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Urban freight transport policy and planning

Review

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Abstract

This report presents a general overview of public policy and planning in the field of urban freight transport. Urban freight transport is the subject of local, regional and national policies in different policy fields, such as transportation planning, environmental planning and economic planning. The most interesting developments in policies related to urban freight transport in the Netherlands, France, Germany and Japan are described. These countries show differences in underlying problems and approaches, but also present similarities. Their policies are mainly based on stimulating consolidation by voluntary co-

operation between transport companies in combination with the establishment of freight centres, and measures in the field of licensing and regulation. None of these countries pretend to have found the optimal solution to the urban freight transport problems, so that further development of urban freight transport policy is still needed. Further regulation of urban freight transport, as well as technological innovation will considerably influence policy-making in the field of urban freight transport in the future.

1. Introduction

The objective of this review is to present a general overview of public policy and planning in the field of urban freight transport. The authors are aware that is a very ambitious goal, for the simple reason that there is not just one single urban freight transport policy to describe, but there are many urban freight transport policies in the world. Urban freight transport is more than any other type of traffic, the subject of local, regional and national policies in different policy fields, such as transportation planning, environmental planning and economic planning. The policies, therefore, differ in the various countries of the world and have changed over time.

The approach we have chosen in this report, is to present a general overview, as a sort of theoretical framework, followed by an overview of developments in so-called case-countries. Case-countries are countries that we consider to be representative for other countries in a particular region. The most interesting developments in policies related to urban freight transport are described in Germany, France, the Netherlands and Japan. In this review we only consider the policies of governments (local, regional or national); it does not cover the policies of private companies or organisations that are active in the field of urban freight transport.

In the general part of the review, we want to present a state-of-the-art theoretical framework as a sort of menu card of value-free knowledge regarding urban freight transport. This framework provides information to the reader in such a way that he will then be able to evaluate the quality of policies and pinpoint the weaknesses of certain policies.

Urban freight transport policies have been studied for quite some time now, a lot of reference materials provide us with useful information. Among them, Button and Pearman (1981), and Ogden (1992) provided an interesting overview of policies and policy measures. The reports from the three Round Table Meetings on urban freight transport, organised by the European Conference of Ministers of Transport (ECMT, 1976; ECMT, 1984 and ECMT,

forthcoming) present interesting overviews. A comparison of these three reports should give a good insight in the evolution of thinking about urban freight transport. In Europe, research was carried out for the European Commission in the period 1994-1998, in close co-operation with research in some member-states, such as France and Germany (COST 321 (1997)). Other sources of relevant information are the national studies on urban freight transport. In Japan, the Japan Society of Civil Engineers formed a research task force on urban freight transport policies, which published a report titled 'Urban Freight Transport System as Social Infrastructure' (1994). In 1997 the Japanese government authorised as a first attempt of its kind 'Comprehensive Program of Logistics Policies', consisting of intra-city logistics, intra-district logistics, and international logistics. The government also decided to periodically review the program's outcomes, and published the first and second follow-up reports in 1998 and 1999.

2. General Framework

2.1 Why policies: problems and objectives

There are several reasons why public policies in a particular field are needed. Policies are made in general because problems arise, challenges occur, objectives have to be set and met, or guidelines or rules are needed. Most often it is a combination of factors. A European comparison study (Lewis, 1997) concluded that congestion, air pollution, noise, safety and intrusion are considered as the most important negative impacts of freight traffic within urban areas and are seen as key factors for implementing policy measures (see Table 1). Other studies show that congestion and poor accessibility (which are not mentioned in the table) also play a role; these factors mainly concern local aspects of urban freight transport. In the discussion about global pollution (greenhouse gasses, acidification) and the use of natural resources (urban) freight transport becomes an issue. Environmental issues are important, but there are also economic objectives at stake. For instance, the official freight transport policy in Japan, the Comprehensive Program of Logistics Policies projected to realise, by the year 2001, convenient and attractive logistics services at a reasonable cost.

If we look at the possible policy objectives, the range is quite large. Ogden (1992) defines the following six areas of objectives for urban freight transport:

- efficiency objectives
- economic objectives
- road safety objectives

- environmental objectives
- infrastructure objectives
- urban structure objectives

Efficiency objectives relate not only to minimising or reducing transport costs, but also to improvement of the quality of transport services (access, reliability, travel time, flexibility or security of freight).

If efficiency improvement in transport affects the national (or regional) income, it serves economic objectives, such as creating business opportunities. Efficient urban freight transport, in fact, serves society at large, as it has economic effects on income, price, market share, and more.

Table 1 Key-factors in the implementation of measures regarding urban freight transport

Key factors in implementation	*Monaco*	*Kassel*	*Zurich*	*Chester/ London*	*Winchester*	*Barcelona*	*Bologna*
Congestion				•		•	•
Environment	•				•		•
Noise					•		
Safety					•		
Intrusion	•				•		
Political considerations	•			•			
Cost							
Lack of loading facilities						•	
High percentage of in-house transport		•	•				•
Poor utilisation of vehicles		•	•				•
High proportion of commercial traffic							•
Restore balance between retail and transport practices				•			•

Source: Lewis, 1997

The following environmental objectives are identified:

- reduction of local air pollution such as carbon monoxide, nitrogen dioxide, ozone, aerosols, benzene and lead
- reduction of traffic noise
- improvement of general safety (reduction of number of traffic accidents)

- reduction of other forms of nuisance such as risk, physical hindrance and vibration
- reduction of the consumption of urban space for transport infrastructures and delivery points
- reduction of emissions which influence climate change, such as carbon dioxide (CO_2) and the greenhouse gasses (N_2O and methane (CH_4)) and acidification (oxides of nitrogen (NO_x), sulphurdioxide (SO_2) and hydrocarbons)
- slowing down of the exhaustion of natural resources, such as materials and fossil energy.

Reduction of road maintenance costs is an infrastructure objective, while preservation and revitalisation of (historic) city centres, and maintaining the level of services within urban areas belong to the group of urban structure objectives.

