



## **BESTUFS WP 3.1**

### **Report on urban freight data collection in the Netherlands**

**Final version**

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# 1. Overview of urban freight data collection in the Netherlands

## 1.1 Introduction

A range of freight data is currently collected in the Netherlands. This includes census and register data (such as economic and land use data used in modelling), continuous and period surveys carried out nationally, and occasional surveys.

Data collection usually takes place on a national basis. The only data collection work in the Netherlands that is solely about urban freight has been occasional surveys carried out in specific towns or cities. These have usually been conducted on a one-off basis as part of a review of urban freight strategy or to assist in making an urban planning decision.

However, the quantity and coverage of available urban freight data is still far less than either: i) freight data available at a national level, or ii) urban passenger transport data. This is due to the fact that governments have traditionally focussed on passenger transport data collection rather than freight data (at national, regional and urban levels), together with the fact that much freight data (urban and elsewhere) is held by private companies and is not made generally available by them.

## 1.2 Main organisations collecting freight data in the Netherlands

The Central Bureau of Statistics in Voorburg (with a second office in Heerlen) is the main organisation collecting statistical data in the Netherlands. CBS uses questionnaires to collect the data. They regularly publish freight transport and traffic data. The level of aggregation is high however. In the past data was collected at the 4-digit postcode level, but in order to reduce the so-called ‘administrative burden’ on society the 2-digit postcode level was chosen as the relevant (adequate) level in official CBS publications. Eurostat is supplied with NUTS-3 data, in the Netherlands this is the so-called COROP region, of which there are 40<sup>1</sup>. A COROP region can be urbanized to various degrees, so there can also be differences between the COROP regions in terms of transport and traffic data. Further disaggregation, e.g., to get data for cities or larger agglomerations is not possible. The statistical reliability of such a disaggregation is not acceptable.

Traffic data is collected by Rijkswaterstaat (RWS), which is responsible for the national road and inland waterway infrastructure. Rijkswaterstaat is part of the Ministry of Transport and Public Works. They measure traffic at road sections outside built-up areas. The geographical regions of RWS are not completely the same as those used by CBS, which makes combining transport and traffic data more difficult. PSD<sup>2</sup> mentions many other regional subdivisions, for instance for the retailing business or administrative purposes, which are not necessarily compatible with one another or difficult to quantify.

The following is an example of the (limited number of) statistics published by CBS:

- national transport by road, rail and barge with inland and international destinations, on a yearly and monthly basis
- regional transport data (the Netherlands is divided into five parts: north, south, west, east and Rotterdam-Rijnmond harbour area)
- national traffic intensity for roads (aggregation of passenger and freight vehicles)
- number of vehicles for the Netherlands and a subdivision into the thirteen provinces, split into numbers of trucks, special vehicles, buses and (semi-)trailers
- sales of new and second hand vehicles

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<sup>1</sup> The geographical scope of NUTS-3 is different per country. For instance, in France it covers the Departement, in Germany the Kreise and in the UK the counties.

<sup>2</sup> PSD, 2001, Voorstel tot regionale afstemming van venstertijden, The Hague.

About 50% of all goods on roads are transported by foreign firms, which are not counted in the national statistics by CBS, because it only interviews Dutch firms.

While aggregate data is published, little is known (or published) about the locations between which goods are transported, what kinds of loading unit are used in particular cases and what kinds of good are actually transported in these loading units. Main entry and exit points like airports and harbours know what goes in and out, because they have a legal obligation to collect data for customs or taxation purposes, but then we talk about medium to long distance transport. Likewise, if we know that goods are transported from Rotterdam to Amsterdam, the final destination of all goods is not necessarily a firm in the receiving harbour. This is especially true in case of the Netherlands, which is mainly trade-oriented and not producing that many goods any more.

From an interview we had with CBS several years ago we learned that they collect data in a way which is a mix of a market-oriented and a supply-oriented approach. Some data are not collected each year, which leads to modifications and reduction of statistical reliability.

