



CiViTAS
Cleaner and better transport in cities

POLICY NOTE

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- Smart choices for cities
- Making urban freight logistics more sustainable

CiViTAS



Smart choices for cities
**Making urban freight
logistics more sustainable**





Smart choices for cities
Making urban freight logistics more sustainable

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Preface

The objective of the CIVITAS WIKI project is to provide information on clean urban transport and the CIVITAS Initiative to European city planners, decision-makers and citizens. With its policy notes WIKI wants to inform people in cities on a number of topics that currently play an important role in urban mobility.

This fifth policy analysis focuses on the topic: 'Making urban freight more sustainable'.

Freight distribution is a vital part of life in modern cities and plays a relevant role within the whole urban mobility system. Although urban freight systems have not received much attention to date, actual demographic trends showing an increasing urbanization, together with the pervasive role of information and communication technologies and the consistent growth of e-commerce are bound to pose further challenges to the urban freight system.

Among the different components of urban mobility, urban freight logistics is in fact traditionally considered as the least sustainable because of its evident negative impacts (generating noise and pollutant emissions, increasing congestion and posing a threat to the safety of road users).

That is why it is necessary to encourage the reflection upon these issues, the sharing of experiences and best practices between cities and the raising of awareness among decision-makers in order to trigger alternative, and more sustainable, approaches to urban freight planning.

Eight policy analysis will be produced by the CIVITAS WIKI project team. Topics can be proposed by cities via the CIVITAS secretariat or through the CIVITAS thematic groups. So if you have a topic you want to know more about, please let us know!

We hope you enjoy reading this policy note,

The CIVITAS WIKI team

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Summary

Freight distribution is an increasingly important part of modern city life.

Most goods consumed in our cities originate externally and the transport elements within the cities are often referred to as the "last mile" in the supply chain. Trucks remain the dominant transport mode as they are perceived to be most suitable to move goods between specific origins and destinations within the complex urban grid of streets.

However, trucks generally have significant environmental impacts such as CO₂, NO_x, particulates (PM₁₀, PM_{2,5}, PM₁), and noise emissions. Traffic safety and parking requirements for delivery vehicles are also of concern. While greenhouse gas emission effects are felt on a global level, others are felt locally. For urban areas the last mile poses the greatest problems for the environment, customers/citizens and logistics service providers. Therefore, promoting and sustaining alternative and sustainable strategies and solutions suitable to the urban environment is a critical aspect of urban transport planning.

This policy note is a concise document intended for wide dissemination within the CIVITAS community to raise awareness and increase knowledge of urban freight issues and challenges.

The note provides a general overview of urban freight issues, definitions, the scope of the subject, and indications of future trends. The note focuses on providing evidence to support the activities of actors and stakeholders when making crucial decisions on, and planning for, urban freight logistics.

A selection of measures is presented to offer a variety of possible solutions to be implemented by local small- to medium-sized European cities in order to achieve more sustainable urban freight transport. The goals are to "reduce the use of conventionally fuelled vehicles in urban traffic and to achieve essentially CO₂-free city logistics in major urban centres by 2030" as set out in the White Paper 2011.

This note offers a toolkit of possible and tested solutions to city decision-makers and planners. It is not intended as an exhaustive document treating all aspects of the freight system.





Smart choices for cities Making urban freight logistics more sustainable

Introduction

Urban freight traffic accounts for about 10-15% of kilometres travelled¹ and emits approximately 6% of all transport-related GHG emissions². It accounts for between 2% and 5%³ of the total workforce employed in urban areas and it is estimated that between 3% and 5%⁴ of urban land is reserved to logistics activities⁵.

Some 20-25% of freight vehicle kilometres is related to goods leaving urban areas, and 40-50% is related to incoming goods. The remaining percentage relates to internal exchange (i.e. goods having both their origin and destination within the city)⁶.

The following estimates of goods generated in an urban context have been deduced from studies and analyses conducted for several urban areas:

- 0.1 delivery/pick-up per person per day;
- 1 delivery/pick-up per economic activity per week;
- between 300 and 400 freight vehicle trips per 1,000 persons per day; and
- between 30 and 50 tonnes per person per year⁷.

Certain emerging global trends will significantly change the logistics sector paradigm and its internal mechanisms.

More and more people live in cities. Applying the Degree of Urbanization classification (DEGURBA classification), in 2012, 200 million Europeans "were living in densely-populated areas"⁸. While a growing population offers an opportunity for urban areas to thrive and for rising prosperity, the problems posed by logistics will increase without radical change.

An increasing number of people order goods via the Internet with growing frequency⁹. In 2013 a report by the European Commission¹⁰ stated that "almost half of EU citizens (45%) say they have shopped online in the last 12 months." It is very likely that in 2015 the equivalent numbers will be even larger.

By 2025, cities are likely to be larger (60% of the world's population is expected to live in cities), information and communication technologies (ICTs) will be pervasive (more than 80 billion connected devices), and the online retail sector will have risen to nearly 20%¹¹ of total retailing.

The trade-off between the economic advantages of an efficient and effective urban freight system and the various environmental disadvantages which may be generated to the detriment of the population is becoming ever more critical. However, there is a general lack of detailed knowledge and actions to address issues relating to urban freight logistics by urban authorities, and of the practical opportunities for improvement which exist.

The reason for this is that the rules governing the transport of goods are different from those affecting the transport of people. Evidence shows that the principles underlying the transport of goods are mainly those of a competitive market among logistics operators based on trying to meet increasingly stringent performance requirements (in terms of quality and timing of the services offered). It can be argued that the resulting apparent neglect of the freight sector is detrimental and disadvantageous for many actors and stakeholders: thanks to a deeper knowledge and involvement by public parties, activities and processes could be further improved and made more efficient with significant benefits not only for operators but also for citizens and all other actors and stakeholders in cities.

During the first three rounds of the CIVITAS Initiative¹², 44 urban freight logistics measures were developed in 30 cities to tackle problems caused by freight deliveries. Urban freight transport measures in the first two rounds of the programme had a high failure rate which was identified as being due

1 <http://www.ppiaf.org/freighttoolkit/knowledge-map/urban>

2 White Paper, 2011

3 Macario R., 2012

4 Macario R., 2012

5 <http://www.ppiaf.org/freighttoolkit/knowledge-map/urban>

6 <http://www.ppiaf.org/freighttoolkit/knowledge-map/urban>

7 Dablanc, 2009

8 EU, 2014

9 Morganti et al. 2014

10 EC, 2013

11 Frost & Sullivan, 2014

12 CIVITAS I, CIVITAS II and CIVITAS PLUS.



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to an inappropriate approach to the involvement of private companies and a lack of support and commitment from other stakeholders. In the third round, CIVITAS PLUS, better results were achieved, but it was again demonstrated that stakeholders (local businesses and delivery companies) needed to be involved early in the process if success was to be possible.

This note is aimed at raising awareness and increasing knowledge of urban freight issues and challenges among policy makers. The document can be considered to be a toolbox of the most relevant initiatives and measures from both CIVITAS and other EU experiences.

It is intended to help decision-makers of small-/medium-sized European cities to identify smart urban freight strategies to tackle major challenges affecting city liveability, including issues relating to mobility, social inclusion, and economic wealth. These challenges differ from city to city not only in relation to whether they are present, but also in relation to their mix and their level of influence (i.e. their related effects).

It is evident that no single solution can address and solve all urban freight transport problems. What is needed to make urban freight more sustainable is an appropriate blend of different initiatives and measures. This note should help city authorities to identify the blend most appropriate for them, but does not claim to be an exhaustive document treating all aspects related to the freight system.

Measures and initiatives are organised and presented for policy makers to draw on for ideas and suggestions to be transferred to their specific contexts. Measures have been grouped into six categories of initiatives: stakeholder engagement, regulations, market-based initiatives, land use planning, new technology-driven measures and “eco-logistics” awareness-raising measures.

The policy note offers city authorities and planners a toolkit of possible and tested solutions available to be implemented in their city, together with an indication of potential positive and negative impacts. A straightforward transfer of a solution from one city to another is not always feasible, so being aware of all the implications of a measure is of vital importance for a better outcome.





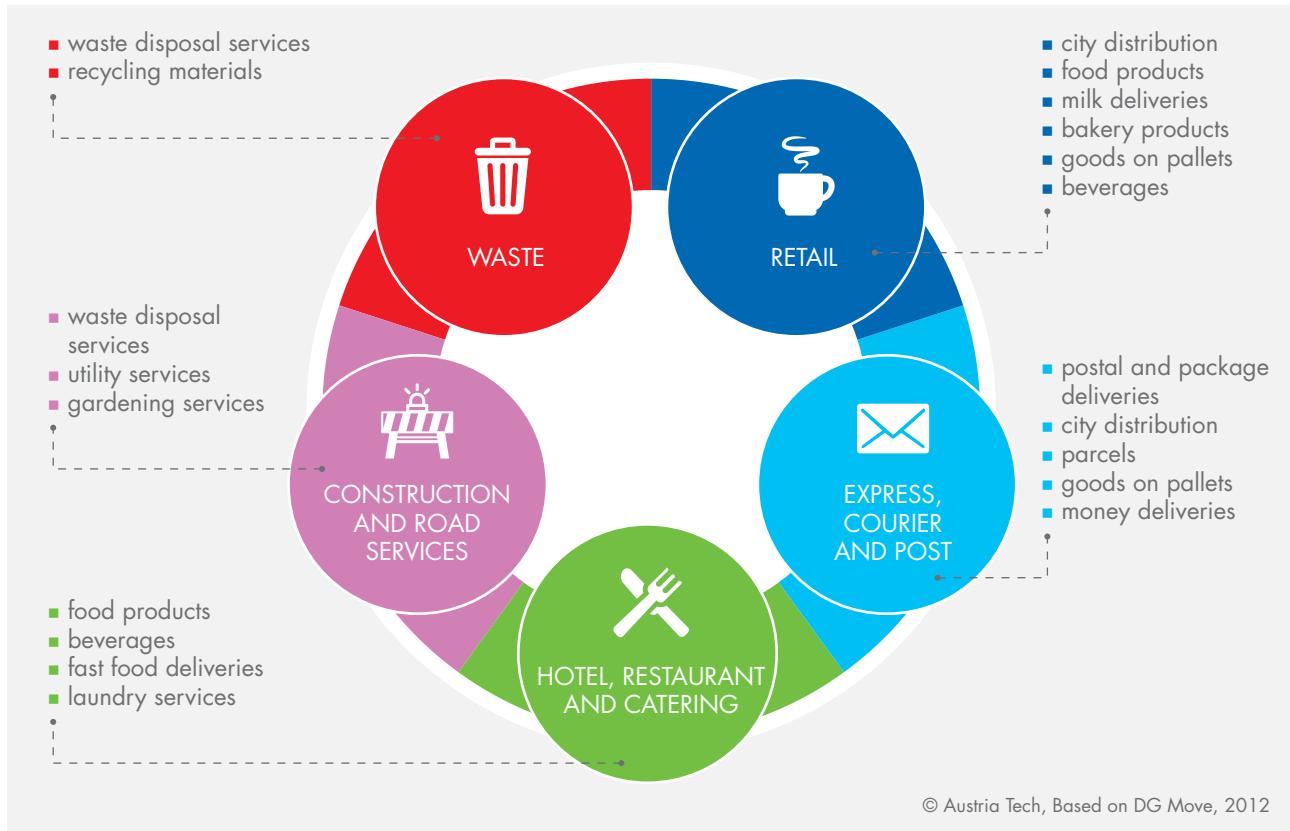
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Urban freight logistics: scope and definitions

There is no common definition of urban logistics. In literature various terms are used to refer to the general concept of the transportation of goods and waste in urban areas; "urban goods movement"¹³, "city logistics"¹⁴, "urban freight transport"¹⁵. The exact definitions of these terms differ slightly as to what is included and what is not.

A simple definition¹⁶ of freight transport in cities is: all movements of goods in to, out from, through or within the urban area made by light or heavy vehicles, including service transport and demolition traffic as well as waste and reverse logistics. Household purchasing trips are not considered to be part of urban freight transport as these are considered to be passenger transport trips.

Market sector of urban freight transport, AustriaTech (2014)



13 Ogden, 1992

14 Taniguchi et al., 2001

15 Allen et al., 2000

16 Based on Alice, 2014; Lindholm, 2013

17 see also Verlinde, 2015





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Urban freight logistics can “be classified by transport mode, type of operator, and origin of goods (the goods can come via a long-distance supply chain, or be part of a very local exchange between a shipper and a receiver)¹⁸”, or by sector served. Furthermore, the vehicles used are also very diverse and include, for example, large trucks, vans and cargo bikes. In addition, a distinction can be made between freight that is handled by companies for their own account or by logistics providers on behalf of third parties. Examples of the former include instances where the transport is operated by manufacturers with their own employees and fleet, by retailers with their own vehicles to supply the store from a distribution centre, or by retailers making home deliveries to final customers such as small retailers or pharmacies. Examples of the latter include a professional carrier, a registered freight or logistics operator operating on behalf of a shipper, for example postal and parcel companies or logistics service providers.