It is interesting to know to what extent the underlying problems have been quantified and to what extent indicators and targets for objectives have been introduced. In general, efficiency objectives can easily be quantified. Economic objectives have been quantified with economic models when they concern specific (infrastructure) projects. Although environmental conditions themselves can be measured for instance in terms of emission concentration, it is not always easy to identify the relations between policies on urban freight transport and environmental objectives. A lot of efforts have been made recently in this research area, particularly in Europe, where even monetary terms are introduced in order to measure the achievement of environmental objectives.

Even if the above mentioned objectives are achieved as a whole by a certain policy, it is not guaranteed that benefits and costs are distributed equally among the concerned groups in society. An important social aspect concerns how much each group would be better, or worse, off; this is particularly important to the group suffering from the external costs of urban freight transport (the social equity principle).

It must also be recognised that policy objectives might conflict. Efficiency improvement, for instance, may conflict with environmental objectives. These conflicts depend very much on the choice of measures. Some measures may even be able to serve both objectives.

2.2 Policy life cycle

Policy making is normally based on top-down or bottom-up approaches. Bottom-up approaches are recognised by the active role of the private sector.

Top-down approaches in urban freight transport generally concern policies that are initiated by the public sector, in particular the national government. A combination of both approaches, as shown in Figure 1, offers opportunities to combine the best of both worlds.

Policies have also a certain life cycle. They move through several steps in a cyclical way:

- issue awareness and recognition, in combination with policy research (I)
- policy formulation (II)
- policy making (III)
- policy implementation (IV)

In theory, such a distinction in steps is certainly valid but in practice it is very difficult to follow this planning process step by step. During the life of the process new issues may arise or new solutions or insights may become available. As a result, policy-making is certainly not a linear process. Policy making, in fact, is a continuous process of these four stages happening at the same time. This has important implications for the contents of the policy. Policies not only have to be robust enough to survive new developments, but also robust enough to fit in regulation or deregulation processes. Long term policies that show hardly any short-term results but that need long term efforts, are seldom viable.

Because of the continuity of this process, monitoring becomes important. The process also needs regular consultation with the actors (public and private). Consultation platforms on a local, regional or national level could fulfil this role.

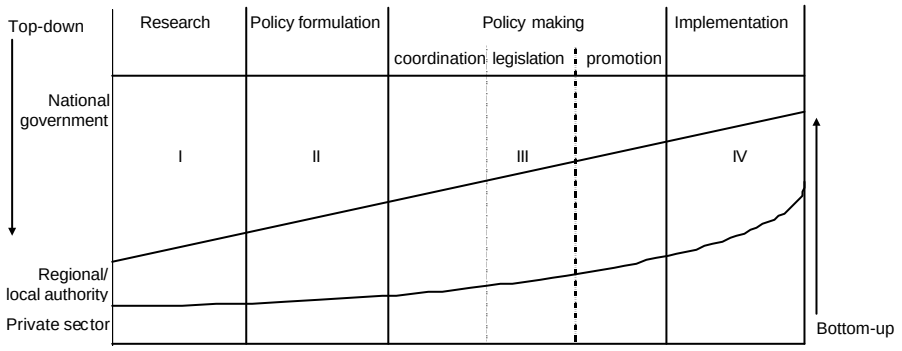

Figure 1 A combined top-down and bottom-up planning process

2.3 Policy scope

Urban freight transport does not only mean the transport of consumer goods, but freight transport in urban areas, including industrial goods, waste materials and construction materials as well. In earlier studies, however, urban freight transport was mostly restricted to transportation of consumer goods within urban areas. Through-traffic, that is freight transport flows with both its origin *and* destination outside of the urban area, can play an important role in the problems caused by freight traffic within urban areas. Exclusion of particular transport flows deserves some consideration because of their role in particular problems.
A point of attention is that freight transport is considered to be urban freight transport as soon as it crosses the city borderline. However, many of these transport flows have their origin outside urban areas or within other urban areas. This has to be kept in mind, because it can affect the effectiveness of certain (local) measures.

2.4 Actors

In the field of (urban) freight transport several types of actors and regulators are involved. The urban freight transport system is a typical multi-layer system. Between the layers you will find market situations (indicated as phenomena in figure 2) with supply and demand of services and regulators that organise these markets.

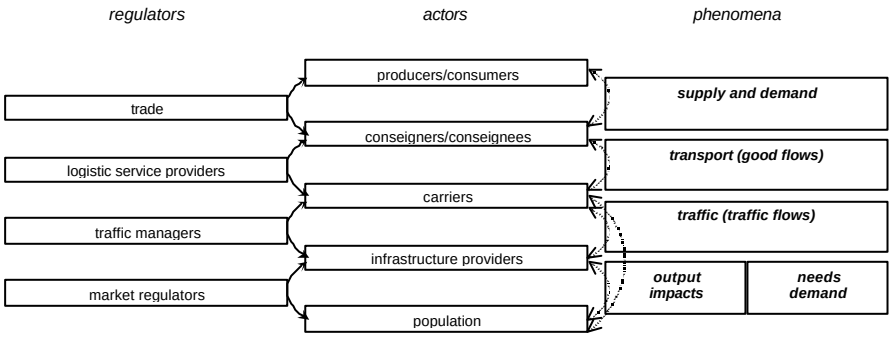

Figure 2 Actors and regulators related to urban freight transport

The role of governments is traditionally that of infrastructure provider and regulator and traffic manager. Governments also intervene in other markets when social objectives are at stake. The way it is done, is called policy or

planning. Even if a government has no policy in a particular field, it still can be called a policy. Policies consist of measures in a certain order. The type of measures will be described in the next section.

There are different planning styles:

- Traditional planning. Governments act as doctors: they try to control processes and try to solve problems with public measures;
- Progressive planning: Governments act as educators: providing information to the relevant actors and try to let them solve the problems.
- Negotiative planning: Governments act as facilitators: They present a window of opportunity and provoke public participation.

In these planning styles the type of measures used will be different.

