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Best Practice Handbook Year 1 (2000)

Statistical data, data acquisition and data analysis regarding urban freight transport
City access, parking regulations and access time regulations and enforcement support

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1 Introduction

1.1 The BESTUFS Thematic Network and need for action

More than 80% of the today performed road freight trips in European conurbations are on distances below 80 km and can be defined as urban or urban-regional transport.

The delivery and collection of goods within urban and metropolitan areas, especially in the core areas of cities with old and established centres has a major impact on the local community concerning the economic power, quality of life, accessibility and attractiveness of a city. This means that an efficient and environmentally friendly urban transport system is essential for the economic health and the quality of life of cities.

It is very important to distinguish the possibilities and chances of technical (vehicle technology, telematic applications, etc.), organisational (co-operation, etc.), operational (route planning, etc.) and political (time windows, weight limits, etc.) approaches.

The EC established the thematic network (TN) on BEST Urban Freight Solutions (BESTUFS) in January 2000 with a duration of 4 years. BESTUFS is aiming at identifying and to disseminating best practices with respect to urban freight transport. The concept of a thematic network is thereby aiming at the cooperation of experts and projects with already existing or just emerging experiences and expertise and at the collection and raw analysis of existing project results of national and European projects - rather than starting new research activities.

The thematic network BESTUFS contributes within the 5th Framework Programme to the Key Action „Sustainable Mobility and Intermodality“ (part of theme 3 “Competitive and Sustainable Growth”) focusing on “Modal and Intermodal Transport Management Systems” (task 2.3), especially transport and mobility services (Task 2.3.2) concerning urban goods transport.

BESTUFS is establishing and maintaining an open European network between urban freight transport experts, user groups/associations, ongoing projects, interested cities, the relevant European Commission Directorates and representatives of national, regional and local transport administrations in order to identify, describe and disseminate best practices, success criteria and bottlenecks with respect to the movement of goods in urban areas. The network is focusing on the movement of goods in urban areas:
- To create a permanent and dynamic concentration activity during the period of the 5th FP;
- To identify and structure the various themes which build the urban freight solutions (UFS) domain and which have relations and influence to it;
Introduction

- To present projects and best practices;
- To support the clustering of projects on European level and to integrate projects and clusters into the network;
- To collect, compare and summarise available experiences and results of projects and initiatives in the UFS domain mainly for Europe but also - if easily obtainable - for the USA and other countries;
- To identify and describe best practices and success criteria within the UFS domain;
- To disseminate experiences, project relations, best practices and success criteria to a broad public of interested actors and thereby aiming at the transferability of solutions;
- To establish links and co-operations with relevant other thematic networks (treating different themes) on European level in order to share and integrate the results (regarding overlapping themes) and to avoid duplication of work;
- To establish links and co-operations with national thematic networks (treating the UFS domain) in order to share and integrate results;
- To support the co-operation between actors in the UFS domain by providing information and by providing contacts.

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The BESTUFS Glossary focuses mainly on urban freight transport and tries to create a common understanding of the used terms within all BESTUFS deliverables, workshops and discussions.
1.2 Relation to previous and running activities concerning urban freight

1.2.1 European level

Within the European Community programs THERMIE (1990-1994) and JOULE-THERMIE (1995-1998) as one aspect the rational use of energy in transport has been looked at. Concerning urban goods transport various measures and technologies have been investigated and assessed. For more information see www.cordis.lu under thermie and transport.

On European level the following COST Actions concerning freight transport and logistics are relevant:


Especially COST 321 provided important base material, information and results as an input for the further activities in the BESTUFS TN [COST 321; 1998]. On one hand COST 321 reviewed current and potential measures promoted by public authorities and private parties, in the logistical, technical, behavioural, infrastructural and administrative field. An extensive survey was conducted, leading to a policy-relevant classification of observed and planned measures which were qualitatively assessed relating to their potential contribution to the improvement of the quality of urban goods transport. On the other hand COST 321 provided quantitative results on the impact of measures using simulation and modelling tools and also estimated effects in projects and case studies. Also some key figures relating to urban goods transport have been identified and provided for several cities.

The BESTUFS TN can be seen as a follow up and continuation of the COST 321 project.

Projects of the 4th framework programme

Within the 4th framework programme several projects are related to urban goods movements dealing with organisational, operational, technical and economical aspects.

Important projects are: DIRECT, ELCIDIS, EUROTOLL, EUROSCOPE, IDIOMA, IMAURO, LEAN, MOMENTUM, MOSAIC, MOST, PROPOLIS, PROSPECTS, REFORM and SURFF. These projects have been identified within the BESTUFS project during a clustering process considering the urban goods transport themes as freight centres, traffic access restrictions etc. For more information see www.cordis.lu.
Projects of the 5th framework programme

Within the 5th framework programme there are also projects with a link to urban goods transport as EUTEP and ITIP.

Other relevant projects concerning Clean Urban Transport demonstrations will start in 2001 as a result of the CIVITAS Initiative (CiTY-VITA1ity-Sustainability), which was launched in autumn 2000 by the European Commission (joint Initiative between Key action Economic and Efficient Energy of the “Energy” Programme and the Key Action Sustainable Mobility and Intermodality of the “Growth” Programme. This Initiative addresses between other aspects city access restrictions and new concepts for the distribution of goods by means of introducing innovative logistics services using clean vehicle fleets, dedicated infrastructure and intelligent technologies. For more information see www.cordis.lu.

1.2.2 National level

On national level the activities concerning urban goods transport vary much between the European countries.

Since the beginning of 1990 are especially France (COST 321, Programme national marchandise en ville) but also Spain (COST 321, initiatives of single cities), Switzerland (COST 321, DIANE 6, City of Zurich), Belgium (COST 321, urban freight transport plans), Italy (COST 321, urban freight transport plans), Denmark (COST 321), Germany (COST 321) and the Netherlands (COST 321) active in urban goods transport issues. The concerns and also the activities differ very much between the cities within a country.

1.3 Themes to be treated within BESTUFS

As a result of the first BESTUFS workshop on 16th/17th May 2000 in Brussels the following catalogue of themes has been determined to be considered with priority within the BESTUFS project:

- Statistical data, data acquisition and data analysis regarding urban freight transport
- City access, parking regulations and access time regulations
- Enforcement support (e.g. by video control)
- Models and methods to deal with the complexity of urban freight transport chains and the shared responsibilities
- Improved management of the urban road space and the kerbside
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- Relationship and harmonisation between the urban, regional, national and European legislation
Innovative urban freight transport ideas (e.g. via underground systems, pipelines, etc.)

Intelligent transport systems (ITS), transport telematics applications and systems

Public-private-partnerships (PPP) and stimulation e.g. via freight forums

Enhanced signage and information systems (e.g. variable message signs - VMS)

E-commerce and distribution (home shopping)

Vehicle technology and functionalities (e.g. low-emission vehicles)

Land use, infrastructure and regulations planning

Enhanced usage and maintenance of infrastructure (e.g. via a road map for transport vehicles)

Intermodal transfer facilities

Integration of distribution centres and traffic management

Goods transport efficiency, assessment and pricing (e.g. how to identify costs?)

Infrastructural solutions (e.g. to improve loading and unloading).

Freight centres

Traffic planning and policy

Weights and dimensions

Transport units

Unusual transport modes (bicycles, etc.)

Tolls and heavy vehicle fees

Door to door freight transport aspects

Telematics for urban goods transport

Environmentally friendly vehicles

Co-operation of transport operators

Interfaces between public and goods transport

Environmental improvements

Improvements for citizens/inhabitants

Win-win situations

These themes form the basis for the further thematic focus to be treated in the BESTUFS thematic network.
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Introduction

Themes treated in year 2000

The following two themes are derived from the first workshop on “Identification of thematic network priority themes” to be treated with priority by the experts:

- Statistical data, data acquisition and data analysis regarding urban freight transport.
- City access, parking regulations and access time regulations and enforcement support.

In addition a city inquiry “European survey on transport and delivery of goods in urban areas” was carried out by the project partners in order to get more insight in the problems and issues to be dealt with in European cities and also to support the process extracting best practices and deriving recommendations on urban freight solutions [RAPP AG Ingenieure + Planer; 2001 or www.bestufs.net].

For the year 2001 the themes “Innovative vehicle technologies”, “E-commerce” and further themes will be treated.

1.4 Aims, contents and use of the handbook

The Best Practice Handbooks aim at

- Giving information and hints about relevant strategies, concepts and activities going on in European countries,
- Providing knowledge, experiences of completed and running projects and actions related to urban goods transport.

It is also planned to support urban freight transport planning activities by giving ideas for innovative solutions and providing experiences.

The present Best Practice Handbook is related to the themes Statistics/Data collection and City access and consists of:

- BESTUFS definition of “Best Practice”,
- Overviews on relevant projects,
- Information and experiences,
- Success criteria and failure factors and recommendations

The material for this handbook was collected and completed by the BESTUFS contractors and members and an important input came from the involved experts and the workshops.
Main focus of this handbook is to get a European coverage of solutions and all existing activities for the considered themes. The results are described as experiences rather than a scientific overview.

The Best Practice Handbook Year 1 is the first one in a series of three handbooks within the BESTUFS thematic network. At the end of the BESTUFS project it is planned to provide a “final” integrated and updated version.

Remarks and input by readers regarding this Best Practice Handbook are welcome. Please send your ideas for updates and additions to the following address:

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2 Best Practices

To develop a common framework for best urban freight solutions as many as possible relevant aspects which will have an impact on urban freight transport are considered. In general, different “types” of actions, research and activities can be distinguished to characterise best practice solutions for urban freight transport.

For example, a best practice solution will not only focus on particular measures as to assess the implementation of freight centres in urban distribution traffic but also on activities which will have no direct impact on the actors of urban transport operations as the improvement of the data and information basis or the quality and capability of planning tools in urban freight transport. In particular the following “types” of action will be distinguished:

- Projects, actions and activities which will not directly lead to changed urban freight transport operations but which provide tools and/or knowledge to influence and prepare decisions in urban freight traffic – “horizontal” projects. These projects are focusing on an improvement of an enhanced overall planning and knowledge, i.e. data collection, education, planning tools etc. Usually, there is no direct aim related to such activities.

- Projects, actions and activities where goods transport changes are realised – “vertical” projects. Normally, these projects are related to a certain aim in urban freight transport.

To analyse existing and ongoing projects in the field of urban freight transport a thematic structure has been applied. The thematic structuring is used to structure all relevant material available concerning the prioritised themes of the BESTUFS network and to analyse the contents of these projects.

To identify best practice in urban freight transport three “sources” will be used within the BESTUFS project:

First, to follow a formal approach by providing tools as a thematic structure, suitable attributes and parameters as well as assessment directions.

Second, to realise a pragmatic approach in order to assess ongoing projects as well as available project results on their contents.

Third, to organise workshops, conferences and clustering meetings in order to extract experiences and knowledge from experts.

The following graphic describes the action lines:
Definition of Best Practice

Best Practices are planned or implemented private only, public only or PPP strategies, measures or activities which have an essential contribution to urban goods transport and ideally lead to benefits for all actors involved. Best Practices will be identified on the fulfilment degree regarding the following requirements:

- Best Practices have to fit to a defined theme or address a relevant problem with respect to the movement of goods in urban areas (see structure of themes).
- Best Practices should be based on real experiences (real world implementations, pilot projects) or analysis in studies.
- Best Practices should have considerable and measurable positive effects for all actors (qualitative, quantitative) on relevant indicators of urban goods transport.

Figure 1: Sources of Best practices and thematic structuring
3 Statistical data, data acquisition and data analysis regarding urban freight transport

3.1 Description of the theme

Statistical data, data acquisition and data analysis regarding urban freight transport has been regarded as one of the most important themes during the first BESTUFS-workshop in Brussels, May 2000.

One of the important first steps within urban freight planning is to get information and statistical data of the current situation and the development. These information and statistical data are important in order:

- To assess the current situation and the development.
- To identify the problems and their causes.
- To make forecasts and identify trends.
- To implement appropriate measures.
- To develop measures and to estimate their impacts.
- To make a success control of the implemented measures and for monitoring.

The Best Practices within BESTUFS show examples of procedures and methods which were successfully used. The following four aspects were regarded in detail during the material collection and assessment:

- Identifying already available data sources of statistics and surveys.
- Methods and experiences on how to acquire data and information.
- The usage of statistical data (analysis and conclusions).
- The quality of data collection and results (in particular the comparability to other data collections).
3.2 Situation of data collection on country and city level within Europe

In general it can be stated that there is a lack of information and data collection on urban freight transport within the European countries:

According to the estimations of the BESTUFS only a low to medium percentage of the medium sized and big cities in selected European countries are collecting data on urban freight transport.

Obviously there must be more cities which are collecting e.g. general traffic data (which includes in most of the cases a diversification between passenger cars and goods vehicles). But these results are often not widespread and therefore not available for further analysis or comparison between different cities. Furthermore the data are very often not detailed enough to answer special questions on urban freight transport.

A more detailed description of the situation within the cities is enclosed within ANNEX 1/I.

Within the BESTUFS City Inquiry 25 cities (= 58%, most of them are rather medium sized cities) answered that they were not collecting data on urban freight transport and 18 cities (= 42%, most of them are bigger cities) answered that they were collecting data [RAPP AG Ingenieure + Planer; 2001].

This shows also that the number of problems (and the awareness of the problems!) caused by freight transport depends on the importance of a city. Information and data which focus exclusively on urban freight transport are therefore in most of the cases only collected in (bigger) cities which have a higher international, national or regional importance.

Concerning the kind of data collection and used methods for data collection on urban freight transport it can be stated that (see also Figure 2):

- Most of the data are collected within special inquiries in order to get information on a special situation or question for preparation of measures (e.g. interviews with different parties of the transportation sector try to give answers on possible effects of measures or projects). In most of the cases data as traffic flows, number of vehicles, number of deliveries, type of vehicle, type of goods, transport demand (tons) or mileage are collected.
- Especially for the assessment of the success or failure of the finally implemented measure often no further data are collected.
- The permanent statistical data and periodical inquiries are not so
widespread and monitoring of urban goods transport plays not yet a main role.
More information and data collection on passenger transport

Table: Kind of surveys

<table>
<thead>
<tr>
<th>Kind of surveys</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent statistical data (yearly basis)</td>
<td>5</td>
</tr>
<tr>
<td>Periodical inquiries</td>
<td>6</td>
</tr>
<tr>
<td>Special inquiries</td>
<td>12</td>
</tr>
<tr>
<td>Others</td>
<td>12</td>
</tr>
</tbody>
</table>

Figure 2: Kind of surveys within the cities

The situation in passenger transport is quite different from the situation in urban freight transport: the availability of statistics and data is much better than in freight transport and therefore a rather complete picture of the passenger transport systems appears. In many cities conventional statistics and surveys are done in order to get e.g. detailed information on the current situation in passenger transport in order to prepare certain measures. Stated preference surveys are used to get e.g. an input for the design and layout of railway stations for passenger transport.

It can be concluded that in general surveys and research which focus exclusively on freight transport are rather seldom and the knowledge on the urban freight transport as one part of the whole traffic system of a city is rather incomplete.

