Sustainable urban freight policies in the Netherlands: a survey

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Abstract

As mentioned in the white paper of the OECD the main policy objective to be tackled is the development of sustainable urban goods transport [1]. Sustainable urban goods transport should facilitate a continuing economic growth and meanwhile protecting the environment and ensuring a better quality of life for future generations.

In the Netherlands various regulations have been implemented with the aim of maintaining an urban living environment with sustainable qualities and facilitating smooth and safe traffic flows. Most of these regulations, like access restrictions based on time and/or vehicle size or weight, have been widely implemented. However, the diversity and different applications of these regulations among municipalities can cause serious (planning) difficulties for logistics operators.

For this reason it is interesting to compare and evaluate the differences of policy measures within municipalities. In this paper an inventory of policy measures have been carried out among Dutch cities. The inventory of measures has been classified according to a transportation system's view. The cities have been ranked according to the number of inhabitants. With the use of a classification of towns into large, middle and small towns a more detailed comparison can be made towards the effectiveness of policy measures.

A detailed evaluation of the measures can give us an insight into how policy measures should be implemented in order to reach a long-term sustainable urban goods transport. Also interesting to evaluate on this level is to look at the rate of harmonisation and standardisation of policies between cities. With this respect it is possible to get some idea what the impact of the OECD white paper is on municipalities in European countries.

Keywords: cost-analysis, future transport system, policy makers.

1 Introduction

The concept of ‘‘sustainability’’ and ‘‘sustainable development’’ has become increasingly influential in policy considerations in recent years. The most widely accepted definition of sustainable development is ‘‘development that meets the needs of the present without compromising the needs of future generations to meet their own needs’’ [2]. This was the definition used by the World Commission and then endorsed by the United Nations at the Earth Summit in Rio in 1992. This conference led to a focus on the policy action required to bring about sustainability, known as Agenda 21, which, whilst having no force in international law, has been adopted by many national governments [3].

In many European countries as a result, many local authorities have been preparing environmental strategies. A key problem to implementing an achievable sustainable strategy is determining the parameters of measurement (e.g. geographical scale, environmental and social impacts, etc.), and not surprisingly it is extremely difficult to achieve a workable, acceptable set of targets, actions and measures which will result in more sustainable cities, and a more sustainable urban freight transport system within that city.

The aim of a sustainable transport strategy is ‘‘to answer, as far as possible, how society intends to provide the means of opportunity to meet economic, environmental and social needs efficiently and equitably, while minimising avoidable or unnecessary adverse impacts and their associated costs, over relevant space and time scales’’ [4]. Since freight transport is part of the transport system it follows that the issue of sustainability must be addressed with regard to freight transport.

Urban freight movement can be improved so as to make it more sustainable in various ways. It is important to distinguish between two different groups who are capable of changing the urban freight system and the rationale for their doing so:

- Changes implemented by governing bodies—i.e. the introduction of policies and measures that force companies to change their actions and thereby become more environmentally or socially efficient (e.g. changing the way in which they undertake certain activities) [5].
- Company-driven change. Companies implementing measures that will reduce the impact of their freight operations because they will derive some internal benefit from this change in behaviour—i.e. companies can achieve internal economic advantages from operating in a more environmentally or socially efficient manner, either through improved economic efficiency or through being able to enhance market share as a result of their environmental stance. Company-led initiatives include increasing the vehicle load factor through the consolidation of urban freight, making deliveries before or after normal freight delivery hours, the use of routing and scheduling software, improvements in the fuel efficiency of vehicles, intelligent communications systems, and improvements in collection and delivery systems [6].

The driving forces behind these urban freight flows are factors such as the geographic location of activities, the costs of transport and related activities, land

prices, customer tastes and required service levels and existing policies governing freight transport and land use. Therefore, in order to change freight transport patterns and reduce their impacts it is necessary to influence some of these factors that determine goods flows as well as simply focusing attention on goods vehicle movements. Sustainable development strategies are likely to require national policies together with measures taken at a more local level. A European and national sustainability strategy could help to ensure that urban sustainability policies do not result in some urban locations becoming less economically attractive than others. It will be necessary to find suitable measures for the town or city in question and these are likely to vary from one urban area to another.