Another way to classify the different forms of urban freight transport is by sector served (i.e. “the market sector of urban freight transport”)¹⁹. Five sectors can be distinguished: i) retail (including e-commerce), ii) express, courier and post, iii) hotel, restaurant and catering (Ho.Re.Ca.), iv) construction and v) waste.

Adding vi) offices and vii) service-related trips to these sectors gives a fair picture of the main freight transport activities taking place in cities. The organisation of logistics, and as a result of urban freight transport, differs between (and within) these sectors.

Different ways for action: policy, technical and logistics

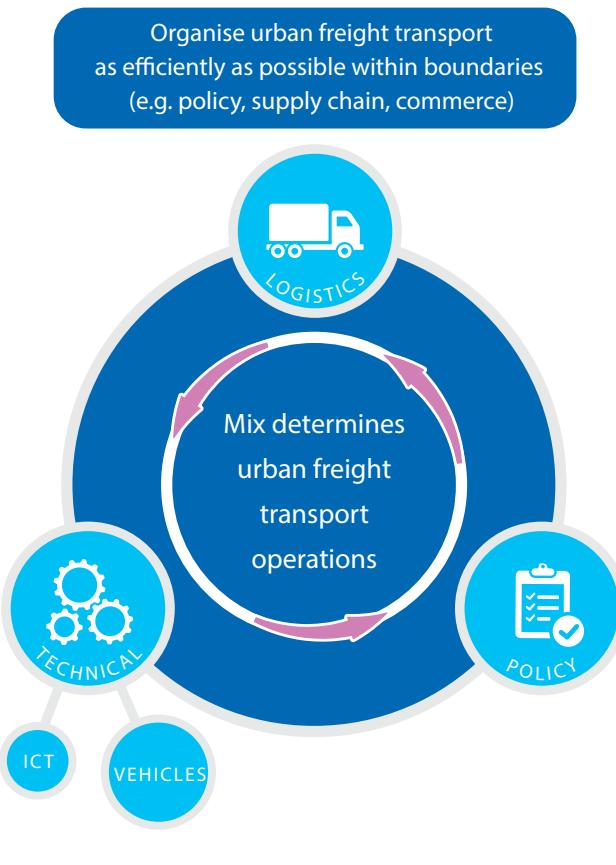
Another way of classifying the urban freight transport field is by differentiating between perspectives of action²⁰. In general, there are three different ways for action to make changes to (a part of) the urban freight transport system:

- **Policy:** determines the urban conditions in which urban freight transport operations can take place (time, location, etc.).

- **Technical:** determines on the one hand the available means (e.g. vehicles) involved in urban freight transport and on the other hand the means to plan trips and communicate (e.g. ICT).
- **Logistics:** determines the operational conditions for urban freight transport trips, e.g. exact location, delivery hours, delivery frequency, means used, etc.

Together, these three perspectives of action determine the actual organisation of the different urban freight transport operations, based on the operational conditions and the available means. These three different perspectives for action also correspond to the different stakes the various stakeholders have in urban freight transport.

The organisation of urban freight transport operations



¹⁸ Dablanc, 2009

¹⁹ MDS, 2012

²⁰ Quak, 2014





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Impacts and challenges

Due to its high level of complexity, urban freight logistics has economic, environmental and social impacts as cities are confronted with more traffic, congestion, noise and pollution. Root causes for these problems range from inadequate road infrastructure and inefficient logistics processes resulting from a low load factor to unnecessarily long dwell times and/or high numbers of individual deliveries.

The relevance of these impacts varies according to city size, and there are differences between large conurbations and small- or medium-sized cities. The latter are particularly affected by urban freight transport. Narrow roads and a lack of loading and unloading areas within city centres combined with inefficient logistics processes produce negative effects that are attributable to the small scale of these cities. In addition, small- or medium-sized cities usually have a lower financial investment capacity and, due to their dimension, the critical mass for innovation is more difficult to reach.

However, small- or medium-sized cities have some conditions that are favourable in relation to urban freight logistics. Citizens' perception of, and involvement in, city life is different, and citizens are generally more active in medium-size urban contexts as compared to larger ones. Greater involvement means that attitudes are often more pronounced with more immediate reactions to policies and measures. In addition, in small- or medium-sized cities, the flow of goods is often easier to control, and access restrictions can be managed more readily due to the limited number of accesses.

There is often a lack of detailed data of exactly what types of urban freight transport activities and trips take place in cities. Vehicle and traffic data is usually available, but it appears to be quite difficult to relate this to the various logistics activities. Moreover, the huge complexity and heterogeneity of urban freight transport makes it complicated and difficult to define transport policies targeted at urban freight.

Impacts of urban freight logistics, AustriaTech (2014)

ECONOMIC IMPACTS	ENVIRONMENTAL IMPACTS	SOCIAL IMPACTS	IMPACTS OF SCALE
road congestion	pollutant emissions	physical consequences of pollutant emissions on public health	few resources
inefficiency	use of non-renewable fossil-fuel	traffic accidents	lack of co-operations
waste of resources	land and aggregates	noise	less policy considerations
	waste production	visual intrusion	few logistics providers based in cities
		other quality of life issues	little infrastructure





Stakeholders in urban freight logistics

Urban freight transport is characterized by the presence of many stakeholders. The main reason for this is that it takes place in the city – the central location where flows and activities intersect. Firstly, the *supply chain actors*, who are responsible for sending, carrying and receiving goods are distinguished²¹

- **shippers** – manufacturers, wholesalers, retailers, etc. Shippers send goods to other companies or persons and are often not located in the city; as a result they usually do not feel responsible for urban freight transport issues. They tend to maximise their levels of service in terms of costs and reliability of transport. In many cases the shipper is the stakeholder responsible for hiring a carrier.
- **transport operators** – freight carriers, couriers, etc. Transport operators usually aim at minimising their costs by maximising the efficiency of their pick-up and delivery tours, and they are expected to provide a high level of service at low cost. There is a trade-off between a high level of service and the efficiency of freight vehicles loads. Transport operators are the stakeholders carrying out urban freight transport, but in many cases they are restricted by boundaries set by others; for example, opening hours of stores or designated time windows to make the deliveries. Transport operators are often active in a geographically larger area than the city.
- **receivers** – shopkeepers, offices, construction sites, residents, etc. Receivers are located in the urban areas and are mostly the endpoint of the logistics chain. Receivers are often not responsible for urban freight transport since shipments are organised and paid for by the shipper (so for the receiver the transport price is included within the price of the ordered goods). In many cases receivers do not realize that they can and do influence urban freight transport by, for example, setting time windows. However, as the receiver is often the only supply chain actor located in the city, they can better identify with local issues than transport operators and shippers who are usually active across a larger geographical area.

The supply chain actors and the specific relations between the shipper, carrier and receiver together determine the logistics activities. To influence urban freight transport by way of policies, it is necessary to understand these relationships in order that the right stakeholders are addressed, i.e. the stakeholders who are able to make a change (see next section: different relations between supply chain actors). The urban logistics activities are constrained by several boundary conditions, as well as by the means available, such as vehicles or loading/unloading areas.

On the one hand policy boundaries by *public authorities* determine the urban freight transport possibilities. We distinguish the following public stakeholders: the local government, the national government, and for some issues even the European Commission (e.g. setting EURO-standards for truck engines). The local authorities focus on an attractive city, and from that perspective urban freight transport can be considered as a main contributor of nuisance and pollution. On the other hand, securing city accessibility and having an effective and efficient transport system is also one of the local authorities aims. Local authorities are interested in the reduction of congestion and environmental nuisances as well as in increasing safety of road traffic. The local authorities often consider the urban transportation systems as a whole. And from that perspective the local authorities aim at resolving conflicts between the stakeholders, i.e. the supply chain actors, the urban traffic and the residents.

National authorities are usually only marginally involved in urban freight transport as it is mainly seen as a local matter. However, the interests of national authorities (such as reducing congestion and externalities at a national or regional level) affects many urban freight transport operations as well as local authority policies.

Other boundaries for urban freight transport result from the available infrastructure set by *resource supply stakeholders*. There are three different resource supply stakeholders²²: infrastructure providers, infrastructure operators (managers), and landowners. These stakeholders and their investments determine the possibilities for urban freight transport.

²¹ following MDS, 2012 and Verlinde, 2015

²² MCD (2012)





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Finally, there is a group of actors who are affected by urban freight transport, but who do not directly influence or affect it: the *impactees*²³. Local authorities often act on behalf of these impactees as these are the actors who vote in local elections, and as a result focus on minimising the real and apparent problems caused by urban freight transport. These impactees include:

- **other traffic participants** – this group consists of vulnerable road users (cyclists and pedestrians) that share the same infrastructure as freight transport vehicles especially in the urban area, and of passenger vehicles that are (sometimes) hindered by double-parked trucks involved in loading and unloading at the kerbside or on the road.
- **city residents and city users** – the people who live, work, and shop in the city. Residents can experience nuisance by urban freight transport (e.g. smell, noise nuisance, or vibration).
- **visitors / tourists** – who are affected by urban freight transport only to a minor degree, although one could argue that (too many large) trucks in a city centre cause visual intrusion or decrease the perception of the spatial quality of the city. Especially from a commercial point of view, having an attractive city (centre) which tourists and visitors want to visit is important, and there is therefore an interest in minimising nuisance by urban freight transport.

People who suffer the negative impacts of urban freight transport are also often benefit from it as they are often the final customers of the products and services delivered (e.g. retail, Hotels, Restaurants & Cafés - Ho.Re.Ca., etc.).

Other stakeholders are the providers of vehicles, information technologies (IT) support systems, and other means that enable especially supply chain actors and public authorities to fulfil their roles in urban freight transport.

Different relations between supply chain actors

The classification of supply chain actors into shippers, carriers and receivers simplifies the private-sector part of urban freight transport. However, in order to make effective policies, it is important to realize that there are major differences in the relationships between these supply chain actors, which result in variations in decision-making power.

As urban freight transport manifests itself especially in transportation in the urban area, one might be inclined to focus on the carriers since these actors are operating the vehicles. However, in many cases, those driving the vehicles have the least decision-making power of all supply chain actors. For example, the carriers are paid by the shippers who can determine the delivery conditions, and the receivers (e.g. shop owners) determine with their opening hours when a carrier can deliver.

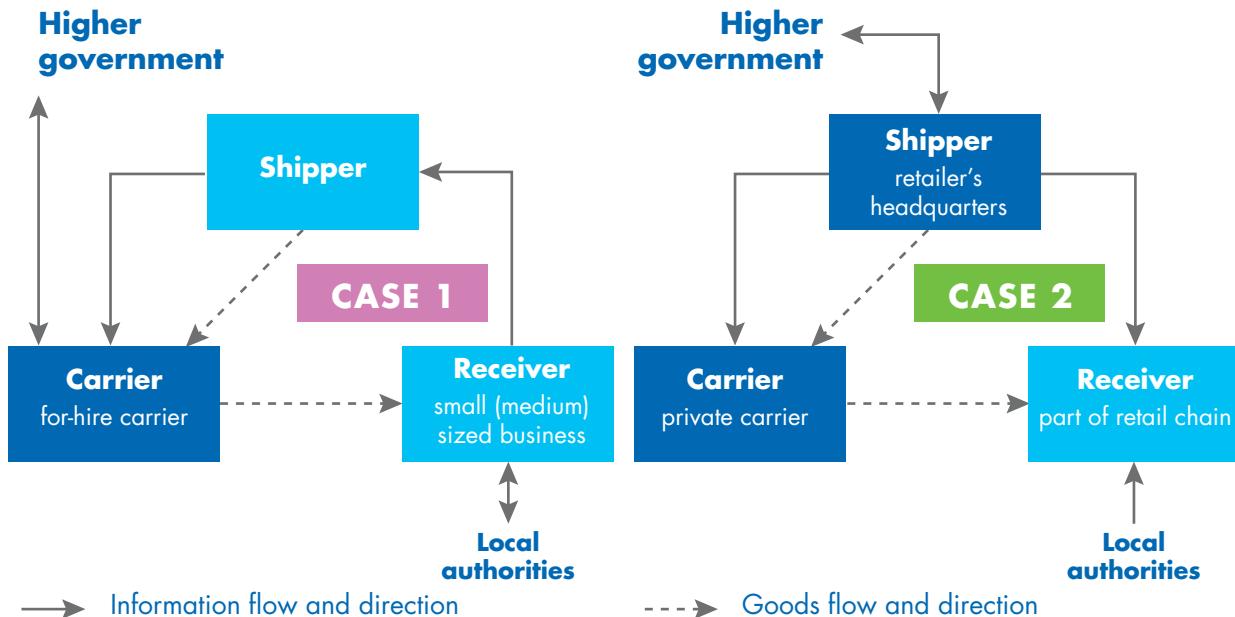
The following example illustrates two types of shipper-carrier-receiver combinations. Although both a retail chain and an independent retailer are receivers in the urban area, they differ considerably. And with that their stakes in urban freight transport issues differ as well²⁴. A large retail chain is supplied differently from a small retailer (see figure below).

Transport is usually carried out by different types of carriers: private carriers and for-hire carriers, respectively.