In some European countries (like Italy and France) the government and the cities co-operate together to overcome the lack of data collection on urban freight transport.

The following example shows the framework conditions and the approach in Italy:

The problem of urban freight distribution seems particularly to be important where historical city centres have been developed many centuries ago (like in many Italian cities).

Public authorities, transport and retail associations, etc. are “thinking about performance of specific studies” and implement specific solutions; many agreements have been done or are in preparation among these different parties at local level in order to realise the necessary political consensus and framework.

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Only a very limited number of specific studies are performed, including surveys and data collection. In spite of the lack of studies and statistical data/surveys many towns have already applied various “simple” strategies for optimising the freight transport phenomena in urban-metropolitan areas. For the most part all the initiatives are developed at local level.

One way to find a solution facing the above mentioned circumstances (in general lack of co-ordination and co-operation facing the existing problems) is a “general transport plan” (like developed in Italy: “Piano Generale dei Transporti”, which gives the guidelines for the transport development of Italy in the next future):

Identification of a “Mobility manager in city logistics” at regional level, at province level and at municipal level. This managers would be the main responsible for the implementation of appropriate freight transport plans at local level.

The setting up, development and implementation of a central observatory at national level for the co-ordination of the different future surveys, monitoring activities, data base maintenance activities etc, performed at local level. This observatory would give the guidelines to face the urban freight transport studies/interventions through a common approach.

Support (also financial) to specific pilot projects already undertaken by local authorities or other parties:

Census and monitoring activities related to the “urban freight categories” (main actors, types of goods, etc.), updating of data bases. Particular attention would be given to the metropolitan areas.

Definition and development of specific solutions for distribution of goods in the urban areas.

Surveys for verifying the status of the commercial vehicle fleet used for distribution of goods at urban level.

The idea of a “Transport Plan” in general seems to be a good first step towards solving the problems in national, regional and urban freight transport and also how to deal with data collection on it. But the way of its implementation depends heavily on the special circumstances and framework conditions of each country and city.

Member of BESTUFS who did the material collection:

Giovanni Ruberti, Centro Studi sui Sistemi di Transporto (CSST)

See also References and contact persons!
3.3 Regarded case studies (project-level)

Within the material collection on the theme statistics a number of examples were collected. Table 1 shows the different statistics and surveys which were done within the regarded examples (for all examples see Annex 1/II).

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Specific surveys</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Observation</td>
<td>BE</td>
<td>AT, CH, DE, ES, FR, NL, SE, UK</td>
</tr>
<tr>
<td>Conventional Questionnaires</td>
<td>CH</td>
<td>AT, BE, CH, ES, GR, NL, UK</td>
</tr>
<tr>
<td>Stated preference</td>
<td></td>
<td>BE</td>
</tr>
<tr>
<td>Workshops</td>
<td></td>
<td>IT (and others)</td>
</tr>
<tr>
<td>Available data used</td>
<td></td>
<td>CH, AT, IT</td>
</tr>
</tbody>
</table>

Table 1: Methods applied within the collected examples

In general:

- The data collection is done in most of the cases by use of written questionnaires which are sent by post or e-mail and they are filled in within personal interviews or phone calls. Furthermore electronic questionnaires are used.
- Observation is done by use of forms for manual counting, tape recorders and automatic counting.
- Very often observation and questionnaires are used together.
- Several kind of software is used for creating databases and for analysis of collected data (e.g. PARADOX database, ACCESS, EXCEL, EMME/2, SATURN model, HIELOW software, WIVER).
- In Italy, France and many other countries meetings and workshops take place in order to get a qualitative idea of the situation.
In three cases the same or only modified concept of survey is used for data collection in several cities (2, 3 and 6 cities) in order to get comparable data and to reduce costs.

The aim of most of the examples is to prepare new concepts, to find out influence of new measures or for modelling. Only a view of the given examples show statistics which are done (periodically) in order to observe developments.

In general it is rather difficult to get detailed knowledge on statistics and data collection done within cities.

The following examples show therefore five different statistics and surveys which can be regarded as "good" examples because the concept was successfully used, shows an innovative approach and/or is regarded as fundamental work.

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Specific surveys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Observation</td>
<td>Example 3.2</td>
</tr>
<tr>
<td></td>
<td>Example 3.4</td>
</tr>
<tr>
<td>Conventional Questionnaires</td>
<td>Example 3.1</td>
</tr>
<tr>
<td></td>
<td>Example 3.4, Example 3.5</td>
</tr>
<tr>
<td>Stated preference</td>
<td>Example 3.3</td>
</tr>
</tbody>
</table>

Table 2: Overview on used methods within the examples for statistics and surveys
Example 3.1: Statistics - main data on national level

“GTS 93”, Switzerland, regarded year of execution: 1993

For the whole description see ANNEX 1/III.

The main objectives of the “GTS 93” in Switzerland were:

- To get fundamental knowledge for development of political frameworks (government, parliament, administration): The increasing importance of freight transports makes it necessary to get a general view on roads goods transports on national and regional level (goods and vehicle flows and structure of these flows).

- To get fundamental knowledge for reaction on new circumstances of European politics: relationship with EU, realisation of NEAT (Alpentransversale), heavy vehicles fee (Lenkungsabgaben) and realisation of the Alpine initiative (Alpeninitiative)

- To get fundamental information and main data for calibration of the models being used for traffic statistics in Switzerland.

The GTS 93 belongs to the type “Statistics”.

A detailed Questionnaire (with examples, descriptions, in German and French) was sent as a paper version via post to the selected interviewees. 80% of the lorry owners had to fill in a detailed questionnaire and 20% a simplified one.

The sample size was found in the following way: Random selection of 22 effective days (only working days, 5 in the 1st and 4th quarter, 6 in the 2nd and 3rd quarter of 1993), each day 1/22 of all vehicles were counted.

The following data were collected:

- Kind and use of goods vehicle on a fixed day (only vehicles with payload > 1t).

- Origin-destination (shuttle traffic, local transports, long distances, international) and all stops (loading and unloading points) during the whole run.

- Use of trailer.

- Reason if there was no run.

- Driven kilometres during the last year, driven kilometres during the day, transports which takes more than one day.

- Transported goods (kind of goods, dangerous goods, weight, customer).

Main Experiences concerning effects, acceptance, procedures, involved parties, etc. are:

- The first GTS was done by the Swiss federal statistical office in 1936/37. In 1984 the survey was boycotted by the Swiss carriers (they decided to stay at home at the chosen days, no deliveries
were done) whereas for the year 1993 part of the concept was modified and the collection of data was successful. One reason for the good feedback and quality of data collection is that the whole data collection and analyses were supported by law („decree concerning data collection on freight transports 1993”).
The GTS is done periodically, only a few adaptations of the whole concept were done. This guarantees a good feedback (the procedure is already known) and the results are comparable and can be used for assessment of the developments.

A detailed description of the whole concept and further interpretation (explanation) of some aspects (e.g. distances) within the public report helps to use data for further analyses.

Concerning the use of the collected data for analysis the following remarks can be done:

- The focus of the whole data collection was on national level. Because of the small sample size and big zones the results can be used on regional level (identification via post code) but one has to be conscious that the results of a projection on regional level can’t be representative. They have to be regarded as approximate values! The statistics on national level are therefore suitable also on regional level but usually not on local level.

- Only road transport excluding delivery vehicles (< 1t) and no intermodal transport has been regarded. Therefore some important parts of the goods transports are missing, especially those which are of a high interest within the cities.

Despite the described problems and crucial points the GTS 93 shows the importance of periodical data collection and how to get representative and useful main data.

More information

Member of BESTUFS who did the material collection:
Martin Ruesch, RAPP AG Ingenieure + Planer
See also References and contact persons!
Example 3.2: Statistics - main data on city level

“Comptage de véhicules de transport de marchandises”, Brussels, Belgium, regarded year of execution: 1999
(For the whole description see ANNEX 1/IV.)

Objectives

The main objective of the “Comptage de véhicules de transport de marchandises” in Brussels, Belgium was to get main data for modelling of the freight transport trends in the Brussels area.

Approach

The “Comptage de véhicules de transport de marchandises” in Brussels, Belgium belongs to the type “Statistics”: Counts on screen lines and number plates tacking down (Observation) gave raw material for OD matrices per type of vehicle and per period of the day.

After many field trials, it was decided to use a classification based on the two following characteristics:

- Single body or articulated body.
- 2 axles, three axles or more than three axles.

After building the current situation, trend matrices for 2005 were built. These were «business as usual» matrices which did not include any kind of transport policy measure or platform implantation. In order to find a way of predicting matrices in the year 2005, a regression analysis was carried out between number of trucks (from and to each zone) and three planning variables, namely population (P), employment in industrial activities (I) and wholesale employment (W).

The results could be used to predict, on the basis of the land use plan, the future traffic emissions/attractions of each zone. The future matrices have then been computed, by means of a Furness algorithm.

Results and experiences

Main Experiences (effects, acceptance, procedures, involved parties, etc.):

The preparation of the whole data collection, implementation and analysis were done by an independent consulting company. They knew about the great accuracy needed, in order to observe the trends. Plate numbers tacking down on small cordon lines around the most important generators/attractors is very powerful for making the distinction between through traffic and origin and destination traffic.

Use of other main data was necessary to create an overall view on the situation within Brussels.

The “Comptage de véhicules de transport de marchandises” in Brussels, Belgium shows the importance of a very good preparation of the whole data collection. Due to a profound knowledge on statistics in general and the circumstances within Brussels good results could be achieved.

More information

Member of BESTUFS who did the material collection:

Hugues Duchâteau, STRATEC

See also References and contact persons!
Statistical data, data acquisition and data analysis regarding urban freight transport

Final: June 2001, 18.06.2001
Example 3.3: Special Survey - Stated preference

(For the whole description see ANNEX 1/V.)

Objectives

The main objective was to develop a modelling tool being able to forecast the behaviour of the shippers facing the choice between sea-river transport and combined transport alternatives (sea + train or sea + road) for transport between the Brussels area and Ireland, UK and Nordic countries.

Specific framework conditions were that the Shippers interviews were made in Belgium, UK, Finland, Sweden and Ireland.

Approach

This Stated preference survey was done by use of a written questionnaire which was distributed to 82 interviewees.

Results and experiences

Main Experiences (effects, acceptance, procedures, involved parties, etc.)

The preparation of the whole data collection, implementation and analysis was done by an independent consulting company.

Stated preference surveys are giving a big amount of behaviour observations with a small number of interviews. Therefore it is possible to spend enough time and money for making face to face interviews.

The reliability of the data could be weak if the stated preference question are not carefully customized for each interview.

The method of stated preference can be very useful for studying the impacts of some urban freight transport related policies aiming to influence the behaviour of shippers and of the customers in an urban environment.

More information

Member of BESTUFS who did the material collection:
Hugues Duchâteau, STRATEC

See also References and contact persons!
**Example 3.4: Special Survey - used in only one city**

"Chancen für City Logistik in Wien, Strukturerhebung", Wien, Austria,
year of execution: 1998
(For the whole description see ANNEX 1/VI.)

<table>
<thead>
<tr>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>The main objective of this survey was to get information on urban transport activities and the potential of city logistic projects in order to reduce the existing traffic problems.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>This specific survey used questionnaires which were distributed via mail to the local business (mainly outlets but also transport providers) and manually counting (observation) of the local traffic was done. It focused only on special parts of the town.</td>
</tr>
<tr>
<td>The collected material included the number of different types of vehicles and their owners and information about service providers; types of companies, ordering systems, service level of deliveries, time of deliveries, home delivery services and other logistical parameters. A qualitative and quantitative description, ratios and conclusions regarding the mentioned categories were based on this information.</td>
</tr>
<tr>
<td>The results of this survey could be used for further analysis and for modeling (feasibility of city logistic projects like city Terminal, Cargo Tram, load zone management, city logistic controlling system, etc.).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Results and experiences</th>
</tr>
</thead>
<tbody>
<tr>
<td>The quality of data collection was very high and the method of the survey was very useful in order to get essential information on transport data. All data helped during the discussion concerning the implementation of city logistic projects within Vienna.</td>
</tr>
<tr>
<td>It's important to mark that the survey only focused on specific urban areas. The city was not regarded completely.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>More information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member of BESTUFS who did the material collection on the theme: Reinhard Dorner, ECONSULT</td>
</tr>
<tr>
<td>See also References and contact persons!</td>
</tr>
</tbody>
</table>
Example 3.5: Special Survey - used in several cities
(For the whole description see ANNEX 1/VII.)

Reasons, framework conditions and objectives

Reasons for the survey (Bordeaux):

- Needed for modelling urban freight, which is useful for decision-making processes.
- Needed for prognosis because of national laws (Clean Air Act, urban planning processes). These surveys have helped produce a series of "unvarying features" (permanent results from one city to another) of urban freight transport that can guarantee the reproducibility of results in any other French cities, without doing extensive surveys.
- Needed to make an environmental assessment of urban freight.

Approach

This specific survey was developed for prognosis and forecast. 3 surveys were administered by questionnaires:

- To a representative sample of 1500 freight generators (industry, commerce, services, ...). A first interview was done by the distribution of a notebook to the interviewee which he had to fill in during one week, then a second interview took place.
- To delivery truck drivers: during one week, they had to fill in a notebook retracing their activities, locating their delivery routes and their delivery operations.
- To main transport companies operating locally and regionally (in Bordeaux, 70 companies, which do most of third party delivery activities in the city). Semi-open interviews describing their practices, the use of transhipment platform, the precise urban areas in which they distribute.
- The unit of observation was the "movement" (delivery or pick up operation of goods with one vehicle in one receiving/generating establishment).
- Different types of questionnaires and kind of interviews were used: Face to face interviews, phone interviews, "on board" surveys, distributing notebooks via post, semi-open questionnaires.

Afterwards a quantitative description of urban freight activities (with emphasis on unvarying features) was done: ratios of movement for each type of economic activity (there exist about 60 ratios); operating modes (own-account/third party); organizational modes (one-point delivery or delivery rounds); type of vehicle, areas of distribution; description of daily and seasonal rhythms of deliveries; duration of deliveries and distances travelled; street occupancy by delivery vehicle during parking for each zone of the city (unit = veh*hours); street occupancy by delivery vehicle during circulation (unit = veh*km).
Good specific framework conditions were given because this survey was co-financed by the city and the national government. Furthermore there were strong incentives and initiative from the State.
The same type of survey or "lighter versions" of it were used in Dijon, Marseille, Lille, Rennes and Lyon.
### Results and experiences

Main Experiences concerning effects, acceptance, procedures, involved parties, etc.:

- The preparation of the survey showed that the traditional techniques of doing interviews by use of questionnaires are justified by the necessity to control the use of vocabulary (vocabulary in transport activities is often ambiguous because transport concerns all sectors of economic activities with many different technical "jargons" for each. Phone method with automatic recording of answers has been abandoned in favour of mail questionnaire).
- Face to face interviews with distribution of a notebook is highly recommended for freight generators survey. Phone interviews have to be short and should be done by knowledgeable staff.
- Long delivery rounds are better known with "on board" surveys. Distributing notebooks to truck drivers (with postal return) means that only a few questions can be asked, but the postal return is fairly high (15% rate of answers).
- Semi-open questionnaires towards truck companies must be done by transport specialists.

