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BESTUFS II

Best Urban Freight Solutions II

Co-ordination Action
Priority 1.6.2 Sustainable Surface Transport

D 3.2. BESTUFS Best Practice in data collection, modelling approaches and application fields for urban commercial transport models

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RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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Summary

1.Introduction

This report presents the works carried out in the BESTUFS II WP3 from 2004 to 2008. The report begins by outlining the objectives of Work Package 3 ‘Urban freight data harmonisation and modelling’ (Chapter 1). The next Chapter then discusses the methodology applied in the WP. Chapter 3 discusses in detail the results of a number of data collection exercises and summarises some of the important issues raised at the four Round Tables that were an integral part of WP3. This section (Chapter 3) will be of particular interest to engineers, consultants and academics involved in the development of surveys and models concerned with urban goods movement. The final section of the report (Chapter 4) brings together the conclusions and recommendations that have emerged from the study. These conclusions and recommendations are based on judgements that have been refined as a result of the discussions and debates that took place within the Round Table events and in the follow-up to each Round Table. This section is intended to be useful for those who use models and are involved in data collection for urban goods movements. In particular the discussion about recommendations is intended to provide insights for those concerned with urban freight policy initiatives within individual urban areas as well as those concerned with broader national and European policies about sustainability in cities. Although the report is complete in itself and documents the work carried out within BESTUF II WP3 it is important to note that the recommendations would require action at various levels if the link between the development of models and data collection techniques and those decision-makers who are involved in urban freight developments are to gain the most from the shared areas of interest to improve the sustainability of urban areas in the future.

2.Objectives of WP3

Urban freight transport has often been rather overlooked in the work carried out by urban planners and researchers. This is explained by several factors. First, freight transport considerations have usually taken place at a national or international rather than an urban scale. Second, freight transport has often been considered to be a private sector issue rather than a matter for the involvement of urban authorities. Third, the range of actors involved in freight transport had the effect of limiting research in urban areas.

During the last decade many freight transport studies have been carried out with a common objective of enhancing sustainable urban development. However, these studies have used very different approaches and methods. It was therefore difficult to compare one case with another and to evaluate their respective outputs. Since 2000, the EU-funded. Co-ordination Action entitled BEST Urban Freight Solutions, (see BESTUFS.net) has been devoted to gathering examples of good practice in urban freight transport from around Europe. From 2004 to 2008, BESTUFS II has sought to disseminate and compare the approaches taken and the results of these urban freight best practice initiatives.

In the BESTUFS II project, work package (WP3) entitled **Urban freight data harmonisation and modelling** has three objectives:

- To collect, compare and describe different data collection approaches, transport models and transport modelling use cases with respect to urban commercial activities (Urban Goods Movement - UGM).
- To provide a platform for urban freight transport modelling experts to exchange their expertise and practical experiences.
- To contribute to a harmonisation and standardisation of data collection methods in the European countries.

Description of work
While best practice and pilot projects in Urban Freight Transport are discussed at a European level, the underpinning methodologies and data issues have generally only received attention at a national level. Therefore there would be a considerable European gain if we could share and - when appropriate - harmonise techniques with respect to data collection, modelling, evaluation and monitoring. The first two topics of data collection and modelling are given special attention in this workpackage (WP3). The work package is structured in four tasks:

2.1. Task 3.1: Data harmonisation

Known urban freight data collection methods and data sources have been identified, described and compared. Advantages and disadvantages of regular data collection practices and single prototypical approaches have been derived and the use of data collected for modelling has been explored.
An important output has been to produce a state of the art relating to available data structure and data collection methods and to suggest harmonisation and standardisation guidelines in this field. Indeed, the comparison of the results of surveys conducted in various European countries has been most effective if the different research teams have:

- The same definitions, about urban goods movement, supply chain description, quantitative and qualitative units. For example, to agree on the definition of round, trip, route, run, itinerary;
- The same unit of measurement about the main basic observations : what is the best unit to answer any particular question: Vehicle ? Parcel ? Movement ?...
- Notably for land use or environmental concerns, the same urban phenomenon would be observed using various units: vVhicle*km ? Or Tonne*km ? Speed, Routes, O-D matrices…
- In other words, the question is: what unit and what method for what results ?

2.2. Task 3.2: Modelling approaches

Urban freight transport model descriptions and prototypical experiment results have been collected and compared in order to identify best practice approaches and to influence ongoing developments. This includes, tools for diagnosis, simulation models and tools for the assessment of effects of urban goods movements on sustainable development of a city (economic, environmental, social aspects).
Works consisted in making an inventory of diagnosis tools, simulation models tools of assessments of the effects of urban goods movement on sustainable development of the city (economical, environmental, social aspects).