23 Ogden, 1992; Quak, 2008
24 Quak, 2008



Heterogeneity in relations between stakeholders: the cases of the large retail chain and the small sized business (Quak 2008)



EXAMPLE: CASE 1

An independent retailer orders from a shipper who is responsible for the transport of the order either by carrying out the transport itself (e.g. some wholesalers) or by using a for-hire carrier. The retailer has no contact with the carrier except for purposes of the delivery. The retailer minimises the perceived inconvenience caused by trucks. Such a retailer does not consider transport to be its own responsibility, let alone its own problem, because it does not pay for the transport directly. The transport price is usually part of the price of the goods, which implies that it is not visible to the independent retailer. Therefore, this independent retailer is usually not willing to participate in any initiative concerning urban freight transport.

EXAMPLE: CASE 2

For receivers that are part of a large retail chain the situation is different. Firstly, deliveries made by a private carrier are usually coordinated from the retailer's distribution centre, which acts as shipper in this case. The retail chain is responsible for the transport. The costs are also clearly visible to the large retail chain, who acts as shipper, carrier, and receiver. Apart from the difference in supply chain organisation, these two cases also differ in terms of their contacts. The independent retailer, frequently a small entrepreneur, is regularly involved in local politics, especially in smaller cities, or in regulations concerning the city centre. However, the chain store manager is not usually involved in local issues. The for-hire carriers that supply the small retailer, usually logistics service providers, are mostly active in more than one municipality, and thus have an approach similar to that of the retail chain. Since the focus of these large organisations is national, they do not usually contact all different local authorities, but take the matter up nationally.

The stakeholders that are directly confronted with difficulties in urban freight transport are shaded blue in figure above.





Decision-making process

As freight transport is a multi-stakeholder activity, the only successful way to foster a real change in attitude and behaviour is through the involvement of all actors and stakeholders in the development of consensus-based strategies. No single stakeholder is capable of finding the most successful solution to the multiple issues that affect freight mobility in our cities.

A structured and sound decision-making process has proved to lead to successful measures in cases where multiple stakeholders were actively involved (see figure below). No particular constraints or preparatory requirements are needed in terms of geographical size of the city, addressed challenges or timeframes to decide to implement this methodology.

The first step is the definition of goals and objectives. The public sector plays the key role, but developing a consensus around such goals and objectives is fundamental. In order to measure the effectiveness of fixed goals and targets, some key performance indicators have to be listed.

The next step – one the most relevant and crucial aspects of the process – is the identification of the causes of the identified problems as a wrong identification can invalidate the success of the whole process.

Potential initiatives have to be identified according to the nature of the problem, its duration and geographic scope using the tools available to tackle freight issues as summarised below. An initiative is selected after an evaluation based on the results derived from an analysis of the potential alternatives initially identified.

The phase of implementation starts with the development of an action plan in which priorities, funding, resources, timeline, etc. are defined, first in draft for an initial round of consultations and then in a final adoptable version.

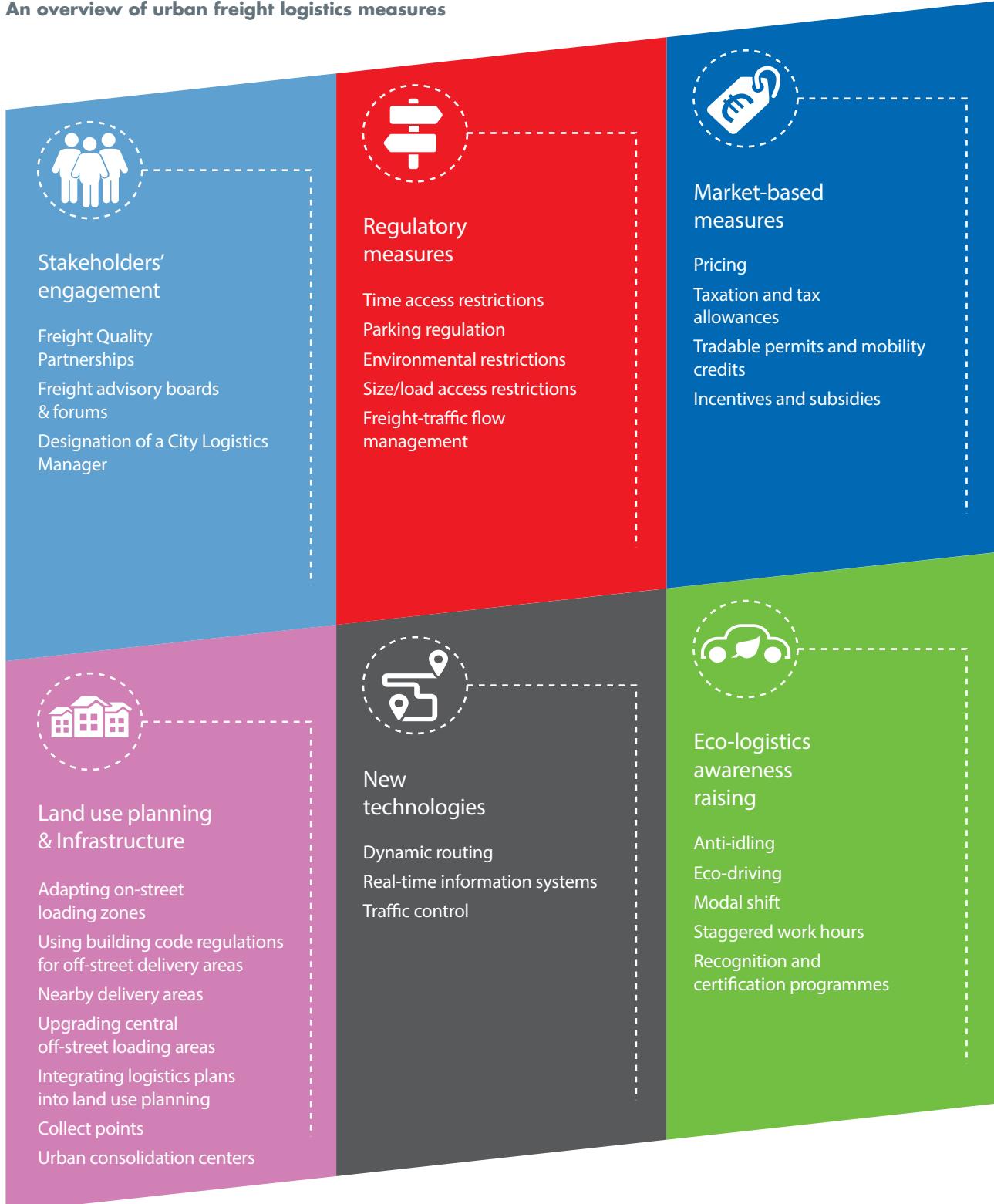
The following phase concerns the pilot-testing of the initiative, as a demonstration of the feasibility and effectiveness of the initiative has proved to be one of the most efficient ways of convincing freight transport actors and operators to accept and adopt any changes to their activities. During this pilot-testing phase, activities should be monitored and changes made as required.

The potential initiatives identified and described in detail in the next chapter have been classified into six main categories, as shown in figure below.

The urban freight logistics decision-making process



An overview of urban freight logistics measures





Overview of successful measures

The issues of freight transport management can be addressed through different initiatives and measures. This chapter lists the most relevant ones selected among those more suitable for small (between 50.000 and 100.000) - to medium-sized cities (between 100.000 and 250.000)²⁵, trying to offer a brief summary of each of them.

Some are more management oriented and refer to the short term, while others are more planning oriented and are therefore related to medium- and long-term objectives. The former are typically small-scale efforts that could be easily implemented, while the latter are of a more strategic nature and larger in scope. In the latter case, a decision-making and planning process is essential to minimise the risk of failure.

The first group of measures to be discussed are those which refer to the stakeholders' engagement. This group is considered first as it is an essential element in all the other groups of measures, too.

STAKEHOLDERS' ENGAGEMENT

The freight delivery system is made up of a constellation of actors and stakeholders with different, often conflicting, interests.

However, it affects a well-defined group of actors, whose acceptance of (and even positive contribution to) policy development can be enhanced by continuing consultation. Stakeholder engagement is becoming increasingly recognized as an important part of any decision-making process.

Experience shows that cities see encouraging results whenever constructive networking with retailers and couriers has been established in order to better design new freight schemes and agree on the governing rules. Successful collaborative partnerships between appropriate stakeholders can lead to the formulation of high impact freight strategies that consider logistical needs of the city, businesses, transport operators, and local residents. Given the complexity of a participative approach, which includes all of the above, the involvement of the different players should be stimulated and maximised from the very beginning of the planning stage.

Multiple ways are available to accomplish the task of engaging stakeholders: these have been grouped under three main topics.





Freight Quality Partnerships (FQPs)



The most common tool for involving stakeholders are freight quality partnerships. FQPs aim to bring together the public- and private-sector parties involved in freight transport and logistics to discuss problems and identify and implement solutions, with the intention of improving the sustainability of freight transport activities in an

economic, social and environmental sense. FQPs are long-term partnerships between urban freight stakeholders that, on a formal or informal basis, meet regularly to discuss (and sometimes find solutions to) problems and issues that occur in the urban area.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Opportunity to achieve worthwhile results at a relatively modest cost 	<ul style="list-style-type: none"> ■ Not always an easy approach or solution to urban freight transport problems since it is difficult to include all types of stakeholders needed

The local freight network of Gothenburg

Since 2006 the City of Gothenburg has been operating a **Local Freight Network** (with **15-20 participants**) where city distribution is discussed in regular meetings with different stakeholders in the logistics chain, such as transport suppliers, property owners and retailers. Urban goods transport measures are developed in dialogue with the Local Freight Network before being implemented, which increases acceptance and leads to a more cost-efficient working process.

The initiative, which has been run by the municipality with the aim of involving stakeholders from different sectors in continuous improvements, encourages different points of view and creates solutions that attract a good level of acceptance and that work well when implemented by the public sector.

tinyurl.com/START-project

tinyurl.com/cities-to-cities-exchange



**Göteborgs Stad
Miljö**





Freight advisory boards and forums



Establishing committees, boards and forums to provide an opportunity for stakeholders to meet and discuss challenges and opportunities of the freight system is the most direct way to engage all the actors. These forums can be established in the form of technical advisory committees that bring together public-sector staff from different administrative bodies and agencies, with the aim of investigating problems, conducting context studies and analyses to coordinate actions and decisions for a sound and effective urban freight policy

at different administrative levels. These technical advisory committees can be complemented by freight advisory boards, structured as forums in which private and public representatives meet to discuss critical aspects for finding the best solutions while taking into consideration the needs of each group. In general, freight advisory boards are implemented as stand-alone bodies in medium and small urban areas, with the aim of coordinating different interests and needs.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Facilitate the implementation of freight initiatives and create communication channels between stakeholders 	<ul style="list-style-type: none"> ■ Require a high degree of coordination among different stakeholders

Organisational and technical frameworks for goods logistics strategies in Tel Aviv-Yafo

The city established an appropriate organisational structure to promote **cooperation between** the large number and **variety of stakeholders** involved in urban logistics activities with the aim of improving decision-making processes regarding goods logistics strategy through the continuous collection of information required for decisions to be taken and for a better understanding of the freight movements within a designated area of the city centre.

This **platform** allows the different municipal departments to modify their strategy on the basis of feedback received and tools available to address urban freight logistics.

tinyurl.com/CIVITAS-Tel-Aviv-Yafo





Designation of a City Logistics Manager (CLM)



Similar to the concept of the Mobility Manager, the function of City Logistics Manager (CLM) is designed to reduce demand in relation to the mobility of goods in urban areas. The Mobility Manager as well as the City Logistics Manager represent real intermediaries between the various local stakeholders and the public authority; their task is to reconcile the needs and demands of the different companies, businesses and associations with

those of the public authority and to select proposals for shared actions and plans.

The profile of the CLM should match the need to communicate with the diverse groups that are involved in UFT: freight carriers, engineers, environmental and traffic technicians, elected officials, retailers, as well as the public.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> Good level of acceptance expected due to the institutional role of the designated person 	<ul style="list-style-type: none"> Lack of lessons learned, new tool, not yet implemented

Functions and role of the city logistics manager (clm) - the c-Liege toolbox

The C-LIEGE (Clean Last mile transport and logistics management for smart and efficient local Governments in Europe) project filled the existing gap in know-how and professionalism in the UFL domain by designing, fine-tuning and delivering the complimentary capabilities of a **City Logistics Manager**. For the first time in Europe, the well-known role of the Mobility Manager can now be complemented with that of the CLM. **The role** of the CLM is to manage freight transport demand in urban areas through the:

- classification and analysis** of the situation characteristic of an urban context;
- discussion and sharing** with key local actors (e.g. trade associations, transport operators, traders, retailers, etc.) and institutions (e.g. the province or region, etc.);
- definition of shared intervention strategies** to apply to the surveyed urban context;
- preliminary, definitive and executive planning** of the UFL model;
- monitoring and evaluation of impacts** of the planned and implemented UFL model.

tinyurl.com/C-LIEGE-project

TRANSPORT DEMAND MANAGEMENT





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REGULATORY MEASURES

Regulatory measures (also called "command and control measures") are rules and prohibitions designed to control the activities of private freight operators in order to preserve the liveability of the urban environment and to guarantee an adequate level of mobility. They are usually easier to implement by city authorities and they are also likely to have a higher degree of acceptability among all stakeholders compared with other kinds of measures. This is due, in the main, to their more traditional nature and apparent equity.