2.5 Policy measures and instruments

Ogden (1992) classifies the different strategies or policy measures in urban freight transport policy and planning as follows:

- Network strategies. Specific routes can be nominated for use by trucks. Truck routes may also be designated only for specific classes of vehicles. For instance the nomination of specific routes for vehicles which exceed statutory mass, height, width or length limits or routes for trucks with hazardous loads. It is also possible to prohibit trucks to use particular routes (route bans), or to enter a designated local area (local or regional area ban).
- Parking or loading strategies. There are different types of facilities for parking, loading and unloading: curb-side use, off-street facilities and truck parking facilities.
- Location and zoning of land use. For instance spatial concentrations of transport generating or attracting activities near freight transport facilities.
- Licensing and regulations. One can think of traffic regulation, like the allocation of curb space, loading time restrictions, truck route regulations and truck access controls, transport regulations, like permits for entering certain areas, or vehicle regulations, to regulate vehicle sizes or emissions.
- Pricing strategies. Road pricing or charges on access or parking are ways to let the market mechanism solve traffic congestion.
- Terminals and modal interchange facilities. The introduction of transfer points at the border of urban areas has some interesting advantages, for instance, transport optimisation. It also limits the number of movements of trucks in the urban area.

New strategies can be added to this list, such as:

- Traffic information systems, for instance providing road traffic information through a vehicle information communication system (in Japan: VICS) or through electronic traffic information boards along the road.

- ITS (Intelligent Transport System). This includes the development of new vehicle control systems.
- Electronic Toll Collection (ETC) systems along the toll roads.
- Logistic information systems (in-company or between companies). These information systems can be applied within a company to improve the distribution of goods or they can be used between companies, for instance, for co-operative pick-up & delivery or for co-operative operation of terminals.
- Vehicle technology improvement. Vehicles can be improved in order to get a better performance or to reduce energy-use. The improvements can affect the engine, cargo handling or construction of the vehicle.
- Voluntary co-operation. This means co-operative pick-up & delivery or co-operative operation of terminals.

Some of the new strategies make use of support systems. The following figure shows what kind of support systems can be defined in the field of urban freight transport.

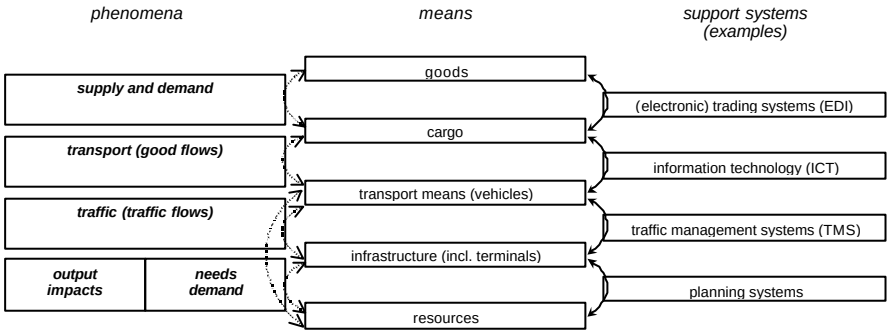

Figure 3 Support systems in urban freight transport

Private companies (retail, wholesale or transport companies) carry out urban freight transport. Public policy regarding urban freight transport is therefore based on regulating and facilitating. This means that a distinction has to be made between private and public strategies or measures. Table 2 shows a classification of strategies or measures. Public measures are actions from public authorities. Private measures are measures that should be initiated by the private sector. Private strategies, such as voluntary co-operation, can be part of an urban freight transport policy, particularly when public measures are taken to support this. Technology improvement and design and implementation of information systems can be public as well as private.

An important aspect of measures concerns the problem of adoption. The adoption of measures can be supported by making correct behaviour more attractive (financial support and licensing) or by discouraging other behaviour (pricing and regulation). This aspect will not be discussed here.

Table 2 Classification of public and private measures (examples)

Policy measures and instruments	*Public*			*Private*	*Public and private*	
Applied on ↓	*Licensing and regulations*	*Pricing*	*Financial support*	*Voluntary co-operation*	*Technology improvement*	*Information systems*
Land use	Zoning for logistic activities or transport-intensive retail	Land use pricing	Subsidies for land use prices	Concentrate businesses on one location	--	--
Logistic operation	Minimal load-factor	--	Subsidising intermodal transport	Load exchange	New load-units	Cargo information systems
Networks	Truck routes, vehicle and time restrictions	Road pricing	New infrastructures for freight	--	Road construction	Real time traffic information
Terminals	Urban distribution centre	--	Terminal exploitation	Operation of terminals	Transhipment and storage	--
Loading/ Unloading	Loading time	Differentiated parking charges	Facility support	Shared unloading facilities	Off-street unloading facilities	Reservation system of parking lots
Vehicles	Emission standards	Fuel taxes	Subsidies for low-emission trucks	Share of vehicle fleet	Electric vehicles, handling equipment	Vehicle tracking systems

Table 2 also shows some examples of measures applied to land use, logistic operation, the (road) network, terminals, loading and unloading locations and vehicles. An overview of promising, and also less promising measures was made by COST 321. You will find this overview in Appendix A.

2.6 Instruments

We will focus on two groups of instruments that evolved during the past decade.

- licensing and regulations
- voluntary co-operation

These groups are particularly interesting because some developments are happening in this area.

2.6.1 Licensing and regulations

Ogden (1992) describes several types of traffic, building and vehicle regulations. Some of these, such as time windows and vehicle restrictions, have been broadly implemented in various countries. Experience with time windows shows that time windows that are too tight, or in too many nearby areas, can cause accessibility problems and extra traffic during certain peak periods. This shows the importance of co-ordinated time-windows. Experience with vehicle restrictions shows that standardisation is very important.

New developments in regulation are, for instance, the introduction of restrictions, based on emissions (environmental zones) and the certification of transport companies in combination with the introduction of permits (green sticker). Certification means that transport companies, organisations or vehicles that meet a set of criteria, for instance size, weight, emissions and/or average load factor, get a permit. With this permit the company can make use of certain routes, may enter certain areas or may use certain public unload facilities. The load factor can be used as a criterion because it is an indicator for an efficient use of vehicles.

Enforcement is always an important issue in the application of regulation. Experience learns that a lack of control can make a policy less effective. In recent years all kinds of tools have been developed to support the enforcement of regulations. Examples are the use of electronic identification, automatic (video-) cameras, and roadblocks (such as rising pyramids or rising steps).