The output has enabled a comparison of urban freight transport models according to the main objectives of decision-makers – for example:
- to get the best local knowledge and diagnosis;
- to know what are the most relevant models for testing various policy management scenarios; to assess the impacts of urban goods transport on the environment;
- to improve the methods used such as stated or revealed preference surveys, to find what sampling, adjustment, calibration are more relevant.

The models as an interface between data collection and measure applications. The logical progression is from the problem addressed, the selected method, the data requirements, the model used, and the results achieved in order to solve the problems (i.e. application fields, which is the topic of this third roundtable).
The classification of urban goods models can be into three types (econometric models, transport demand models, and transport distribution models).
The main characteristics of 14 models used in 7 different countries objectives, type of model, model resolution, input and output are presented in table 9.

2.3. Task 3.3: Application fields, case studies and opportunities

Work consisted in identifying the current application fields of modelling in various countries.
Outputs have been aimed at answering the questions: When, how often and in which situations should models be used or data acquired and why should someone pay for it?
The main output was to find in various countries what use has been made of each model and what potential use has not been exploited (and why).
Tasks 3.1, 3.2 and 3.3 have involved material collection about urban freight data (3.1), modelling (3.2) and case studies and opportunities (3.3) by partners and subcontractors.

2.4. Task 3.4: Roundtable organisation

Data collection approaches, different models as well as application fields, use cases and opportunities have been presented and discussed at annual roundtables with experts from the field. The comments and results generated by these roundtables have been used to address the objectives of the above three tasks (i.e. 3.1, 3.2 and 3.3). The organisation of one roundtable per year was the focus of this task. Preparation of discussion material and minutes is included in this activity.

3. Methodology

The methodology included: Finding associates in several european countries to act as subcontractors. The foreseen subcontractors were known for their relevant work. Each of them has been involved in urban studies, has worked with technicians or researchers and have network.

- Defining the role of subcontractor.
- Selecting numerous experts able to provide information about UGM data collection, modelling and application fields for data and modelling in one or more countries.
- Placing a specific Internet site at experts disposal in order to facilitate the exchanges and to administer on line surveys.
- Elaborating questionnaires concerning each task.
- Collecting completed questionnaires.
- Listing the main definitions and units used in all the european countries taking part.
- Collecting the bibliography.
- Collecting current data sources.
- Identifying the different current models and users.
- Organising roundtables in order to debate about the results of surveys.

3.1. The subcontractors role

The subcontractors were responsible for collecting the data sources and methods used in their country and in an another one according to their knowledge. For example: Germany and Switzerland, Belgium and Sweden, Italy and Austria, Spain and Portugal, Holland and Norway. When necessary they centralised the information from their network partners.
Five **subcontractors** have been involved.
University of Applied Sciences in Berlin *Herbert Sontag* and *Bertram Meimbresse*, **Germany**;
TRAIL Research school : Delft University of Technology, University of Groningen and Erasmus University Rotterdam *J.Visser, Vleugel Jaa,* **The Netherlands**
BRRC (Belgium Road Research Center) *Wanda Debauche* and *Davy Decock,* **Belgium**.
University La Sapienza, Rome, *Antonio Musso*, **Italy**
University of Sevilla, *Jesùs Munuzuri*, **Spain**
Some of them were responsible for specific tasks. Three have hosted roundtables.
The share of the works was as following:

Tasks	Taskleader partners
1.Data harmonisation	Michael Browne, Julian Allen, UoW, U.K.
2.Modelling approaches	Herbert Sonntag, Bertram Meimbresse/TFH, Ge.
3. Use cases and Application fields	Wanda Debauche, Davy Decock, BRRC, Be.
4. Round tables organisation	Danièle Patier, Jean -Louis Routhier, LET, Fr.
Platform of urban freight transport modelling experts	LET, Fr.
Country partners	Antonio Musso, University of Roma, Italy Jaap Vleugel, Johan Visser University of Delft, Netherlands. Jesus Munuzurri, Univ. of Sevilla, Spain

The subcontractors had to contact local experts in order to collect information about the three tasks. They were the link between local actors (academics, consultants, local authorities) and the LET for analysing the results of the surveys. The subcontractors and partners participated to roundtable organisation:

- selected the experts,
- prepared position papers for the roundtables,
- reviewed data collection and models in different countries (this review was carried out on the basis of the results of the experts questionnaires)
- took part in preparing the minutes of the roundtables,
- played a role of raporteur or chairman in the roundtables.