These kinds of measures must be supported by a control/enforcement system in order to prevent possible infractions.

Examples of these kinds of measures can be grouped into the following sub-sets: **time access restrictions, parking regulations, environment restrictions, size/load access restrictions, freight traffic-flow management**.





Time access restrictions



These measures impose restrictions on the times when freight activity can take place. The intent is to reduce freight traffic during peak hours in urban areas or to ban nighttime deliveries due to noise constraints.

The promotion of off-peak deliveries in cities is a promising strategy for offsetting the traffic impacts of urban freight. Off-hour deliveries have the potential to reduce peak-hour congestion by giving delivery

drivers a wider delivery window and avoiding traffic delays. Relaxation of such delivery windows can reduce congestion by helping to spread peak freight traffic.

The main types of time access restrictions can be divided into: **daytime delivery restrictions**, **daytime delivery bans**, and **nighttime delivery bans and silent deliveries**.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Improve reliability ■ Improve parking availability during ban interval ■ Increase efficiency ■ Enhance environmental sustainability & safety 	<ul style="list-style-type: none"> ■ High probability of unintended consequences ■ Require a high degree of coordination among jurisdictions ■ Increase congestion during daytime ■ Increase operational costs ■ Reduce operational capacity

Silent nighttime deliveries in Barcelona

During the **CIVITAS MIRACLES** project (2002-2006) the Municipality of Barcelona developed a system for **quiet night deliveries** in collaboration with two supermarket operators, Mercadona and Condis. In Valencia Street, the operator Mercadona demonstrated that night-time deliveries could be made using **adapted trucks and quiet unloading methods**. From the municipality's point of view, greater efficiency was achieved by replacing seven daytime deliveries at times of congestion with two deliveries by larger, quieter vehicles outside peak hours.

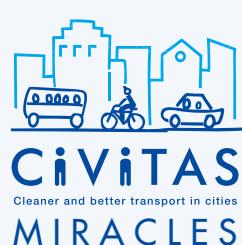
The pilot projects showed that this initiative works and achieves good results: **benefits** in terms of **reduced delivery times** and associated **lower transport operating costs**. The city benefits from **lower**

congestion and a **reduction in emissions** associated with stop-start driving.

Special trucks, special equipment and corresponding driver behaviour are the conditions required. **Good communication** between shop owners, the municipality and the residents is necessary when introducing night-time delivery schemes. A nationwide up-scaling of the Barcelona trial was undertaken by Mercadona, which still operates silent unloading in off-peak hours where access and regulations permit.

tinyurl.com/MIRACLES-Evaluation-results

tinyurl.com/Barcelona-night-deliveries



Parking regulations



Frequently, the number of parking spaces available for delivery is not enough to satisfy the needs of delivery trucks; carriers are forced to double-park as the demand for parking exceeds the linear capacity of the streets. The provision of loading/unloading spaces are a common local policy to organise last-mile delivery operations. Lack of delivery spaces shifts delivery operations to traffic lanes or pavements and leads to congestion and potentially hazardous situations for other street users.

Additionally, the design and location of loading/unloading areas in many cities are often inadequate. Many bays are unable to accommodate trucks (with their handling equipment)

and sometimes bays are designed according to a fragmented vision, often in response to the demand of a local shopkeeper for example, without large scale planning. Recent initiatives have generated more efficient approaches. Special measures, also called 'Peak-hour clearways' have been implemented; these are streets with parking or stopping restrictions during peak hours. These kinds of measures make the movement of all vehicles easier by increasing road capacity.

The main types of parking regulation measures are as follows: **loading and parking restrictions, vehicle parking reservation systems, timeshare of parking spaces, peak-hour clearways**

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Reduce congestion ■ Enhance safety and liveability ■ Increase efficiency 	<ul style="list-style-type: none"> ■ Require enforcement ■ Require public and private-sector acceptance and coordination with other parties ■ May require additional parking space due to high demand

Delivery space booking system in Bilbao

The city of Bilbao developed a **delivery space booking system** as a pilot test within the **FREILOT project**. The system enables the driver to book a delivery space before he arrives at his delivery point. The objectives of the project are to:

- increase the number of stops in delivery areas and to **optimise delivery times**;
- **improve traffic flow** and **reduce congestion**;
- **avoid double parking** and avoid searching for delivery space.

The solution is based on the existing road parking scheme and allows the booking of three types of loading/unloading bays: via the Internet (periodical or punctual) or in real time (if the slot is free). Each vehicle can book slots of 30 minutes, with a maximum of two consecutive slots.

Special lights on the road indicate if the slot is free (green light) or booked (red light). If a vehicle runs out of scheduled time, the operator can reassign a new delivery space according to the new time schedule in order to keep the

delivery area available for other users. The system is open to all **pre-registered users**.

[Zubillaga F., 2011, Bilbao Prototype, FREILOT Project,](#)

[Simeoni T., 2011, ITS per la gestione di piazzole di carico e scarico - Il caso di Bilbao -FREILOT Project](#)





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The vehicles and pedestrians traffic ordinance in Donostia-San Sebastian

The Council of **Donostia-San Sebastian** introduced several measures for **regulating** urban access as well as freight vehicles' **parking and loading/unloading operations** in the city.

The city has **several dedicated parking and loading/unloading** areas for delivery vehicles. Alternatively, urban delivery operators can access and park on one side of the pedestrian zone for the distribution of goods between 7:00 am and 11:30 am. In this case the maximum permissible duration is 40 minutes. After this time window they are not allowed to park on that street and should use dedicated parking spaces for loading and unloading located throughout the city.

Except in the case of special authorization, for the rest of the day, Sundays and bank holidays the zone is reserved exclusively for pedestrians. Circulation and parking is never allowed in some unauthorized areas, such as where the access to or exit from residential or commercial buildings is precluded, where two vehicles are prevented from passing each other, where access by cleaning or emergency vehicles is prevented, or where the streets are so narrow that pedestrian traffic would be precluded.

tinyurl.com/Donostia-San-Sebastian



Donostiako Udala
Ayuntamiento de San Sebastián





Environmental restrictions



These kinds of measures are aimed at preserving the liveability of city centres by trying to reduce the negative externalities produced by freight vehicles, both in terms of emissions and noise. These strategies have a twofold positive effect: on the one hand they reduce the environmental impact of freight traffic, while on the other hand they foster the use of clean technologies by promoting the use of electric or low-emission vehicles for urban deliveries. Vehicles renewal programmes can support this type of initiative.

The introduction of Low Emission Zones may ban all vehicular traffic, or just vehicles that do not meet a minimum environmental standard (engine-related restrictions).

The main environmental restriction measures are as follow: **emission standard & engine-related restrictions, noise programmes/regulations, low emission zones.**

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Enhance environmental sustainability and liveability ■ Increase efficiency ■ Facilitate off-hour deliveries ■ Social acceptability 	<ul style="list-style-type: none"> ■ Require high capital investments for the private/public sector ■ Require coordination among municipalities and control/enforcement ■ Require private-sector cooperation ■ High probability for unintended consequences

[Low emission zone \(lez\) in Gothenburg](#)

A **Low Emission Zone** was originally introduced to improve air quality in Gothenburg in 1997 and was then extended to cover a larger area in 2007. **All HGVs (over 3.5 tonnes gross laden weight) are required to meet Euro 4 emissions standards.**

The year after the extension of the LEZ, some 96% of HGVs operating in the city centre met Euro 4 emissions standards and the city authority expected to **reduce the amount of PM₁₀** by 1 tonne and of **NOx** by 40 tonnes each year between 2007 and 2013.

The impacts measured after four years since the establishment of the ban showed a significant decrease in **PM₁₀** per year. In Sweden seven cities are using LEZs: Gothenburg, Helsingborg, Lund, Malmo, Molndal, Stockholm, Umea and Uppsala.

tinyurl.com/Environmental-zones-in-Sweden

tinyurl.com/Goteborgs-Stad

tinyurl.com/CIVITAS-Goteborg



Size/load access restrictions



These kinds of measures are aimed at increasing the liveability of urban areas and optimising the use of public space, specifically of public streets. More specifically, restrictions that prevent vehicles of a certain weight or size (length or width) from using a particular road or area can result in benefits on congestion levels and on road accident rates caused by large trucks.

Moreover, in order to reduce the number of freight trips entering a target area, these strategies can also impose a minimum load factor per truck.

These measures generally induce cargo consolidation and increase efficiency of urban deliveries. Load factor restriction measures are, however, not easy to implement. Load factors are, in fact, the result of specific market conditions, rather than purely logistical decisions. Furthermore, target areas are most often at the end of the delivery chain where the load factor is, not surprisingly, expected to be low.

The main size/load access restriction measures are: **vehicle size and weight restrictions, load factor restrictions.**

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Enhance environmental sustainability, liveability, improve accessibility and safety ■ Reduce infrastructure damage ■ Increase efficiency and cargo consolidation 	<ul style="list-style-type: none"> ■ Require coordination among municipalities ■ Very hard to enforce ■ High probability for unintended consequences

[Ecologistics in Parma](#)

The basic idea of the overall **ECOLOGISTICS** scheme is to allow operators to choose between two options for accessing the city centre.

They can "**credit**" their **vehicles** if they meet some **specific requirements** regarding: type of goods to be transported, the use of eco-friendly fuels (CNG, bi-fuel or electric and/or Euro 3, 4, 5), the use of vehicles not exceeding 3.5 tonnes, a threshold value **loading factor of at least 70%** and the use of a location system for vehicle traceability.

Alternatively, they simply do not have access to the city centre: they unload their goods at the CAL platform: goods are then consolidated and delivered in the city centre by the ECO CITY service.

tinyurl.com/Parma-Ecologistics





Freight-traffic flow management



Some measures are applied in order to prevent freight vehicles from using inadequate or sensitive routes that can be inappropriate in medium-sized urban contexts. These rules impose special restrictions by specifying the routes of the transportation network that cannot be used by freight traffic.

Other options are the use of available road capacity by allocating rights of way to restricted lanes to trucks or other

categories of vehicles. Lane usage can be allocated to different users according to time windows: it can be shared by all users at specific time periods or assigned only to certain users all day.

The main freight-traffic flow management measures are: **truck routes, restricted multi-use lanes**

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Enhance environmental sustainability and safety ■ Increase efficiency ■ Provide useful info and guidance to cargo drivers ■ Discourage unnecessary truck movement in sensitive areas 	<ul style="list-style-type: none"> ■ High probability for unintended consequences ■ Challenging to ensure accessibility ■ Require proper communication, education and enforcement by authorities ■ Require high degree of coordination among jurisdictions ■ May not be adequate for sensitive locations

Priority network for heavy goods vehicles in Malaga

The measure aims to design and implement a **heavy goods vehicles (HGV) priority network**, in order to limit and regulate their presence within the city consolidated area. The network will allow HGV to access Malaga Port only in accordance with a **specific itinerary**, going from the highway ring entrance in the west-coast along the city waterfront, until the Port.

tinyurl.com/CIVITAS-Malaga

The main objectives of the measure are:

- to avoid a situation of conflict with other urban activities, for which HGV involve a visual intrusion, noise pollution and high occupancy levels on the roads and the rest of the urban space;
- to establish valid routes and timetables, as well as to develop technological measures for monitoring HGV traffic within the city.



MARKET-BASED MEASURES

Market-based measures are intended to intervene in relation to delivery costs, with the aim of using the price mechanism to persuade operators and their customers to change their transport behaviour. Changes in prices have been proven to have a direct effect on the behaviour of freight industry operators as the sector is highly competitive.

These strategies can act as levers on the three components of the urban freight system: vehicle, fuel, and traffic. Economic leverages are: pricing and charging (road pricing, congestion charging, and parking charges), taxation, tradable permits and mobility credits, subsidies and incentives.





Pricing (road pricing, congestion charging and parking charges)



These are the most common options adopted by local authorities to reduce externalities of road transport in general.

Road pricing means that motorists pay directly for driving on a particular roadway or in a particular area. Charges can be fixed or variable according to a vehicle's emission standards if the reduction of emissions is the target.

Congestion charging refers to variable road tolls (higher prices under congested conditions and lower prices or free passage at less congested times) established in central areas to reduce peak-period traffic volumes. Tolls can be dynamic, meaning that rates change depending on the level of congestion that exists at a particular time. Examples include

charging that affects the costs for logistics operators of entering a designated urban area.