The aim of this paper is to evaluate the rate of harmonisation and standardisation of policies between cities. With this respect it is possible to get some idea what the impact of the OECD white paper is on municipalities in European countries. A detailed evaluation of the measures (of cities in the Netherlands) can give us an insight into how policy measures should be implemented in order to reach a long-term sustainable urban goods transport. With this respect it is possible to get some idea what the impact of the OECD white paper is on municipalities in European countries.

2 Policy evaluation in the Netherlands

2.1 Facts and figures

The Netherlands is a country with relative small size but very high population density. There are around 16 million people live in this 41528 km^2 country, of which 89% lives in urban areas. It is predicted that more than 93% of the Dutch people will live in the urban areas in 2025 [8]. With the increasing population and highly concentration of economic activities in urban area, congestion becomes inevitable in downtowns as well as on highways. Like many other European countries, the freight transport experiences a substantial increase in these years due to various reasons, like economic globalization induces longer journeys and "just-in-time" delivery asks for smaller and more frequent shipments. Such tendency will last for a long time as long as the economy grows continuously. Although the country has a world famous inland water transport system, the road transport has a much high proportion which occupies 80.8% of total goods transport in 2002. The passenger cars still hold the dominant position on the road traffic which has 87% of the total vehicles. The freight vehicle takes the rest 13%. Vans, less than 3.5 tons loading capacity, represent 86% of the total freight vehicles.

2.2 Freight policy development

The attention for urban freight transport problems has already a long tradition in the Netherlands. Serious attention for urban freight problems started in the early 90's with the introductions of public distribution centres (Coopers & Lybrand, 1991). After a trial period of five years in several cities in the Netherlands the

first evaluations came out (Duin, 1997) and has lead to a change of policy and policy management. Before National governmental plans had been very directive and top-down with implementing (Heijden, 1995). In 1995 the raise of the platform urban distribution caused a turn in influencing and stimulating innovative urban freight policies. The platform was a constitution of eleven parties: Union of Dutch municipalities (VNG), Ministry of Transport (V&W), Ministry of housing, spatial organisation and environmental affairs (VROM), Ministry of economic affairs (EZ), inter-province organisation (IPO) Inter-provincial debate (IPO), Association of Transport owners (EVO), Royal Association of retailers (MKB) and Dutch society of large retailers (NVG). This platform tries to stimulate and co-ordinate and support all kind of promising initiatives in the field of city logistics, namely:

- Upstream collection of goods for the same area;
- Co-operation between transportation organisations;
- Distribution outside of the opening hours of the shops;
- Ideal time windows;
  The time windows in which it is allowed to distribute goods in a particular urban area must be tuned to the specific situation in the area in order to work efficiently for the carriers;
- Central and local rules;

According to the platform the governments (central, province or local) must be one of the initiators for new policies and measures. The policies and measures themselves should not be seen as complete solutions. However it is a way to stimulate other parties to find a solution together. Therefore they have developed three kinds of process management models:

- The **Amsterdam model** (1995) – All actors decide about the best measures to be taken. Finally the municipality decides about the legislation. For specific situations exemptions are possible.
- The **Groningen model (**1999) – All actors decide about the measures to be taken, innovation is obtained by facilitating private city distribution with regional coverage. Municipality decides about the legislation of measures.
- The **Hague model** (2003) – All actors determine the rules. Innovation is obtained by searching integration with other transport modes and functions (for example garbage collection). Municipality is facilitator, less legislation of rules and responsibility for implementing is shared among the actors.

So far the effects of the platform have leaded to an increase of attention for urban freight problems and have leaded to more appropriate attention of freight issues in the political agenda of municipalities. From a survey (PSD, 2002) among 278 municipalities with more than 15000 inhabitants around 20% of the municipalities shows a growing political interest for freight transport. *However, still 38% of the municipalities has no political attention for freight!!*

2.3 Survey

280 Cities are investigated from a total of 509 municipalities and the population of sample cities ranges from 15,084 (Boskoop) to 734,594 (Amsterdam) inhabitants. The average size of the city is around 50,000 inhabitants. Therefore, middle to small-sized cities are strongly represented. To make the analysis easier to understand, we split the cities into two categories. The cities with population over 50,000 are defined as big cities and the small cities are below 50,000. The density of a city also plays a crucial role with regard to the traffic situation in general. This is particular important to the urban freight transport since the higher density means more problems will occur. From the statistics, the densities in big cities like Amsterdam (33,574p/km^2) and Rotterdam (19,568 p/ km^2) are much higher than the average (for the size takes into account is only the inner city and not including the suburbs). Also like above, places with inhabitants more than 2,000p/km^2 are defined as high-density areas.