3.2. Experts selection

The process of decision making can only be efficient if those who build the tools and those who carry out and use the models have a high degree of mutual understanding. It is clear that all the stakeholders should be represented: academics, who devisethe methodologies, consultants who develop the surveys and the modelling tools, the decision makers who need tools and who express the demand and technicians who manipulate the data and have to use those tools for decision making.

A total of 106 different experts have been involved in the project. 46 accademics 32 consultings and 28 ministry and city ingeneers took part in this work.

In the first step, 78 have been requested to complete a questionnaire (43 have given an answer). 44 other experts have taken part in the various roundtables.

The first step consisted in selecting experts and offering them access to the co-operative site Docapolis. The following table shows the distribution of experts according to their country and their activity.

Country	Academics	Consulting	Country/City Ingeneer
Belgium	3	1	3
France	2	3	5
Germany	6	6	6
Hungary		1	
Italy	3	4	2
Netherlands	5	3	3
Portugal	3		1
Spain	4	3	
Sweden		2	1
Swizerland		2	2
UK	3		1
Total	29	25	24

Table 1: Number of requested experts

3.3. Collaborative platform

A platform has been developed by the LET, in order to facilitate the task of urban freight transport experts to exchange their expertise and practical experiences**.** It is a multimedia platform to exchange data and information about city logistics. This site is supported by the French environmental agency (ADEME).

It includes:

- A data base with schemes and links audio and video documents,
- A thematic dictionary
- An agenda
- A forum

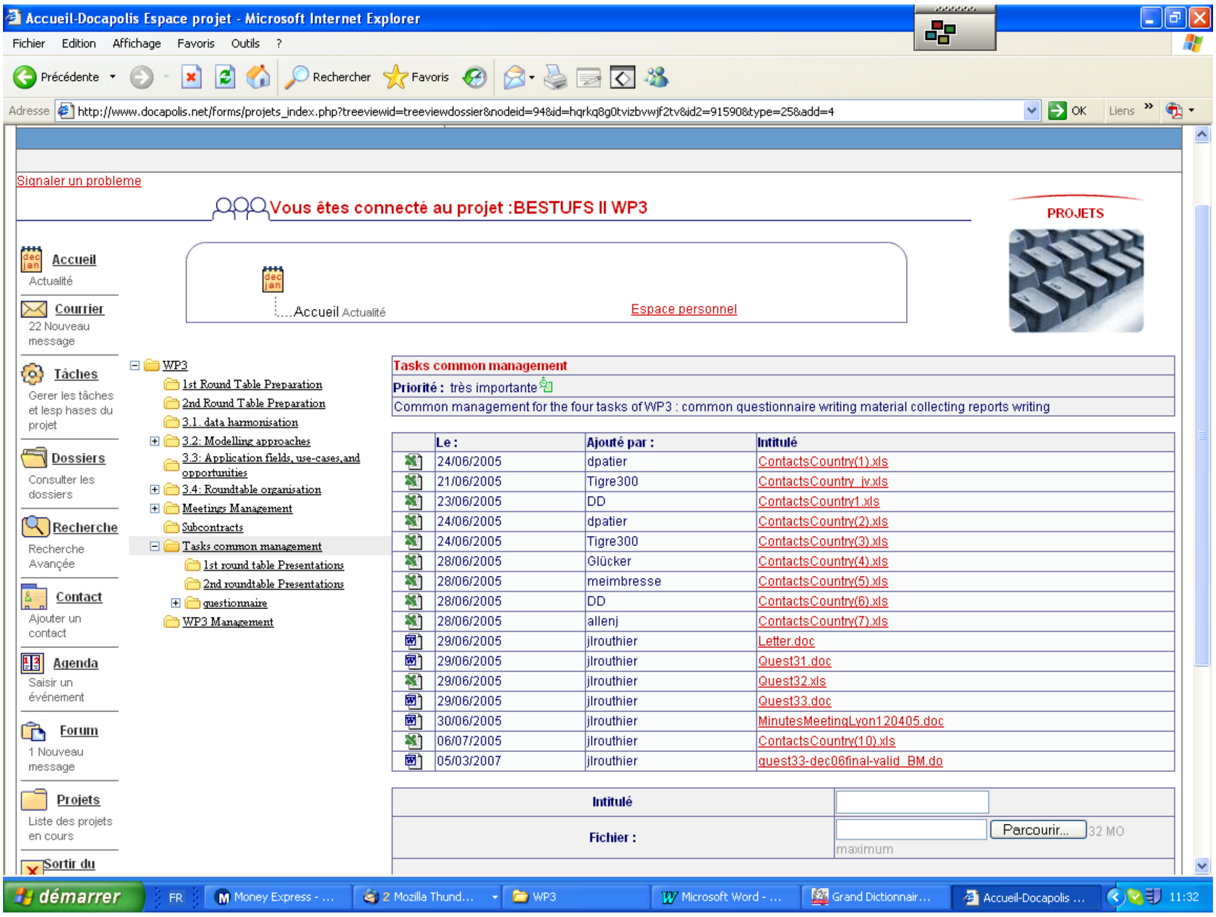
Welcome page:

