	Local Freight Development Plans	Driver training	Pack Station	Freight Quality Partnerships (FQP)	Use of Intelligent Traffic Management	Harmonisation of regulations	Differentiated fees for loading/unloading	FORS Scheme	Freight map
Research to support dissemination /exploitation / testing															
Promote and support the **exchange of experiences** in UFT among European cities and key stakeholder associations, disseminating best and good practices in UFT based upon achieved results and impacts in terms of energy saving, traffic emissions reductions, vehicle-kilometres reduction, operation costs reduction	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Continue the support and promotion of **dedicated events and workshops facilitating the share and exchange of experiences** of urban freight solutions, technologies, measures and actively support the scientific and industrial share with cities and urban decision makers	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Research to support training / capacity building															
Promote and funding initiatives and R&D addressed to the "CO2-free City Logistics in major urban centres by 2030", including road pricing schemes based on the internalisation of the external costs in urban areas	●														
Support research into mechanical, architectural and management/ organisational solutions to attenuate noise and better (improved) technology to minimise night time disturbance from goods delivery, e.g. develop acoustic materials for trucks, ancillaries and logistic sites.					●										

Major influence on C-LIEGE measures

EC Priority Axis	Access and time windows restrictions	Environmental zones	Loading bays	Multi-user lane	Night deliveries	Delivery and servicing plans	Local Freight Development Plans	Driver training	Pack Station	Freight Quality Partnerships (FQP)	Use of Intelligent Traffic Management	Harmonisation of regulations	Differentiated fees for loading/unloading	FORS Scheme	Freight map
Implement research programme for estimating the benefits and costs for the inclusion of standards of low noise equipment in manufacturing for freight vehicles and associated loading and unloading equipment, so that future generations of vehicles and other equipment are more likely to be suitable for night-time deliveries without additional capital investment.					●										
Support research to increase understanding of more effective approaches to educating the public about eco-driving techniques and about the role of vehicle technology and ITS. Run more European campaigns to promote the notion of “eco-driving”.								●			●				
Support research on alternative delivery systems as innovative approaches to city logistics.						●			●		●		●	●	●
Research to support close to market solutions (i.e. harmonisation / standardisation)															
Support the development of standard framework for urban freight information exchange covering all transport modes and all stakeholders											●		●		
Support the development of common noise standards for urban freight delivery operations					●							●			
Support the development of labelling systems for quiet trucks.					●										

Major influence on C-LIEGE measures

EC Priority Axis	Access and time windows restrictions	Environmental zones	Loading bays	Multi-user lane	Night deliveries	Delivery and servicing plans	Local Freight Development Plans	Driver training	Pack Station	Freight Quality Partnerships (FQP)	Use of Intelligent Traffic Management	Harmonisation of regulations	Differentiated fees for loading/unloading	FORS Scheme	Freight map
Lobby for a mandatory element to the EU Driver Certificate of Professional Competence (DCPC) to be introduced to include training on eco-driving					●			●							
Support research into integrating traffic management and freight transport management, defining a technological baseline of ITM on the operational level, and improving interoperability of the systems.											●				
Development and promotion of standards for differentiated fees for loading and unloading (enabling cross-border recognition of vehicle type, emissions and Euro standards). Development of common UF restriction signage in terms of layout and access parameters	●	●											●		
Integrate urban freight management in the adoption of specifications for the six priority actions laid down by Directive 2010/40/EU, more specifically identify ITS services to be deployed in support of freight transport (e-Freight) and development of appropriate measures to progress from concept to realisation.											●				●

It is worth to notice that C-LIEGE proposals are being released almost at same time as the new call for proposals for the next transport research & innovation program (Horizon 2020) is launched. One of the key novelties of this program is its focus on improving the market uptake of research results and close to the market solutions with a new focus on innovation-related activities, such as piloting, demonstration, test-beds and support for public procurement. As seen the good results of the C-LIEGE pilot measures show that urban demand-oriented soft measures can be an effective solution in urban areas, but a full scale application is still lacking and as such the new research program should be seen as an opportunity for the deployment of these measures. While different solutions have been tested and are technically proven, cities are not always prepared to provide the right framework conditions and are not effective in their actions due to a lack of integrated approaches, emphasis on capacity building activities, particularly touching integration and looking for synergies and conflicts, reveal as an important step to be promoted in parallel with demonstration and implementation schemes and minimise the effects of regulatory failures.