Based on the information provided by CBS and our own experience with data collection and statistical analysis within cities we should conclude that reliable public data about urban freight transport is not available. To fill this 'gap' one is forced to rely on cases studies or 'guessestimates' (using some rules of thumb, see for instance Maas et al., 2000), which reduces their value for modelling purposes.

With the privatization of CBS a few years ago, a researcher has to pay for additional work, which is problematic given the general lack of funding for (urban) transport research in the Netherlands.

A second major source of data is NEA Transport Research and Training in Rijswijk. They are a major commercial source of transport data. NEA performs studies into branches of industry concentrating on business-economic transport data, for instance about trends in costs of road transport. But it does not collect urban data as far as we know.

A third source of data could be local governments. However, data collection by local governments takes place by means of periodic or occasional vehicle traffic counts that include goods vehicles but these governments hardly carry out surveys of goods vehicle operations. Their policies tend to focus on vehicle movements, not on goods flows. This can be explained by their legal obligations, which are related with the use and maintenance of physical infrastructure. Hence, vehicle movements are treated with policy instruments in the field of infrastructure policy, like physical access restrictions. To create a certain level of accessibility, such access restrictions are related with time windows for delivery. Local governments tend to copy practices from other urban areas, usually restricting freight vehicle movements, while there is doubt that in all cases proper research was carried out before the policy was put into practice.

The idea that freight and passenger transport are not comparable, hence need a different treatment is not generally accepted. To mention two polar cases, the city of Amsterdam has closed the special small office dealing with freight transport, but the city of Utrecht has made a special plan to improve delivery traffic for which they used the so-called delivery profile we made for them.

Other bodies collecting freight data (including urban freight data) are TLN and EVO. They are transporters' lobby and support organizations and are mainly road oriented. Then there is the HBD, which is the representative of retailers in the Netherlands. They collect data and lobby for their respective branch of industry. There is also the road safety organization SWOV that collects data about road accidents.

These are the most relevant sources of freight (traffic) data in the Netherlands. Of course, this list is not complete.

Main difficulties in extracting urban data include:

- Lack of funding to collect urban transport data.

- Industries complaining about a too high demand for data (by authorities, researchers, etc.).
- There is no valid source of urban transport data, collecting data in an objective, transparent way.
- Sample sizes for smaller urban areas are likely to be relatively small in vehicle activity surveys. From a statistical point of view such sample sizes have a limited application field and it is therefore difficult to use them to support policy-making.

### **1.3 Reviews of freight data collection in the Netherlands**

The Dutch national government has in the past tried to convince the freight transport industry that a modal shift in freight transport is necessary. Its policies have had a limited effect on business decisions. Nowadays, at least at the national policy level such policies have been abandoned, and strict targets are not in place anymore. However, there has been an official program to improve transport efficiency in road transport, to improve air quality, reduce accidents etc. In urban transport, rail and barge do not play a role in the Netherlands, which makes a modal shift policy not relevant for Bestufs. Regional transport by other modes is nearly always transport of raw building materials (barge) and maintenance (rail), because pre- and post haulage by road is way to expensive given the short distances.

We do not know of any review of data collection studies in the Netherlands. However, there are some relevant things to be mentioned.

The Platform on City Logistics (PSD) has developed a few products, which can be used by local governments to identify issues in city logistics, especially to improve accessibility of inner cities. For this purpose they can use the so-called vehicle matrix, which matches freight vehicles with local accessibility conditions. They also marketed the so-called delivery profile, which can be used to collect data and monitor the local freight distribution situation. We have been engaged in the development of this distribution profile tool together with commercial partner DHV Consultants and a few representatives of local governments. An essential part of this development process was to determine the data requirements of local governments in specific main shopping quarters of cities in the Netherlands.