Table 1: The relation of size and density.

		Density		Total
		High	Low	
Size	Big city	44	20	64
	Small city	32	184	216
Total		76	204	280

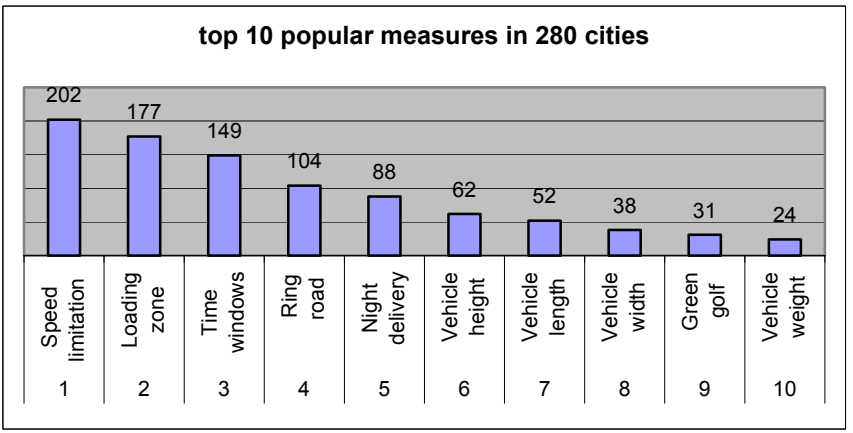

Figure 1: Top 10 measures in the Netherlands.

2.3.1 Frequently used policy measures

For all the measures, speed limitation, loading and unloading zones and time windows are among the top three most popular measures in the Netherlands. From these measures, the desired effects mainly to achieve are to protect people in the downtown area, regulate the goods supply flow, prevent physical damage to the inner city and create a good shopping environment.

2.3.2 Speed limitation

Speed limitation is the most popular measures in local municipalities. There are 72% of cites in favor of this measure. For these cities, more than a half restricts the speed regardless of the downtown or suburb. There is no difference of implementing the measure in terms of the size of the city. Around a quarter of the cities don't have speed regulation both in big and small cities.

Table 2: Size and speed limitation.

Size	Yes, inside downtown	Yes, outside downtown	Yes, thinking	Yes, both inside and outside downtown	No	No, inside downtown	Total
Big city	10	11	1	25	17	0	64
Small city	39	35	0	83	58	1	216
Total	49	46	1	108	75	1	280

2.3.3 Loading and unloading zones

The use of loading and unloading zones is another important policy measure for local authorities. Sixty three percent of the cities have this policy in general. The big cities have stronger tendency to support this policy that 92% of big cities have. The difference is probably attributable to the higher frequency of social and economic activities in the big cities. The more people live there, leading to a large amount of shipments. The design of loading and unloading zone could regulate the traffic flow go in and out the downtown.

Table 3: Load and unloading zone and size of the city.

		Loading and unloading zone		
		Yes	No	Total
Size	Big city	59	5	64
	Small city	118	98	216
Total		177	103	280

2.3.4 Time windows

Time windows are widely implemented in the Netherlands. More than 50% of the cities have this kind of measure. Five working days plus Saturday are the most frequent days. The main reason is the shops are open on Saturday. People go to the downtown to make shopping and they don't want to be disturbed by trucks. However, more than a quarter of the cities also restrict the freight traffic on Sunday. The range of the time period is widely diversified which is from one and half hours to more than 20 hours (see Figure 2). However, the time windows in the morning period from 6:00 to 12:00 count for 43.6% of the total cities. 2/3 of the cities have time range from three hours to six hours.