2.6.2 Voluntary co-operation

The main purpose of voluntary co-operation is that by consolidation an

efficiency improvement can take place in terms of cost reduction or quality improvement. There are different ways to consolidate: terminal consolidation, route consolidation and activity consolidation (combining pick-up and delivery in one route). City logistics is defined in some countries as a service based on co-operation between companies that pool their distribution trips on a voluntary basis. City logistics is a combination of terminal consolidation and route consolidation. Transhipment terminals are, therefore, very important for city logistics. In 1978, in the Central Business District (CBD) of Fukuoka City (Japan), 29 trucking companies started to work together to set up a collective delivery and pick-up service to and from this congested Central Business District. Compared to what it would have been if the 29 companies operated separately, this service reduced the volume of truck traffic by 60 % (Nemoto, 1997). Other examples can be found in Europe, for instance in Germany.
Consolidated despatch and receiving facilities, a sort of terminal consolidation, serve a range of receivers (and also shippers) in a certain area, for instance a shopping area or shopping mall. Examples can be found in the USA.
Consolidation might take place at several stages in the logistic chain. If a group of shippers outsource their transport to a single transport company, it is called "upstream" consolidation (at least in the Netherlands). The initiative may also come from a transport company. Another kind of voluntary co-operation starts, for instance, when several receivers in one shopping area or mall, decide to group their delivery, or when similar retail businesses, for example the fashion retail branch work together.

2.7 Field of application: freight centres

The development of freight centres is part of many national policies regarding freight transport. The term freight centres is used here as a generic name for transhipment terminals, or spatial concentrations of distribution or other transport-related activities with a terminal facility for transhipment. The reason behind developing freight centres is twofold: to facilitate logistic activities with location, space and transport facilities, and to consolidate goods flows by developing certain transport services. Freight centres come in different forms and under different names, such as Freight Villages, Güterverkehrszentren, Tradeports, Interporti, Platformes Logistique, Distribution Business Areas, or logistic centres. The original concept of freight centres referred to a terminal building for transhipment activities: a transfer point between long-distance and short-distance transport. A freight centre can also be an area where transport activities are concentrated.

Table 3 Classification of freight centres

	Terminal development			*Area development*			
	Private terminal		*Public terminal*	*Transport oriented*	*Transport + other*	*Industrial + some transport*	*Port related*
	Forwarder DC	Transport company DC	Urban consolidation terminal	Freight Village	Industrial and logistic park	Business Grouping Developments	Special logistic area
Transport modes	Road-road Road-rail	Road-road Road-rail	Road-road	Road-road Road-rail-(barge)	Road-road Road-rail	Road-road	Road-sea/air Road-rail-sea/air
Main aims	Optimisation logistic operation	Optimisation transport operation	Traffic reduction in cities	Modal shift and urban traffic reduction	Regional economic growth and modal shift	Revitalising small- and medium-sized firms	Regional economic growth
Operator (typically)	Huge forwarder, retailer or transport company	Transport company	Transport company and an authority	Operating company (public influence)	local government and/or private company	Development by local government and transfer to private firms	Airport or harbour authorities
Company structure	Huge forwarder or retailer or company	Huge transport company or co-operating companies	Local transport company or co-operating companies	Mostly small companies	Large industrial companies and transport companies	Wholesalers and transport companies	International oriented companies
Land use	Small areas in urban areas or in the outskirts	Small areas in urban areas or in the outskirts	Small areas in urban areas or in the outskirts	Large areas in the outskirts of urban areas	Large areas in the outskirts or at old industrial areas	Large areas in the outskirts of urban area	Near airports and harbours
Orienta-tion	Urban area	Urban area	Urban area	Urban and regional	Regional and international	Urban area and Regional	International

Note: There are many different types of freight centres and many different names. This is an attempt to classify and to name them.

Windborne International Group (1994) uses the following definition for this type of freight centre:

> Freight centres form intersections of at least two different transport modes at which independent companies from the distribution sector and other transport-intensive business (e.g. component manufacturers) are located in a designated area.

The aim is to enhance co-operation between transport modes and to improve the supply of distribution services in a region.

A freight centre also implies an organisational element, in that individual forms co-operate or share the use of on-site facilities (for example through information systems) and may therefore benefit from significant synergistic effects. Freight centres are intended to improve urban goods traffic, boost the regional economy and enhance international trade.

The definition suggests that freight centres are conceptually multi-modal. A lot of freight centres are only transfer points between long-distance and short-distance road transport. Long-distance and short distance road transport can, for this purpose, be defined as different transport modes.

In the REFORM-project (Sonntag and Tullius, 1998) a classification of freight centres has been suggested. Table 3 is based on that classification, with some adjustments. The main function of the terminal-type freight centre is the distribution of freight from long-distance trucks to small city delivery trucks. This type of freight centres can be divided into the private terminals, operated by a forwarder or transport company, and public terminals. The purpose of a public terminal is that its service is open to other transport companies.

Freight centres based on area development can have a different orientation. For this reason this group of freight centres is distinguished into four types. Transport oriented freight centres, here called *'freight villages'*, have a transhipment terminal. Service providers are established on site. It is actually an area with several terminals. This kind of platforms is found in Germany and Italy where they are known as GVZ or Interporti.

Industrial and logistic parks not only fulfil transport functions but are also industrial areas.

Business Grouping developments are primarily set up to group businesses. When in such areas also grouping of transhipment, storage and transport activities take place, they operate like a freight centre.

Special logistic areas such as cargo centres and seaports provide an interface for additional transport modes.

The public sector plays an important role in the development, but in many cases also in the operation of these freight centres. In Japan, about 280 freight centres were developed under the guidance of several ministries in 1960s and 1970s. About 230 of these were projects with the purpose of grouping small-

and-medium-sized wholesalers and to make them competitive (business grouping developments). Twenty-five freight centres, called Common Truck Terminals, were built in order to increase the efficiency of truck transport. The freight centres that are expected to solve urban problems are called Distribution Business Areas. There are 22 Distribution Business Areas in Tokyo and 14 in other cities. In other countries it is a regional authority or the private sector that set up freight centres.