## **2. Specific urban freight data collected**

This section provides information about specific freight data collection exercises in the Netherlands.

Table 1 on the following pages provides an overview of freight data collection in the Netherlands.

## 2.1 Overview of relevant data sources

Type of data collection exercise/survey	Name of data collection/survey	Name of organisation collecting data	Reason for data collection	Is data used for modelling?	Frequency of data collection	Last time data was collected	Type of data collected	Method of data collection	Sample size	Units of measurement used	Geographical area over which data collected
<b>Commodity flow survey</b>	None										
<b>Site/Land Use/Establishment surveys</b>	?	CBS, HBD etc.	Legal obligations, commercial services, lobbying	Probably	Regularly	2005	Employees, houses, premises etc.	Surveys	Large	Number of..	NL, regional
<b>Transport operator surveys (including driver surveys)</b>	MG-10	Connekt	Standardized method to collect data (Delivery profiles)	Yes	Once	2001	Routing, vehicles, load units, type of goods, etc.	Postal questionnaire	A few hundred	Several	Regional/urban in NL
<b>Shipper surveys</b>	None										
<b>Receiver surveys</b>	MG-11	Connekt	Standardized method to collect data (Delivery profiles)	Yes	Once	2003	Routing, vehicles, load units, type of goods, etc.	Postal questionnaire	A few hundred	Several	Regional/urban in NL
<b>Good vehicle fleet licensing data</b>	[Internal name]	Office for National Statistics (CBS)	Legal requirement for licensing	No	All the time - published annually	2005	Vehicle type and weight, registered address of owner	Postal licensing form	All vehicles		All of NL
<b>Traffic counts</b>	Manual and automatic counts in NL	Various	Traffic management, infrastructure provision, etc.		Regularly	2005	Traffic flows	Manual and automatic counts	Not applicable	Vehicles	Road sections anywhere in NL
<b>Distribution industry surveys</b>	Various studies into logistics issues	Various institutes and agencies	Commercial, scientific	Usually not	Variable	-	Depends on the case studies	Postal or personal questionnaire	Various branches of industry	Several	All of NL
<b>Vehicle operating cost surveys</b>	Vehicle operating costs / Distribution Cost surveys	NEA	Commercial	Yes	Published regularly	2005	Wages, warehouse costs, vehicle costs, haulage rates	Postal questionnaire	?	Several	All of NL
<b>Loading/unloading/parking infrastructure data for goods vehicles</b>	?	Local governments	Infrastructure-, parking policies	No	?	?	Number of (dedicated) parking lots, rate of availability	On site assessment	Not applicable	Number of lots, size, other parameters	Urban areas

(continued)

Type of data collection exercise/survey	Name of data collection/survey	Name of organisation collecting data	Reason for data collection	Is data used for modelling?	Frequency of data collection	Last time data was collected	Type of data collected	Method of data collection	Sample size	Units of measurement used	Geographical area over which data collected
<i>Data on road accidents involving goods vehicles</i>	?	SWOV, Ministry of Transport and Public Works	Legal requirement & accident analysis	Probably	Regularly	2005	Day, date, time, location, vehicles involved, casualty information for each accident	Police reports	Not applicable		All of NL
<i>Data on lorry/lorry load thefts</i>	?	(National) Police	Crime investigation	No	All the time	2005	Location, time, date of incident, type of vehicle, type of load	Reported by Police Forces, hauliers, insurance companies, goods in transit claims handlers, loss adjusters and private investigators	Not applicable		All of NL
<i>Employment surveys in freight transport and logistics industry</i>	Various employment statistics	Office for National Statistics (CBS), NEA, TLN, EVO	Employment in NL	Probably	Published annually, quarterly and monthly	2005	Number of employees by sector	Postal questionnaire	Business firms	Number of employees	All of NL
<i>Land use databases for town/city needed for freight modeling</i>	None										
<i>Port freight traffic data in the urban area</i>	?	Office for National Statistics (CBS)	Legal requirements, incl. customs	Yes	Regularly	2005	Freight handled by commodity, type of ship, port	Returns by port operators	All port operators	Various	Main harbours (Rotterdam, Amsterdam, Vlissingen, Delfzijl)
<i>Rail freight traffic data in the urban area</i>	?	Port of Rotterdam	Legal requirements, incl. customs	Yes	Regularly	2005	Number of trains, volume transported			Number of trains, destinations, load units	
<i>Inland waterway freight traffic data in the urban area</i>	?	Local governments	Taxation	No	Published Annually	2005	Number of ships, volume transported	Barge and ship operators and ports	All ports	Tonnes and tonne kilometers	All of NL