Complementarily to all research domains, efforts are still need along horizontal aspects: i.e. to improve urban logistics in the long term there needs to be better definitions, data collection, monitoring and evaluation. While it is widely known and acknowledge that data collection is crucial for the decision making process and definition of public policies, as it provides a realistic assessment of the freight impacts in cities, few common indicators are currently in use by the different governments levels to monitor the performance of urban freight transport and its assessment in the context of integrated urban mobility.

EC support throughout common guidance documents will facilitate this overall goal, particularly by focusing on two essential aspects: a) definitions and data collection harmonised procedures; b) evaluation methodologies (in particular energy efficiency ones).

C-LIEGE emphasis on concerted actions at city level throughout dedicated round tables as revealed as a fundamental tool to facilitate a common understanding and to get commitments towards the implementation of urban freight solutions that have an important influence in making last mile processes more efficient. Throughout dedicated events and workshops, and taking as basis the C-LIEGE policy statements, EC to continue this effort of engagement and commitment towards “Clean Last mile transport and logistics management for smart and efficient local Governments in Europe”.

6. POLICY STATEMENTS: THE C-LIEGE CHARTER OF SUSTAINABLE URBAN LOGISTICS

A political statement encouraging counterparts to share the C-LIEGE common goals of UFT energy efficiency and sustainability as well as to accept the five principles of the "C-LIEGE Charter for sustainable urban transport" was signed by 36 cities across Europe (please find the signed C-LIEGE charters in the Annexes of this document).

The Charter subscribers confirm that the city/region/association that they represent shares the following three common goals of energy efficiency and sustainability of the UFT system:

a) *Looks forward to implement future actions and policies - based upon the results of C-LIEGE project co-funded by the Intelligent Energy Europe (IEE) Programme - that will contribute to an energy-efficient urban freight transport through a cooperative public-private approach;*

b) *looks forward to promote and support the introduction of the City Logistics Manager (CLM) to properly manage and contribute to the definition of targets, measures and solutions for an effective urban freight transport management and planning that benefits all parties;*

c) *looks forward to setting up planning and future implementation of specific urban freight transport demand-oriented measures, based upon the C-LIEGE measures portfolio, to facilitate and promote energy efficiency of urban freight transport in the city.*

The five principles of the C-LIEGE Charter are:

1) ***Co-operation**: the urban freight transport management is guided by the principle of continuous consensus building be-tween public and private stakeholders achieved through a Freight Quality Partnership.*

2) ***Integration**: C-LIEGE has proved the effectiveness of combining various push and pull measures into an integrative soft policy mix.*

3) ***Systematisation:** Local Freight Development Plans ensure a systematic process of envisioning desired goals and applying a sequence of necessary steps and measures to achieve these goals.*

4) ***Institutionalisation:*** *the introduction of City Logistics Manager ensures an effective co-ordination, implementation, monitoring, assessment and improvement of measures for sustainable urban freight transport.*

5) ***Proliferation****: C-LIEGE is free and transferable, and the Charter is open for every interested local administration in Europe.*

The list of the C-LIEGE Charters achieved is provided as follows:

1. C-LIEGE Charter subscriber: Tyne and Wear Freight Partnership, Newcastle upon Tyne
2. C-LIEGE Charter subscriber: Verband Region Stuttgart
3. C-LIEGE Charter subscriber: Verband Spedition und Logistik, Stuttgart
4. C-LIEGE Charter subscriber: Regional Department Control Activity Dai Montana
5. C-LIEGE Charter subscriber: Falcon – VD Ltd, Montana
6. C-LIEGE Charter subscriber: Leicester City Council
7. C-LIEGE Charter subscriber: Regional Inspectorate of Environment and Water, Montana
8. C-LIEGE Charter subscriber: City of Ludwigsburg
9. C-LIEGE Charter subscriber: Mont 7 Holding Ltd, Montana
10. C-LIEGE Charter subscriber: Municipality of Montana
11. C-LIEGE Charter subscriber: Montana AT
12. C-LIEGE Charter subscriber: Sector “Traffic Police” at the District Directorate of interior, Montana
13. C-LIEGE Charter subscriber: Municipality of Vratsa
14. C-LIEGE Charter subscriber: Zaragoza Logistic Center
15. C-LIEGE Charter subscriber: Emilia Romagna Region
16. C-LIEGE Charter subscriber: Municipality of Bologna
17. C-LIEGE Charter subscriber: Town of Miedzyzdroje
18. C-LIEGE Charter subscriber: City of Stargard Szczeinski
19. C-LIEGE Charter subscriber: Marshal’s Office of the Westpomeranian Region, Szczecin
20. C-LIEGE Charter subscriber: Integer Group, Warsaw
21. C-LIEGE Charter subscriber: Urzad Miasta Szczecin
22. C-LIEGE Charter subscriber: Recykler Piotr Zywot, Szczecin
23. C-LIEGE Charter subscriber: Department of Mobility, Arnhem Nijmegen
24. C-LIEGE Charter subscriber: Logistics Association of Murcia
25. C-LIEGE Charter subscriber: EuroFreight Service Ltd, Malta
26. C-LIEGE Charter subscriber: Hal Tarxien Local Council