The first freight centres in Europe were developed in Paris during the mid 1960s in response to urban congestion. In the United Kingdom and later in the Netherlands and Monaco urban distribution centres (a type of consolidation centre) were developed. The majority of existing facilities in France, Italy and Germany was established during the 1980s and was developed from existing locations, like industrial sites or rail-terminals. Several countries included the development of freight centres in their national policies. Italy was the first in 1990, followed by Germany in 1992 and France in 1993.
There are plans to develop new freight centres in Europe. In the port of Brussels (Belgium), for instance, a multi-modal logistic centre (probably a type of freight village) is planned, also intended for urban distribution. The city of Rome also has plans for a multi-modal freight centre.

3. Urban freight transport policies in Germany, France, the Netherlands and Japan

In this section we will start with a historical overview of urban freight transport policy in general. Then we will discuss developments in Germany, France, the Netherlands and Japan. We will draw some conclusions on similarities and differences between the policies in these countries.

3.1 Historical overview

Policies related to urban freight transport are almost as old as urbanisation itself. Even old Rome took measures to control freight traffic entering the city. Dufour and Patier (1997) start their historical overview in the seventies, because at that time motorised traffic, in particular freight traffic, started to cause problems in urban areas. Button and Pearman (1981) mentioned some developments that cause the special interest in freight movement:

- Growth in freight traffic. The continued growth in economic prosperity increased the flow of merchandise both into and through the main urban areas of Western Europe.
- Limits to increasing road capacity. It became clear that congestion problems could not been solved simply by providing more and more road capacity. This meant that less capacity for freight transport became available.
- Land use planning as a policy instrument. In policy making it became clear that urban land use patterns could be influenced and used as a tool, particularly to stop inner city decay.
- Environmental concern. The increasing awareness of the environmental problems leads to concerns about the externalities generated by goods vehicles in urban areas.

Vehicle weight restrictions and time windows were introduced in many urban areas. These measures accelerated the moving of transhipment activities to the outskirts of urban areas.

During the late 1980s and early 1990s, rapid and far-reaching changes took place in logistics and city planning. In the logistics sector the factors most affecting cities were the rapid growth of road transport, the spread of hub and spoke networks and a growing demand for speed, flexibility, reliability and variety in logistics services. The key-factors in regards to urban areas were rapid growth, even faster growth of road traffic, the building of ring-roads and by-passes and rising city property prices. According to Dufour and Patier (1997) the combination of both sets of factors had different consequences: growth in commercial vehicle movements; business relocations and restructuring in both the production and distribution sectors, causing growth in HGV traffic in certain areas; development of private distribution centres; a worrying loss of vitality in some inner cities, and so forth. All these changes took place in a situation where the available space for (freight) traffic reduced by congestion, concerns about the environmental quality and budget restrictions. The result was a growing concern on the part of both the freight transport sector and city authorities. In the early 1990s national programs were set up in France and the Netherlands, for instance to find long-term solutions to the problems, which were roughly defined as environmental and accessibility problems.

3.2 Developments in Germany

Two developments in Germany that are particularly important for urban freight transport are the development of Güterverkehrszentrums (GVZ's or Cargo

Traffic Centres) and City logistik. In recent years, these have been a suitable approach to modernise the transport system. Whereas GVZ, generally speaking, aim at the creation of inter-regional networks between conurbations, City-Logistik want to organise the delivery of goods within urban areas.
The introduction of GVZs is an initiative by the national government. The so-called GVZ masterplans have been developed in Germany since the beginning of the 1990s. The objective is the creation of 30 GVZ locations that aim at shifting traffic from roads to rail and ship. Besides the GVZ Bremen, GVZs have been realised at Augsburg, Dörpen, Dortmund, Hannover, Leipzig, München, Neurenberg, Rostock, and Trier.

Table 4 City-Logistik projects in Germany and Switzerland

City	*Starting date*	*Participants*	*Results*
Augsburg	Nov 1994	6 transport companies	-83 % trips
Basel	Sept 1994	12 transport companies + postal services	Positive
Berlin	Mid 1993	9 transport companies	- 50 % deliveries
Berlin	Jan 1995	5 transport companies	From 5 to 2 trucks
Bielefeld	May 1994	3 transport companies	-
Bremen	1992	9 companies	- 70 %
Dortmund	-	-	-
Duisburg	Feb. 1995	7 transport companies	-
Düsseldorf	1992	3 transport companies	-
Freiburg	Oct 1993	12 transport companies + DB	-33 % trips, - 51 % trucks, -48 % time, cap.util. from 45 to 70 %
Gütersloh	Feb 1995	transport companies and local authorites	-
Hamburg	Sept 1994	8 transport companies	from 8 to 4 trucks, -70 % vehicle kilometres
Hannover	-	-	-
Kassel	Aug 1994	10 transport companies	from 10 to 2 trucks, from 15 to 4 trips per day
Koblenz	April 1994	5 transport companies	- 30,000 km/year
Keulen	July 1994	4 transport companies	-150 veh km/day
Munich	May 1993	22 transport companies	-
Munich	Midst 1993	4 transport companies	From 4 to 1 truck
Munich	Sept 1994	3 transport companies	-
Neuss	1993	3 transport companies	Positive
Nuremerg	End 1994	3 transport companies	-
Stuttgart	1993	3 transport companies	-
Stuttgart	Jan 1994	2 transport companies	From 23 to 14 trucks
Ulm	Jan 1995	2-4 transport companies	-

Source: COWI/NTU, 1996

City-Logistik refers in short to a joint service of delivering goods to urban areas by different transport companies. The Bremen City-Logistics Company has set up such a service in June of 1994. The associates of this company are the GVZ development company and nine forwarding agents. This company uses 13 ‘ecological’ trucks. In 1996 1,500 tons was distributed monthly (this is equivalent to 5,000 consignments or 4,000 delivery-stops); this led to a reduction in traffic of about 100 transportation stops a day. In other German (as well as Swiss) cities City-Logistik projects also started. Although the presence of a GVZ is not a pre-condition for City-Logistik, both concepts

benefit from this combination. Table 4 gives some information on City-logistik projects in Germany and Switzerland in 1996. Although at the start these projects looked promising, a significant number of these projects are now brought to an end, both in Switzerland and in Germany. In the period 1995-1999 transport companies withdrew their participation in City-Logistik projects, mainly for commercial reasons, but also because of a lack of sufficient support by public policy.