(continued)

Type of data collection exercise/survey	Name of data collection/survey	Name of organisation collecting data	Reason for data collection	Is data used for modelling?	Frequency of data collection	Last time data was collected	Type of data collected	Method of data collection	Sample size	Units of measurement used	Geographical area over which data collected
<i>Airport freight traffic data in the urban area</i>	7	Ministry of Transport and Public Works	Produce national estimates		Published monthly	2005	Freight lifted by airport, by scheduled or chartered flight, and by passenger and cargo aircraft	Returns by airports	All airports	Tonnes, airplanes	All NL airports
<i>Freight informatics data (from cameras, sensors &amp; other automatic data capture devices)</i>	GPS	Fleet owners	Used by operators to monitor vehicle fleet	Used by operators for trip planning and scheduling	All the time	2005	Vehicle ID, location and time data	Satellite tracking			
<i>Other sources of urban freight data</i>	None										
<i>Vehicle safety and maintenance</i>	?	Ministry of Transport and Public Works	Part of vehicle road safety and environmental standards within NL	No	All the time	2005	Vehicle test fail rates, road worthiness spot check test, exhaust emission tests	Vehicle testing	Varies depending on test - for some tests all vehicles are included	Several	All of NL
<i>Other sources of urban freight data</i>	None										

**Table 1. Overview of data collection in the Netherlands**

Notes:

- We have made this overview according to our best knowledge. It is important to consider that not all mentioned sources contain dedicated information about urban areas, as in practice the transport, storage etc. facilities may have a much wider geographical span than just the urban areas. This holds in particular for rail, barge and air transport.
- In various cases, the source of information will be an annual report by a port, airport etc., not containing a specific reference to the name of the inquiry, the database etc.

## 2.2 Specific information about Connekt MG-11 project

### *Scope of the project*

In 2002 Connekt commissioned a study with two aims. First, to optimize a previously developed method of collecting data about urban freight transport. Next, to apply the method on data about shopping centers in the inner cities of Amsterdam, Rotterdam and Utrecht. This led to so-called delivery profiles for specific shopping areas in these cities. A second aim was to develop a model for explaining relations between key variables in urban freight transport in these cities.

### *Major results from the data collection and analysis*

Data were collected during the surveys, even in areas known to be difficult, such as deliveries per branch of industry and commodity, vehicles, O-D pairs and route choice. A delivery profile was developed (see Table 2). The profile could eventually be compared with profiles of other urban shopping areas of comparable size and (spatial, economic) structure.

