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URBAN FREIGHT LOGISTICS SYSTEMS: AN OVERVIEW OF POLICY FRAMEWORKS FOR SOUTH EAST EUROPE

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Abstract. Studies show that urban freight policies have not kept pace with the rapid growth of freight demand. Urban freight is of particular importance, as the high population density of cities generates high demand for goods in a specific space and timeframe for the products to be delivered. Although, most countries have generic freight strategies in place, only in certain cases these strategies address urban freight issues. This research identified that most regulations are mostly focused on general traffic issues and transport of dangerous and oversized goods. To draw that conclusion, the research examined urban freight measures that have been applied by countries in South East Europe as well as Central Europe. Based on the conclusions and recommendations mainly from European projects that have been implemented in large municipalities, the paper recommends a set of possible urban freight policies tools. It then examines recommendations concerning the creation of coherent urban freight policies in the countries of South East Europe.

Keywords: city logistics, freight policy, South East Europe, urban freight, best practices.

1. Introduction

This paper provides an analytic overview of urban freight policies in a set of countries in South East Europe and compares these policies with the "state of play" as well as best practices that have been in place in European cities. Urban freight policy is of major importance nowadays, as the population growth, the population transfer towards larger cities and the density of cities itself create higher demand for goods in a restricted in geographic terms area to deliver them.

The methodology that was selected includes the following 5 steps:

Step 1: Identification of the relevant competent authorities vis-à-vis the development and implementation of urban freight strategies in South East Europe,

Step 2: Identification of Urban Freight Policy best practices based on state of play from EU experience in other EU countries and or EU capitals,

Step 3: A thorough desk research on information available in local, regional and national public domains especially those of the relevant ministries (Transport or Public Works) of each country, as well as the websites of the municipalities of the capitals,

Step 4: A thorough desk research on information available in international information repositories (i.e. within the IRU - International Road Transport Union website).

Step 5: Gap analysis and recommendations for future research.

It should be mentioned that information regarding urban freight policies/ measures available in the English language was limited, which suggests either a lack of such policies or in case this exists, an insufficient promotion of those policies. Conclusively, based on the gap analysis, the paper recommends the establishment of comprehensive state driven urban freight policies and strategies in South East Europe as well as the initiation of relevant promotion activities.

2. Review of urban freight systems in European cities-Best Practices

At a national or regional level, policies concerning urban freight transport are either non-existent or mildly approached in most European countries' national transport policy documents. Apart from the UK, Netherlands and Germany, who have emphasised in urban freight policy by creating freight centres and collecting data (Miodonsk 2009), most countries seem that have only adopted generic freight strategies, which rarely address real urban freight issues. The research identified that in many cases, regulations are mostly focused on traffic management issues and transport of dangerous and oversized goods, without addressing the broader scope for urban freight transport and logistics. In addition, loosely defined general traffic regulations are in some cases supplemented

with regional and local regulations in order to restrict goods vehicle traffic, unloading and loading activities and parking, especially in the city centres (Emberger 2004).

In the absence of coherent urban freight policies, most countries regulate the access and loading/unloading activities of freight vehicles to urban areas using different strategies. However, established categories of measures that may span from technical (vehicle technology, telematics applications), to organisational (co-operation, urban consolidation centres), to planning (e.g. route planning), to operational (night deliveries) and to political (low emission zones, time windows, weight limits) solutions (Becker *et al*. 2008) are not yet utilized in order to improve the environmental situation in city centers.

To that extent, the Table 1 presents the most common measures for access and loading strategies for freight vehicles, while Table 2 presents the specific measures that have been applied in four cities in Central Europe.

Table 1. Common measures for access and loading of freight vehicles

Category	Measures
Planning	Lorry routes
	Lorry lanes
Information	On-Street loading bays
	Urban freight information and maps
	Signing
Organisational	Nearby delivery area
	Urban consolidation centres
Political (regulations)	Vehicle weight and size regulations
	Time regulations
	Imposing and enforcing access and loading regulations
	Environmental zones/ emission standard regulations
	Road charging systems
Operational	Night delivery

Source: Commercial Transport in European Cities, 2008

Table 2: Applied measures on cities of central Europe (Commercial Transport in European Cities, 2008)

	Measure fields									
	Distribution Scheme	Urban Distribution	Loading and Uploading	Loading Zone	Clean vehicles/ clean fleet	Fleet management and	PP cooperation	Access management	Travel information	Parking
Barcelona	x		x	x	x					
Berlin		x	x		x		x			
La Rochelle	x				x		x			
Norwich	x	x			x	x	x			

For the purposes of this paper, best cases were predominantly derived from the European Local Transport Information Service (ELTIS) database. ELTIS, an initiative of the European Commission's Directorate General for Energy and Transport. The aim of ELTIS is to provide information and to support the practical transfer of knowledge and exchange of experience in the field of urban and regional transport in Europe. This database contains (Feb. 2011) more than 1700 good practice examples. As an information dissemination tool, ELTIS offers its users the possibility to spread their good practice examples.