3.3 Developments in France

A growing concern on the part of both the freight transport sector and city authorities, in particular because little or no data, methods or references were available to construct a policy framework, was behind a national experimental and research programme on urban goods transport in France. The Transport Ministry (MELTT) and the environmental and energy agency ADEME launched this programme in 1993. The research focused on freight transport surveys in urban areas, modelling, starting pilot projects and making policy recommendations. The programme aimed at providing useful information to several groups of players:

- planners, whose work involves some aspects of urban planning, especially traffic and transport
- those who are responsible for managing road networks
- those who are responsible for managing national transport infrastructures, especially in a multimodal approach
- elected officials in central and local government
- the transport sector as a whole, covering the entire logistic chain

In the first phase (1993-1996) of the programme relevant quantitative information on urban goods flows was collected. An in-depth survey in Bordeaux was carried out. Information about the different players' views on urban freight transport, their main concerns and their strategies was collected. Other activities in this phase of the programme were a critical review of the legislative, regulatory and institutional framework, an analysis of the cost structure of the urban sections of logistic chains and a review of experiences in neighbouring countries. In the second phase of the programme experiments were carried out. In December 1996 cities of more than 100,000 inhabitants had been given two years time to draw up "urban movements plans", including urban freight transport. One of the intentions during this phase is to provide cities with information about flows, and with an urban freight transport model. Pilot experiments for urban freight management will also be set up. One of the ideas is to create a permanent urban freight transport monitoring system.

Generally speaking, no practical experiments have been undertaken in France yet, except in Monaco where a public terminal for urban freight transport is operational. It consists of delivering goods from a dispatching platform, in order to prevent trucks larger than 8.5 tons from entering into the inner city.
A project has been recently launched in Lille – Douai – Arras. Much research has been carried out but there is no extensive practice. This is probably caused by the fact that private companies manage their own freight problems, and do not rely on public intervention. The new platform of Castelnau d'Estrétefonds (near Toulouse), which is promoted by the region, should also be mentioned. La Rochelle has carried out a feasibility study for a public terminal where electric vehicles will be used. Rouen, with Le Havre is involved in the 'Sustainable urban and regional freight flow' project (SURFF). The aim of this project is to create an intelligent freight platform with processing and exchange of information about the freight logistic chain. Strasbourg experiments with deliveries of urban goods according to a 'park and ride' concept.
It must be mentioned that France knows a long tradition of developing freight centres, such as Garonor and Rungis in the Paris region. These areas are developed by private developers. In 1993 there were about 150 freight centres in France. The three largest private developers are Garonor, Sogaris and Pan Euro Log.

3.4 Developments in the Netherlands

In the national transport policy in the Netherlands, the introduction of urban distribution centres was on the agenda to solve the accessibility and environmental problems of freight transport in cities. The introduction of urban distribution centres (UDC's) was one of the measures, mentioned in SVV II (The Second Dutch National Transport Plan) (Ministerie van Verkeer en Waterstaat, 1990). For this reason the Ministry of Transport and Public Works initiated a research project on the feasibility of urban distribution centres (Coopers & Lybrand, 1991a and 1991b). The Ministry of Transport and Public Works considered the introduction of a UDC in the city of Maastricht as a pilot project. A few attempts were made to start up urban distribution centres elsewhere. The first UDCs were not operational before 1993. At this moment (April 1999) these UDCs prove to be not very successful. New projects started in 1996 in Amsterdam and Leiden. The Amsterdam project looks very promising, and many cities are therefore waiting for the results. The UDC in Leiden makes use of special electric vehicles.
In April 1995 a Platform Urban Distribution was installed. This national platform is associated with the Ministry of Transport and Public Works and

supports initiatives from local authorities or private enterprises that will lead to a more efficient urban freight transport. Different interest groups, such as shippers, wholesale companies, retail organisations, transport companies and local and provincial governments are represented in the platform. The role of the platform is to initiate and stimulate new projects, to guide and support projects and to publish the results. At least five projects are supported by the Platform: co-operation between fashion shop retail chains for upstream consolidation purposes, reduction of own account transport by fashion shop owners, collective delivery of goods for one street, selective accessibility in the city of 's-Hertogenbosch, and urban distribution in Amsterdam. The platform also prepared a set of guidelines for the evaluation and monitoring of urban freight transport projects. One of the most recent actions of the platform is to support the concept of the urban distribution truck. In 1999 the national government proposed, as an environmental target, that in the year 2010 between thirty and sixty percent of the vehicles within inner-cities have to use lpg or lng as fuel. The introduction of the urban distribution truck based on lpg or lng could support that policy.

The provinces in the western part of the Netherlands (Zuid-Holland, Noord-Holland and Utrecht) initiated a policy programme called GOVERA (Freight Traffic Randstad). This programme focuses on the communal research and demonstration projects on consolidation by voluntary co-operation and the use of intermodal freight transport with interest groups in freight transport. One project deals with consolidation of regional transport flows (Leidra) and another with consolidation of interregional transport flows (Dadira). GOVERA also considers the implementation of intermodal services within the Randstad, the western part of the Netherlands.

Another long-term project is the development of underground transport systems for freight. The feasibility and desirability of an underground freight transport system in cities are being studied in different projects initiated by the national government, for instance, DTO (Haccou et al, 1996; Brouwer et al, 1997). At the end of 1999 the government will publish a policy report on this topic.

At the end of 1999 the national government will introduce a new national transport plan, which will probably propose a new urban freight transport policy for the long-term. This policy will contain the earlier discussed initiatives in the field of urban freight transport.