This multimedia platform is accessible for everybody and operates by projects (actually, 12 currentprojects)

All the drafts and final works are available for each partner of the project. Each member is regularly informed about all events which could interest them.

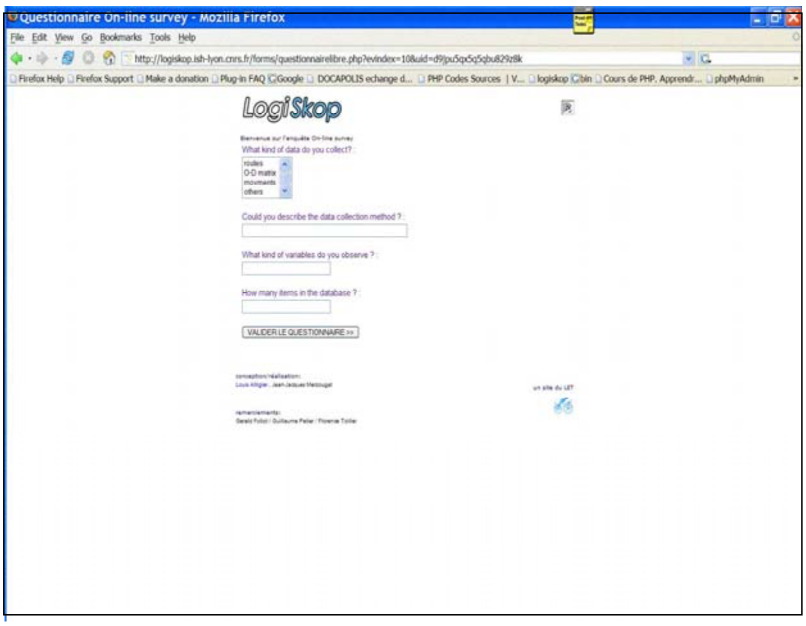
Each member of the Workpackage 3 team have a login.

Project Page:



The questionnaires and reports which were collectively elaborated have been fulfilled in real time processing thanks to a module (logiskop, see below). The different tasks have been planed, shared and carried out by this means. Thanks to this collaborative structure, the roundtables have been organised and the minutes more easily elaborated.

Logiskop : On line questionnaire



3.4. Questionnaires

The objective was to collect informations about the practices of freight data collection and modelling in each country. Three questionnaires were used during the study (relating to each of the tasks). Relevant experts had to fill one or more of these parts: (See the questionnaires in annex 5)

1st Questionnaire: an overview and information about the freight data collected, indicators and terms used. University of Westminster was responsible for the of Urban freight data task, divided in 4 parts:

- Overview of urban freight data collected in the country
- Information about specific surveys / data collection exercises
- Indicators of performance of Urban freight transport.
- Definition and translation of terms

2nd Questionnaire: an inventory of the Urban Goods Movement models developed and/or used. Tfh-Wildau German was responsible for the Modelling task, diveded into three parts related to a typology of models (devised during the study):

- UGM Econometric Models to compute key figures without spatial distribution (e.g. for a whole city/region)
- UGM Transport Demand Models to compute traffic volume per zone (only lines and colums of O/D matrices)
- Transport distribution models (O/D matrices)

In addition, consideration was given to any atypical models and those which were specifically adapted to local needs

3rd Questionnaire: Information relating to the use cases, application fields of modelling and opportunities. BRRC Belgium was responsible for the use cases task which had to answer the questions:Why, when, how are the models used ? What costs are involved in their development and application (use)?

The first result of this survey (based on the three questionnaires) are:
Few experts could answer the 3 questionnaires since experts are often specialists in one aspect only (e.g. data collectuion OR modelling rather than both).
Most modelling experts appear to use the available data (rather than try to use specially collected data).
Few, if any, examples were found where data have been collected specifically in support of building a model
The following table shows the number of filled questionnaires according to the type of experts.