In order to provide a sound overview of the state of play, this paper is based on selected cases from the 'CIty VITAlity Sustainability (CIVITAS)' and BEST Urban Freight Solutions (BESTUFS) projects. CIVITAS aims to promote and implement sustainable and energy efficient urban transport measures, whereas BESTUFS is a thematic network that addresses all aspects of urban freight transport and aims at establishing an open network between all stakeholders in order to identify and disseminate best practices, success criteria and bottlenecks with respect to the distribution of goods in urban areas.

The selection criteria for the cases include applicability of the measures undertaken, similarity in geographic and population situation, demand/supply characteristics.

The following paragraphs illustrate selected Best Practices.

2.1 Urban Transhipment Centre- Norwich (United Kingdom)

This measure aimed at demonstrating the potential of a transhipment centre for freight deliveries and collections within the city centre and its contribution to clean urban transport objectives. The expected benefits included reduced congestion, emissions and noise, by optimising urban goods delivery journeys with clean and energy efficient vehicles.

The main objective of the project's measures was to achieve an overall reduction in the number of freight vehicle movements within the Norwich urban area, and the city centre in particular, by consolidating loads and to ensure that the final delivery is made by vehicles with low emission engines.

This case study was led by a commercial partner who developed and operated the transhipment process as well as established and promoted the transhipment centre in order to attract customers. The location of the transhipment centre played a key role, as it was expected to provide fast and direct transport links to the city centre. The intention was to implement the measure by building upon an existing privately operated transhipment centre.

The measures as proposed by the project consortium achieved limited success in terms of attracting customers; however the existing customers appeared to be extensively satisfied by the services. The measure has yet to achieve significant consolidation of loads, but has had

some success in switching urban deliveries to smaller goods vehicles.

2.2 Space management for urban delivery- Barcelona (Spain)

As in many other large cities and metropolitan areas, the uncontrolled growth of private vehicles makes the distribution of goods even more difficult in the city of Barcelona. In order to tackle this problem, the municipality initiated a project analysing the effects of urban commercial transport on the traffic situation. Based on the results of this survey several different measures were implemented within the city centre of Barcelona such as surveillance of loading time with parking (loading) disks, multi-use lanes, night deliveries as well as other similar measures.

An interesting measure is the installation in reference roads of multi-use lanes, a system that classifies the lanes which are used through VMS technology (variable message signs), and allows the usage the lane/street by certain transport groups (i.e. residents, clear-way, deliveries) based on various criteria, including restrictions, time of the day, traffic etc. The city plans to extend the implementation of this approach to similar primary network streets in Barcelona.

In addition, the city also identified the need from the police to enforce the new measures. For this reason and in order to decrease the operational expenditure, automated enforcement is a central recommendation. Only step by step further lanes (applicable only to primary routes of the grid road system) or zones can be equipped. The multi-use lane is, however, a successful measure to regulate urban transport flows, which gains approval from the users and can raise the innovative image of the city.

2.3 City Logistics Strategic Extension, La Rochelle (France)

This measure aimed to enlarge the city surface covered by controlled city logistics and to define the relevant environmental standards for clean vehicles. The first objective was to define the real area of city logistics that is the physical and managerial boundaries which may already exist or have to be drawn between industrial supply chains and city logistics. A second objective was to build a methodology for developing a systemic approach of goods transportation in cities and to design relevant tools. The objective is to better control the organic growth and evolution of this system.

The idea of consolidating goods on the urban periphery for subsequent delivery to retail outlets has never been successfully implemented. Moreover, a global systemic approach of all actors transporting goods in a city has not been started yet.

This will lead to the development a strategic goods distribution plan, which will include:

- Investigation on the localisation of the best places for access control for distribution vehicles space wise and time wise
- Installation of several specific urban delivery zones where retailers will come and take their parcels
- Localisation of new boundaries to the main commercial surrounding zones;
- Establishment of specific regulation for control access zones
- Test of new delivery vehicles
- Global assessment and control on pollution impacts
- A methodology to optimise the development of goods distribution in medium sized towns

This project is expected to increase the efficiency of goods distribution in the city leading to a reduction in goods vehicle traffic and emissions through the introduction of clean vehicles. It will also contribute to a specific traffic hierarchy and regulation for goods distribution and involve all partners in the search of solutions.