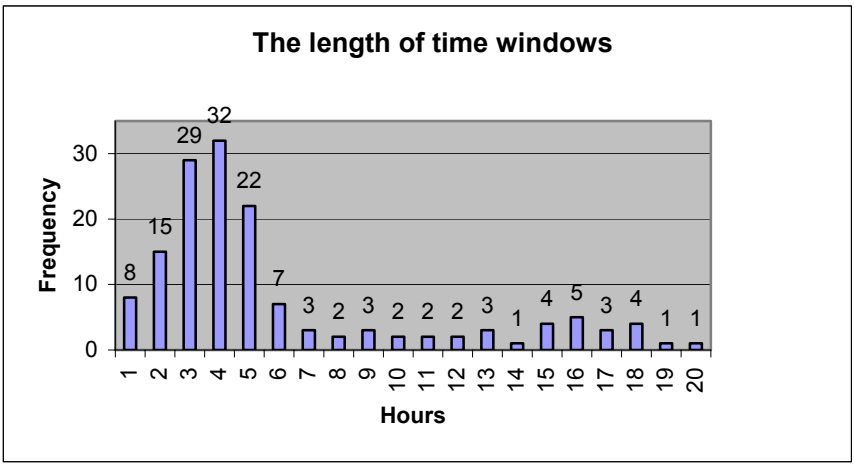

Figure 2: Lengths of time windows.

Table 4: The size of city and time windows.

			Time windows		Total
			No	Yes	
Size	Big city	Count	6	58	64
		% of Total	2,1%	20,7%	22,9%
	Small city	Count	124	92	216
		% of Total	44,3%	32,9%	77,1%
Total		Count	130	150	280
		% of Total	46,4%	53,6%	100,0%

2.3.5 Vehicle restrictions

The vehicle restrictions are also very popular in the Netherlands. Many aspects have regulated the movement of lorries in the downtown. 138 in 280 cities have at least one kind of vehicle restriction. As different cities may have their own

unique characteristics related to historical center, transport infrastructure and economic situation, the difference of the same regulation varies considerably for each individual town. The limitation of height ranges from two meters to values of 4.5 meters. The differences observed here are also largely attributable to the local structure. Especially in the inner cities, some historical buildings limit the height of trucks. The most frequently used limitation is three or four meters high, i.e. more than 50% of the total cities. In big cities, the height limitation is higher than the small cities, ranging from three meters to 4.4 meters. The height of three meters (17%) and four meters (46%) are the top two, respectively. The width restriction ranges from two meters to four meters. Small cities use this regulation more often, i.e. 82% of the total small cities. Two or three meters limitations are used intensively, combining 76% of the total number. The length limitation is equally distributed between big and small cities. Ten and twelve meters are used more frequently, which have proportion of 23% and 31% respectively.

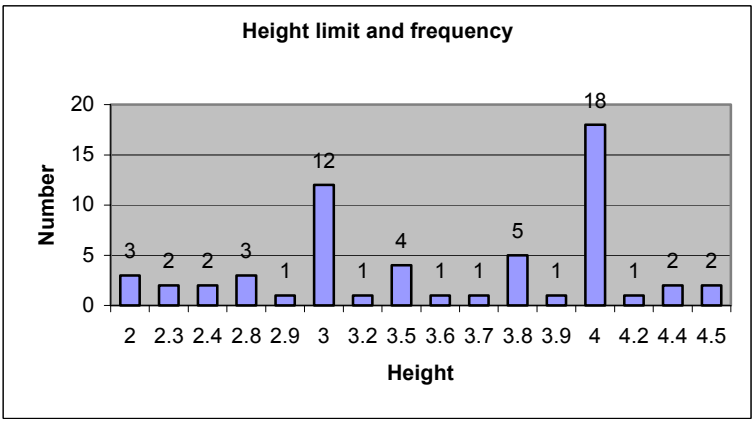

Figure 3: Height limitation and frequency.

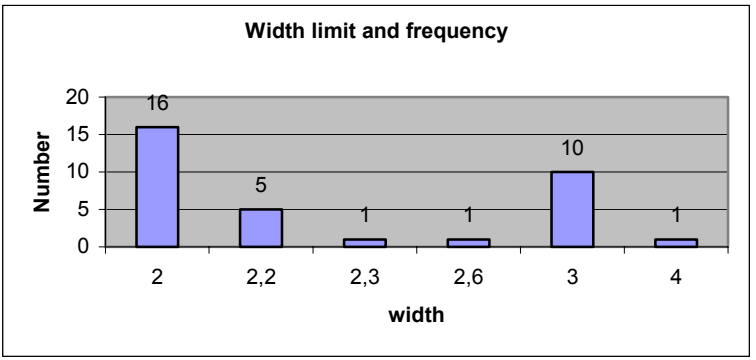

Figure 4: Width limitation and frequency.