**Table 2 Delivery profile for Utrecht innercity (summary)**

<b>Economic vitality and attractiveness</b>	<ul style="list-style-type: none"> <li>• The more than 3000 firms generate 21000 deliveries or 9000 m<sup>3</sup> of freight per week</li> <li>• Average dwell time is 23 years <sup>1)</sup></li> <li>• 79% of the inhabitants rates the shopping climate as ‘good’</li> </ul>
<b>Traffic safety</b>	<ul style="list-style-type: none"> <li>• 48% of the inhabitants is satisfied with the level of traffic safety</li> <li>• There were no deadly accidents between 1999-2001 <sup>1)</sup></li> <li>• Freight vehicles were involved in 27% of all accidents, on the ring road this was 18%. In nearly all cases there was only material damage</li> </ul>
<b>Liveability</b>	<ul style="list-style-type: none"> <li>• More then 50% of the inhabitants rates the living climate as good</li> <li>• Most of the hindrance related with delivery is due to noise (36% of the inhabitants) and vibration (15%, idem)</li> </ul>
<b>Accessibility</b>	<ul style="list-style-type: none"> <li>• Accessibility of the city centre is regarded as ‘good’ by about one third of all people, inhabitants experience less, and receivers and freight vehicle drivers mention much more problems</li> <li>• It takes about 21 minutes to drive from the main road (city ring) to the inner city, average stay time is about 2.5 hours</li> </ul>
<b>Quality of delivery</b>	<ul style="list-style-type: none"> <li>• In about 65 % of all cases small vehicles are used</li> <li>• Delivery is evenly spread over the week</li> <li>• About 75% takes place in the morning and 25% in the afternoon</li> <li>• Accessibility of the area is regarded to be good and bad, the latter is due to the segmentation of the inner city (no direct connections <sup>2)</sup>). The locations for delivery and pickup and the transport distance from there are regarded as ‘good’</li> </ul>

Notes:

1) Most recent data;

2) Nowadays, freight vehicles are allowed to pass, which improves accessibility

The dataset also enables certain estimations. For instance, the number of delivery trips is the number of deliveries per week divided by the average number of stops per (round) trip. This gives an indication of weekly freight traffic in the area. Similar estimations can be made for days of the week or periods of the day.

### *Difficulties in collecting the data*

The dataset turned out to have serious flaws. Three of them will be discussed, namely variance in outcomes per variable, (useable) sample size and data from local governments. The most common way to determine variance around a mean is by calculating variance or standard deviation. The latter turned out to be very large (much larger than the mean), which prevents making statistically valid statements about many variables or about the relations between them.

A second problem has to do with the response rates. They varied between 3 and 9 % for receivers<sup>3</sup>, nearly 100% for drivers (on street) and less than 0.1% for inhabitants. The low scores for 2 out of 3 user categories mean that the answers should be dealt with in a careful way. Another problem was that many questionnaires were not completely filled in or contained ‘surprising’ answers, hence could not be used to analyze all questions.

One likely cause of these statistical ‘problems’ was most likely outsourcing of data collection. Another is a routing error in the questionnaire, despite the fact that the questionnaires were tested. The last problem relates to data obtained from local governments. They may provide data about traffic/infrastructure, economic situation and environment. In practice the officials contacted had very little or no freight traffic data, because traffic counts make no distinction between cars and other motorized vehicles. This is an indication of a commonly found aggregation problem or collection of information on an ad hoc basis. ITS is not relevant as a source of information either.

There are nevertheless some exceptions. For instance Utrecht developed a dedicated policy note, partially based on our findings, while Amsterdam also has dedicated instruments for urban goods transport, partially based on experience and partially based on the (political) decision to ban or reduce motorized traffic in certain streets or areas. Agencies in the different city quarters can have their own policies, however.

Economic data has to come from other departments than the one dealing with traffic and transportation, which is not always easy. Environmental data is usually available, but also as aggregate data for all kinds of traffic.

### *Things to improve*

To improve the quality of the dataset, data acquisition should first be improved and second, the group of potential data suppliers should be broadened. It is vital to find a way to extract logistic information from the system. It may help if suppliers of goods (shippers) would be willing to participate in the study. The inclusion of (more) information from chambers of commerce would improve the economic part of the analysis. This would imply a broadening of the number of parties involved. The result would be that some of the existing gaps in the database could be closed.

A consistent and statistically valid dataset is a precondition for any kind of quantification and particularly for the definition of mathematical formulas and estimation of parameter values.