The main challenge affecting freight vehicles parking in cities is the lack of space, especially in historical centres. This results in parking violations and fines. Through **parking charge** schemes, motorists pay directly for using parking facilities. These schemes can be established for the use of kerb space, some being based on fixed rates, others involve variable pricing schemes and are generally implemented as part of a group of strategies. The general aim is to manage freight demand in order to reduce freight traffic entering the city and minimising parking dwell times.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Provide effective price signals to private-sector freight operators to adapt their behaviour ■ Can be implemented independently of other measures ■ Enhance city liveability and generate revenues for financing construction and maintenance investments 	<ul style="list-style-type: none"> ■ Tend to encounter strong opposition from citizens and private operators that are affected ■ Parking charges require large kerb spaces to be allocated for freight vehicles ■ Parking charges seem to have limited effectiveness as a demand management tool

Road pricing in Oslo

The Oslo scheme is a simpler **"road user" charging scheme** which started in 1991. The toll is collected from the drivers through **"toll rings"** covering all roads leading into the central parts of the cities.

In Oslo the objective was not to reduce traffic or the pollution from vehicles, but rather to levy new funds in order to **finance a package of new infrastructure investments**.

Toll systems were also introduced in Trondheim (1983) and in Bergen (1986). The schemes are operated by private companies partially owned by the city councils. The toll for **vehicles under 3.5 tonnes is 1.5 – 2 euros and 3.5 - 4 euros for vehicles over 3.5 tonnes**.

tinyurl.com/OSMOSE-Oslo

tinyurl.com/BESTUFS-Good-Practice-Guide





Area C: the congestion charge in Milan

Milan adopted the "**AREA C**" scheme (C stands for congestion charge), a combined LEZ and urban **road charging scheme** in force in the central area. The scheme entered into force on 1st January 2012 when the previous ECOPASS scheme (a pollution charge scheme) stopped working. The road charging scheme operates on weekdays, from 7:30 am - 7:30 pm, Thursdays from 7:30 - 6:00 pm and does not operate on weekends or bank holidays. The fee is 5 euros for all vehicles.

The payment allows users to travel for the whole day in the area to which the charge relates. **Special terms** are apply to **registered duty vehicles** (5 euro ticket for entrance plus two hours of free parking, or a 3 euro ticket for entrance only - with no parking facilities). Entrance is forbidden for gasoline pre-EURO and diesel pre-EURO, EURO1 and EURO2 vehicles. The decline in the number of cars has led to a **significant reduction in harmful emissions**, particularly black carbon (-30%), a component of particulate matter considered by experts to be the most toxic to human health.

tinyurl.com/Milan-Congestion-Charge





Taxation (and tax allowances)



Taxation is routinely used to raise revenues and foster behavioural changes that will lead to public benefits. Taxation can be imposed on vehicle emissions, fuel, vehicle ownership or use.

By contrast, tax allowances can be applied on the purchase of new vehicles (examples include tax incentives or tax allowances for consumers who buy electric vehicles or for companies that use energy-efficient equipment).

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Significant revenue generation 	<ul style="list-style-type: none"> ■ Difficulty in determining the exact charge

The swedish clean vehicles programme in Stockholm

In Stockholm a **clean vehicles programme** has been run by the Environment and Health Administration of Stockholm since **1994**. The aim is to **speed up the transition to clean vehicles** and renewable fuels. The scheme introduced **monetary incentives** for **clean vehicles** and, in a second phase, the city introduced a **purchase subsidy** for transport companies.

Discussions with the national government together with other cities and NGOs led to **tax discounts** on vehicles and fuels – first on a trial basis for a few years and ultimately as a **long-term national policy**. The city offered **subsidies** for a few, chosen clean vehicle models that still were expensive, making the costs 10 - 50% lower (vehicles included 3,000 delivery vans running on ethanol). The city also provided free parking for clean vehicles owned by residents or companies using their vehicles for commercial traffic (a special permit is needed).

tinyurl.com/CLEEN-FLEETS

tinyurl.com/C40-Case-Studies-Stockholm

tinyurl.com/Stockholm-J-Ericson





Tradable permits and mobility credits



These measures involve the introduction of a pricing scheme based on the mobility credits model in order to reduce high levels of congestion and pollution in busy city centres. The mobility credits model establishes the total amount of "acceptable" emissions within a specified zone of a city and then allocates them to economic operators such as retailers and occupiers of offices to enable them to "purchase" freight transport services that are not subject to additional access charges or restrictions.

When credits have been used up, more credits can be purchased from the city authority or, if a market has been established, from economic operators who have a surplus of credits. It therefore provides a financial incentive for the receivers of freight in city centres to analyse and carefully plan their deliveries to avoid exceeding their mobility credit budget.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Could be effective in changing the behaviour of the receivers of freight in city centres ■ Achieve predefined environmental or traffic-related targets 	<ul style="list-style-type: none"> ■ Likely to be difficult to design and implement in an equitable way because of the practical difficulty of valuing and allocating mobility credits to different kinds of operator ■ May entail resistance from operators to the increased costs ■ May be difficult to implement from a political perspective

Mobility credits for goods distribution in Genoa

The mobility credits system called "Mercurio" was the first test-case ever of this approach, both on a European and global level. It consisted in making the access of freight vehicles to a target area subject to a self-adapting charging scheme based on credits (virtual money). Each economic operator settled in the historical centre has the right to a predetermined amount of credits.

- Transporters had their own **virtual account** too, which started from zero; **each access to the area was charged** (in credits), and for each freight delivered they received credits transferred from the operators.
- The target area boundaries were equipped **with automatic number plate recognition gates**, which were able to register vehicles entering the area.
- When their starting budget had been fully used, the economic operators were able to **buy additional credits** from the municipality.

Due to strong opposition of operators the measure was finally abandoned, but with stakeholders and actors involved from the beginning, such a measure has the chance to be a valid option for achieving sustainable urban freight logistics.

tinyurl.com/CIVITAS-Genova

tinyurl.com/cities-to-cities-exchange





Incentives and subsidies



The opposite of taxation and tolls is the use of incentives or subsidies to encourage the development of sustainable urban distribution. The direct provision of incentives or subsidies by local authorities to operators is not widely used because it is too expensive, while provisions entailing cost advantages (indirect incentives) are more frequently used.

To this extent, incentives are designed to encourage more sustainable and energy-efficient urban freight transport by

offering economic (or access) advantages to operators and/or shippers. Incentives may be economic (i.e. offered when purchasing electric or low emission vehicles) or competitive (i.e. rewarding those operators, who are in compliance with scheme requirements such as limits in relation to emissions standards, load factors, etc., with the right to access environmental zones for extended time intervals, to use reserved bus lanes, etc.).

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Foster the use of environmentally friendly vehicles 	<ul style="list-style-type: none"> ■ Require (albeit minimal) investment of public resources

The promotion of electric vehicles in Madrid

Madrid, through its **Air Quality Plan 2011-2015**, has developed a group of nine measures specifically focused on e-mobility, including the development of a strategic framework for the **promotion of electric vehicles**, mobility advantages for cleaner vehicles, vehicles tax incentives and voluntary agreements with the private sector. The use of electric vehicles was also promoted through measures such as:

- exemption from the municipal street parking regulation (**unlimited free parking** is available for electric and plug-in electric hybrid vehicles),
- **free recharge** at 24 street points,
- **75% reduction in municipal tax on motor vehicles** (during the first 6 years for hybrids and permanent for electric and plug-in hybrid electric vehicles) and
- **a discount on the annual fee for freight operations for hybrids** (free for electric and plug-in electric vehicles).

tinyurl.com/C40-Case-Studies-Madrid

tinyurl.com/CIVITAS-Madrid





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Funding scheme for cargo bike in Graz

The City of Graz **grants subsidies for cargo bike investments** with 50% of the investment costs up to 1000 euros.

Eligible are companies and institutions like couriers, schools, universities, building and property management companies. The city defines eligible purposes and limits the number of grants to one bike per institution or company. The eligibility criteria for this subsidy were compiled and elaborated within the EU project CycleLogistics. **Subsidies are granted for cargo bikes with 2 or 3 wheels** and the city recommends purchasing the bikes at specialist shops. The process is very easy: to receive the money,

companies only need the invoice, a written application and a copy of their trade licence or excerpt from the companies register. Since 2011, **the programme has supported 34 cargo bikes**.

Another Austrian city in the region Styria adopted the same scheme: the city of Hartberg funds the purchase of cargo bikes and trailers. The funding is up to 50% of the purchasing price and up to 500 euros.

tinyurl.com/CLEAN-AIR-Cargo-Bikes

tinyurl.com/CYCLELOGISTICSAhead-Project





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LAND USE PLANNING & INFRASTRUCTURE MEASURES

Land use planning measures change the private use of space in urban areas for the public good, 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. Examples include planning regulations that allocate space to logistics activities in urban areas and that require to provide for on-street and off-street loading/unloading areas for freight vehicles as well as land use planning for modal integration.

Infrastructure measures, which are often integrated into land use planning measures, are the most substantial category of measures and are usually implemented by public authorities. Due to the high cost of planning, implementing, and maintaining transport infrastructure in urban areas and their perception as being for the "public good", city authorities are often the only actors willing and able to fund their implementation. Moreover, reaching the break-even point may take a long time (particularly, to achieve a critical mass of freight volume handled).



Adapting on-street loading zones



On-street parking measures are aimed at adapting existing street designs and loading areas to accommodate current and future traffic and commercial vehicles volumes. The measures focus on allocating adequate kerb space for parking and loading activities. Parking places and loading-zone-related strategies focus on designating and enforcing kerbside parking, reallocating kerb space, and identifying potential freight traffic parking locations.

This initiative requires significant effort to coordinate multiple stakeholders, from planning to transportation organisations,

in order to update and modify current regulations, land use codes, and re-zoning strategies. Careful planning is needed when allocating kerb space or implementing fees or other parking constraints. Investment costs for updating parking regulations are low and implementation times short. Increasing the capacity of parking and loading areas is an easy and low-cost way to reduce congestion and improve traffic. The freight industry usually reacts very positively to this policy as it makes it easier for them to do their job.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Enhance environmental sustainability ■ Reduce congestion ■ Improve operational efficiency ■ Enhance safety ■ Reduce traffic/parking violations 	<ul style="list-style-type: none"> ■ May require retrofitting existing developments ■ May result in lack of kerbside space ■ Require public and private-sector acceptance ■ May not be feasible at specific locations

Kerbside loading guide in London

This guide, commissioned by the Transport for London (TfL) Freight Unit, aims to meet the information needs of those involved in **providing kerbside loading facilities** on London's road network. Comprehensively addressing relevant freight and delivery issues, it sets out to aid decision-making and to assist and influence everyone involved with the streetscape. Ignoring demand for loading and delivery activity can create congestion, harm road network performance and reduce the effectiveness of traffic engineering schemes (e.g. bus priority measures).

By contrast, **facilitating kerbside loading** at the right place and time, through a combination of appropriate physical infrastructure and traffic regulation/management orders, **improves traffic flow** and **benefits the local economy**. Kentish Town, in the London Borough of Camden, has developed a programme of "waiting and loading review" with the aim of **simplifying parking controls** and, where possible, both **increasing short-stay parking provisions** and **introducing additional loading bays**.

tinyurl.com/TfL-Kerbside





Using building code regulations for off-street delivery areas



This measure involves 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, the number of on-street loading/unloading activities

causing congestion and obstruction due to the high number of delivery trucks and the related heavy burden on public streets can be reduced. Markets, bars, and restaurants are the most relevant targets for this measure as they generate very frequent deliveries.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Reduce congestion ■ Enhance environmental sustainability ■ Enhance safety ■ Increase operational efficiency ■ Improve inadequate infrastructure ■ Low probability for unintended consequences 	<ul style="list-style-type: none"> ■ Require private-sector acceptance ■ Require high capital investment costs when constructing or retrofitting existing infrastructure ■ May require updating of existing development regulations ■ May require political consensus on updating design standards ■ Require available space for off-street loading

Design and adaptation of off-street delivery and storage areas in Barcelona

The results of local surveys carried out by the Municipality of Barcelona showed that many public markets as well as shops and businesses in private buildings were not properly designed and organised to allow goods handling and storage. The remodelling of the Mercat de la Concepció in 1998 was the start of the initiative to **provide off-street cargo handling space in public markets**. Other follower applications involved the public markets of Sta Caterina, St Antoni, Ninot and La Boqueria.

For the private sector, in 1999 the city adopted the "Ordenança Municipal de Previsió d'espais per a càrrega i descàrrega en els edificis", a local ordinance that re-organised several **regulations to build off-street delivery areas** or storage areas within newly built business establishments and stores, with the objective of **reducing the number of on-street operations**.

The ordinance states that all new buildings of at least 400 m² have to arrange at least one **delivery zone within their premises**. New bars and restaurants have to build a **storage area with a minimum size** of 5 m² or 5% of their total floor area. The remodelling of public markets as well as the loading/unloading and storage areas in private buildings could include the design and provision of proper facilities for cycle logistics.

tinyurl.com/SUGAR-Handbook





Nearby delivery areas



The lack of parking and loading facilities aimed at receiving freight may require the use of staging areas (or nearby delivery areas). The objective is to develop an implementation-site and off-street areas at businesses or facilities that regularly receive freight. The establishment of common loading areas for sites that are large traffic generators or for other multi-tenant facilities may be a viable option. Alternatively, municipalities might foster the development of nearby delivery or staging areas that could serve as urban transhipment platforms.

These areas might be implemented on public or private parking lots, empty lots, or other spaces that can accommodate a number of freight vehicles to conduct loading and unloading activities. In these staging areas, cargo can be unloaded from freight vehicles and loaded onto trolleys, carts, or other vehicles for last mile distribution.