27. C-LIEGE Charter subscriber: Wester Association of International road Carriers and Freight Forwarders in Szczecin
28. C-LIEGE Charter subscriber: Maritime University of Szczecin
29. C-LIEGE Charter subscriber: S.O.S. Nauka Jazdy – Filip Grega, Szczecin
30. C-LIEGE Charter subscriber: Gmina Goleniow
31. C-LIEGE Charter subscriber: Department for Environmental Protection of the City of Ljubljana
32. C-LIEGE Charter subscriber: Riga City Council Traffic Department
33. C-LIEGE Charter subscriber: City of Zagreb
34. C-LIEGE Charter subscriber: Municipality of Piacenza
35. C-LIEGE Charter subscriber: Municipality of Turin

The above listed C-LIEGE Charters have been included in the Annexes of this deliverable.

7. ANNEXES

7.1 Multi-Criteria Analysis (MCA) application and results

The approach followed for the evaluation of the measures and good practices is the Multi-Criteria Analysis (MCA), a typical method for the appraisal of transport measures, particularly in the cases whereby other impacts, not directly quantifiable, but equally critical, such as environmental, social impacts, transferability, level of cooperation, etc., should be taken into account. Accordingly, a set of criteria (with related sub-criteria) are introduced, considered to be the factors determining the effectiveness and efficiency of the push and pull (soft) measures/good practices. Furthermore, weights are established for each of the criteria together with associated indicators for their measurement. Resulting criteria values are converted to a single unit via an artificial scale. The overall score for each measure is computed through the aggregation of the resulting weighted scores. In this way, an individual score is computed for each measure evaluated, with its value ranging between 0 % (measure not effective) to 100% (measure highly effective). The latter permits a ranking of all the measures evaluated based on their score. To this end, an MCA was carried out for all push and pull measures identified by C-LIEGE, as well as for the good practices included in the UFT database. The individual steps of the MCA are described in more detail in the following.

MCA Steps

Step 1-Selection of criteria: A set of criteria (with related sub-criteria) are introduced, considered to be the factors determining the effectiveness and efficiency of a measure/good practice. For the purpose of consistency with the evaluation procedure employed in the elaboration of WP6, similar criteria have been selected.

Step 2-Weighting of the criteria: The weighting technique includes the criteria related weights (criteria will be weighted against each other). This step is to determine the priorities of elements at each level. For the purpose of the present analysis, the simple Paired Comparison Approach is employed in order to derive criteria weights using the question “is this criterion more important than the other?”, offering a binary choice. For each respondent, the full set of choices yields a preference score for each criterion, that is, the degree to which

a criterion is more important compared to all other criteria. This score is calculated by creating a paired comparison matrix entering unity (1) in each cell, where the column item was preferred to the row item, or zero (0), otherwise. Column sums give the preference scores, which if standardised, produce a set of criteria weights. For the purpose of the present analysis, criteria weights were obtained from the following standardization equation:

$$\text{Standardised score } w_i = \frac{\text{'preference' score } w_i}{\sum \text{'preference' scores}} \qquad (1)$$

Each 'preference' score was divided by the sum of all 'preference' scores. This type of transformation is particularly appropriate in standardising various sets of different criterion weights, since an application of the above equation implies that all weights will add up to unity. In accordance with the above exercise, criteria weights were obtained from all the partners of the C-LIEGE project, based on their related expertise. The selected criteria, together with their units of measurements and related weights, are presented in Table A.1.

Step 3-Estimation of criteria levels in physical scale: At this stage the scores for each criterion are estimated. For the purpose of the present analysis, criterion scopes are measured on a qualitative scale, similar to the evaluation approach employed in WP7, whereby the scale of performance is measured in a "verbal" scale with 2 or more discrete points. The qualitative criteria scores are derived by ranking the "verbal" physical performances from the "worst " to the "best", and then assigning the values of the selected scale [0,5], respectively, from the lowest to the highest values. For all, but one criterion, this is the following:

1 Low

2 Low/Medium

3 Medium

4 Medium/High

5 High

For the criterion of geographical coverage, the scale selected is "1" for "local", "2" for "urban", and "3" for "regional.