Bordeaux, Marseille and Dijon urban freight surveys constitute a breakthrough in urban freight data collection in France. The methodology which has been elaborated since then helps all the other French cities to get a better knowledge on their freight activities without paying large amounts of money to do an extensive survey.

There is a very high interest of developing a common methodology, which can be used in all French cities and help make comparisons.

It is necessary to get financial help (from the State or any national body) for the first surveys.

*The use of the same concept for survey within several cities is a very good approach to get comparable data, to save money and to avoid faults.*

More information

Member of BESTUFS who did the material collection:

Laetitia Dablanc, GART

See also References and contact persons!
3.4 Conclusions and recommendations

All European states and roughly all medium and large sized European cities acquire regularly statistic data including information on traffic and transport.

Some data sets address directly freight transport, e.g. the number of lorries of a special size registered in a city or region or the transport amounts (in tons) of single business fields etc..

These data mainly describe those details which can be obtained easily without much financial effort and its use is rather limited for urban freight transport planning.

Information as e.g. the number of trips of single actors, the capacity use factors of vehicles, vehicle fleet structures, goods transports via cars or vans, the use of road space of trucks and lorries and many information more is usually missing.

Furthermore, to develop goods transport models there is information needed about e.g. transport chains, number of tours and number of stops and origin-destination matrices related to transport weights, consignments, vehicle types etc. which is also not available from the regular common statistical surveys.

In the following only these in-depth statistic data are addressed.

The availability of statistic data about urban goods movements in European cities is in general rather poor.

This assessment is especially true when the availability of statistics is compared to the situation in general traffic and in passenger transport (both public and private), where the data basis is much better than in the freight domain. Within the city inquiry, less than 50% of the cities did some sort of freight transport data acquisition, while the majority did not report about any efforts.

Looking in more detail to the frequency the data are acquired, it can be seen that most of the data are collected just once, within special single inquiries in order to get information about special situations or to find answers to questions in relation to the preparation of new measures.

The acquisition of permanent statistical data and the performance of periodical inquiries are not common. Especially for the assessment of the success or failure of a finally implemented measure there were often no data or not enough data collected and a robust evaluation is therefore not possible.

The reason for this poor situation in regard of statistic data must be seen first of all in relation to the limited available budgets of public
Statistical data, data acquisition and data analysis regarding urban freight transport

Authorities and second in the ranking of priorities of cities. This can easily be proven by regarding the staff working within city administrations on goods transports. Again the rather small sample of contacted cities show clear tendencies:

- About 20% of the cities have no employees at all addressing urban freight transport issues.
- More than half of the cities have less than 50% equivalent fulltime staff (max half of one employees working time).
- And less than a quarter of the cities have one or more employees working on freight (more than 100% equivalent fulltime staff).

These percentages are not representative and have to be considered critically because very often different administration levels within a city have a joint responsibility of a task but often don't know about the total equivalent number of fulltime staff working on a specified subject. Nevertheless, the tendencies can clearly be identified [Rapp AG Ingenieure + Planer; 2000].

To identify problems and solutions concerning urban freight transport statistics and surveys play a crucial role. In general the regions and cities should put more effort in statistics and surveys on urban freight transport in order to reach the same level of information as in passenger transport because the statistics and data allows:

- To assess the current situation and the development.
- To identify the problems and their causes.
- To make forecasts and identify trends.
- To implement appropriate measures.
- To develop measures and to estimate their impacts.
- To make a success control of the implemented measures and monitoring.

In order to get as good results as possible the key data has to be well chosen. Besides structure data (enterprises, employees, etc.), network data (length, density, etc.) especially the following data are in general necessary for situation analysis and monitoring (examples):

- Number of deliveries per week according to each category of activity
- Used vehicle types (trucks, lorries, vans)
- Goods vehicles flows
- Share of goods transport (in tons, mileage, etc.)
- Daily levels of road transport (over time)
- Mileage per day and per vehicle type
- Use of capacity
- Number of trips per vehicle, medium distance per trip
- Number of stops per vehicle, medium time per stop
- Number of tours per vehicle
- Use of road space by trucks, lorries, vans
- Service level (e.g. deliveries in due time)
- Emissions per vehicle km, tkm or delivered consignment
- A differentiation of key figures relating to commodity group or logistic families is often useful.
### Key data for effects analysis and modelling

For effects analysis and modelling the following data are in general necessary (examples):

- Structure data per zone (inhabitants, employees per branches, etc.)
- Network data (capacity of links, nodes, travel time etc.)
- Modes (kind of vehicles, etc.)
- Data for trip generation depending on branches / products
- Data for transport chain generation
- O-D-Matrices in tons / consignment / trips (branches / vehicle types)

A lot of surveys and data collections are mode based. For effects analysis usually consignment based data is necessary to consider the whole transport chains. Data collection and surveys should be focused more on consignments to get information over the whole transport chain.

The surveys and data collection carried out take often into account only trucks and lorries and not cars (conventional cars which are used to deliver e.g. medicaments or pizza service). But in cities the goods transport by car plays also an important role. Therefore transport of goods by cars should more be considered carrying out surveys in urban areas.

### More consignment based information needed

Italy and also France show how to deal with the lack of data collection but also with a lack of co-ordination and co-operation. The following aspects have to be regarded furthermore:

- The idea of a “Transportation Plan” in general seems to be a good first step towards solving the problems in national, regional and urban freight transport but the “Transport Plan” has only been launched recently in Italy and to predict its influence and effects is not possible yet.
- The implementation of a “Central observatory for surveys” has to be regarded very critically. Its competence depends heavily on the special circumstances and framework conditions of a country.
- The integration of data collection within such a “Transportation Plan” underlines the necessity of statistics and forces regional administrations to collect and prepare data.

A central institution being responsible for all questions of data collection and statistics in this context should help to get useful and competent help if it is the first time for a city or region to deal with freight transport and the according data collection

- This institution should give guidelines for all questions of statistics

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Final: June 2001, 18.06.2001
data and collection which are developed by use of all experiences available.

- Integration of statistics and data collection within national or regional law (like done in Switzerland and Italy) helps to enforce people in participating in necessary surveys. But especially questions concerning data protection have to be regarded carefully.
A data base on urban goods transport could provide data to compare the situation between different cities. Such a data base should be supported by the European commission.

In general one of the important first steps within urban freight planning is to get information, especially detailed statistical data. Many surveys are done in regard of special problems but often the quality of results is bad. The following reasons for the failure of a survey can be given:

- Survey is not done by competent companies / specialists.
- Insufficient preparation of used concept of survey and tools for data collection (causes e.g. faults during data collection or misunderstandings).
- Poor co-ordination with transport actors during the preparation phase. No personal contact (e.g. telephone calls) between interviewer and interviewees. Asked parties could not be convinced to fill in questionnaires.
- Not enough knowledge of the use of vocabulary (vocabulary in transport activities is often ambiguous because transport concerns all sectors of economic activities with many different technical "jargons" for each).
- Not enough knowledge on the local circumstances (e.g. important parties within transport sector, traffic situation).
- Use of conventional methods which are not able to generate the needed data. New concepts of surveys (e.g. stated preference) and new technical possibilities are rarely used (e.g. electronic questionnaires, telematics applications, via internet).
- Not enough financial means for appropriate data collection or analysis and for repetition of surveys. Therefore in many surveys only "light versions" were realised providing fairly inaccurate results. Such "light versions" are however acceptable if the concept of a survey was prepared once and then used in an appropriate scale for another city (see example of France).
- Not enough (useful) primary data available.
- Results are not comparable (e.g. with other cities).
- No adequate sample sizes according lack of financial means.

Because of the above mentioned reasons for the failure of surveys the following recommendations can be given in order to approve data collection and surveys:

In order to get satisfying results on (international), national, regional and local level data collection has to be planned in co-ordination with the
transport actors and co-ordinated between cities.

A “Transportation Plan” gives e.g. the guidelines for the transport development:

- Identification of a “Mobility manager in city logistics”.
- Central observatory.
- Support (also financial) to specific pilot projects.

The results within different cities or regions have to be comparable. An integrated planning of data collection allows to develop appropriate concepts of surveys and to use them for different cities.

On one hand side existing concepts should be used whenever possible (see the examples described within this Best Practice Handbook). Especially the French example shows that the use of the same concept of survey in more than one case can save money and allows to compare results between different cities.

But if necessary success promising new concepts should be used. Stated preference or stated ranking are nowadays only rarely used because there is still a lack of knowledge on these concepts (e.g. methods to get reasonable and qualitative results). Science and practice has to provide as fast as possible new concepts and corresponding methods. Experiences will show the practicability and then they should be used instead of inefficient “old fashioned” concepts.

New “technologies” have to be used in order to make data collection and analysis more efficient, to avoid faults and to save money. Examples are electronic questionnaires, telematics applications (on board units, GPS), video based observation, questionnaires which can be answered directly via Internet.

In the French example an automated tool for transfer of ratios and some unvarying features to any SIRENE data file for any city (the SIRENE data file is the statistics of all companies located in a city) was used. A software under Access is available on a CD-ROM which is available free of charge to any French city. This tool helps computing the number of “movements” according to operating mode and type of vehicle for any given area of the city (provided the area contains at least 500 economic units).

According to the objectives of a data collection or a survey and the requirements for exactness the sample size has to be chosen.

It is difficult for different reasons to get information about costs of data collection and surveys. In general only an appropriate financial support allows to get respectable surveys and statistics. The use of new technologies can reduce the cost for data collection and preparation.

In order to avoid poor results and to waste money statistics and data collection should be done by independent and competent specialists in
close work together with the responsible administrative units and the transport actors. The specialists should:

- Consider all relevant factors which could have an influence on the results (e.g. specific sample, conditions, interests of interviewees, etc.)
- Use the most suitable methodology and tools and consider all relevant factors which could have an influence on the results (specific sample, conditions, interests of interviewees etc.).
- Motivate and convince the interviewees.
- Keep the survey as simple as possible (unmistakable questions, limit the questions and data collection to the information needed).
- Make a test run (especially using new approaches or when the framework conditions are difficult)
- Guarantee a realistic time schedule and good organisation.
- Use staff according to the specific requirements and make a good training for the field survey team.
- Have good connections to transport actors.

The analysis and presentation of results of a survey are as important as the whole preparation of the survey and the according data collection. Therefore consistent data bases and evaluation tools have to be implemented and a proof of reliability and plausibility of results (comparison with and analogies to other surveys) is as important as commented figures and tables.
4 City access, parking regulations and access time regulations and enforcement support

4.1 Description of the theme

“City access regulations” are regulations for all types of goods vehicles in the access to the inner cities.

Freight transport in this respect concerns both pick up and delivery activities in retailing, parcel and courier services, waste transport, transport of equipment for the construction industry and a broad range of other types of transport.

The purpose of these regulations is to reduce the negative effects in the city area caused by the interaction of goods vehicles with the inhabitants of the city and the other users of the infrastructure.

Several actors are directly or indirectly involved in urban goods transport. The following Table 3 shows all actors and their own specific interests to be regarded during planning and implementation of a measure or project:

<table>
<thead>
<tr>
<th>Actor</th>
<th>Main interest in regard of urban goods transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipper</td>
<td>Delivery and pick-up of goods at the lowest cost while meeting the needs of their customers</td>
</tr>
<tr>
<td>Transport-company</td>
<td>Low cost but a high quality transport operation, satisfaction of the interests of the shipper and receiver (shop)</td>
</tr>
<tr>
<td>Receiver / shop owner</td>
<td>Products on time delivered at a short lead-time</td>
</tr>
<tr>
<td>Inhabitant</td>
<td>Minimum hindrance caused by goods transport</td>
</tr>
<tr>
<td>Visitor / shopping public</td>
<td>Minimum hindrance caused by goods transport and a high variety of the latest products in the shops</td>
</tr>
<tr>
<td>Local government</td>
<td>Attractive city for inhabitants and visitors: minimum hindrance but having an effective and efficient transport operation</td>
</tr>
<tr>
<td>National government</td>
<td>Minimum external effects by transport, maximum overall economic situation</td>
</tr>
</tbody>
</table>
Table 3: Main interest group in regard of urban goods transport
To find an optimal compromise between all these interests of the involved actors is therefore a main problem of all implemented measures concerning city access, parking regulations and access time regulations like:

- Establishing special protected loading zones in areas where there is considerable delivery traffic, parking places.
- Fee for parking or use of special delivery window (city-centre-licence).
- Pedestrian zones in which deliveries can only be carried out at certain times of day or night or certain events.
- Protected zones that have to be kept completely or partly free of trucks.
- Vehicle-limiting measures (e.g. only vehicles on high standard concerning noise and emissions, length/width/height) or weight regulations (axle-weight, total train weight).
- Access regulations depending on (only at certain points) existing regulations within the urban infrastructure (e.g. narrow bridge).

In addition project relevant enforcement support (enforcement of rules and regulations) has to be regarded because it is a critical factor in the success of the policy on parking/loading/unloading and city access in general. Enforcement is traditionally a labour intensive task and is therefore costly. However new applications of information and communication technology (ICT) may improve the “enforcement efficiency” and enlarge the scope of enforcement.

The Best Practices within BESTUFS show projects of city access and sometimes also the according enforcement support which were successfully used.

As many innovative projects are implemented a selection of the most advisable ones had to be done. The following aspects were regarded:

- Relevance for BESTUFS, innovative character and contribution to solve problems.
- Success/failure and important experiences.
- Availability of further information.
- Accordance to the following main categories of measures (see also Annex 2/I):
  - Vehicle: Emissions
  - Vehicle: Weight
  - Vehicle: Space
  - Time Windows
- Licences (for use of loading zones)
- Loading- and Unloading Zones
- Road network for Heavy Vehicles
- Slot permissions
4.2 Situation concerning City Access on country and city level

In the following some examples of access regulations implemented within different European cities are given and further specified. In general it can be stated that:

Within the different European countries the possibilities to implement access regulations by law are very different and the legal framework conditions (Environmental law, Land use regulations, “open access for everybody”) have to be regarded well during planning of a measure. Also the crucial point of enforcement support has to be considered in this context.

Due to this fact measures and projects are implemented rarely and in most of the cases without integration in overall concepts.

In some countries and cities also the overall strategies have been described (besides the existing special projects) which give the framework for recent and future projects:

In France most of the urban freight regulation initiatives and strategies derive from the new transport planning process initiated by the 1996 Clean Air Act, which has obliged all large cities in France to integrate freight into an Urban Mobility Master Plan (Plan de Deplacements Urbains, or PDU).

In Germany due to an increase of environmental legislation the big cities have to work on their problems of congestion also caused by freight transport. Furthermore the rapid increase of the number of all kind of vehicles in the cities made special legislation for city planning necessary (e.g. guarantee of a certain number of parking places).

But the implementation of city access measures in Germany is depending to a large degree on the possibilities provided from the public law.

Generally, there are two possibilities to be recognised for German initiatives on access regulations:

- First to close areas for all traffic.
- Second to ban traffic due to environmental reasons.