Filled questionnaires			**Ministry,**	
Country	**Academics**	**Consulting**	**City Ingeneer**	**Total**
Belgium	**1**	**2**	**1**	**4**
France	**2**	**2**	**4**	**8**
Germany	**2**	**3**	**3**	**8**
Hungary		**1**		**1**
Italy	**3**	**1**	**2**	**6**
Netherlands	**2**	**2**	**1**	**5**
Portugal	**2**			**2**
Spain	**4**		**1**	**5**
Sweden		**1**		**1**
Swizerland		**2**	**1**	**3**
UK	**2**	**1**	**1**	**4**
total	**18**	**15**	**14**	**47**

Table 2: Number of filled questionnaires

3.5. Roundtable organisation

Four roundtables have been organised. The following table shows the topics discussed at each round table, the number of participants and the countries they represented:

Place	Date	Objective	Nb of experts	Nb of countries
Lyon	2005	1. Inventory of current data about UGM Are collected data useful for answering decision makers' concerns?	24	8
Berlin	2006	2. Inventory of existing UGM models Are models efficient to simulate and forecast the global UGM management?	27	8
Brussels	2007	3. How are the existing UGM data and models used? Are they answering to the decision makers atempts?	33	9
Rome	2008	4. Policy, Data collection and modelling methods, integration : *how to progress*? What recommendations?	29	10

Table 3: Roundtables themes/topics

First round table in LYON, LET, France, 2005:

Organised by the Laboratoire d'Economie des Transports (LET), it was held in Lyon, France, on the 22nd and 23rd of September 2005 on the theme of "Definitions, data sources and data collection methods about Urban Goods Movement" with the participation of 24 experts from 8 different countries. The experts discussed urban freight data availability in European countries and suggested steps to establish the state of the art for urban freight data collection. Six papers, each focusing on urban freight data collection in a specific European country, were presented during the two-day Roundtable. The presentations were on UK, Spain, France, Germany, the Netherlands, and Italy including an explanation of available data sources, data collection, its reliability and completeness. Presentation topics included data collection method, sampling, difficulties encountered and indicators derived from the data.
A synthesis report 3.1. deliverable « Urban freight data collection » has been written by Julian Allen and Mike Browne, UoW, U.K.,

Second round table in BERLIN, TFH, Germany, 2006:

The second roundtable took place in Wildau on the 8th and 9th of June 2006 about "Modelling approaches on Urban Goods Transport"**.** It allowed participants to compare urban freight transport models according to the objectives of the decision-makers and to provide a platform for urban freight transport modelling experts to debate the range of modelling approaches available. The roundtable was organised by the Wildaü University, THF, with the participation of 27 experts from 8 different countries. The event consisted of 3 parts : the first was a review of the data collection task (and a discussion about the link to models). The second one was devoted to national contributions with five topics and a large discussion about modelling approaches. The third part was devoted to the experiences of transport and urban planners when they sued urban freight models.
The aims of this second roundtable were to present the urban freight transport model descriptions and prototypical experiment results collected and compared in order to identify best practice approaches and to influence ongoing developments. Included in the appraisal are tools for diagnosis, simulation models and tools for the assessment of effects of urban goods movements on sustainable developments of a city (economic, environmental, social aspects). Three main approaches were noted: -(i) econometric models, starting with economy and activity figures, at a region/city level; (ii)modelling emission-reception of goods traffic on a zoning; (iii)modelling the transport distribution (calculation of an O/D matrix of

goods transport in a region/city. Thanks to the active participation of about 12 European experts, we have today the possibility to discuss around a typology of modelling both from a methodological and geopolitical point of view.

Third round table in BRUSSELS, BRRC, Belgium, 2007:

The roundtable took place in Brussels on the 3rd and 4th May 2007 on the theme of "A**pplication fields, use cases and opportunities",** with the participation of 33 experts from 9 different countries. It was organised by the BRRC. The purpose of this roundtable was to consider the decision makers objectives and whether the modelling tools developed by researchers and consultants were meeting their needs. For this reason, the presentations aimed to provide both of these parties' views (i.e. the decision-maker and the researcher/consultant (however, this was not possible in the case of Stuttgart and the Netherlands where only one party was available to participate in the roundtable). Presentations were made about urban freight modelling work in the following cities:

- Brussels (presentations made by a local authority representative and a Consultant)
- Cities of Emilia Romagna (presentations made by a representative of the regional authority and a university researcher)
- Zaragosa (presentations made by a Chamber of Commerce (CCI) representative and a university researcher
- Cities in the Netherlands (presentation by a consultant who worked on a project for the government)
- Stuttgart (presentation by a consultant who worked on a project for the city authority)

The outputs of the discussion sought to answer the questions:Has the model been used (and for what task)?