Step 4-Estimation of criteria/impact levels in artificial scale: To make the various criterion scores compatible in order to facilitate their aggregation, it is necessary to transform them into one common measurement unit, for example forcing each criterion score to take values between [0,1], by making use of the so called utility functions of the following form:

$$U_{Cj} = \begin{cases} +P_{Cj}/A, & \text{if } P > 0 \\ 0, & \text{if } P = 0 \\ -P_{Cj}/A, & \text{if } P < 0 \end{cases} \quad (2)$$

Where:

j: criterion number
C_j: criterion j
P_{Cj}: Physical (real) performance of criterion j (an absolute value)
U_{Cj}: Artificial (after transformation) performance of criterion j
A: Constant variable set to 5.

Step 5: Aggregation. Aggregation of the weighted values (using criteria related weights) of each criterion, providing a total score of the good practice overall performance. Weighted summation of criterion scores takes place by applying Multiple Attribute Utility Theory (MAUT). The final score is calculated by the following equation, using the results of Steps 2 and 4:

$$T.P. = \sum_{j=1}^{J} W_j * U_j \quad (3)$$

Where:

j: criterion number
W_j: criterion weight
U_j: Artificial performance of criterion j
T.P. : Total performance

The application of the methodology yielded a ranking of the above measures and good practices, from which the 15 highest scoring were selected, as the 15 most prominent measures to be included in the Action Plan.

TABLE A.1-MCA Criteria for GP Evaluation

Group	*Criterion*	*Criterion Number*	*Units of measurement*	*Physical Scale*	*Weight of Group*	*Weight for each criterion*
Energy efficiency	Energy saving	$C_{1,1}$	0-5	Low (1)/Low-Medium(2) /Medium(3)/Medium-High(4)/High(5)	0,3	
Impacts/benefits	Environmental benefits	$C_{2,1}$	0-5	Low (1)/Low-Medium(2) /Medium(3)/Medium-High(4)/High (5)	0,2	0,4
	Economic benefits	$C_{2,2}$	0-5	Low (1)/Low-Medium(2) /Medium(3)/Medium-High(4)/High (5)		0,4
	Social benefits	$C_{2,3}$	0-5	Low (1)/Low-Medium(2) /Medium(3)/Medium-High(4)/High (5)		0,2
Cost	Implementation cost	$C_{3,1}$	0-5	Low (5)/Low-Medium(4) /Medium(3)/Medium-High(2)/High (1)	0,1	0,6
	Operating cost	$C_{3,2}$	0-5	Low (5)/Low-Medium(4) /Medium(3)/Medium-High(2)/High (1)		0,4
Implementation Requirements	Political/Institutional requirements	$C_{4,1}$	0-5	Low (5)/Low-Medium(4) /Medium(3)/Medium-High(2)/High (1)	0,1	0,25
	Regulatory framework	$C_{4,2}$	0-5	Low (5)/Low-Medium(4) /Medium(3)/Medium-High(2)/High (1)		0,25
	Technical requirements	$C_{4,3}$	0-5	Low (5)/Low-Medium(4) /Medium(3)/Medium-High(2)/High (1)		0,25
	Time	$C_{4,4}$	0-5	Low (5)/Low-Medium(4) /Medium(3)/Medium-High(2)/High (1)		0,25

Number of Urban Freight Actors/ Stakeholders targeted	C_5	0-5	Low (1)/Low-Medium(2) /Medium(3)/Medium-High(4)/High (5)	0,025
Geographical scale of influence	C_6	0-3	local(1)/city(2)/regional(3)	0,05
Level of cooperation	C_7	0-5	Low (1)/Low-Medium(2) /Medium(3)/Medium-High(4)/High (5)	0,05
Level of transferability	C_8	0-5	Low (1)/Low-Medium(2) /Medium(3)/Medium-High(4)/High (5)	0,05
Degree of innovativeness	C_9	0-5	Low (1)/Low-Medium(2) /Medium(3)/Medium-High(4)/High (5)	0,025
Soft measures relevance	C_{10}	0-5	Low (1)/Low-Medium(2) /Medium(3)/Medium-High(4)/High (5)	0,05
Sustainability	C_{11}	0-5	Low (1)/Low-Medium(2) /Medium(3)/Medium-High(4)/High (5)	0,05

7.2 The C-LIEGE Charters collected