There have been trials in several cities (Lübeck, Aachen) to close the city centre for particular groups, with no success due to law reasons. Usually, cities have pedestrian zones with limited time frames for pick up and delivery transport operations. Environmental law allows to ban or reduce traffic due to particular emissions (air pollution). Additional measures (lorry network in Bremen) requires for particular agreements in the municipality. Furthermore, several approaches to influence city
delivery and city parking can be influenced by the construction and city planning (duty to build or not build parking spaces by the construction of a new building).
One example for an overall approach to reduce emissions by use of general framework conditions is the “Luftreinhalteplan Stuttgart”. Following the questions how to reduce air pollution (by means of NOX and SO2) resulting from different user groups several measures have been developed and implemented.

In concrete: if air pollution exceeds a particular level the following (implemented) measures are related to traffic:

- Case dependent measures (e.g. foldable signs).
- Reduction of speed level.
- Re-routing lorries.

Further measures are considered (close particular routes for traffic, limited city access for lorries between 10 to 16 h) but have not passed the political decision yet.

From 1990-1994, the Dutch Ministry of Transport pursued a policy to establish municipal distribution centres around cities. This policy was not successful. It required government interference into the liberalised supply chain market.

This national policy combined with a municipal policy to foster the implementation of pedestrian zones of inner cities and environmental protection had a damaging effect on sustainable solutions for the management of the (urban) supply chain. Public-private partnership was urgently required.

In 1995 a public private partnership, the Forum for Physical Distribution in Urban Areas (PSD), was established.

The work of the PSD results in profound and competent help for the cities and a catalogue of innovative measures for choice (e.g. back door deliveries, logistic routing, loading and unloading zones, dedicated infrastructure / public transport lanes, flexible time frames zones, off time and in-night distribution, urban and regional distribution centres, ICT / underground transports).

Furthermore the Dutch government initiated a White Paper in 2001 on spatial development the Dutch government indicated 14 possible urban areas. Indicating 6 national and 8 regional urban networks, the extended company concept for urban distribution can be experimented through co-operation between municipalities, provinces and business (see Figure 3).
In Zurich (Switzerland) also the overall frameworks “Urban freight transport 1992” and “Goals 1996” have been developed as a strategy in order to react on the following circumstances:

- Increase of freight transports within the agglomeration.
- Urban freight transport contributes in an above-average percentage to noise and land-use; conflicts between heavy vehicles and slow traffic (bicyclists, pedestrians, motorcyclists).
- Negative impacts of urban freight on environment and quality of life.
- New laws (protection of environment, air pollution, regional planning).

The main question was “How can a certain piece of freight be transported with the most useful mode, on the shortest way and without loss of time, from its origin to its destination causing minimal costs, using a minimum of land and a minimum of follow-up pollution?”. The answer on this question includes various measure like e.g.:

- Planning of policy measures (in regard of air pollution).
- Innovations, more commercial transports (less transport for own account) and better circumstances on the market in order to get a better density of deliveries.

- Better co-operation of road and rail transport systems, between pre- and end-haulage and between companies.

Furthermore there are certain measures (concerning city access) foreseen:

- To close certain roads for certain kinds of utility-vehicles, access for low-noise-vehicles.

- Commercial vehicles get access to certain zones not being available for motorcar during certain hours of the day

- Flexible delivery-windows.

- Regulations of parking- and loading-times

- Reform of wages and taxes.

The above described overall plans or frameworks to solve the problems in the European countries and cities show some existing examples. In other countries like e.g. Spain there is only a vague legislation which causes a lack of co-ordination between the responsible authorities and which avoids effective projects to solve problems.

Within the existing integrated concepts and projects processed in Europe several regulations and single measures are used. The most well-known ones are:

- Time and weight regulations (e.g. vehicles heavier than 3.5 tons only access to the inner city from 6 till 11 hrs in the morning).

- Regulations on the dimension of the vehicle (length, wideness, height).

- Regulations on levels of emissions (e.g. only EURO-2 trucks are permitted to enter the city).

In general the strength of the measures depends on the weight and size of the vehicles (the bigger, the more prohibitive they are).

Furthermore the following measures are implemented in different European cities:

- Organisation of specific parking places.

- Fee for parking or use of special delivery window (city-centre-licence).

- Protected zones that have to be kept completely or partly free of trucks.

- To allow or not allow night deliveries.
City access, parking regulations and access time regulations and enforcement support

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4.3 Regarded case studies (project-level)

Within the BESTUFS material collection on the theme City Access a number of examples were collected (for all examples see Annex 2/I).

Figure 4 shows the use of different types of measures within the collected examples.

It occurs that in most of the cases time windows, regulations concerning the weight of the vehicles, special loading- and unloading zones or special road networks for heavy vehicles are used. But they are not used as single measures but in most of the cases combinations of different types of measures are implemented (the matrix in ANNEX 2/I shows the combinations within the regarded projects).

![Figure 4: Use of different types of measures within the regarded projects](image)

The following examples show different ways how access regulations are implemented within several European cities and which experiences were made. These 8 examples have been chosen mainly because they include several (innovative) approaches to find solutions for the existing problems and because rather detailed results and reasons for success or failure are available and help to assess the example.
Example 4.1: Barcelona

“Urban Freight Management in Barcelona”, Spain
[Hayes, Simon; 2000]

The project (including several different single measures) was initiated by the Municipality of Barcelona in order to approve the uncontrolled use of private vehicles which make goods deliveries more and more difficult. Furthermore, the management of kerbside access with efficient enforcement was regarded as powerful measure to solve the problems and the following aspects were found within a survey:

- Some 25'000 vehicles realise approx. 100'000 loading/unloading operations each day in Barcelona.
- 4,000 kerbside spaces are required to accommodate the needs of goods delivery vehicles.
- Different measures need to be applied according to different typologies (area, street - in hierarchical design).
- Urban development planning norms should be modified to require delivery bays to be provided in new constructions of 400+ sq. m.
- Pilot regulatory measures require efficient, automated enforcement.
- Telematics techniques should be employed to optimise operations.

Approach

Because of the above mentioned survey the following measures were implemented within the city centre of Barcelona (see Figure 5):
Figure 5: Survey Zones and Measures in Barcelona
Traffic regulations at junctions (see Figure 6) which include:

- Zones which are reserved for loading/unloading only from 08.00 until 14.00 (or 20.00) within the city centre.
- Maximum stay period: 30 minutes.

700 zones have been implemented and within the “Forum 2004 - Poble Nou Infrastructure plan” the measure will be extended to all junctions involving “Primary” roads.

![Figure 6: Traffic regulations at Junctions in Barcelona](image)

Combined-use of streets which is done by use of VMS messages which clarify who is allowed to use the street (residents, clear-way, deliveries) according to time of day.

It is planned to extend the implementation of this measure to similar primary network streets.
Special zones for pedestrians where access is only possible with a special permission: These zones (5 zones which are centrally controlled) have only a few entrances (50 gates are installed city-wide) with barriers which can be entered by use of a special key-card (8'000 resident cards are issued, further cards are available for delivery vehicles). For delivery vehicles access is only allowed during defined time windows. In order to avoid abuse the entrances are monitored by camera (see Figure 8).
Last but not least two transhipment points ("Mercabarna" – see Figure 9 and "Parc Logistic Zone") have been implemented. Access to this two transhipment points is controlled and restricted by use of different equipment. The whole concept and the implemented kind of equipment might be used e.g. for access regulation of a city centre and not only for a transhipment area:

- Controlled access system: Entry by toll payment (Mercabarna).
- Contact less card payment, with automated pre-classification and NPR-systems (Mercabarna).
- Contact less card, magnetic ticket and digital video technologies control entry and exit movements (Parc Logistic Zone).
- System handles different sizes and monthly subscription is offered (Mercabarna and Parc Logistic Zone).

Figure 8: Automatic Enforcement based on advanced camera image processing (Digidock) in Barcelona
Results, experiences

Figure 9: Transhipment at Mercabarna Wholesale Market in Barcelona

The following figures can be stated today:

- In Mercabarna (opened in 1998) the average entry volume is 10'000 vehicles per year.
- The units of Parc Logistic Zone (opened in Feb. 2001) are already 100% subscribed.

The following experiences have been made during the first period of implementation:

- The good progress could only be reached because of a strong political will to continue & improve.
- The signed spaces allocated for goods give a 30-minute limit (defined through surveys, which is sufficient for all-but exceptional deliveries) for deliveries. Tow-away enforcement is used (strong and expensive efforts of the police are necessary in order to enforce the new measures) but to automate the enforcement is an important task which is currently a heavy policing burden.
- The implementation of all equipment (especially for the combined-use of streets, approx. 0.5 M. Euro per route) is quite expensive. Only step by step further lanes (applicable only for primary routes of the grid road system) or zones can be equipped and city-wide implementation takes long time.
- The combined-use of streets is successful. This measure is accepted by the users and could also rise the innovative image of the city.
- The acceptance of the inhabitants of the special zones for

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pedestrians is very high, quality of live increased.
The used concept for automatic fee collection (including pre-classification and automatic number plate registration) reduces waiting times and makes security measures more effective. It might be used as a “portal to the city” in order to regulate city access.

Future approach

In future the following measures and services are planned in addition to the already implemented ones and their enlargement on a broader scale all over the city:

- A “depot-to-door-step” Internet trip planner is under development which incorporates the reserved spaces at the junctions as special data objects – in a similar manner to how bus stops are identified for public transport trip planner applications. This tool will become an important mechanism for helping operators decide which spaces to reserve once kerbside spaces can be individually managed.
- Clean zones with special access windows for registered, low-emission goods vehicles.
- Automated enforcement which guarantees services.
- Fixed/mobile internet itinerary guidance which integrates kerbside and network information systems.
- Assurance of final stage of the delivery chain for registered goods vehicles/operators (e.g. those recognized at transhipment centres).

It is expected that electronic kerbside access will result in shorter times for delivery based on guaranteed time-slots for goods vehicles. It will also assure the final stage of the delivery chain and improve the reliability of primary roads capacity. Furthermore service booking will increase knowledge of demand and lead to a more rational roads catalogue and better network management strategies (see Figure 10).
Figure 10: Zone Access Control - Old Town of Barcelona
In Barcelona some further single measures have been implemented which will be regarded within other themes of BESTUFS (e.g. Distribution platforms, Internet roads network information services).

More information

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Example 4.2: Paris

“New regime for the City of Paris goods delivery regulations”, France
[Dablanc, Laetitia; 2000]

Paris is the only city in France where traffic and parking matters are not regulated by the local government, but by a representative of the national State (“prefet de police”). A review of the previous regulation was necessary as a reaction on the large amount of expressed discontents of e.g. residents, truck drivers, truck companies, police forces, bus companies.

Approach The new delivery regime in Paris includes 6 strategies:

- To simplify past regulations and to make them more understandable by truck drivers: Instead of 4 categories of vehicles only three are defined now. The same principle as before applies (the bigger the truck the larger the time regulations, with trucks defined by the floor surface they occupy):
  - Vehicles which occupy less than 16 m² are authorised to deliver goods at all time in the city (forbidden in bus driveways between 7:30 - 9:30 and 16:30 – 19:30)
  - Vehicles which occupy between 16 m² and 24 m² are authorised to deliver goods from 0:00 to 16:30 and from 19:30 to 24:00 (forbidden in bus driveways between 7:30 - 9:30)
  - Vehicles which occupy more than 24 m² are authorised from 0:00 to 7:30 and from 19:30 to 24:00.

- To increase maximum size of authorised trucks (16 m² instead of 12 m², and 24 m² instead of 20 m²) so that professional carriers can make a better job at consolidating their load and increase the length of their delivery rounds.

- To increase the number of on-street loading/unloading zones and better protect them by enforcement.

- To give permanent and temporary derogatory permits to specific deliveries (flour, oil, cold, construction material, outdoor markets, post office, etc.).

- To favour night deliveries.

- To protect passenger peak hours from freight traffic.

Exceptions exist for specific categories of goods.

In order to enforce the regulations traditional police forces are intended to be used. But so far (despite promises of the “prefet de police” to
approve enforcement), enforcement remains the weak point of delivery regulations in Paris (as in many other French cities). The harmonization with the neighboring cities is still missing and causes problems.

More information

Member of BESTUFS who did the material collection:
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See also References and contact persons!

Example 4.3: Copenhagen

“City Distribution in Copenhagen”, Danmark
[Jensen, Søren B.; 2000]

Reason, framework conditions

The project was initiated by the Mobility and Parking Directorate. Because of the increasing problems due to freight transport within the city centre.

The City Centre in Copenhagen has an inner area with a road net from medieval time. It is about 1 km x 1 km.

About 6,000 lorries and trucks daily have got their origin or destination within the city centre. The capacity utilization is very low (see Figure 11).

![Use of Capacity 1996](image)

**Figure 11: Use of Capacity in Copenhagen**

Objectives

The main objective for the whole projects was to increase the use of capacity in the lorries and vans entering the city centre. The philosophy behind is that the State and the Municipalities can not establish a sustainable urban freight transport, but they can “make it easier” for the carriers to choose a sustainable solution.

Approach

In order to work on the problems caused by freight transport and
especially a low capacity utilization a working group about goods freight in the inner city was founded and consisted of representatives from: Danish Rail, Danish Mail, Danish Transport and Logistic Association (Danish hauliers organisation), Danish Freight Association, The brewery Carlsberg, Dairy company MD-Foods, Retail store Magasin, Copenhagen City Centre Association, The Business University of Copenhagen, Copenhagen Road Department.

The carriers commit themselves to:

- In averages utilise the capacity of every single vehicle 60% over a 3-month period
- Sign up all the vehicles between 2-18 tons driving to/from the area.
- Only uses vehicles with engines younger than 8 years.
- Once every 3 months the company must send a report of the capacity use to us.

As participation in the scheme is voluntary some accompanying measures were implemented in order to encourage the companies to join in the project:

- 10 loading zones were established, exclusively reserved for the participants to load/unload goods on weekdays between 8-12.
- The companies will be entitled (by streamers etc.) to show their surroundings that they are participating in an environmental improving scheme.
- A list of the companies involved was put on the “City Distribution” webside on the Internet. So the customers could choose a “green” carrier.
- Possibility to influence a later obligatory scheme.

The control is being performed on the basis of the report send to the Road Department for each vehicle. The parking guards check if only vehicles with a certificate (sticker) in the windows hold in the loading zone between 8 and 12. All other vehicles are being fined. At the same time the guards observe the vehicles in the certificate area so that the administration can crosscheck with the information given by the companies about the capacity use.

After a year and a half the experiment ended in agreement with the carriers in the end of February 2000. 80 companies have sign more than 300 vehicles to the scheme. Several of these cars were entering the city centre several times a day. The bigger vehicles were dominating the experiment (see Figure 2). Of the total number of trucks and vans to the inner city, 88 % is between 2 and 3½ tons.

Almost all of the participants in the voluntary scheme were reportedly able to use 60% of the capacity. There were some problems with certain kind of transport(e.g. chilled goods).
Results, experiences

- The carriers were in general satisfied with the scheme. For the majority it took less than 10 minutes to fill in the application form and the quarterly reports. 86% of the participants would like to have an obligatory arrangement.
- 20% of the carriers have changed their daily transport planning behaviour during the experiment.
- Also more city logistic collaboration between the carriers has appeared during the experiment, naturally also for several other reasons.