3.5 Developments in Japan

Until 1997 Japan did not have a national policy on urban freight transport, although several ministries were, separately, concerned with freight centres. In 1997, however, the Japanese national government authorised a set of policies on freight transport, titled 'Comprehensive Program of Logistics Policies'. This program covers not only urban freight transport but also inter-city and international freight transport, from economic, environmental, and social viewpoints. The objectives of the program are:

- to be able to offer one of the most convenient and attractive logistics services in the Asian-Pacific Region
- to be able to provide logistics services at a reasonable cost so that they may not disturb competitiveness in inviting new enterprises to set up their business bases
- to cope with energy problems, environmental issues, and traffic safety that are related to logistics

One of the most important concerns behind the program was the strengthening of the international competitiveness of Japanese businesses. Improvements in logistics should support such a strategy. The following policy measures to improve urban freight transport are mentioned:

- investments in improving the infrastructure to reduce the time and cost for goods transportation based on the principle that beneficiaries should pay for part of the capital.
- further support to private enterprises by providing subsidies to logistics-related facilities/equipment
- to promote improvement and to strengthen the functions of the logistics business in urban areas and joint collection and delivery points where the sorting of goods for final consumers in metropolitan areas is carried out
- to develop logistics facilities in the vicinity of major highway interchanges, industrial areas, and seaside industrial zones
- to utilise the rail system for waste transport and as a feeder for international transport
- to promote deregulation in the logistics field
- voluntary co-operation, such as:
  - joint collection and delivery points in urban areas
  - facilities for disposal of goods towards buildings in metropolitan areas
  - facilities for joint collection and delivery in business district
  - stopping facilities for on-road collection and delivery
  - setting up delivery boxes
- to support the development of an advanced logistics system

- the development and standardisation of the Intelligent Transport System (ITS)
- providing road traffic information through bringing the Vehicle Information Communication System (VICS) into nation-wide use
- introduction of Electronic Toll Collection (ETC) system at tollgates
- a shift from own-transport by private companies towards transport by professional carriers

3.6 Conclusions

On the basis of these country reports we can draw some conclusions about the underlying objectives, the measures considered and the type of policy.
There is a clear distinction in phase of development of urban freight transport policies between the different countries. For instance, in France there is a strong emphasis on research and analysis, while in the Netherlands it is in a more experimental phase. Both countries focus in their policy more on investigating urban freight transport than on promoting and implementing a national policy. Earlier experiences probably made them careful. Germany went beyond the experimental phase and tries to implement measures related to regulation, inter-modal terminals and city logistics. However, as far as we know, there is no long-term public policy. The policy can be described as 'learning by doing'. Japan has been in an implementation phase since the authorisation of the 'Comprehensive Program of Logistics Policies' which gives priority to the national budget related to logistics.
In all four countries the private sector shows that they take an interest in public policies.
Another aspect is the definition of the urban freight transport problem itself. Questions about qualitative and quantitative aspects of the existing urban freight transport problems should easily be answered with the policy reports that deal with urban freight transport but most urban freight transport policies only deal with the current situation. Surprisingly, no attempts are made to make forecasts for future developments, when the situation might deteriorate. It might be assumed that urban freight transport is excepted to follow trends that take place in other fields of transportation. The underlying problems are also not always well defined and the relation with the proposed measures is sometimes missing, nor are the objectives. Although no attention was paid to this aspect in this section, it has to be mentioned.

Table 5 Differences in policies between the countries

	Germany	France	The Netherlands	Japan
Two main policy objectives	• Efficiency improvement • Reduction of hindrance	• Reduction of freight traffic and shopping trips • Reduction of local emissions	• Reduction of local emissions • Accessibility improvement	• Efficiency improvement • Reduction of energy consumption and emissions
Underlying problems	• Transport inefficiency • Heavy duty trucks in urban areas	• Urban structure enforcement • Congestion • Environmental problems	• Environmental problems • Accessibility problems	• High transport costs • Congestion
Licensing and regulations	• Implementation of time windows and weight restrictions • Experiments with low-emission zones	• Implementation of time windows, weight and volume restrictions • Experimenting with temporary closing when emission limits are exceeded	• Implementation of time windows, weight and size restrictions • Experiments with permits (green sticker)	• Implementation of weight restrictions • Implementation of permits to enter shopping malls
Freight centres	• Implementation of (multi-modal) freight centres (GVZ)	• Implementation of freight villages	• Experiments with consolidation terminals	• Implementation of different types of freight centres
Freight routes	• Experiments with freight routes • Intercity freight trains	• No special routes	• Attempt to use bus routes • Experiments with freight routes near industrial areas	• Truck ban in outer lanes of some routes at night
City logistics	• Implementation of co-operation in city logistics, but ending	• No city logistics experience	• Attempt, but failed • No experiments	• A few cases of implementation • Governmental promotion
Low-emission vehicles	• Experiments with electric and CNG-trucks	• Experiments with electric trucks	• Experiments with electric/ hybrid and LNG-trucks	• Subsidising of electric vehicles
Consultation	Local consultation platforms	Local consultation platforms	National consultation platform	National consultation platform

Policy level	Local	National	National	National

Note: In relation to measures distinction is made between implementation and experiments. Experiments means small-scale implementation in one or two cities on an experimental basis. Implementation means that it has become a well-practised policy.

The main policy objectives are quite different. Although the reduction of local traffic and the reduction of emissions are important in all countries, there is a difference in emphasis. Japan focuses very strongly on economic objectives, while on the other hand the Netherlands emphasise the reduction of local emissions (including noise).

Table 5 presents a comparison of measures in the four countries. A distinction is made here between attempts, experimentation and implementation of measures. Time windows and weight restrictions seem to be popular measures but time-windows are mainly to be found in the European countries. New types of restrictions may also be noticed, for instance eco-zoning or the load-factor as a criterion. Eco-zoning means that only low-emission vehicles are permitted to enter a specific zone. The temporary measure to close cities in France is also a sort of (temporary) eco-zoning.

The concept of freight centres is very different in these countries. The Netherlands promoted the concept of consolidation terminals ("Urban Distribution Centres") while the other countries focused on area-type freight centres, such as freight villages.

There are some experiments with freight routes but the background of these routes is mainly a concern to avoid freight traffic on other routes rather than to improve the quality of the route for freight.

Collective co-operation, especially City-Logistics gets attention in most countries but its implementation is not easy. A few successful cases exist in Germany and Japan.