3. State of play in South East Europe- Best practices

3.1 Urban freight in South East Europe: an overview

The desk research which was carried out for the purposes of this paper revealed that there is limited or no information regarding urban freight policy documents for countries in South East Europe. Some countries have engaged in entry level measures including low emission zones and/or time windows. More precisely:

- In Ljubljana a Low Emission Zone is in place (HDV Euro 3 > 3.5 ton) (Study on Urban Access Restrictions, 2010).
- In Sofia a Low Emission Zone is in place (HDV Euro 3 > 3.5 ton). Especially, for temperatures over 35°C, there is a prohibition on lorries throughout the road and motorway network between 12h00 and 21h00. The exact dates of the beginning and end of the restrictions are announced in the media at least two days in advance (Study on Urban Access Restrictions, 2010).
- In Athens City Centre, there is access restriction for vehicles >3.5 tonnes between 07h00-14h30 and 17h00-21h00 every day.
- In certain zones in the city of Bucharest there is access restriction for goods vehicles of over 5t MPW as follows: from 1 July to 31 August daily between 07h00 and 20h00; from 1 September to 30 June daily between 08h00 and 19h00. Outwith these hours, access is permitted provided a special authorisation is given (International Road Transport Union, 2011).

The following table illustrates some popular measures that have been applied by cities in Central and South East Europe.

Table 3. Urban Freight Policy Measures in selected countries of Central and South East Europe

	Operational measures	Political	Planning/ Information	Organisation l
Albania				
Slovenia		Low emission zone (Ljubljana)		
Bulgaria		Low emission zone (Sofia)		
Croatia		Restricted delivering times and particular delivery zones (Zagreb)	Signposts (Zagreb)	
Serbia				
FYROM				
Bosnia Herzegovina				
Romania		Time window (Bucharest)	Defined and signed routes (Ploiesti)	
Greece		Time window (Athens)		
Turkey				
Spain	Night Delivery (Barcelona)		Multi use lanes (Barcelona)	
UK		Low emission zone (London)	On street loading bays, Signing	Urban Transhipment Centre (Norwich)
Germany		Environmental loading points (Bremen)		Inner City logistics centr
France		Time window (La Rochelle)		Nearby Delivery Area (Bordeaux)

3.2 Freight delivery restrictions- Zagreb (Croatia)

Currently, freight delivery in Zagreb is controlled by different regulatory systems. However, this regulation is not thoroughly implemented (ELTIS database 2011), thus delivery trucks further increase congestion during peak hour. Furthermore, the strong presence of trucks is clearly discouraging sustainable non-motorised means of transport and has a negative impact on the quality of urban space.

A new freight regulation for the city centre will be introduced including restricted delivering times and particular delivery zones. Furthermore, the city traffic department will introduce adequate signposts. The new regulation will be enforced trough frequent controls by the traffic police.

The main objectives are to improve the traffic situation, especially in the historic centre, as far as freight deliveries are concerned, which will in turn improve the quality of public space, as well as the environment for pedestrians and cyclists. It also aims at increasing public awareness about the benefits of sustainable transportation systems, at shifting towards cleaner and more energy efficient modes and at decreasing pollutant emissions from urban freight traffic.

Through a comparison of current freight delivery restriction measures in Zagreb and other European cities, new and improved measures will be proposed in order to reduce traffic of freight vehicles in the city centre during peak hours.

This project is expected to result in an improved situation for pedestrians and cyclists in the city centre, in a more liveable city centre and enjoyable urban space for everyone. Moreover it is expected to decrease congestion in the historic city centre and in the long term change the attitude of delivery companies.

3.3 Sustainable Freight Logistics- Ljubljana (Slovenia)

The primary objective of this scheme was the establishment of local freight network and the creation of a new logistics strategy for better freight transport in the city. The main objectives were to set up efficient distribution of goods in a demo area, whilst maintaining a vibrant city centre by changing the existing pattern of goods distribution. Additionally, a reduction of the number of deliveries in the corridor and demo area by 20 % is also expected, together with significant reductions in pollutant emissions (CO2, NOx and PM10).

The pilot project will include testing a combination of measures that are quite different in terms of content, yet they form a coherent unit aimed to improve city delivery. The pilot testing area will be near the corridor (along a street) in the city centre and also on the eastern side of the corridor where the main roads connecting the city centre and logistics areas (the most convenient places for testing consolidation centre) are situated.

In the testing facilities the goods will be collected and then re-distributed to the target area both on the corridor and on other streets in the city centre. The objective is to decrease the number of deliveries and to improve the load factor of cargo vehicles.