The ministry of Transport explained in spring 1999 that it was against the law to reserve loading zones for cars with certificate. They should be open for all trucks. At the same time the ministry promised that they would prepare a new paragraph in the law making it possible for municipalities to make experiments.

This new paragraph was presented for the Parliament in November 1999 and they agreed late April 2000. In March the Town Council has decided that we should come with a proposal for an obligatory arrangement when the new law for experiments was ready.

Within an obligatory scheme the following regulations and exceptions will be included:
- It will either not be allowed to enter or to stop in the inner city for lorries and vans over 2 tons.
- To reserve 40 loading zones reserved for vehicles with a “green” certificate, cars there use 60% of their capacity in average over 3 months.
- “Red” (one day) and “Yellow” (transitional phase) certificate for

\[\text{Figure 12: Consignment sizes in Copenhagen}\]
special cases.

- Different fee for the different certificates.
- Fines for trucks and vans which are parking within the zones without certificate (about 100 Dmk).
- Vehicles as emergency or vehicles, more tools than vehicles as lifts, garbage collection etc. will not be included.

The following problem in a obligatory scheme has still to be solved:
Some types of transports can not fulfil the demand of 60% use of capacity.

It is expected that the obligatory project will lead to a reduction of the number of lorries and trucks entering the city centre (about 30%). This would lead to a reduction of emissions (particles: 25%, NO2: 5%. and NOx: 10%).

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Example 4.4: Stockholm

“Environmental zones and other regulations in Stockholm”,
Sweden, 1996

[Fager, Mats; 2000]

The project was initiated by the City of Stockholm. From the 1st April 1996, environmental zones were implemented in the central area of Stockholm.

The same measures were also implemented in the cities of Göteborg and Malmö.

Within the “Environmental Zones” special environmental regulations for diesel driven heavy goods vehicles and buses were implemented. These zones are areas within a built-up area, which are especially susceptible to disturbances from traffic and where traffic regulations are implemented. Vehicles which do not have an environmental classification (noise and emissions) are not allowed to enter these zones.

Municipal Councils have, in accordance with the Road Traffic Ordinances, the right to forbid traffic with polluting diesel driven trucks and buses with a total weight over 3.5 tons in these areas.

The vehicles need environmental class stickers on the windscreen to get permission to the “Environmental Zone” and the police monitors.

The following regulations are implemented within the city centre of Stockholm:

- No lorries heavier than 3.5 t from 10 p.m. to 6 a.m.
- No vehicles longer than 12 meters.
- No motor traffic (except taxis) from 11 a.m. to 6 a.m.
- Heavy diesel powered vehicles must not be older than 8 years (domestic and foreign vehicles).

Exceptions:

- A few through roads are excluded from the zone.
- Vehicles which are equipped with additional catalytic converter and not older than 12 years.
- Engine replacement to engine meeting the EU-requirements for the best environmental class.
- Vehicles which rarely have destinations in the environmental zone.

The measure led to a reduction of emissions (particles: 15 to 20%, hydrocarbons: 5 to 10 %, and NOx: 1 to 8%).
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Example 4.5: Amsterdam, Haarlem, Tilburg, Groningen

“Urban distribution in Amsterdam”, “Dadira in Haarlem”, “Efficient supply in Tilburg, Groningen - from city logistics to urban distribution”, Netherlands

[Quispel, Martin; Visser, Hans; 2000]

In Amsterdam Haarlem, Tilburg and Groningen a bundle of measures was initiated by the municipalities in close work together with PSD (Platform Stedelijke Distriubtje / Forum for Physical Distribution in Urban Areas).

Figure 13: Vehicle Matrix in the Netherlands

The above shown matrix (see Figure 13) includes several vehicle classes and vehicle characteristics. The according regulations are used in regard of the special circumstances within the cities and city centres:

Amsterdam has narrow roads and streets with a lot of traffic (80% of cargo is for/from city hart). This causes hindrance for
loading/unloading, stench, noise, vibrations and danger. Therefore HGV are banned out of the hart of the city. In October 1996 and end 1997 the following measures were implemented in regard of regulations of city access:

- City hart (see Figure 14) is not accessible for trucks over 7.5 ton.
- Transhipment is possible at Urban Distribution Centre
- Euro-2 norm is obliged.
- Length of the vehicles: max 9 metres.

[www.dro.amsterdam.nl/eng/01dro/0review.html; 2001]

Figure 14: City Centre of Amsterdam

The main goal of DADIRA in Haarlem was to improve the supply of supermarkets in the non-congestion hours (6 - 7 hrs and 19 – 21 hrs) in order to improve efficiency and effectiveness in the total distribution chain.

By means of creating co-operation and using an integral approach more efficiency and effectiveness in the distribution chain is stimulated. Dadira wants to get more combined transport flows going into the city and wants to stimulate a modal shift. Two main aspects characterise this project:

- Shift the primary distribution (from production to distribution centre) to the non-congestion hours. Main purpose is to relieve the pressure on the infrastructure and to decrease the lead-time.
- Realising enlargement of the time windows in the secondary distribution (from DC to the supermarket.

The outcome of the project was quite positive.
The main lesson to be learned was to involve all parties in these type of issues.

City centre of Tilburg was upgraded from April 1999 till 2001. Implementation of the following six projects is the goal:
- Using the possibility of supplying by means via the backsides of shops.
- Making a logistic framework of requirements (weights and dimensions trucks, routing, etc.).
- Tuning, differentiating and creating flexible time windows.
- Common supply depots for shops near shop centres.
- One distribution company that takes care of the stock of the shops and home deliveries.
- Joint waste collection and cleaning services.

There is also thought about innovative logistic systems (tubing).

The most important proposed measures in Groningen are:
- Use of bus lanes for freight transport during time windows.
- More open definition of city logistics. Companies with an own DC at the outer side of the city and more than 100 shipments per day from/to the city are also recognised as being ‘city logistics’. These shipments may be fulfilled outside time windows also.
- Introduction of joint depots for dropping cargo.
- Introduction of a hybrid vehicle with an exemptions to time windows and access regulations.

In all cities PSD measured and will measure the effects of the policy packages by doing a reference state measurement and a measurement after full implementation in order to find out effects and potential for improvement.

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Example 4.6: Bremen

“Recommended Urban Truck Routes - Bremen Approach”, Germany

[Just, Ulrich; 2000]

In Bremen a bundle of measures was initiated by the city of Bremen in order to work against the problems caused by rising transport volume transported by road (due to the ongoing decrease in road transport prices and the poor flexibility of the railway).

The first step was to implement the concept "Integrative transport planning" ("IVP") in 1991: In an ongoing, open planning process all relevant economic, social and planning aspects are considered in an integrative framework including all transport modes for freight and private transport and their interactions, especially regarding correlation between land utilization, regional economic structure and mobility.

The Truck Guidance Network was one of the measures implemented in the framework of the "IVP". It was developed for the following reasons:

- Traffic increase on the main routes (motorways, highways, arterial roads) lead to a shift of through traffic from these routes to smaller roads in residential areas.
- Due to the increase of truck traffic in residential areas it has become more likely that courts pass regulations and/or bans on certain roads for heavy trucks. These regulations can lead to detours and possibly (if areas with a high population density are affected by diverted traffic) to even greater problems in certain residential areas.

The concept has to determine in the street network:

- Which routes will not be restricted for the through truck traffic.
- Which routes might be restricted for heavy trucks.

A Truck Route System was developed as a second measure (detailed analysis of the circumstances within the city were done for preparation of it) which includes different categories of streets (see Table 4). The regulations regard weight and emissions of the vehicles with exceptions for low emission trucks). The draft of the truck route system as part of the IVP concept was discussed in seven work groups. These groups consisted of delegates of local authorities (city and its surrounding municipalities), lobbies and other sectors affected (environment, harbour, commerce).
Table 4: Street quality classification in Bremen

<table>
<thead>
<tr>
<th>Street Category</th>
<th>Options for regulations</th>
<th>Weighting factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorway</td>
<td>no regulations, only guidance</td>
<td>1.0</td>
</tr>
<tr>
<td>Main routes</td>
<td>no regulations, only guidance</td>
<td>1.0</td>
</tr>
<tr>
<td>Main roads</td>
<td>no regulations, only guidance, higher resistance</td>
<td>2.0</td>
</tr>
<tr>
<td>Other roads</td>
<td>regulations e.g.: speed limits, total weight, temporary bans</td>
<td>3.0</td>
</tr>
<tr>
<td>Residential roads</td>
<td>significant regulations e.g. general bans</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Additional measures for implementing the Truck Route System:

1st stage: Voluntary Avoidance
- Map indicating the truck routes for drivers to keep the truck routes: The digital map of the city of Bremen was used as a background to which the truck route guidance network, other main roads, industrial parks (incl. street names), truck relevant information (such as bans during day or night-time, height regulations e.g. of railway underpass) and additional information are attached. Explanations are given in German, English and Russian (2). The map is free of charge.
- Improvement of the guiding system to industry parks.
- Extension of city logistic measures.

2nd stage: Avoidance by Measures
- Traffic regulation: e.g. regulations on through traffic and/or on night traffic, possibly differentiated by truck weight.
- Construction measures: e.g. guidance to extended routes of the IVP.

The impact on truck traffic as calculated in the prognosis are as follows:
- If truck routes are taken and other roads avoided (assumed rate of
voluntary avoidance: 50%) the average length per trip is increased by 2.7% and the travel time is increased by 0.8%.
After implementation of the measures of the first: potential of disturbance (number of trucks on the roads multiplied with the corresponding residential units) is reduced by 15.7% (due to the shift of truck traffic to less sensitive routes).

- The additional noise emissions occurring from the concentration of truck traffic on the roads which are part of the truck route system do not increase the existing noise level significantly.

The recommended truck routes were accepted by the truck drivers. A concentration of trucks on roads of the truck guidance network could be measured:

- Increase on highways and highway-like roads: + 1.5%.
- Decrease of truck volume on minor roads which are not part of the truck routes: - 11%.
- Decrease of truck volume on residential roads: - 40%.

The reactions were primarily positive. However, it was criticised that no limits regarding the maximum number of trucks were implemented on streets of the truck route system.

More information

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Example 4.7: Cordoba and Sevilla

“Integration of LEAN logistics into urban multimodal transport management”, Spain, 1997 - 1999

[Montero, Guillermo; Larraneta, Juan; Munizuri; Jesus; 2000]

The project was implemented in 1997 till 1999 and was initiated by the Andalusian General Directorate for Transport (AICIA) in work together with the University of Sevilla, PROINCA, DG 7.

In the city centre of Sevilla the needs and requirements of the different user groups (freight carriers, receivers and community) are often contradictory. Due to this situation, it is usually the Public Administration who needs to act as a referee, because individual user groups can barely achieve any improvements without affecting other user groups and thus creating conflicts.

Figure 15: Freight problems in Cordoba
Despite being a private initiative which is co-financed by EU, the strategic solutions that are given for the city centre of Sevilla are mainly based on Public Administration guidance, in the manner of regulations, sometimes co-ordination, and often funding support. Logistic, telematic and marketing-related concept elements have also been included to complete the concept.

Objectives

The following requirements are regarded as most important for an improvement of the situation:

- Enforcement and Legislation
- Consultation and co-operation
- Intermodal Transhipment Networks
- Logistic Sites and Facilities
- Traffic Management and Operational planning
- Land Use and Traffic Planning

These aspects are considered within the strategic solutions for Cordoba and Sevilla in the following way:

Approach

The concept to be applied in Cordoba consists of a classification of the city centre in two or three different zones (See Figure 17) that have different treatment, permissions, etc. The next step is to give regulations to each defined area. These regulations are based on the access of vehicles and loading/unloading activities.
Figure 17: Zones with different regulations in Cordoba
The idea in the case of Cordoba, is to control the access and the allowed routes for the freight transporters. Often the access regulations are not observed, the authority should try to keep the quality of life for the citizens, and one way is through good control, as well as allow in special cases the access. This permitted entrance needs a permit that is given by the Council. Examples for this case are: Containers transport, Construction transport and Large vehicles.

An overview of the zones and time windows in Cordoba gives Table 5. The measures include and involve loading/unloading activities and imply loading/unloading time regulations, as a balance to the access regulations.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Vehicles</th>
<th>Access time window</th>
<th>Load/unload time window</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Weight ≤ 6 Tm.</td>
<td>20:00 – 8:30</td>
<td>20:00 – 12:00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9:30 – 11:30</td>
<td>14:30 – 17:30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14:30 – 17:00</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Weight ≤ 6 Tm.</td>
<td>20:00 – 11:30</td>
<td>20:00 – 12:00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14:30 – 17:00</td>
<td>14:30 – 17:30</td>
</tr>
<tr>
<td></td>
<td>Weight 6 – 9 Tm.</td>
<td>20:00 – 09:00</td>
<td>20:00 – 10:00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14:30 – 17:00</td>
<td>14:30 – 17:00</td>
</tr>
<tr>
<td>C</td>
<td>Weight ≤ 6 Tm.</td>
<td>20:00 – 11:30</td>
<td>20:00 – 12:00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14:30 – 17:00</td>
<td>14:30 – 17:00</td>
</tr>
<tr>
<td></td>
<td>Weight 6 – 9 Tm.</td>
<td>20:00 – 09:00</td>
<td>20:00 – 10:00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14:30 – 17:00</td>
<td>14:30 – 17:00</td>
</tr>
<tr>
<td></td>
<td>Weight 9 – 12 Tm.</td>
<td>20:00 – 09:00</td>
<td>20:00 – 10:00</td>
</tr>
</tbody>
</table>

Table 5: Zones and time windows in Cordoba

The generic concept developed for the city of Sevilla consists of five different strategies which are not necessarily separate alternatives, but rather are complementary. They are presented here from the easiest one to the hardest to implement, and can be viewed as five correlative steps which constitute the suggested solution for the centre of Sevilla.
City access, parking regulations and access time regulations and enforcement support

(see Figure 18).
Each strategy is suitable to include concepts related to Public Administration, Logistics, Telematics and/or Marketing. For each one, a list of concept elements is given.

**Figure 18: Solutions in the city centre of Sevilla**

**Figure 19: Strategy for Sevilla**

More information

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See also References and contact persons!

Final: June 2001, 18.06.2001
Example 4.8: Genoa

“Management of Urban Freight Transport – MUFT”, Italy
[Contursi, Vito M.; 2000]

The project was initiated by the Mobility and Parking Directorate. Because of the increasing problems due to freight transport within the city centre which show the following Figure 20 and Figure 21.

Figure 20: Goods demand in Genoa

Figure 21: Vehicles for freight transport in Genoa
Objectives

The main objectives for the whole projects were to:

- Improve the quality logistic and define services with new added value (collection of packings) and new functionalities.
- Demonstrate a rational use of the intermodal transport.
- Reduce the trips due to the freight in the urban zones and their impacts on the urban traffic flows.