- Are the tools provided in the model relevant for the decision-maker?
- When, how often and in which suitutaions should the models be used or data acquired?
- What are the motives and reasons for someone to fund the development of the model and pay for its use (i.e. what are the benefits for users)
- What improvements are needed?

The debate that took place during the roundtable addressed the issue of the extent to which the actual and suggested modelling corresponded to the needs of decision-makers.

A meeting set up in Paris on the 29-30th of November 2007 in order to prepare the 4th round table. The tasks have been to iddentify main issues in urban freight transport knowledge and to define the themes of discussion for the fourth roundtable. The previous round table did not permit to know some indications about models: Who is initiator? What data for what models? How? When?….

The main issues observed in Paris meeting were:

No consensus about methodology;
Standard data do not exist at urban scale;
Available data are not suitable with objectives;
Lack of reliability for urban goods data collection;
A problem with : Who has to pay the collection?

The difficulty lies in the complexity of urban logistics. Current data can't explain the behaviour of a great number of economical actors. The data collected concern mostly long distance goods traffic, inter-regional traffic, large vehicles, third part transport.

So, during the meeting, each country leader proposed a list of 10 main issues concerning the three fields of thought. A classification of the whole of issues has been realised, with 3 key words, regarding "general, policy or methodological framework", (see table 6).

Fourth round table in ROME, Università la Sapienza, Italy, 2008

The 4th roundtable took place in Rome on the theme of "Urban freight data harmonisation and modelling", with the participation of 29 experts from 10 different countries. It was organised by the Università la Sapienza. The aim was to analyse the main issues

concerning data colection, modelling and application fields, to bring out remaining problems, to harmonise definitions and to consider recommendations.
The roundtable has been organised around four themes/issues:
Policy
Methodology for modelling
Methodology for data collection
Integration

The following table shows the themes and the remaining problems that formed the basis for discussion.

Issue 1: Policy

Definition	Remain problems
Different goals…………………	Compatibility goals/tools.
Knowledge, training, incentives, competence, maturity,…………..	Lack of … …
Noise, air quality, safety,………..	Integration of external costs in data collection and modelling.
Costs……………………….	Low investment /significance of stakes.
Different scales……………….	Local/regional/national surveys, lack of transferability.
Black box, exchange level………	Relations between decisions makers and modellers, modellers each others.

Issue 2: Methodology for modelling

Definition	Remain problems
Data for modelling……………..	Unsuitable data for modelling.
Complexity of methodology…….	Choice of observation units, of survey method, of type of model.
Data for calibration…………..	Suitable is costly.
Timing…………………………..	Difference user/builder.
Land use and environment……..	Lack of integration.
Push and pull ………………...	Driving by supply/ demand.
Economy and modelling………..	How to model complexity of urban logistics?
Visibility and reliability of results	Calibration, and terminology. Lack of prospective modelling.

Issue 3:Methodology for data collection

Definition	Remain problems
Methodology of UGM surveys	No consensus about methodology. Standard data do not exist at urban scale.
Link between unit and objectives of collection…..	They are not suitable with objectives.
Cost of collection…………	Who has to pay ? Frequency of collection.
What data for who……….	Reliability of existing data.
What data for which model	" "
Harmonisation…………….	Different senses for a same word.

Issue 4: Integration

Definition	Remain problems
Urban traffic / outbound traffic………………………	Space and time connection.
Link between model and urban planning……………	Gap of interaction between user and builder
Case studies………………	Need of case studies for modelling.
Traffic simulator………….	Need of module of traffic simulator?

Space allocation …………..	Land use and transport modelling.
Macro / micro economical and spatial models…………	Optimisation of sustainability is not optimisation of firm.
Integration in global model…….	Difficulty to integrate passengers and goods models.

Table 4: Main issues and remaining problems

The main result from the roundtable has been to collect recommendations from the participants and to organise them into a coherent summary (see section 4).