This initiative requires private-sector acceptance and may generate resistance from nearby residents.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Reduce congestion ■ Enhance environmental sustainability ■ Enhance safety ■ Improve mobility ■ Improve inadequate infrastructure 	<ul style="list-style-type: none"> ■ Require private-sector acceptance ■ May require high capital investment ■ Require additional space ■ May generate resistance from nearby residents

Nearby delivery areas in Bordeaux

In Bordeaux, a system was established in 2003 to facilitate the delivery of goods in the city centre, involving the creation of '**nearby delivery areas**' (Espace de livraison de proximité - ELP). ELP is an area of street space that has been dedicated to goods vehicles for the **loading and unloading of goods** destined for nearby shops. This space is reserved and controlled by up to **two members of staff** who can also help goods vehicle drivers to deliver their goods to the shops using trolleys. The ELP approach comprises the installation of an **urban transhipment platform** on which dedicated personnel provides assistance for the dispatching of consignments for the last mile (inner city). Goods are unloaded from incoming vehicles, and can be loaded onto trolleys, carts, electric vehicles and bicycles for the final distribution leg. The space can accommodate **3 to 5 delivery vehicles at once** (it is about 30 metres wide). The ELP operates from Monday to Friday between 9:00 am and 5:00 pm and on Saturday between 9:00 am and 11:00 am. ELPs are also being established in other French cities (e.g. Rouen).



tinyurl.com/BESTUFS-Guide

tinyurl.com/Espace-de-livraison-de-prox





Upgrading central off-street loading areas



Shopping centres and large stores in central business districts have limited space and often have insufficient or out-dated loading docks. This initiative recommends redesigning docks to accommodate the geometric needs of current and future trucks. Access to and egress from these areas are also important (for instance adequate distance from intersections facilitates cargo operations and minimises traffic impacts).

Truck access should be separated from car and pedestrian access for operational, security, and also aesthetic reasons. Changing design standards and building/zoning codes would not be costly. By contrast, retroactively updating existing loading docks or constructing larger loading docks could be very expensive. The measure requires private-sector acceptance, high capital investment, and additional space.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Improve urban planning ■ Enhance liveability ■ Reduce unintended consequences ■ Reduce congestion 	<ul style="list-style-type: none"> ■ Require coordination among multiple stakeholders/jurisdictions

The freight transport association loading dock safety guide

Loading docks present a number of significant risks that require careful management. Differing specifications for docks and vehicles, visiting drivers, and the lack of direct communication between drivers and warehouse staff all contribute to potential problems. The Freight Transport Association (FTA) has developed a guide for delivering safe, efficient, and sustainable logistics.

tinyurl.com>Loading-dock-safety



Integrating logistics planning into land use planning



A more proactive approach is to incorporate freight planning into the land use planning process by identifying areas of conflict between freight activities and other land uses. By understanding the sources of conflict between freight activities and other land uses, efficient strategies for a compatible development can be delineated and selected.

The implementation of this initiative requires a multi-layered, multi-stakeholder collaborative approach and a strong cooperation between all the actors. City authorities should develop urban logistics plans to ensure that urban freight transport measures are developed following an analysis of the likely impacts and only after extensive consultation. These plans should include the collection of some freight data and some ex-ante and ex-post evaluation of impacts.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Improve urban planning ■ Enhance liveability ■ Reduce unintended consequences ■ Reduce congestion 	<ul style="list-style-type: none"> ■ Require coordination among multiple stakeholders/jurisdictions

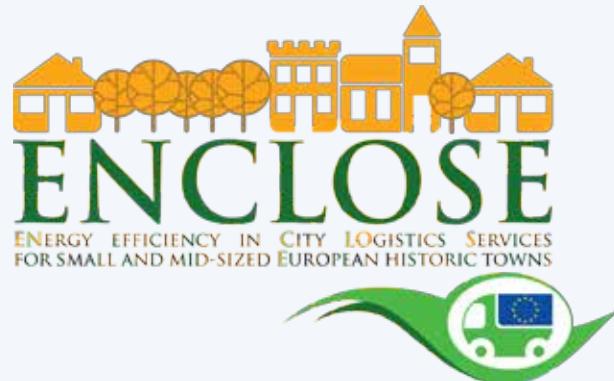
Sustainable urban logistics plans - the enclose project

The ENCLOSE Project considers **Sustainable Urban Logistic Plans** (SULPs) to be one of the essential parts of the town mobility plan. It aims to address the development of a SULP in each ENCLOSE town, while taking its relation with the Sustainable Urban Mobility Plan (SUMP) into account.

The ENCLOSE project aims to raise awareness about the challenges of **energy-efficient and sustainable urban logistics in European Small and Mid-sized Historic Towns** (SMHTs) and about the concrete opportunities of achieving highly significant improvements and benefits by implementing and operating suitable and effective measures, schemes and framework approaches specifically targeted at such urban environments.

Within the ENCLOSE project **9 cities** (forerunners: Lucca, Trondheim and Den Bosch and learner cities: Burgos, Almada, Dundee, Alba Julia, Serres, Balchik) have **developed discussed and adopted SULPs** based on a participatory and integrated approach for embedding the logistics strategy in the overall urban mobility policy.

tinyurl.com/ENCLOSE-Project





Collection points



This initiative promotes the use of specific locations for pick-up and deliveries, such as on-street automated locker systems, parcel shops and post offices as well as mini-depots. In this scheme trucks deliver to collection points and customers travel to these pick-up areas to get their goods. This practice reduces delivery costs by concentrating deliveries and reducing delivery failures. However, since customers must pick up the orders using their own cars, it may increase overall traffic.

To be socially beneficial, these points need to be located at places where customers only need to make short deviations from their daily routines. City authorities should collaborate with private-sector courier and parcels operators to develop networks of pick-up points for e-commerce parcels, in locations that are convenient for customers but also minimise the use of private cars. Pick-up/drop-off sites are to be considered after careful examination of specific local conditions. The main costs are likely to be related to ensuring security and organising the inventory.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Increase efficiency ■ Reduce operational costs ■ Enhance environmental sustainability ■ Reduce vehicle miles travelled ■ Locker banks can be used to replace post offices in rural areas 	<ul style="list-style-type: none"> ■ May cause security and liability issues ■ May induce an increase in traffic at/in the vicinity of the area/facility ■ Require economies of scale on the vendor's side ■ Require warehouse management and inventory organisation ■ Require coordination among multiple stakeholders/jurisdictions

The Berlin bentobox

Bentobox is a **locker system or pack-station with removable trolleys** and was firstly tested under the CITYLOG project in Berlin in 2012. Instead of just being used by one single carrier, it is based on a flexible container system comprising two elements: a fixed docking station containing a user interface and control unit and a chassis divided into six modules in which multi-owned, moveable and transportable trolleys can be locked.

Similarly to other B2C locker systems it can be installed in residential districts, shopping malls or at transport nodes – wherever a critical mass of customers can access it with short pick-up distances. The idea is that more couriers can already fill the trolleys in their warehouses, and then transport trolleys to a number of shared Bentobox docking stations. The last mile parcel-tracking device notifies the receiver if a parcel has been delivered to the Bentobox. Residents and shop owners can also deliver parcels to the Bentobox, in which case the logistics operator is notified.

Berlin also tested the Bentobox as a consolidation hub and trans-shipment location between vans and cargo bikes for last-mile home delivery. The integration of the Bentobox in bike messengers' operations resulted in the de-coupling

of the delivery (or collection) process, which resulted in a larger working area for the bike couriers.

tinyurl.com/Polis-Berlin-Bentobox

tinyurl.com/TRAILBLAZER-Berlin



Urban Consolidation Centres (UCCs)



This measure contributes to the reduction of freight traffic circulating within a target area by promoting the consolidation of cargo shipments at one or more urban terminals. Carriers that would otherwise make separate trips to the target area with low load factors, transfer their loads to a neutral carrier that consolidates the cargo and manages the last leg of the deliveries. Conceptually, this may include "joint delivery systems", "cooperative logistics," and "urban distribution centres".

However, UCCs have a mixed success record since they have struggled to attract a sufficient number of users. Some of the obstacles faced include: competitive pressures that discourage suppliers from participating; overall costs that are frequently higher than direct deliveries once the UCC's space costs are taken into account; and the difficulty of finding enough suitable space for a UCC in urban areas where property is at a premium and often unavailable. As a consequence, public subsidies are often necessary, and if they do not materialize, most UCC operations come to an end. However, UCCs could be financially viable if they attract a significant amount of cargo.

City authorities should focus on providing incentives to encourage the use of UCCs through regulatory differentiation in favour of vehicles operating from UCCs,

rather than direct capital and operating subsidies to private-sector operators.

The main advantages are: improving load factors, reducing congestion, reducing vehicle kilometres travelled, and promoting environmental sustainability. By contrast, the main disadvantages are: low probability of being sustainable due to different factors (opposition from unions and suppliers, requirement of public subsidies, increase of operational cost), high capital investments, extremely large physical space requirement, and increase in traffic near the UCC.

The e-commerce and on-demand service boom (e.g. grocery, food and meals orders via smartphone) combined with the offer of same-day or instant delivery is increasing the demand of medium-sized fulfilment facilities and of dedicated and centrally-located urban logistics spaces. These facilities, also known as urban micro-consolidation centres (UmCCs), are emerging in densely-populated areas as additional transhipment points.

UmCCs serve as typical warehouses for the consolidation and bundling of goods and for the organisation of last-mile deliveries with smaller and cleaner vehicles (e.g. electric micro vans or cargo bikes).

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Improve load factors ■ Reduce congestion ■ Enhance environmental sustainability ■ Reduce kerbside occupation time 	<ul style="list-style-type: none"> ■ Opposition from unions and suppliers ■ Require public subsidies ■ Increase the operational cost ■ High capital investments ■ Extremely large physical space ■ Difficult to enforce ■ Increase in traffic at/in the vicinity of the area/facility





Smart choices for cities Making urban freight logistics more sustainable

The cityporto of Padova

Cityporto is a logistics scheme for urban freight consolidation and distribution that has been successfully operating in Padova since 2004. It consists of an **urban consolidation centre** located in the freight village Interporto Padova, an environmentally friendly fleet of hybrid and CNG vehicles, a dedicated ITS system and a set of coordinated local rules for urban freight transport.

The Cityporto model is based on a **voluntary subscription**: freight transport operators can choose to join the initiative and thus benefit from easier access to the city centre for freight deliveries, rather than continuing to access the city according to general time-slots. **Cityporto vehicles are allowed to:**

- **enter the city 24 hours a day;**
- **use reserved public transport lanes;**
- **use dedicated loading bays** for their loading/unloading operations.

tinyurl.com/Cityporto

tinyurl.com/ELTIS-Padova



The cycle logistics micro hub of Donostia-San Sebastian

During the CIVITAS ARCHIMEDES project (2008-2012), the city of **Donostia-San Sebastián** started to implement a strategy for a more efficient system for goods distribution in the old city centre.

The strategy was based on the creation of a urban consolidation centre for last mile distribution, **the use of clean vehicles**, regulatory options to improve loading factors, increased control in the use of loading bays, a night distribution protocol and the use of new technologies to facilitate communication between distributors and local shops, including communication with the municipal police and the possibility of reserving loading and unloading zones.

The city combined the **new urban consolidation centre** with the use of **electric cargo bikes** for last mile goods distribution in the inner city. In one year, the fleet of 6 pedal-assisted tricycles, each with a cargo capacity of 1,500 litres or 180 kg, performed about 21,000 shipments, saving up to 26,849 kilometres in van and truck journeys. This approach led to a **significant reduction in terms of energy consumption and harmful emissions**. The distribution centre is located in the city centre and covers approximately 500m².

tinyurl.com/CIVITAS-San-Sebastian

tinyurl.com/CYCLELOGISTICSAhead-Project





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NEW TECHNOLOGIES

The role of new technologies in the optimisation of urban logistics can be very diverse. Intelligent Transport Services (ITS) can be exploited to allow freight vehicle drivers to opt for alternative routes in response to information received regarding urban road network conditions.

Alternatively, new technologies can be applied and tested to promote the development and spread of low emission vehicles (LEVs) for "last mile" deliveries. Currently, there

is a clear distinction between road traffic management and freight management. However, there might be mutual benefits in cooperating as road traffic management can plan the transportation infrastructure to provide more optimised conditions for freight vehicles, while freight vehicles can act accordingly to ensure a safe and efficient environment. Both infrastructure utilization and logistics performance will benefit from the cooperation. Freight vehicle drivers will benefit from more integrated communications and plans.