In order to solve the problems in the city centre different tasks were defined like “New Delivery Services Planning” and “Use of electric vehicles”.

Approach

The task “Access regulations included certain places (stop stations) which were fixed within the city centre of Genoa (see Figure 22).
Figure 22: Stop stations for the freight transport in the city centre of Genoa

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4.4 Conclusions and recommendations

In general the following conclusions can be drawn:

Access regulations are widespread in Europe and it is expected that more and more cities introduce new access regulations. Information and communication technologies together with access gates are becoming less expensive and are offering a variety of complex new access schemes tailored to individual infrastructures of single districts.

Currently applied regulations can be grouped as follows: (1) regulations related to the type of transport means especially to vehicle emissions, weights and sizes; (2) regulations related to the access time to determined areas; (3) regulations related to preferred truck routes; (4) regulations related to loading and unloading zones; (5) regulations based on licences. A forthcoming regulation addresses access slots and this leads also to the issues of access control and enforcement support.

Weight restrictions are the most common regulations in Europe and they tended in the past to be more and more restrictive in urban areas, which has enhanced the use (and number) of small delivery vehicles.

Existing regulations on truck size and weight within city centres are currently reviewed for making them simpler and closer to the professional needs of carriers and retailers.

The new strategies tend to stabilise regulations at a higher weight level because of the positive effects regards the number of trips and the corresponding emissions. Access regulations based on vehicle size and weight are very different within Europe but also from city to city within one and the same country.

Vehicle emissions improved considerably in Europe in the last years due to the treatment of this topic on European level leading to the ratification of the EURO norms. Nevertheless, there is an increasing number of cities offering limited access to central urban areas only for zero-emission vehicles, for electric vehicles or low emission hybrid vehicles, e.g. in the cities Amsterdam, Nürnberg and Zermatt.

Regulations related to transport vehicles are crucial for vehicle manufacturers and for fleet owners. They have to provide the right vehicle for a dedicated transport application in a dedicated region. A widest possible harmonisation of regulations is therefore highly recommended.

Many European cities have regulations on delivery time windows within city centres and especially for pedestrian zones.

E.g. the most common rules in France are to authorise deliveries
between 9:00 and 11:00 or 12:00. There, the current strategies tend to open up time windows in the morning (starting at 7:00, closing at 12:00 or 13:00) and to extend them also in the afternoon for pick up activities and home deliveries.
Regarding night deliveries, French cities are (nearly equally) divided in two: While some cities consider this as a very good strategy to decrease the number of trucks in the city during the day, other cities argue that truck and delivery noise impacts are too high and night deliveries should be banned.

The delivery time windows are very much depending on the opening times of shops while local habits and cultural differences lead to an acceptance or disapproval of night deliveries.

City planners regarding the flows of heavy vehicles within a metropolitan area on a larger scale distinguish small street network links from medium and large sized main routes – as they do also for the overall traffic. Then it is possible to attach preference attributes with regard to heavy vehicle flows to single links and to assess the environmental but also the trip length effects within a model. This process leads to a preferred truck routes network and is especially useful to prevent transiting trucks from penetrating city centres.

E.g. the city of Bremen has investigated in such a truck guidance network due to the following two reasons: (1) The increase of traffic led to a shift of transit traffic from main routes to smaller roads in residential areas; (2) Experiences have shown that restrictions and/or bans are leading to detours and even bigger problems in certain (other) residential areas. The aim of the new truck guidance network was to minimise the travel times and trip lengths for all trucks on the Bremen road network and for all residents affected by freight traffic. As a result the city printed and distributed a map for drivers with recommendations on routes and a final evaluation showed a positive acceptance.

Licences (for use of loading zones)

The provision and access regulation of loading and unloading zones is also an important aspect for many dense urban areas. Without such zones the delivery vehicles often stop on a regular lane as on a 2nd parking row, with partly immense negative effects to the road capacity.

Many cities meanwhile provide dedicated zones for freight handling and e.g. in Copenhagen the access is depending on a license (see next section). In addition to public zones it is also possible to regulate the provision of private loading/unloading zones in relation to large commercial and industrial buildings. E.g. within the city of Paris all new commercial and industrial buildings larger than 250 square meters have to provide an off-street unloading area.

Access slots

Access slots are yet only in use on the private side in order to regulate and optimise the gate access e.g. for a warehouse or a large retailer. Nevertheless, it will become relatively easy possible on the basis of conventional technologies to control the access of individual vehicles at certain entry points or within predefined areas.

Measures allowing only a limited number of accesses per district or per
time unit can then be realised and approaching vehicles can register in advance for their access. This is still future for public domains but allows tailored solutions to implement a regulated access.
Access control and enforcement control

Closely related to the access regulation is the access control and the enforcement control. Quite often in Europe the given regulations are ignored by individuals and if there is no control and no enforcement the regulation will become weaker and weaker and finally useless. A good access control hinders an easy ignorance and strengthens a regulation.

Cities in BESTUFS have shown interest to go into more detail regards access control and enforcement support because there are new supporting techniques which are yet rarely implemented and tested in Europe as e.g. the video surveillance.

Recommendation on international, national and regional level

On international, national and regional level the following recommendations can be given:

Harmonization of regulations on city, regional and national level

Many shippers and transport companies which access city centres operate not only on a local level, but are active in a much bigger geographical area. From their point of view (a higher scale level) there could exist severe conflicting regulations between cities.

These problems arise e.g. when on a tour either the same or completely different time-windows are faced. Then there is either little room for delays or else forced waiting during the trip. Also weight regulations may be substantially at odds between cities within a region. These differences are not only bad for operator productivity but are also bad for the environment (at least if one views this also from a regional/ not purely local perspective).

Conflicts may arise if e.g. in international transport one needs in the near future for each city different system technologies and components (e.g. smart cards, on-board systems) for road pricing, parking and city access control. There is little doubt that this also completely at odds with the idea of the freely accessible EU internal market.

Implementing new concepts and technologies ask for technical, operational and organisational interoperability.

Technical interoperability

The example of a public private partnership between authorities and transport actors in the Netherlands (Forum for Physical Distribution in Urban Areas - PSD) shows that an integrated planning of measures which is supported by the municipalities and the government helps to make implementation of measures easier.

This includes especially the possibility to compare the results and to use common experiences. But the legal status of such a PPP has to be considered well as well as the involvement of different parties.

Integrated planning of measures and PPP

Recommendation

In regard of the implementation of measures and regulations the
following recommendations can be given:

Tailor-made solutions (examples Cordoba, Seville, Genoa, Barcelona) help to point on the problems which occur within the different zones of the city centres. Special cases and exceptions are always necessary and have to be foreseen within the measures like e.g. in Copenhagen where different categories of certificates are available. The local framework conditions are important for the suitability and feasibility of access regulation measures.

Work together of all influenced parties (like e.g. in Copenhagen) helps to get a high acceptance and to find solutions for the different needs. This work-together has to be done already in an early stage of planning but also after implementation and analysis of first results in order to do necessary adaptations.

The acceptance of the inhabitants of the special zones for pedestrians is in most of the cases very high because the quality of life increases. But it has to be considered that at the same time the access for deliveries of the stores gets worse. Therefore these solutions should only be implemented if really necessary and the access has to be guaranteed for all legal users. Especially the used barriers have to be well chosen in agreement with the users.

Often strong efforts of the police are necessary in order to enforce the new measures. They have to be considered already during planning of a measure especially in regard of the arising costs. New and automated enforcement techniques will therefore get more important in the future.

The implementation of the needed equipment is in many cases quite expensive. Very often the areas for implementation of a measure can only be equipped step by step. City-wide implementation can take a long time or is even impossible. There is still need for simple and cheap solutions.

In order to get also a high acceptance of non-residentials and commercials it is recommended that information on the existing regulations is provided like e.g. done within the Bremen Truck Route System.

If a city is easily accessible and heavy goods vehicles operate effectively with high load factors there are strong arguments against the use of ‘rigid time-windows and weight regulations’. Effective policy requires in this case flexible, ‘tailor-made’ regulations that better take into account the situation of transport operators and their customers. E.g. exemptions of access regulations (time windows, vehicle size) should be possible if vehicles are fully loaded. Also, as another example, one may think about allowing exemptions when transport operators voluntary provide route-information to the enforcement authorities (e.g. large vehicles may enter city centres provided the routes can be checked on-line by the police e.g. by using mobile communication and GPS).
The measurement of the effects of the different implemented regulations is a major task. Comparison has to be done between the reference state and the state after full implementation in order to find out effects and potential for improvements. For decision making the costs and benefits have to be analysed.
## REFERENCES AND CONTACT PERSONS

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<td>Karl Arnost</td>
<td>Magistratsabteilung 46, Wien, Austria</td>
</tr>
<tr>
<td>Belgium</td>
<td>J-P. WOUTERS</td>
<td>Cabinet du Secrétaire d'Etat R. DELATHOUWER, Avenue Louise 54/11, 1050 BRUSSELS, BELGIUM, <a href="mailto:jpwouters@delathouwer.irisnet.be">jpwouters@delathouwer.irisnet.be</a></td>
</tr>
<tr>
<td>France</td>
<td>Jean THEVENON</td>
<td>CERTU, 9 rue Juliette Recamier, 69456 LYON cedex 06, 75015 PARIS, <a href="mailto:jean.thevenon@certu.fr">jean.thevenon@certu.fr</a></td>
</tr>
<tr>
<td></td>
<td>Laetitia DABLANC</td>
<td>GART, 17 rue Jean Daudin, <a href="mailto:laetitia.dablanc@gart.org">laetitia.dablanc@gart.org</a></td>
</tr>
<tr>
<td>Germany</td>
<td>Dr. Reuter, Dr. Baumüller</td>
<td>Amt für Umweltschutz Stuttgart, Gaisburgstraße 4, 70182 Stuttgart, Germany</td>
</tr>
<tr>
<td>Greece</td>
<td>Ass. Prof. Th. Vlastos</td>
<td>National Technical University of Athens–Rural and Surveying Dpt 9, Heron Polytechniou, 15780 Athens, GREECE, <a href="mailto:vlastos@survey.ntua.gr">vlastos@survey.ntua.gr</a></td>
</tr>
<tr>
<td>Italy</td>
<td>ing. Alessandro Fuschiotto</td>
<td>STA – Roma, Viale Ostiense 131 L, Italy</td>
</tr>
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Final: June 2001, 18.06.2001
<table>
<thead>
<tr>
<th>Country</th>
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<tbody>
<tr>
<td>Netherlands</td>
<td>Roeland van Bockel</td>
<td>Gerard Wesselink</td>
</tr>
<tr>
<td></td>
<td>Platform Stedelijke Distributie</td>
<td>GOVERA / Provincie Zuid-Holland</td>
</tr>
<tr>
<td></td>
<td>P.O.Box 20904, 2500 EX The Hague</td>
<td>P.O.Box 90602, 2509 LP The Hague</td>
</tr>
<tr>
<td></td>
<td>The Netherlands</td>
<td>The Netherlands</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:psd@psd-online.nl">psd@psd-online.nl</a></td>
<td><a href="mailto:Wesselink-g@pzh.nl">Wesselink-g@pzh.nl</a></td>
</tr>
<tr>
<td>Spain</td>
<td>Rafael Ruiz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Municipality of Cordoba (Traffic department)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Avda. de los Custodios, s/n</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14004 Cordoba</td>
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</tr>
<tr>
<td></td>
<td>Spain</td>
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</tr>
<tr>
<td>Sweden</td>
<td>Mats Fager (Head of traffic unit)</td>
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</tr>
<tr>
<td></td>
<td>The Real Estate and Traffic Department (GfK)</td>
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<td>Stockholm Stad</td>
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<td></td>
<td>P.O.Box 8311</td>
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<td></td>
<td>104 20 Stockholm</td>
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<td></td>
<td><a href="mailto:mats.fager@gfk.stockholm.se">mats.fager@gfk.stockholm.se</a></td>
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<tr>
<td>Switzerland</td>
<td>Martin Ruesch</td>
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<td></td>
<td>RAPP AG Ingenieure + Planer</td>
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<td></td>
<td>Oerlikonerstrasse 38</td>
<td></td>
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<td></td>
<td>8057 Zürich</td>
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<tr>
<td></td>
<td>Switzerland</td>
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<tr>
<td></td>
<td><a href="mailto:martin.ruesch@rapp.ch">martin.ruesch@rapp.ch</a></td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Mr. Chris Kutesko</td>
<td>Mr. Bryan Stead</td>
</tr>
<tr>
<td></td>
<td>Norfolk County Council, Planning &amp; Transportation</td>
<td>Independent Transport Consultant</td>
</tr>
<tr>
<td></td>
<td>County Hall, Martineau Lane, Norwich NR1 2SG</td>
<td>5, Bramble Way, Poringland, Norwich NR1 7RT</td>
</tr>
<tr>
<td></td>
<td>UK</td>
<td>UK</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:Chris.kutesko.pt@norfolk.gov.uk">Chris.kutesko.pt@norfolk.gov.uk</a></td>
<td><a href="mailto:bryan.stead.1964@pem.cam.ac.uk">bryan.stead.1964@pem.cam.ac.uk</a></td>
</tr>
</tbody>
</table>

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ANNEX

ANNEX 1/I  Situation concerning data collection within European countries
ANNEX 1/II  Collected case studies (projects-level) - Statistics
ANNEX 2/I  Overview on regarded case studies (projects-level) – City Access
ANNEX 2/II  Collected case studies (projects-level) – City Access
## ANNEX 1/I

### Situation concerning data collection within European countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>25% of all important cities (9) are collecting data.</td>
</tr>
<tr>
<td>Belgium</td>
<td>All important cities (5) are collecting data.</td>
</tr>
<tr>
<td>France</td>
<td>4 cities have collected data comprehensively, 5 are planning doing it (important cities: 60); Most of the cities are collecting data in general.</td>
</tr>
<tr>
<td>Germany</td>
<td>20% of all important cities (70) are collecting data.</td>
</tr>
<tr>
<td>Greece</td>
<td>All important cities (6) are collecting data.</td>
</tr>
<tr>
<td>Italy</td>
<td>Public authorities, transport and retail associations etc. are all &quot;thinking to perform specific studies&quot; and implement specific solutions; many agreements have been done or are in preparation among these different parties at local level in order to realise the necessary political consensus and framework.</td>
</tr>
<tr>
<td></td>
<td>Development of the “Piano Generale dei Trasporti” as a “general transport plan” which gives the guidelines for the transport development of Italy in the next future (“Mobility manager in city logistics” at regional level, a central observatory at national level for the co-ordination, support (also financial).</td>
</tr>
</tbody>
</table>
### Netherlands
- 60% of all important cities (19) are collecting data.
- Collected data: Number and times of vehicles passing certain points (by deduction loops in or on the road); Kilometres driven in city limits (national level by general inquiry); Number of stops and specific addresses in the town (inquiry at transport company); Number and times of deliveries (inquiry/interview at shop owners/managers).

### Spain
- 1 (out of 15) city is collecting data: Barcelona
- Unfortunately, there is not enough information about freight transport in urban areas for Spanish cities. Almost all the data can give us an idea is the (vehicles) mobility research for the important cities, such as Madrid, Sevilla, Cordoba, Valencia, etc.