4. Results of the four working steps

4.1. Methodology for data collection

All European cities are faced with congestion, pollution and varied problem concerning the road use in urban areas. Decision makers have to decide between different solutions in order to improve the quality of life of inhabitants and at the same time try to decrease energy consumption, pollutant and greenhouse gas emissions. To achieve this there is a need for good quality data. . Concerning Urban Goods Movements (UGM), a large survey realised within the framework of WP3, (involving 78 experts in 11 different European countries), revealed the lack of urban freight data. The table below summarises 20 different types of data collection which should be used for urban logistics knowledge (Deliverable D31, see Table 5).

Table 5 summarises the type of data collected, the field of observation, the level at which the data is collected and their usefulness for planning and modelling.

The column “useful for UGM” gives the possibility to use the data for a part of UGM diagnosis. The last column specifies the condition of use of data in order to produce a global view of UGM functioning and for modelling.

Type of data collection :	Countries	Concerns:	Level	Useful for UGM	Condition for modelling
Commodity flows (O/D)	Belgium, Sweden, Switzerland	Exchanges between regional areas	N	No	
Site/Land Use/Establishment surveys	Belgium, Germany, France, UK Netherlands	Movement generation	N SUS R	Yes	Large stratified sample
Goods vehicle activity surveys (including driver diary surveys)	All countries (9), except Hungary, Netherlands	Vehicles use and traffic	N SUS	Yes	To know the link with the generator
Shipper surveys	France, Switzerland Belgium Germany, Spain Italy	All sending	N OUS SUS CD	Yes, if we find the consignee	Only for supply chain models (last mile?)
Receiver surveys	Be, Fr, Ge, It, Neth, Sp, UK Switzerland	All deliveries	SUS N N	Yes	Road occupancy models
Good vehicle fleet licensing data	All, Except Hungary Spain	All vehicles	N SUS R	Yes	For calibration
Traffic counts	Ge, Portugal, Sweden Be, Fr, Uk Hun, It, Neth, Sp, Sw,	All vehicles	N AUS SUS SUS SUS	Yes	For calibration
Distribution industry	Ge, It, Neth, UK	Logistics chain	CD	No	

surveys					
Vehicle operating cost surveys	Be, Fr, It, Ge, Neth, Switz Spain	Cost	N CD R	No	
Loading/unloading/parking infrastructure data for goods vehicles	Be, Hungary, Fr, Port, Sp, Neth	Way of deliver	OUS SUS AUS	yes	If linked to nearby activities
Data on road accidents involving goods vehicles	All, except Hu, Sp	Security	N OUS	No	
Data on lorry/lorry load thefts	Be, Fr, Neth, UK Ge, Switz	Security	N CD	No	
Employment surveys in freight transport and logistics industry	All, Except Hun, Sweden, Switz	Employement	N ? ?	No	
Land use databases for town/city needed for freight modeling	Fr, Ge, UK It Portugal	Location, Road occupancy	N OUS SUS	Yes	Zonal analysis
Port freight traffic data in the urban area	Neth, UK Be Fr, Ge,	Contribution of port to UGM	N OUS CD	Yes	If urban activity can be extracted
Rail freight traffic data in the urban area	UK Neth Ge	Modal Share of UGM	N OUS CD	Yes	If urban activity can be extracted
Inland waterway freight traffic data in the urban area	UK, Neth, Fr, Ge	Modal Share of UGM	N CD	Yes	If urban activity can be extracted
Airport freight traffic data in the urban area	Be, Fr, Ge, UK, Neth	Contribution of airport to UGM	CD N	Yes	If urban activity can be extracted
Freight "NTIC" data (from cameras, sensors & other automatic data capture devices)	Neth, UK	Movements of vehicles, traffic	CD	Yes	For calibration

Table 5: available UGM data and their utility

Key to Table 5:
For each line, countries are facing the level key.
? - uncertainty exists about whether freight data is collected,
N = national survey/data collection, SUS = survey in some urban areas,
R = regional survey/data collection, OUS = survey in one urban area,
AUS = survey in all urban areas,
CD = data collected by companies, trade associations or other commercial organization

The following points about data collection exercises and the results can be noted (based on table 5):
Many data collection exercises are useful for local or specific diagnosis of UGM problems.
Some data collection exercises take place only at local or regional level
Several are useful for calibration of models.
Some of the data collection exercises can be useful for a global dignosis and model building (but only under certain conditions).

4.1.1. What is UGM data collection for?

First, the UGM data collections are useful in order to know how urban logistics functions.. They have to help decisions-makers to reach the objectives they have for the city. In particular they are needed in order to solve major problems such as congestion, pollution, safety, greenhouse gas emission, noise, and issues of more global sustainability influenced by UGM.