Dynamic routing



Dynamic routing systems are used by public authorities to enhance safety and prevent violations of access regulations. Truck routing and the decision support system are based on

Intelligent Transportation Systems; they require high-quality real-time traffic data, information on the road network and land use in the area.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Increase efficiency ■ Improve reliability ■ Reduce congestion ■ Enhance environmental sustainability 	<ul style="list-style-type: none"> ■ Require real-life traffic information ■ Require very high/high capital investments

Freight routing optimisation in Vienna

ILOS (Intelligent Freight Logistics in Urban Areas) is a project of **Freight Routing Optimisation** in Vienna with two main objectives: to develop and define possible indicators to show the potential time and/or distance savings based on information of traffic flows; i.e. **delivery routes are optimised with the help of traffic data**. The use of floating car data for real-time navigation enhances the routing solution:

- the selection of optimal routes and the avoidance of stop & start driving conditions **reduces emissions** and **saves costs**;
- route optimisation **reduces journey times**.

The first stage of the project has achieved a **60% reduction in travelling time**, a **15% reduction in distance**, a **20% reduction in fuel** and a **30% reduction in cost**.

tinyurl.com/BESTFACT-Project



BESTFACT
 Best Practice Factory
 for Freight Transport



Real-Time Information Systems (RTIS)



Real-Time Information Systems are a set of technologies and strategies that can help monitor and manage traffic based on real-time traffic information in terms of 1) road safety, 2) reduction of congestion, 3) regulatory compliance, and 4) supply chain information. RTIS

rely on a computer system that responds to activities/facts (captured data), generates an immediate response (information to user), and has a direct impact on real-time decision-making for freight transportation system users and managers.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Increase efficiency ■ Reduce operational costs ■ Improve reliability ■ Reduce congestion ■ Enhance environmental sustainability 	<ul style="list-style-type: none"> ■ Require real-time traffic information ■ Require very high/high capital investments ■ Require management of data

Variable message signs (VMS) regulating multi-use lane

Within the SUGAR project, the city of Barcelona developed VMS displaying **real-time access regulations on multi-use lanes for freight vehicles**. Today, seven multi-use lanes with VMS technology exist in Barcelona. Through better regulation of traffic and parking on major boulevards, the objectives of this measure are:

- **to reduce travel times** and search times for delivery parking spaces;
- **to optimize the use of the street space;**
- to suppress double parking.

The main result has been a reduction of between 12-15% in travel time and more fluid traffic.

tinyurl.com/ITS-international

tinyurl.com/SUGAR-Handbook





Traffic control



These are strategies to monitor and control traffic with the aid of signs, equipment, and devices. Among the approaches used to assist truck drivers are signs that provide information

about speed limits, access restrictions, loading zones, and other regulations. Another type of initiative focuses on the coordination of traffic signals.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Increase efficiency ■ Enhance environmental sustainability ■ Decrease congestion ■ Enhance safety ■ Improve system performance ■ Reduce number of stops ■ Reduce travel times 	<ul style="list-style-type: none"> ■ May produce adverse effects on other modes

Marking routes for smooth freight and city logistics in Tallinn

As a significant harbour city, freight and passenger transport generate a high traffic flow in Tallinn. Goods transport causes congestion and high volumes of exhaust gas emissions in the city centre. The objectives of the measure were to **define freight traffic corridors** in and out of the city, to **divert freight transport** along these corridors and to **raise truck drivers' awareness** of the new freight traffic concept.

To achieve its goals, the city of Tallinn decided to work out an **optimal freight route** from the old city harbour to the national road network by installing a **new guidance sign system** for the freight route, **making freight routes for GPS** car navigation systems available for free and disseminating the information among truck drivers by

way of **posters and booklets**. The key results from the measure were:

- **40%** of the interviewed truck drivers have noticed the new guidance sign system installed under the measure;
- the **number of visits** to the Tallinn HGV web pages –amount to **167 times** from the Estonian language page and **60 times** from the English language page;
- the number of **downloads of GPS** navigation routes was amounted to **188 times** for the TomTom format and **129 times** for the Garmin format.

tinyurl.com/CIVITAS-Tallinn





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ECO-LOGISTICS AWARENESS RAISING

Eco-logistics measures are intended to promote eco-friendly (but also economic) sustainability in urban distribution. Businesses have been concentrating on improving supply chain visibility, refining efficiency, and minimising cost; but now, many of them have shown that there is a link between improved environmental performance and financial gains.

A review of the most relevant measures to achieve "green or sustainable logistics" has identified the most promising actions to be developed by local authorities together with private companies.





Anti-idling



These measures focus on the reduction of the pollution caused by idling truck engines. The most popular anti-idling technologies are fuel-operated coolant heaters, auxiliary power units, and truck stop electrification.

Anti-idling programmes will play a more critical role as gas prices and environmental awareness increase. The main costs lie in the development of anti-idling technologies and

environmental awareness campaigns. The success of these strategies, however, depends on an integrated consideration of regulations, technologies, financial incentives, public education, and an effective coordination between all the stakeholders involved. It might therefore prove difficult for this measure to be broadly implemented and it will require high/moderate capital investments.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Reduce fuel consumption ■ Environmental sustainability 	<ul style="list-style-type: none"> ■ Difficult to implement broadly ■ Require high/moderate capital investments

Anti-idling toolkit in London

Transport for London has developed an **anti-idling toolkit** as part of its Clean Air Fund Programme. The toolkit offers practical **advice to help to reduce levels of unnecessary vehicle idling**, which will save money while helping to reduce harmful emissions from a company's operations. Several companies have adopted the guidelines of the promotional campaign.

The Travis Perkins Group is the UK's biggest supplier of building materials to the trade, construction industry and serious DIYers, with brands that include Travis Perkins, Wickes, BSS Industrial and Toolstation with a fleet of 3,000 vehicles nationwide. Because of the nature of their deliveries and the need to run ancillary equipment Travis Perkins will never be able to eliminate idling completely, but by implementing a monitoring system they have:

- **cut idling time by around 70 minutes per vehicle per day;**
- **saved over 1 million litres** of fuel between 2009 and 2011;
- **saved over 2,440 tonnes of CO₂** between 2009 and 2011.

tinyurl.com/FORS-Anti-idling





Eco-driving



This initiative is aimed at changing driver behaviour and enhancing driver competencies to improve delivery efficiency, energy consumption, environmental impacts, and the safety of all road users. It involves training drivers to drive in eco-friendly ways in order to save fuel and reduce emissions. The training includes presentations, vehicle checks, driving assessments, driver debriefs,

demo drives, and knowledge tests. The eco-driving programmes are a cost-effective approach to improving delivery efficiency, but require coordination between the public and private sectors. The courses should have clearly defined goals, professionally trained instructors, well-organised training materials, and a carefully planned certification programme.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Enhance environmental sustainability ■ Increase efficiency ■ Improve load factors ■ Reduce fuel consumption ■ Enhance safety 	<ul style="list-style-type: none"> ■ Require moderate capital investments ■ May require additional systems to be installed on vehicles ■ Require coordination among multiple stakeholders/jurisdictions

Eco-driving in Maribor

Snaga, a **waste collection, management and transport company** based in Maribor (Slovenia), operates seventy municipal vehicles and mobile machinery which differ according to their specific function. Given the growing importance of ecological aspects of the company's primary activity (waste collection and removal), Snaga has joined the **RECODRIVE project** as a demonstrator in order to implement and test driver training and rewarding.



It was observed after the training that drivers have achieved **noticeable savings in an eight month period** – on average **56 litres** of fuel were **saved** by each vehicle every month, i.e. the **reduction in fuel consumption** is **4.23%** per month on average (a vehicle covers 1,743 kilometres consuming 1,115 litres of fuel a month on average after the driver training).

tinyurl.com/RECODRIVE-Maribor

tinyurl.com/RECODRIVE-Lessons-Learned





Modal shift



The aim of a modal shift programme is to encourage the use of alternative modes to reduce the number of trucks and vans in the city centre. Although appealing to many, this initiative faces major obstacles in urban areas where it is often impossible to find modal alternatives that effectively compete with trucks or vans. However, a number of pilot tests and small-scale implementations suggest that it is possible to induce small modal shifts. A shift of cargo flows from road to intermodal transport was achieved, using a combination of road and short sea shipping, inland waterways, rail, freight motor tricycles, or cargo bikes.

Modal shift programmes require the management of information access and exchange between large and small, public and private stakeholders across all business sectors and transport modes. Public-sector capital investments are required to provide sufficient facilities to support flexible multimodal transport. Depending on the scope of the programme, the implementation costs range from moderate to high. This measure requires a high degree of coordination among multiple stakeholders/jurisdictions and incentives to foster a modal shift.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Enhance environmental sustainability ■ Reduce congestion ■ Reduce fuel consumption ■ Enhance safety ■ Facilitate multimodal freight ■ Particularly appropriate for heavy and non-perishable goods 	<ul style="list-style-type: none"> ■ May increase operational costs ■ Require integration of freight deliveries with current transportation system ■ Require coordination among multiple stakeholders/jurisdictions ■ Require incentives to foster a mode shift

River barges and cargo bikes for urban delivery in Paris

tinyurl.com/Prezi-Paris tinyurl.com/LAMILO-Project

tinyurl.com/Vertchezvous

Since early 2011, Vert chez Vous uses an unusual solution to delivering cargo in Paris.

Using a **combination of a river barge and e-tricycles** they deliver up to **2,500 packages each day**. The ship acts as a floating warehouse that cruises on the river Seine, with 5 pre-set stops per day.



After a trip, the cargo trike can go back to the barge to load additional cargo. Each trike has a 2m cargo hold, while the barge holds 120m. So a total of **60 full bike loads can be delivered each day**. The addition of a moving warehouse adds value because more stops can be made per day compared to a warehouse that is located at one location. This provides a clear advantage over other forms of transport.



Within the **EU project LaMiLo**, a new ICT system has been tested to optimise the calculation of both road and cycle routes taking into account specific bike accessibility (such as bike lanes) in Paris.



Staggered work hours



This initiative aims to reduce truck demand during peak periods by distributing the receiving hours throughout the day. In passenger transport, there is a long history of staggered work hour programmes, originally intended to redistribute workers' demand for public transport. A similar concept can be applied to freight demand management by staggering receivers' delivery hours, which could lead to reductions in truck traffic during peak periods.

This initiative targets receivers as the key decision-makers and seeks to convince them to spread out the reception of deliveries. Staggered work hours programmes involve the engagement and collaboration of multiple stakeholders and business support is key for its success. The measure requires a high degree of coordination among all the stakeholders and may require the inclusion of incentives to participate.

Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Reduce congestion ■ Enhance environmental sustainability ■ Increase efficiency and reliability ■ Moderate implementation costs 	<ul style="list-style-type: none"> ■ High degree of coordination among multiple stakeholders ■ May require incentives to convince businesses to participate

The food distribution model in Borlänge

The municipality of Borlänge (Sweden) have developed a food distribution model where **food procurement and food transportation have been separated**. The model has been in place for 10 years and it is now a good example of best practice. Instead of having numerous trucks stopping at schools and kindergartens several times a day for food deliveries, the new system has been planned to collect food by all suppliers in one distribution centre, and then redeliver.

All distributors leave their food in the centre in Borlänge. From there the food is re-packed and transported to the different locations according to a fixed schedule. **Truck**



drivers have keys to the storage/freezers in the different units and leave the food directly there with no other personnel assistance needed.

The deliveries take place during the night and very early in the morning. By doing this, **noise levels** near schools have also been significantly **decreased**, **road safety** has greatly **improved**, and food is at the immediate disposal of kitchen staff when they start work (thus allowing them to plan their daily cooking activities in the most efficient way)

tinyurl.com/ELTIS-Borlange





Recognition and certification programmes



These programmes are voluntary schemes that are usually free to join. Recognition schemes are 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 determine levels of legal compliance, as well as operational and environmental performance, and those complying with the required standards are certified accordingly.