### *Lessons learned*

The success of such a survey is strongly dependent on the following factors:

- willingness of actors to co-operate (response rate)
- knowledge of those who are interviewed about the logistic process
- logic and language, with particular reference to the feasibility of understanding and answering the questionnaire
- time of the day when the interviews were carried out

### *Costs of the data collection*

The cost of the study, which also included modeling work, was about 100000 Euros. This figure does not include co-financing.

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<sup>3</sup> Range of averages for all branches of industry. There were substantial differences between branches of industry, e.g., in Amsterdam between > 80% for super markets to 1% for other business.

*Content of the data collection*

Receivers, delivery vehicle drivers, shopping people and government officials were interviewed, either personally or a questionnaire was sent to them.

*Example of units in which the data is collected and analysed*

- vehicle information (vehicle type)
- routing information (O-D, number of stops, stop time, waiting time etc.)
- infrastructure information (number of parking lots and their use)
- receiver information (storage, frequency of delivery, kind of loading units, volumes etc.)
- external effects (air quality, noise, traffic accidents)
- economic information (average life of a firm)

*Availability of data and organizations that wish to use it*

The database is open to the local governments that co-operated and those governments that (directly or indirectly) add new datasets. As researchers directly involved, we have used the data for research purposes.

*Geographical breadth of data captured*

Urban and some regional data.

*Whether the data collected and analysed helps to provide insight into the total freight transport in an urban area, and the units this data is expressed in*

Very limited, we have tried some aggregation, but far too many variables are involved. A much larger survey is needed, and it has to be complemented with traffic counts as well.

### 3 Data gaps and concluding remarks

#### 3.1 Gaps in freight data collection in the Netherlands

The most important gaps in urban freight data collection in the Netherlands are as follows:

- Urban freight is not very well represented in existing statistics.
- National vehicle trip origin and destination survey data is limited when disaggregated for particular urban areas.
- There is limited data on the freight flows and goods vehicle trips generated by different types of urban businesses in terms of factors such as trip frequency, time, vehicle type.
- Rail and barge play no role in city distribution in the Netherlands.

In addition, much of the freight data in the Netherlands is collected and analysed at a national scale. Urban data can potentially be extracted from these national datasets but this can prove difficult depending on type of data. Special requests have to be made to CBS for the extraction of urban data from most of the surveys/data collection exercises.

A limited amount of data is already published at the urban level (e.g. quantity of cargo handled by airport, and by seaport) but this gives no indication of where/how the goods moved in the Netherlands.

There is some traffic count data, but freight vehicles are usually not a separate category.

Main difficulties in extracting urban freight data include:

- Dependent on CBS' choices and willingness.
- Surveys are based on vehicle activity, not specific geographical location, so both urban and non-urban data is collected (with no easy method of separation)
- Sample sizes for smaller urban areas likely to be relatively small in vehicle activity surveys.

#### 3.2 Concluding remarks

The national statistical agency CBS, as well as other producers of information in this area produce a very limited amount of information.

Urban authorities have a certain interest in urban freight transport, because of a mixture of legal requirements, economic policy, infrastructure/traffic management, environmental policy and accident management. However, the data that is currently being collected may not be as complete as is needed to base such policies on.

Most urban authorities in the Netherlands do not tend to carry out surveys of goods vehicle operations. They stick to infrastructure policies instead of developing a proper accessibility policy for both passenger and freight transport. Recently, road transport has become higher on the political agenda, because of the problem of pollution by fine particles, which also restricts building near roads in many parts of the Netherlands. Diesel engines are a particular target for anti-air pollution policies. Whether this will lead to a further ban on truck use in cities, the future will tell.

In addition, there have been a few one-off surveys of freight transport operations at an urban level as part of research projects and local developments.

One cannot really speak of an improvement of urban freight data collection in the Netherlands over the past few years, especially not after the closure of the Platform on City Logistics (PSD).

There are no plans for expansion in urban freight data collection in the Netherlands at a national level at present.

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