In all four countries platforms have been installed with the purpose to discuss the problems and measures with representatives of the private sector. An important difference is that, for instance, in Germany local platforms are set-up, while in Japan and the Netherlands national platforms exist.

In relation to urban freight transport traditionally little attention is paid to transport outside urban areas but it has to be noticed that in many cases urban freight transport is directly related to transport outside urban areas. In many cases the goods come from another region or even from another country. Some studies and experiments are going on to consolidate interregional transport flows that are related to urban freight transport. The use of rail for transport between freight centres on a relatively short distance (between 100 and 300 kilometres) is also studied.

4. Some final remarks

In this review we looked at urban freight transport policies from different viewpoints. The general overview of public policy and planning in the field of urban freight transport shows that some very interesting developments are taking place. These developments can be recognised in the policies in Germany, France, the Netherlands and Japan. These countries vary in underlying problems and approaches, also show similarities, be it with some local flavour. Their policies are mainly based on stimulating consolidation by voluntary co-operation between transport companies in combination with a freight centre and measures in the field of licensing and regulation.

In the field of voluntary co-operation, next to collective co-operation between transport companies in city logistics, co-operation between shippers is seen as an interesting strategy to consolidate ('upstream'-consolidation) transport flows. There are some examples of co-operation in consolidated despatch and receiving facilities. In some countries attention is paid to this concept of co-operation, mainly between receiving companies. There are indications that this could be an interesting development, but that it needs to be worked out in innovating concepts.

The concept of freight centres has been moved from public terminals to areas with concentrations of logistic activities and multimodal transhipment facilities. Although freight centres are not directly the solution to the problems, it provides important spatial conditions for co-operation and consolidation. Freight centres also provide space and infrastructure facilities for city logistics.

In the field of regulation besides time-windows and vehicle restrictions, the emission and the load-factor of vehicles are used more and more as access restrictions. Both are efficiency indicators, the load factor for an efficient use of vehicles and emissions as an indicator for environmental efficiency.

The different approaches, however, clearly seem to converge. Measures that were introduced earlier in some countries are now starting to be discussed in other countries. None of the countries pretend to have found the optimal solution to the urban freight transport problems. This means that progress in the field of urban freight transport policy is still needed. The developments that were discussed earlier enforce progress in this field. There are two developments that will very much influence the organisation of urban freight transport in the future. First, despite the deregulation process in the past, governments are willing to increase regulation of urban freight transport in the future. This process of regulating urban freight transport needs careful planning. The other development has to do with new technologies that will be introduced in transportation, for instance low-emission propulsion technology and information technology. Even new transport systems may come available, such as automated (underground) transport.

Finally, issues that certainly need to be addressed in urban freight transport planning research, are:

- how to develop fruitful co-operations between the public and the private sector in order to improve the efficiency of urban freight transport
- how to set-up efficient co-operation between transport companies, receivers and shippers to set-up network logistics services
- the development and implementation of technology in the field of urban freight transport, in particular information technology
- the role or multi-modal transport regional or national networks in relation to city logistics
- the role of new infrastructures, such as underground freight transport for city logistics
- how to support policy making with sufficient tools

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Appendix A: Measures

In the COST 321 Action (1999) a list of measures related to urban freight transport has been provided. Working group A of the COST 321 Action distinguished promising and less promising measures based on a survey under experts (Tanja e.a., 1995). About 60 measures were identified. These measures were already implemented, tested or only considered. The measures were classified.

Logistic measures

Thirteen measures of the list could be classified as "logistic measures". Considered as promising on a local level are:

- transport co-ordination and co-operation between retailers
- reduction in package volumes
- information systems and systems based on the use of telematics
- goods distribution centres
- use of urban transport containers/ local service containers
- replacement of large trucks or vans
- route/tour planning

The following measures seem less promising:

- service differentiation / reduction of service level requirements
- shared use of storage by retailers
- promotion of storage facilities in inner urban areas
- outsourcing of freight transport
- development and use of light goods handling equipment
- development of lock chambers common to a group of receivers

Modal choice

Six of the measures were so-called modal changes. As promising are ear-marked:

- inter-mode transport co-ordination
- regional rail network in conjunction with urban distribution centres

Less promising are:

- use of bicycle transport for the small or short range transport of retailshops
- use of pipelines for transport of fuels and certain types of waste
- underground freight manipulation
- use of cheaper handling equipment

Price measures

The following measures were considered as promising in the survey:

- truck-ownership licences for urban distribution
- road pricing in cities

Less promising are:

- parking duty for delivery trucks modulated according time of day, parking time and site
- public subsidisation of railway transport in cities

Infrastructure and physical planning

Promising:

- optimisation of distribution systems including transport centres
- geographical bundling or separation of functions
- strong expansion of the rail network

Less promising:

- promoting less transport intensive economic activities
- extension of transhipment facilities
- assignment of industrial/commercial estates to existing/future transport infrastructure
- solve infrastructure problems
- removal of freight transport depots from residential areas
- wide lanes to accommodate freight transport
- energy conscious road design
- to re-value railway or fluvial central urban sites as urban distribution centres
- accelerate procedure and direct routes between distribution centres and the inner city

Traffic management

Promising:

- regulation of freight traffic
- guidance and information systems for traffic management

Less promising:

- specific use of infrastructure for goods transport
- HGV or truck routes in cities
- reservation on streets of special sites for truck stops
- speed limits and external speed control
- hierarchy in infrastructure for freight transport

Technical measures concerning the vehicle

Promising:

- use of alternative fuels
- harmonisation of load characteristics and units
- development of silent vehicles and handling engines: delivery and pick-up during the night

Less promising:

- stopping of engine during goods handling
- speed limiters
- technical measures concerning the vehicle
- electronic devices for fuel use and gear shifting recommendations
- regeneration of brake energy

Measures concerning the way of driving

Influencing the driver behaviour was not considered promising

Other measures

These measures were not considered promising:

- harmonisation of national regulation
- search for an optimum sized Urban Delivery Vehicle
- to remove obstacles to electronic proof of delivery

An Urban Delivery vehicle seemed only promising on the long term.