Currently (Feb. 2011) the project achieved:

- A reduction of energy consumption by 10% on the target demo area
- A reduction of CO2, NOx and PM10 emissions by 15% on the target demo area
- Improvement of the quality of urban space in commercial areas and the quality of life for residents

3.4 Freight partnership, planning, routeing, signing- Ploiesti (Romania)

A Strategic Plan of city logistics is considered to be a significant step that will help to restrict heavy transport and will set up alternative routes for delivery of goods.

In Ploiesti, policies regarding freight transport were non existent prior to implementing this project, while there were no investments for logistics facilities. As a result, pollution and congestion were major issues for the city, and the need for putting together all the actors was urgent.

The steps of this project were:

- Tender procedure for elaborating the City Logistics Strategic Plan (conditions of contract and services delivery contract for the strategic scheme design)
- Elaboration of a City Logistics Strategic Plan (rules and measures for organizing the traffic)
- Feasibility Study elaboration (defining freight routes and freight signing as well as a financial assessment)
- Consulting transporters and businessmen in order to establish the technical solution
- Setting up promotion activities

The objectives of this project were to: (a) create discharging crossing stations (North and West terminals), (b) reduce the traffic congestion inside the city, (c) optimise the transport network, and (d), bring together all stakeholders. The success of this project is a clear definition and sign-posting of freight routes, increased efficiency of goods distribution, while reducing traffic congestion and pollution due to the introduction of clean vehicles.

3.5 Management of Pedestrian Zones- Maribor (Slovenia)

As part of this project, an access restriction has been introduced for delivery vehicles, which involved weight and time restriction.

The main issue in Maribor was a very dense motorised traffic in the city zone resulting in poor safety for pedestrians. There was a substantial public pressure to improve the situation and because of the negative situation there were several public discussions about reducing the volume of traffic.

The general enforcement concept defines a restricted access to the city zone (by physical restriction). The Municipal Police was in charge of the supervision of the area, in which the enforcement activities take place, and recorded the vehicles violating the rules and imposed appropriate penalties.

The delivery window is open from Monday to Friday 6h00- 9h00 and 19h00- 22h00. On Saturdays, Sundays and holidays, the delivery window is open between 13h00- 15h00. Parking is not allowed in the public traffic areas, stopping at the delivery point is limited to 15 minutes and a special written certificate has to be kept on board. The maximum weight of vehicles entering the city zone is limited to 3.5 tonnes, while vehicles exceeding this weight are requested to have a special permit for entering the city zone.

The concept is publicly controlled and the enforcement concept was initiated by the Municipal authorities. The municipality of Maribor has adopted a decree determining the elements for the road traffic regulation. Its articles regulate the delivery time, set-up the criteria for access rights in the pedestrian zone, and the volume of freight permitted. This new scheme contributed to a decreased traffic volume in the city zone, which resulted in higher safety for pedestrians.

4. Conclusions and recommendations

Freight transport in European cities has increased rapidly in the past decades and the negative aspects of this development came along. Freight transport vehicles demand increasingly space for delivery and parking in the cities, they compete with other mobility groups, they cause congestions and they themselves raise obstacles making distribution of goods and services less efficient (Becker *et al*. 2008), while they also threaten the quality of urban life and sustainable urban environment.

In light of this rapid growth, there is a need for consistent freight policy documents in South East Europe countries. Many of the best practices presented above appeared to be successful in mitigating problems caused by urban freight transport including (a) congestion caused by lorries and delivery vehicles, (b) emissions of noise and air pollutants, (c) deterioration of the urban environment and (d) de-pedestrianization of the city centres. The analysis has shown that most of the South – East European countries either don't have an Urban Freight Policy or this is not adequately promoted and enforced.

With the experience provided by other European countries' best practices in the field of urban freight solutions, some basic and important steps need to be followed in order to successfully approach the freight transport growth, including

- Development of a Urban Logistics Vision
- Elaboration of a Urban Freight and Logistics Strategic Plan
- Development of Urban Freight and Logistics Operational Strategy
- Feasibility Study for implementation of infrastructure projects
- Local stakeholders consultation
- Initiation of promotion activities

These steps will thoroughly analyze and implement various operational, tactical and strategic measures, including:

- Access Control
- Emission Standards
- Strategic City Logistic Plans
- Regulatory policy support
- Co-operative approach of the very many stakeholders involved in urban freight
- Marketing Campaigns/ Promotion activities
- Dissemination tools
- Development of a comprehensive Key Performance Indicator measuring system
- Encouragement of alternative modes of transport / radical rethinking of last mile deliveries.

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