### Sweden
- 3 (out of 10) important cities are collecting data.
- Collected data: Number and type of vehicles, mileage, freight volume, type of freight, loading-unloading points (geographical) (differ from city to city)

### Switzerland
- 20% (total = 16) of the important cities are collecting data
- Collected data: Road: Mileage, Tons, Ton-kilometers, Number and kind of vehicles, number of trips, capacity utilization, percentage of empty trips, number of trips through the city centre, number of trips per vehicle, driving times, time for loading and unloading, number of stops per vehicle and day, transport chains, percentage of transport of own account (Werkverkehr) / transport by forwarders (Spediteurverkehr), positions of and land use for distribution sites; Rail: Tons, railway stations, connection tracks (Anschlussgleise); Water: Tons; Data of transit, in general, of single companies, building site traffic; delivery-windows; peak hours
- Use for: Modeling, Projections, Studies

### United Kingdom
- Only 4 (out of 33) important cities are collecting data.
- There is an important number of towns and cities in the UK (33) with a population between 100,000 and 200,000 inhabitants, with historical centres, which have special concern about urban freight distribution requiring urgent solutions.
- Collected data: Kind of vehicles used for delivery in the city centre areas. Reaction of suppliers and customers using those vehicles for small part-load deliveries to the idea of using Urban Distribution Centres just outside the city where the loads could be consolidated with others for final delivery in smaller vehicles.
ANNEX 1/II

Collected case studies (projects-level) - Statistics

<table>
<thead>
<tr>
<th>Code</th>
<th>City</th>
<th>Name of statistics</th>
<th>Kind of statistics, intervals of execution</th>
<th>Method of Survey, Way of data collection, Tools</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT - 01</td>
<td>Wien</td>
<td>Chancen für ein City-Logistik in Wien Strukturerhebung, WIKA Studie</td>
<td>Specific survey 1x</td>
<td>Observation: Forms for counting Questionnaires: written EXCEL, ACCESS</td>
<td>A survey which regarded the urban transport activities in Wien and focused only on special parts of the town.</td>
</tr>
<tr>
<td>AT - 02</td>
<td>Wien</td>
<td>City Logistik Phase 1, CL 1</td>
<td>Analysis</td>
<td>No primary survey EXCEL</td>
<td>The results of the above mentioned survey on the urban transport activities in special parts of Wien, the data of other towns (Linz) and the data of other European countries were used in order to create generic models of city logistic instruments and solutions for the current problems.</td>
</tr>
<tr>
<td>AT - 03</td>
<td>Wien, others</td>
<td>City Logistik Phase 2, CL 2</td>
<td>Analysis</td>
<td>No primary survey EXEL, ACCESS</td>
<td>Next step of analysis of the above described survey and analysis in order to improve the knowledge on the implemented city logistic projects. The analysis focused on special parts of the town and included a comparison to other towns.</td>
</tr>
<tr>
<td>AT - 04</td>
<td>Wien</td>
<td>City-Logistik Ein Ausweg aus der Wiener Verkehrsmisere</td>
<td>Analysis 1x</td>
<td>No primary data, use of official transport statistics</td>
<td>Further analysis of the above mentioned surveys and analysis focusing on city logistic.</td>
</tr>
<tr>
<td>AT - 05</td>
<td>Wien</td>
<td>Optimierung der innerstädtischen Zustellogistik in Wien</td>
<td>Specific survey 1x</td>
<td>data from involved companies</td>
<td>The survey tried to find out the opportunities of city logistic concepts/ city terminals in Wien.</td>
</tr>
<tr>
<td>AT - 06</td>
<td>Wien</td>
<td>Güterterminal Wien Inzersdorf</td>
<td>Specific survey 1x</td>
<td></td>
<td>The survey focused on the feasibility of a cargo terminal within Wien and its best location.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Code</th>
<th>City</th>
<th>Name of statistics</th>
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<th>Method of Survey, Way of data collection, Tools</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE - 02</td>
<td>Brussels</td>
<td>COMPTAGES DE VEHICULES DE TRANSPORT DE MARCHANDISES</td>
<td>Statistics Every 5 years</td>
<td>Observation: Forms for counting, tape recorders PARADOX database SATURN model</td>
<td>The collected data could be used for modeling of the freight transport trends in the Brussels area.</td>
</tr>
<tr>
<td>BE – 03</td>
<td>Brussels</td>
<td>INTERVIEWS OF THE GOOD CARRIERS</td>
<td>Specific survey 1x</td>
<td>Questionnaire: electronic, Interview (telephone) PARADOX database</td>
<td>The reactions of the carriers facing the measures envisaged by the public authorities were found out within interviews. It was important that specialised carriers and own account carriers were asked because own account carriers form an important part of the short distance freight movements.</td>
</tr>
<tr>
<td>BE - 04</td>
<td>Brussels</td>
<td>STATED PREFERENCE SURVEY ON THE ‘SEA-RIVER’ TRANSPORT</td>
<td>Specific survey 1x</td>
<td>Stated preference PARADOX database HIELOW software</td>
<td>This stated preferences survey was done in order to forecast the behavior of the shippers facing the choice between sea-river transport and combined transport alternatives (sea + train or sea + road) for transport between the Brussels area and Ireland, UK and Nordic countries.</td>
</tr>
<tr>
<td>CH - 01</td>
<td>Switzerland</td>
<td>Gütertransportstatistik (GTS93)</td>
<td>Statistics Every 5 to 15 years</td>
<td>Questionnaire detailed and simplified</td>
<td>This statistics is needed for creating political frameworks especially in regard of new circumstances of European politics. Furthermore the data is used for calibration of the models being used for traffic statistics in Switzerland.</td>
</tr>
<tr>
<td>CH - 02</td>
<td>Basel, Bern, Genf, Luzern, Zürich</td>
<td>COST 321: Stadtverträglicher Güterverkehr</td>
<td>Analysis</td>
<td>EXCEL</td>
<td>Analysis of GTS 93 with focus on a comparison of the structure of urban freight transports within different cities.</td>
</tr>
<tr>
<td>CH - 03</td>
<td>Bern</td>
<td>Gütertransporterhebung Innenstadt Bern</td>
<td>Specific survey 1x</td>
<td>Observation: Forms for counting Questionnaires: written ACCESS</td>
<td>This specific survey was done in order to get main data for planning of new concepts or measures (e.g. city-logistics-system).</td>
</tr>
<tr>
<td>CH – 04</td>
<td>Basel</td>
<td>Basel City Logistics</td>
<td>Specific survey</td>
<td>Questionnaires: written EMME/2, EXCEL</td>
<td>This specific survey was done on order to get data on road transports of goods on short distances within the city centre and to prepare a city logistics project.</td>
</tr>
<tr>
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<tr>
<td>Code</td>
<td>City</td>
<td>Name of statistics</td>
<td>Kind of statistics, intervals of execution</td>
<td>Method of Survey, Way of data collection, Tools</td>
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<tr>
<td>DE – 01</td>
<td>München</td>
<td>Analyse und Prognose des Wirtschaftsverkehrs in der Region München</td>
<td>Specific survey 1x</td>
<td>Questionnaire: Individual WIVER</td>
<td>The data of this specific survey was used for the development of a measure oriented model for commercial traffic on road for city planning calculation. The model (WIVER) provides the basis for different scenarios and measures.</td>
</tr>
<tr>
<td>ES – 01</td>
<td>Bacelona</td>
<td>SMILE Street Management Improvements for Loading/unloading Enforcement</td>
<td>Specific Survey</td>
<td>Questionnaires: Written direct interviews Observation</td>
<td>The surveys involved interviews with representative samples of all types of shops/ stores, direct observation of kerbside activities, plus interviews with goods vehicle operators. Therefore the basic parameters of on-street goods delivers activities in the city of Barcelona were known and the implementation of junction measures and piloting a new combined-use lane concept could be done.</td>
</tr>
<tr>
<td>FE – 01</td>
<td>Bordeaux, Dijon, Marseille, Lille, Rennes, Lyon</td>
<td>Enquêtes quantitatives TMV</td>
<td>Specific survey 1x</td>
<td>Questionnaire: Interview SIRENE ACCESS</td>
<td>The survey used a series of &quot;unvarying features&quot; of urban freight transport that can guarantee the reproducibility of results in any other French cities, without doing extensive surveys. The unit of observation was the &quot;movement&quot;.</td>
</tr>
<tr>
<td>GR – 01</td>
<td>Thessaloniki, suburbs</td>
<td>GENERAL TRANSPORTATION AND TRAFFIC STUDY FOR THE WIDER THESSALONIKI AREA</td>
<td>Specific survey 1x</td>
<td>Questionnaire: Interview EXCEL, ACCESS</td>
<td>The interviews were done with transport companies, as well as food and oil product companies which own a significant number of freight transport vehicles. The given information was used for observation of developments, modeling and forecasting for city development planning purposes. Furthermore the extent up to which the urban traffic and environment are burdened by freight transport was assessed.</td>
</tr>
<tr>
<td>Country</td>
<td>City</td>
<td>Study Title</td>
<td>Survey Type</td>
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<tr>
<td>GR - 02</td>
<td>Athen</td>
<td>ATHENS METRO (ATTIKO METRO) STUDY</td>
<td>Specific survey</td>
<td>1x / 2x</td>
<td>The interviews were done in order to get better knowledge on the best possible integration between the Metro and other transportation systems operating in the Attica area, or the systems that will operate in the future.</td>
</tr>
</tbody>
</table>

Questionnaire: Interview EXCEL, ACCESS

Final: June 2001, 18.06.2001
<table>
<thead>
<tr>
<th>Code</th>
<th>City</th>
<th>Name of statistics</th>
<th>Kind of statistics, intervals of execution</th>
<th>Method of Survey, Way of data collection, Tools</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT - 01</td>
<td>Mestre</td>
<td>_</td>
<td>Statistics Specific Survey Analysis</td>
<td>Questionnaires: Written direct interviews, telephone interviews. Observation: manual/ automatic traffic counts some simulations Others: Workshops, meetings</td>
<td>In the Italian cities many questions on goods transports have to be answered: transport demand, functionality of ZTL (limited access traffic zone) entry points, environmental effects of measures, etc. Statistics, specific surveys and analysis, help to get information for policies and strategies for the future.</td>
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<td>Roma</td>
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<tr>
<td>NL - 01</td>
<td>Haarlem</td>
<td>DADIRA (Distribution of goods on quiet hours of the day)</td>
<td>Specific survey 1x</td>
<td>Questionnaire: Interview Observation: on street</td>
<td>The survey was done in order to prepare new strategies and policy measure like e.g. using other delivery hours. The survey regarded only urban goods transport to retail shops in the city limits of Haarlem.</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>SE - 01</td>
<td>Stockholm</td>
<td>Commercial Transports in the Stockholm County (NÄTRA)</td>
<td>Specific survey 1x</td>
<td>Questionnaires: Intervies ACCESS</td>
<td>The survey was done in order to get a statistical data base for modeling and forecast and included city and agglomeration.</td>
</tr>
<tr>
<td>UK - 01</td>
<td>Aberdeen</td>
<td>City centre delivery survey</td>
<td>Specific survey 1x</td>
<td>Questionnaires: letters Observation EXCEL</td>
<td>This one-day survey was done for collection of data covering the key shopping area of the city. The letters were sent to companies and included e.g. questions about their possible interest in a Urban Distribution Centre just outside the city and if not, the reasons why.</td>
</tr>
</tbody>
</table>
## ANNEX 2/I

Overview on regarded case studies (projects-level) – City Access

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Project name</th>
<th>Vehicle: Emissions</th>
<th>Vehicle: Weight</th>
<th>Vehicle: Space</th>
<th>Time windows</th>
<th>Licences (for use of loading zones)</th>
<th>Loading / unloading zones</th>
<th>Road network for HVs</th>
<th>Slot permissions</th>
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</thead>
<tbody>
<tr>
<td>AT</td>
<td>Linz</td>
<td>City Logistik Phase 2, CL2</td>
<td></td>
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<td>✓</td>
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<tr>
<td>BE</td>
<td>Liège</td>
<td>Diversion of the trough traffic in Liège</td>
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<td></td>
<td></td>
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<tr>
<td>BE</td>
<td>Brussels</td>
<td>Freight transportation Master plan of Brussels IRIS plan</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH</td>
<td>Brig, Zermatt Saas Fee</td>
<td>General access restrictions</td>
<td>✓</td>
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<td>✓</td>
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<tr>
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<td>Zürich</td>
<td>Delivery Shop-Ville (Main station)</td>
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<tr>
<td>DE</td>
<td>Stuttgart</td>
<td>Lufreinhalteplan Stuttgart</td>
<td>✓</td>
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<td>DE</td>
<td>Bremen</td>
<td>Truck guidance network</td>
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<td>DK</td>
<td>Copenhagen</td>
<td>City Distribution in Copenhagen</td>
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Final: June 2001, 18.06.2001
<p>| ES | Madrid | Ordenanza de Circulación para la Villa de Madrid (Traffic By-law for the city of Madrid) | ✓ | ✓ | ✓ |   |   |   |</p>
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<tr>
<th>Country</th>
<th>City</th>
<th>Project name</th>
<th>Vehicle: Emissions</th>
<th>Vehicle: Weight</th>
<th>Vehicle: Space</th>
<th>Time windows</th>
<th>Licences (for use of loading zones)</th>
<th>Loading / unloading zones</th>
<th>Road network for HVs</th>
<th>Slot permissions</th>
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<td>La Rochelle</td>
<td>Plate-forme urbaine de fret de La Rochelle (Urban Distribution Center of La Rochelle).</td>
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<tr>
<td>IT</td>
<td>Roma (Mestre, Treviso, Padova, Bologna, Verona, Genova, Milano, Parma, Palermo)</td>
<td>Progetto distribuzione merci - STA Roma</td>
<td>✓</td>
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<tr>
<td>GR</td>
<td>Athen</td>
<td>PEDESTRIANISATION OF THE ATHENS COMMERCIAL TRIANGLE (CENTRE)</td>
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<td>Monaco</td>
<td>Plat-forme de fret Parc d'activités logistiques (PAL)</td>
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<td>NL</td>
<td>Tilburg</td>
<td>Efficient supply Tilburg</td>
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<td>Groningen</td>
<td>Groningen, from city logistics to urban distribution</td>
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<td>SE</td>
<td>Stockholm, Gothenburg, Malmö (Lund)</td>
<td>Environmental zones</td>
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<td>London</td>
<td>London Lorry Ban</td>
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<td>Southampton</td>
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Final: June 2001, 18.06.2001
### ANNEX 2/II