Certification programmes recognize participants that achieve a minimum level of performance and follow a clear path to certification. These schemes can be structured in various ways and are aimed at addressing the main aspects of a company's operations such as driver skills and driver management, vehicle maintenance, transport operations, performance management, safety, and use of ITS. In most cases they set specific targets for different levels of achievement (bronze, silver or gold, for example).,

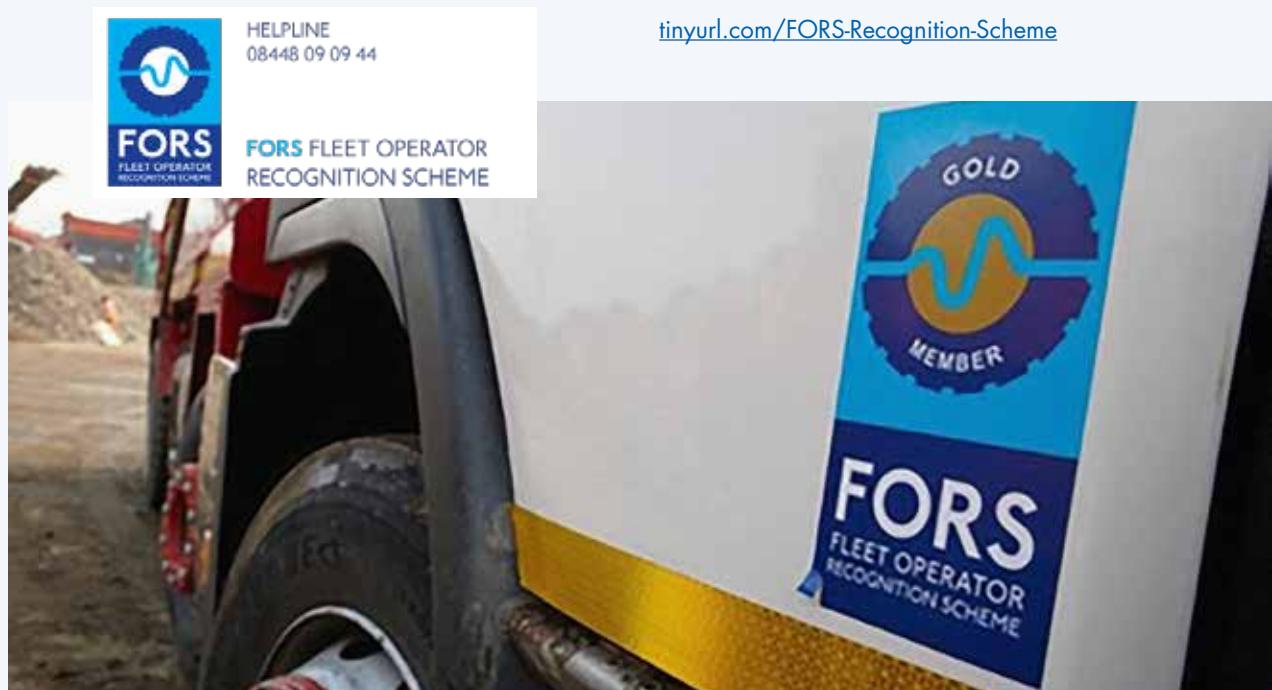
Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> ■ Reduce congestion ■ Foster the use of alternative vehicles ■ Enhance economic competitiveness 	<ul style="list-style-type: none"> ■ Require strong dissemination efforts. ■ Require training programmes

Fleet operator recognition scheme (fors) in London

The **Fleet Operator Recognition Scheme (FORS)** is an accreditation scheme that aims to improve fleet activity throughout the UK and beyond. FORS is voluntary and open to any company operating a fleet including vans, lorries, mini-buses and coaches. The scheme boasts **87 gold accredited companies** across the country, which represents over **21,700 vehicles**.

FORS has teamed up with a number of companies to offer accredited operators great deals on the latest technology including proximity sensors, left-turn warning alarms, Fresnel lenses and reversing cameras. They can also take advantage of funded driver Certificate of Professional Competence (CPC) training, discounted Safe And Fuel Efficient Drive (SaFED) training and a 50% reduction on the annual price for driving licence checks.

tinyurl.com/FORS-Recognition-Scheme



Conclusions

The impacts of freight movement to/within cities suggest that city logistics should be a key priority for their evolving transportation networks. The measures presented in the previous section offer an overview of options that local decision-makers have at their disposal to tackle the challenges posed by urban freight logistics.

Logistics needs and requirements are rather different from town to town due to specific local characteristics, including the size of the city, the dimension and structure of the city centre, the existence of specific facilities, the urban road network, as well as the shops and products.

Therefore, it is not possible to identify a “one for all” solution, but it is essential to define several options based on the specific features of the town, as well as characteristics and needs identified (ENCLOSE, 2015). There is a growing consensus on the idea that more sustainable urban freight operations and significant benefits in terms of energy efficiency can be achieved by an appropriate mix of different measures.

All analysis conducted and references collected on urban freight logistics measures have been summarised in the following table, which gives an overview of the measures/initiatives described in the previous section using key elements regarding:

- the nature of the main problem the measure intends to address (congestion, inadequacy of infrastructures, pollution, noise or safety);
- the level of investment required by public authorities (low, moderate or high);
- the implementation time (short, medium or long).

This table enables decision-makers to have a clear picture of potential solutions to be adopted to address local urban freight logistics issues.





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CATEGORY	MEASURES	NATURE OF THE PROBLEM					INVESTMENT	IMPLEMENTATION TIME
		Congestion	Inadequate Infrastructure	Pollution	Noise	Safety		
Stakeholders' engagement	Freight Quality Partnerships	X	X				low	medium
	Freight advisory boards & forums	X	X				low	medium
	Designation of a City Logistics Manager	X	X				low	medium
Regulatory measures	Time access restrictions	X			X	X	low	short
	Parking regulation	X				X	low	short
	Environmental restrictions			X	X		low	short
	Size/Load access restrictions				X	X	low	short
	Freight--traffic flow management	X			X	X	low	short
Market-based measures	Pricing (road pricing, congestion charging/ park pricing)	X			X		high/moderate	medium/short
	Taxation and tax allowances	X		X	X		high	medium
	Tradable permits and mobility credits			X	X		moderate	medium
	Incentives and subsidies			X	X		high	medium
Land use planning & Infrastructure	Adapting on-street loading zones	X	X			X	low	short
	Using building code regulations for off-street delivery areas		X				low	medium
	Nearby delivery areas	X	X			X	high	medium
	Upgrading central off-street loading areas		X			X	high	short
	Integrating logistics plan into land use planning	X	X	X	X	X	moderate	long
	Collect points	X	X				low	short
	Urban Consolidation Centers	X	X			X	high	medium
New technologies	Dynamic routing	X				X	high	medium
	Real-time information systems	X					high	medium
	Traffic control	X				X	high	medium
Eco-logistics awareness raising	Anti-idling			X			moderate	short
	Eco--driving			X	X		moderate	medium
	Modal-shift	X		X	X		low	medium
	Staggered work hours	X					low	medium
	Recognition and certification programmes			X	X		low	medium





Smart choices for cities Making urban freight logistics more sustainable

Within urban transport, urban freight logistics poses the most significant challenges to public authorities and policy makers in relation to decision-making and successful outcomes for a range of stakeholders. Historically, the success rate of such measures is lower than hoped for.

The main reason for this is that these measures take place in a competitive market in which the financial drivers for private companies are a key feature. Measures in other thematic areas focus instead on topics such as passenger transport, traffic management, public transport and infrastructural developments that are under more direct influence and control of the city authorities.

Lessons learned from past experiences within CIVITAS and other projects show that success in implementing urban freight logistics measures requires the involvement of multiple stakeholders. Private, public and community stakeholders are all impacted by freight issues and/or could potentially play a role in developing their solutions. However, no single stakeholder is capable of completely solving the most acute freight issues affecting metropolitan areas.

Setting up a long-term coordination with the different stakeholders is very important, especially with local businesses such as shop owners and local freight delivery operators. Their participation and adherence to the new measure will foster successful implementation. City logistics stakeholders such as local businesses and transportation companies should be involved as early as possible in the development of solution options.

Local administrations, such as city councils or transport/environmental departments of local administrators are important as they usually initiate measures dealing with urban freight logistics. Agency staff can work with stakeholders to help them to develop a consensus around the goals and objectives that should guide the way forward. This almost always requires the public sector to play a key role to act as a catalyst in securing the support of the various stakeholders. To do this, the support of additional external expertise in form of a single person or in form of advisory boards could be of great help in building strong relationships between stakeholders involved in order to ensure acceptance.

The central role of urban freight logistics within the whole urban mobility governance is clear: city logistics should be planned by city administrations with the aim of supporting sustainable freight distribution processes in terms of economic, environmental and social equity/cohesion aspects.

To this end, the concept of Sustainable Urban Logistics Plans (SULPs)²⁶ has been developed as a useful tool to identify the main needs, and to plan and evaluate the possible solutions integrated with the overall Sustainable Urban Mobility Plans (SUMPs). SULPs involve strategies, measures and rules that can be adopted with a cooperative approach between the different actors to reach common objectives aimed at an overall urban sustainability outcome.

²⁶ ENCLOSE Project (ENergy efficiency in City LOgistics Services for Small and mid-sized European historic towns) - <http://www.enclose.eu/content.php?p=1>





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Making urban freight logistics more sustainable

UFLI

Urban Freight Logistics

All movements of goods in to, out from, through or within the urban area made by light or heavy vehicles, including also service transport and demolition traffic as well as waste and reverse logistics



Urban freight traffic accounts for about

10-15%	2-5%	6%
of km travelled	of the total work force employed in urban areas	of all transport-related GHG emissions

Goods generation by an urban context

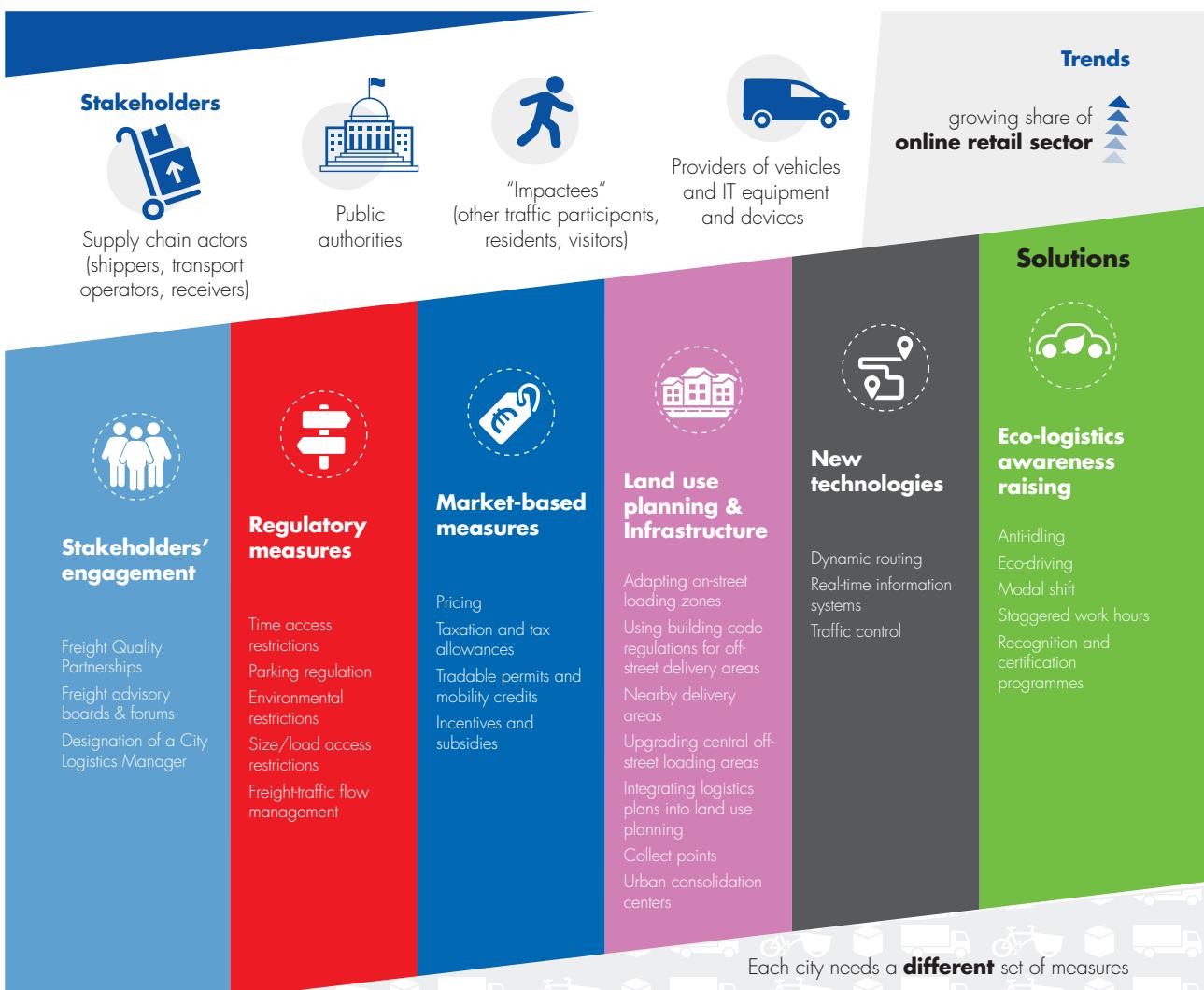
0.1 delivery/pick-up per person per day	1 delivery/pick-up per economic activity per week	300-400 freight vehicles trips per 100 people per day	30-50 tons per person per year
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Positive aspects
Wealth
Competitiveness
Efficiency

Pollutant emissions
Congestion
High accidents rates

Negative aspects





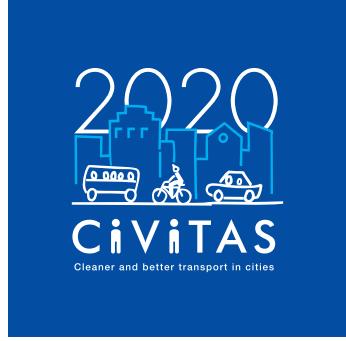
Lessons learned and recommendations

Long-term coordination with the different stakeholders (private, public, community)

Public sector must play a key role as catalyst of the various stakeholders. The support of additional external expertise can be of great help

SULPs (Sustainable Urban Logistics Plans) as a tool within the whole urban mobility governance

For more information, please download the "Making urban freight logistics more sustainable" CIVITAS publication from www.civitas.eu



Smart choices for cities

Making urban freight logistics more sustainable

NOTES



- Smart choices for cities
- Making urban
- freight logistics
- more sustainable

CiViTAS

CiViTAS
Cleaner and better transport in cities

POLICY NOTE