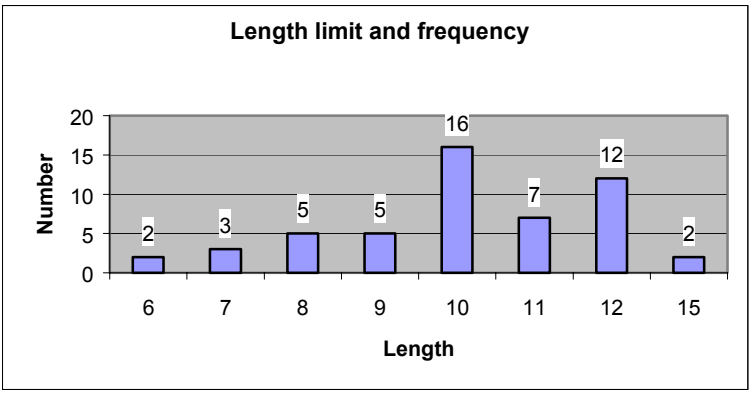

Figure 5: Width limitation and frequency.

2.3.6 Innovative policies

With respect to innovations in the field of city logistics, the Netherlands is representative of the use of city distribution centres for freight delivery. So far it has not shown any signs of feasibility due to the low level of participation shown by carriers, who prefer direct deliveries, still possible in a low enforcement scenario. Other innovative policy to be found in Dutch cities is the designation of logistic routes, which sometimes consist of designated detours for heavy goods traffic (Amsterdam, Tilburg), and sometimes of bus lanes used for city distribution (Utrecht). Somehow innovative, but actually based on very old traditional delivery in towns, are freight carriers operating in the Dutch channels. With small vessels, in the cities of Amsterdam and Utrecht, parcel services operate to distribute in the inner centre. Underground freight transport has been studied over in the Netherlands for a couple of cities. For sustainable development of a city these systems might have the future. However, at this moment the building costs are too much expensive to be considered seriously.

3 Conclusions

In our study among the Dutch municipalities we have noticed that regulations concerning city logistics are very much the same, independent of the size and characteristics of towns. Access restrictions according to weight, occasional time windows, and load zones available until 11 a.m. represent the typical regulations, very often without a previous analysis or without having any information about deliveries in the congested areas of the city.

Along this line, city logistics policies are not very often the result of detailed analyses and evaluations. This is reflected in similar types of regulations repeated through the different cities regardless their characteristics, the same schedules for time windows and load zones, and the failure to recognise different types of urban distribution which require different types of regulations. Apart from copying regulation frameworks, however, cities do not share information,

knowledge or cooperation, and the lack of national or regional bodies dealing with city logistics, as there exist for urban passenger traffic, is significant.

Time windows both for access and for the use of load zones seem to be the most widespread policies both in the Netherlands. However, the question still is: 'are these policies really the best ones for all the towns'? In the Netherlands the problem of introducing time windows has been recognised by municipalities and about 45% out of 278 municipalities shows interest in a regional coordination of the time windows.

On the other hand, it should be mentioned that in the Netherlands knowledge and experience on city logistics have been institutionalised into one platform, i.e. PSD. The commitment of the members and the information sharing among their members have led to a good common thinking for making city logistics policies. Sixty percent of the municipalities (out of 278) know what the platform stands for. Last year the platform ceased to exist and divided itself among four geographical zones in the country, in order to get more insight into the processes of supplying the inner cities with goods and the effects of measures taken by the municipalities. The platforms have more discussions in detail since not only union members will join these platforms but also the real companies operating in the city.

For the sustainable development of freight transport in Europe this ideology has been followed by the BESTUFS platform [8]. The idea is not to impose regulation frameworks on cities, but to make available for all of them a common source of data, experiences and best practices. That's why this initiative like the BESTUFS II platform represent probably the best type of institution for this knowledge exchange role and can build the bridge between academic knowledge, policy and practice. In these platforms the new roads to sustainable urban freight policies can be explored.

Acknowledgement

I thank Zhengqin Qian for his master thesis work [9].

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