**Collected case studies (projects-level) – City Access**

<table>
<thead>
<tr>
<th>Code</th>
<th>City</th>
<th>Name of concept</th>
<th>Short description of concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT - 01</td>
<td>Linz</td>
<td>CityLogistik Phase 2, CL2</td>
<td>Establishing a telematic based system for load zone management focusing also on load zones which are occupied by private cars.</td>
</tr>
<tr>
<td>BE - 01</td>
<td>Liège</td>
<td>Diversion of the trough traffic in Liège</td>
<td>A new North-South motorway link between the E25 and the E40 motorways should be built and the through traffic along this new link should be influenced by appropriated traffic regulation measures and according enforcement.</td>
</tr>
</tbody>
</table>
| BE - 02| Brussels          | Freight transportation Master plan of Brussels's IRIS plan | The Freight transportation Master plan of Brussels includes:  
  - Traffic management scheme:  
    - only a small part of the city area is made accessible by all the heavy vehicles; the rest of the city area is only accessible by 2 axles trucks, but environmental licences may authorise firms to use dedicated paths for heavier vehicles;  
    - two specialised networks are designed for the heavy vehicles: one on which all heavy vehicles are authorised; one on which more than two axles vehicles are banned with exception for local traffic.  
  - Long stay parking:  
    - On-street long stay parking is banned; public off-street long stay parking places are planned.  
  - Delivery:  
    - Public loading areas are generalised in the commercial zones, on-street and off-street; Building permits will be used for encouraging firms to design private off-street loading zones.  
  - Inter-modal facilities:  
    - Create a tri-modal platform on the Sea Canal in the north part of the city. |
<p>| CH - 01| Zürich            | Güterverkehr 1992, Zielsetzungen 1996           | The strategy for urban goods transport planning includes the main aspects “Access, Innovation, City-Logistic and metropolitan logistic”. A new part of the strategy will be developed soon.  |
| CH - 02| Brig, Zermatt, Saas Fee | General access restrictions                     | There is no access via motor vehicle possible. The whole supply of the hotels and inhabitants is done by rail and the distribution of the goods is done by small electric vehicles which can easily be driven through the small and narrow streets of the villages. |
| CH - 03| Zurich            | Delivery Shop-Ville (Main station)               | The “Shop-Ville” in Zürich is a shopping zone which lies underground (under the main station). All deliveries are done by use of special loading and unloading zones and according access time windows. |</p>
<table>
<thead>
<tr>
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</table>
| DE – 01 | Stuttgart | Luftreinhalteplan Stuttgart | The “Luftreinhalteplan Stuttgart” is a overall approach to reduce emissions (and immission) in the city and the area of Stuttgart. Following the questions how to reduce air pollution (by means of NOX and SO2) resulting from different user groups several measures have been worked out and implemented. If air pollution exceeds a particular level the following (implemented) measures are related to traffic:  
  - Case dependent measures (e.g. foldable signs)  
  - Reduce of speed level  
  - Re-routing lorries  
  Further measures are considered (close particular routes for traffic, limited city access for lorries between 10 to 16 h) but have not passed the political decision yet. |
| DE - 02 | Bremen   | Truck guidance network          | 1st step: Map indicating the truck routes for drivers to keep the truck routes, improvement of the guidance system  
2nd step: Avoidance by measures  
The expected effects are: increase of average length of trip (2.7%), increase of travel time (0.8%) and reduction of disturbance of inhabitants (15.7%). |
| DK - 01 | Copenhagen | City Distribution in Copenhagen | The main objective for the whole projects was to increase the use of capacity in the lorries and vans entering the city centre. The philosophy behind is that the State and the Municipalities can not establish a sustainable urban freight transport, but they can “make it easier” for the carriers to choose a sustainable solution.  
The carriers commit themselves to:  
  - In average utilise the capacity of every single vehicle 60% over a 3-month period.  
  - Sign up all the vehicles between 2-18 tons driving to/from the area.  
  - Only uses vehicles with engines younger than 8 years.  
  - Once every 3 months the company must send a report of the capacity use to us.  
As participation in the scheme is voluntary some accompanying measures were implemented in order to encourage the companies to join in the project. |
<table>
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</table>
| ES - 01 | Madrid     | Ordenanza de Circulación para la Villa de Madrid (Traffic By-law for the city of Madrid) | The basis of the concept implies three different kind of areas for the traffic movement and parking:  
- Non restrictive areas, that do not have any sort of restrictions except the usual ones.  
- Orange areas, where movement and loading / unloading activities are not allowed for vehicles with 12 Tm or more during working days (09:00 - 21:00) and weekends.  
- Red areas, where movement and loading / unloading activities are not allowed for vehicles with 2 m width or 5.5 m length or more during working days (09:00 - 21:00) and weekends.  
The classification also implies the definition for preferential lines, freight or transport sorting, … |
| ES - 02 | Sevilla    | Integration of LEAN LOGISTICS into urban multimodal transport management          | The needs and requirements of the different user groups (freight carriers, receivers and community) are often contradictory in the city centre of Sevilla. Due to this situation, it is usually the Public Administration who needs to act as a referee, because individual user groups can barely achieve any improvements without affecting other user groups and thus creating conflicts.  
This is why the strategic solutions that are given for the city centre of Sevilla are mainly based on Public Administration guidance, in the manner of regulations, sometimes co-ordination, and often funding support. Logistic, telematic and marketing-related concept elements have also been included to complete the concept.  
The generic concept developed for the city of Sevilla consists of five different strategies, which are not necessarily separate alternatives, but rather complementary. They are presented from the easiest one to the hardest to implement, and can be viewed as five correlative steps which constitute the suggested solution for the centre of Sevilla.  
Each strategy is suitable to include concepts related to Public Administration, Logistics, Telematics and/or Marketing. For each one, a list of concept elements is given. |
The concept to be applied consists of a classification of the city centre in two or three different zones that have different treatment, permissions, etc.

The next step is to give restrictions to each defined area. These restrictions are based on the access of vehicles and loading/unloading activities.

The access time windows into the city centre are one of the most common policies used to manage urban freight accesses.

The idea in the case of Cordoba is to control the access and the allowed routes for the freight carriers. Often the access regulations are not observed, the authority should try to keep the quality of life for the citizens, and one way is sharp control, as well as to allow in special cases the access. This permitted entrance needs a permit that is given by the Council. Examples for this case are: Containers transport, Construction transport and Large vehicles.

These measures include and involve loading/unloading activities and imply loading/unloading time restrictions, as a balance to the access restrictions.

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<th>Cordoba</th>
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| FR - 01 | Paris         | New regime for the City of Paris goods delivery regulations                      | The new delivery regime in Paris includes 4 strategies:  
- **Simplify** past regulations to make them more understandable by truck drivers. Instead of 4 categories of vehicles authorised, only three are defined now. The same principle as before applies (the bigger the truck the larger the time restrictions, with trucks defined by the floor surface they occupy):  
  Veh≤16 m²: authorised to deliver goods at all time in the city (forbidden in bus driveways between 7:30 - 9:30 and 16:30 – 19:30)  
  16m²<veh≤24m²: authorised to deliver goods from 0:00 to 16:30 and from 19:30 to 24:00 (forbidden in bus driveways between 7:30 - 9:30)  
  Veh>24 m²: authorised from 0:00 to 7:30 and from 19:30 to 24:00.  
- **Increase maximum size of authorised trucks** (16m² instead of 12m², and 24m² instead of 20m²) so that professional carriers can make a better job at consolidating their load and increase the length of their delivery rounds.  
- **Increase the number of on-street loading/unloading zones** and better protect them by enforcement.  
- **Give permanent and temporary derogatory permits** to specific deliveries (flour, oil, cold, construction material, outdoor markets, post office, etc.).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| FR - 02 | La Rochelle   | Plate-forme urbaine de fret de La Rochelle (Urban Distribution Center of La Rochelle). | The Urban Distribution Center will be opened from early in the morning till late in the evening. All carriers who have to deliver parcel-size goods within the city will be encouraged (but not obliged) to deliver them in the Urban Distribution Center, so that they don't have to penetrate the congested narrow streets of the city center.  
  The UDC staff will then consolidate the goods before delivering them to the city center with **electric or hybrid vehicles**. About 10 light electric will be used by the UDC. Carriers who do not wish to use the UDC will still be able to access the city center, but existing time window regulations (morning deliveries only) will be strictly enforced as soon as the UDC opens (today, existing regulations are poorly enforced).  
  The UDC will be privately managed by a consortium of interested carriers, the Chamber of Commerce, the city and the metropolitan administrative body.  
  In 2002, an economic and environmental assessment of the experiment will be made which will conclude whether the service is worth continuing or not.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
A whole area embraced by three main roads in the traditional centre of Athens has been pedestrianised. The area serves to a large extent commercial activities (retailing and wholesaling). In addition, the Athens Stock Exchange is located in the same area, which means that a significant number of security trucks (for money dispatches) also use the area. Access of vehicles to the pedestrian area is enabled, when necessary, by lowering to ground level the poles which block all entrance points. Truck deliveries are restricted to specific off-peak times. To alleviate the impact of these restrictions mainly on major retailers of the area, a proposal has been made to support these operations using electric trucks (up to 2.5 t) routed and managed by an operation centre in the vicinity of the commercial triangle. The system should be developed through a public-private partnership. However, this proposal remains ineffective at the moment.

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| IT - 01 | Roma (Mestre Treviso Padova Bologna Verona Genova Milano Parma Palermo Salerno Napoli) | Progetto distribuzione merci - STA Roma                                      | Object: Freight traffic in the urban road network  
Activities: transport demand analysis, analysis of functionality of ZTL (limited access traffic zone) entry points, criticality analysis, environment impact, distribution times, interviews, policies and strategies for the future, enforcement on flows into the ‘ZTL’ and parking control |
| Monaco | Monaco     | Plat-forme de fret Parc d’activités logistiques (PAL) | Vehicles > 6.5 t are not allowed to enter the city. Electric driven vehicles are used instead and stocks nearby Nice have been implemented.  
As a result between 30 and 40% of all TMV (= transport de marchandises en ville) could be saved.                                                                                     |
| NL - 01 | Haarlem    | DADIKA                                              | By means of creating co-operation and using an integral approach more efficiency and effectiveness in the distribution chain is stimulated. Dadira wants to get more combined transport flows going into the city and wants to stimulate a modal shift. Two main aspects characterise this project:  
1. Shift the primary distribution (from production to distribution centre) to the non-congestion hours. Main purpose is to relieve the pressure on the infrastructure and to decrease the lead-time.  
2. Realising enlargement of the time windows in the secondary distribution (from DC to the supermarket.  
The outcome was quite positive. The main lesson to be learned is to involve all parties in these type of issues.                                                                                           |
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<td>NL-02</td>
<td>Amsterdam</td>
<td>Project “Urban distribution Amsterdam”</td>
<td>In October 1996 and end 1997 the following measures are implemented with regard to restrictions on city access: city hart is not accessible for trucks over 7.5 ton, transhipment is possible at Urban Distribution Centre, Euro-2 norm is obliged, length max 9 metres, 80% of cargo is for from city hart. PSD let measure the effects of the measures on several criteria (accessibility, liveability, transport-efficiency, economic development, public support) by means of various indicators (ton kilometres, vehicle movements, time driven, obstacles, vehicle type, noise, emissions, complaints by inhabitants and shopping public, traffic safety, average payload, fuel consumption, square metres of shops, number of visitors, number of shops, turnover, profit, costs and the opinion of inhabitants, shopping public, transport companies, truck drivers, shop managers and local authorities).</td>
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<tr>
<td>NL-03</td>
<td>Tilburg</td>
<td>Efficient supply Tilburg</td>
<td>City centre is upgraded from April 1999 till 2001. Implementation of the following six projects is the goal: • Using the possibility of supply via the back sides of shops • Making a logistic framework of requirements (weights and dimensions trucks, etc.) • Tuning, differentiating and creating flexible time windows • Common supply depots for shops near shop centres • One distribution company that takes care of the stock of the shops and home deliveries • Joint waste collection and cleaning services There is also thought about innovative logistic systems (tubing). PSD is doing effect measurements on these projects (2002) and has done the reference state measurement in 1999 (2nd semester).</td>
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<tr>
<td>NL-04</td>
<td>Groningen</td>
<td>Groningen, from city logistics to urban distribution</td>
<td>The most important proposed measures are: Use of bus lanes for freight transport during time windows More open definition of city logistics. Companies with an own DC at the outer side of the city and more than 100 shipments per day from/to the city are also recognised as being ‘city logistics’. These shipments may be fulfilled outside time windows also Introduction of joint depots for dropping cargo Introduction of a hybrid vehicle with an exemption to time windows and access restrictions PSD will measure the effects of this policy package by doing a reference state measurement and a measurement after full implementation.</td>
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<tr>
<td>SE - 01</td>
<td>Stockholm, Gothenburg, Malmö, (Lund)</td>
<td>Environmental zones</td>
<td>From the 1st April 1996, environmental zones are implemented in the central areas of Stockholm, Göteborg and Malmö. Within these areas special environmental restrictions for diesel driven heavy goods vehicles and buses will apply. Environmental Zone An environmental zone is an area within a built-up area, which is especially susceptible to disturbances from traffic and where traffic restrictions will be implemented. Municipal Councils have, in accordance with the Road Traffic Ordinances, the right to forbid traffic with polluting diesel driven trucks and buses with a total weight over 3.5 tonnes in these areas. Environmental zones are therefore being introduced in order to improve the environment in built-up areas. In addition, the regulation is an instrument with which to bring about the development of cleaner and quieter vehicles. The decision to introduce environmental zones will mean that disturbances from heavy traffic will be reduced by up to 30% within these zones. Prohibition of vehicles which do not have an environmental classification. From 1st April 1996, within the environmental zones, it will be prohibited to drive diesel driven heavy trucks and buses over 3.5 tonnes that do not belong to at least environmental class 3. All vehicles from 1993 models have been given an environmental classification. There are three environmental classes in which class 1 is the cleanest and quietest. In 1999, the requirements will be stricter. By then all heavy trucks and buses with a total weight over 3.5 tonnes must belong to environmental class 1 or meet the EURO 2 requirements (1) as well as the stricter noise pollution requirements (2) in order to be allowed to drive within the environmental zones. Vehicles which meet these stricter requirements will be allowed to drive within the environmental zones until the end of the year 2004. The rules for dispensation apply until the end of 2001. During 1997, decisions will be taken regarding dispensation for the years 2002 - 2004.</td>
</tr>
<tr>
<td>UK - 01</td>
<td>Norwich</td>
<td>Norwich Area Freight Forum</td>
<td>The forum comprises four local authorities covering the Norwich area, representatives from local/national hauliers and distributors, the Chamber of Commerce and the local goods receivers.</td>
</tr>
<tr>
<td>UK - 02</td>
<td>London</td>
<td>London Lorry Ban</td>
<td>To control the access of heavy vehicles in London, from 7p.m. to 7 a.m. lorries over 17 tonnes need a licence to operate in London</td>
</tr>
<tr>
<td>UK - 03</td>
<td>Chester</td>
<td>---</td>
<td>From 10.30.m. to 16.30 p.m. the city centre is a pedestrian area. No traffic of any kind is allowed. Chester city council provides a map with details of the restrictions and recommended routes into the city centre</td>
</tr>
<tr>
<td>UK - 04</td>
<td>Southampton</td>
<td>---</td>
<td>7.5 tonnes weight limit to prevent lorries on through journeys to and from the docks from using Hill lane and Bassett Avenue as a short cut in preference to the signed route to and from the M6, using the M27, M271 and A3024</td>
</tr>
</tbody>
</table>