Moreover, some UGM data collection are useful for UGM modelling (providing the data is coherent, , pertinent, measurable) in order to:

- permit a diagnosis of UGM
- to simulate impacts of planning or regulation decisions on the traffic generation
- to anticipate traffic in a zone… without heavy surveys.

Finally, some UGM data are useful for the calibration of models.
The following table shows the need of knowledge face to these 3 requirements:

Need of knowledge	**Objectives for decision makers**
Contribution of each economical activity in UGM, Role of urban density (activities, employment) in distance covered for UGM, Quantification of number and type of vehicles involved in deliveries and pick ups, Role of organisation (round, direct trip) and management (own account, third part) in UGM traffic.	**UGM traffic calming** : (purchasing trips, business trips, supplying of establishments, goods movements for urban management (waste, postal, works)), Decreasing of distances covered, **Optimisation of urban supply chain,** (standardisation, regulation, urban logistics area fitting…)**,** **Equitable road sharing** (UGM, individual trips, public transports), Decreasing of energy consumption and greenhouse gas and pollutant emissions.
Effect of purchasing consumer behaviour on UGM.	Urban management, location of shops.
Effect of logistics places location and type of logistics place on traffic generation.	Regulation, parking places, delivery places, urban logistics area, platform location.

Table 6: Necessary knowledge and objectives

4.1.2. Which indicators for which objectives?

Table 7 shows indicators that are the result of data collected in complex surveys (each indicator permits to answer one or more of the objectives of UGM management).

Objectives	**Urban freight indicators**	**Way of collect**	**Units in which the indicator is measured**
To know the contribution of each industry sector. Make possible a fast appraisal of the generation of deliveries and pick-ups in a town without any survey.	Number of Loading /unloading in each activity	Establishment survey	Number of deliveries and pick-ups per employee per time unit
To measure the importance of the goods flows in a zone	Loading/unloading density in a zone	Establishment survey	Number of deliveries and pick-ups per km²
To measure the contribution of each industry sector to the goods flows	Loading/unloading intensity per activity in a zone	Establishment survey	Number of deliveries and pick-ups
To measure the contribution of each industry sector to the road congestion by the on street double parking deliveries	Loading/unloading time in a zone, per vehicle, per activity	Establishment survey	Number of hours of on street double parking for delivery or pick-up
To measure the contribution of the running vehicles delivering each industry sector to the road congestion.	Distance covered for Loading/unloading in a zone, per vehicle, per activity	Establishment + Driver survey	Number of kilometres covered for one delivery or pick-up
To measure the impact of the location of the platform delivering goods relating to its market radius	Average length of the first leg from platform to the delivery area	Carrier survey	Km

To measure the contribution of one delivery/pick-up to the urban traffic (per type of involved vehicle)	Average distance travelled per pick up/delivery	Driver survey	Km per pick up or delivery
To measure the contribution of the total industry activity on the traffic.	Total distance travelled on roads in urban area transporting goods by HGV, rigid lorries, and LGV (<3,5T) used.	Establishment + Driver survey	Total vehicle km
To measure the time taken for delivering in a tour, on a street, for an industry activity,…	Average time taken per delivery (per activity type, per vehicle, own account, for hire…)	Driver survey	Minutes per delivery
To measure the performance of the rounds for each way of organisation, type of vehicle.	Average speed per round (including and excluding stops to make deliveries) km/hour	Driver survey	Km per hour
To measure the performance of the rounds for each way of organisation, type of vehicle…	Average payload per kilometre per tour, per activity, per type of vehicle	Driver survey	Ton*km
To measure the road occupancy per hour	Number of vehicles involved in deliveries and pick ups per hour per type per size.	Establishment + Driver survey	Number of vehicle /h.
To measure of the impact of urban goods movement on the energy consumption, local and global nuisance and greenhouse gas.	Greenhouse gas* and pollution according to the zone, the vehicle, the activity, the management	Establishment + Driver survey	- g Pollutant per km - g CO2 per km - litre of fuel per km.

Table 7: Indicators and objectives

These indicators are the results of calculations of variables deriving from surveys (this involves weighted data, expansion of samples, models).

4.1.3. Quality of data for quality of indicators

The quality of indicators and models relies on the quality of data collected in surveys. Efficiency of data depends on the choice of statistical unit observed. What unit provides information about how the main flows are generated and hence makes it possible to establish a link between economic activities and the congestion they cause in a conurbation?

Considering *commodity trips* as the observation unit, origin-destination of goods has no meaning in term of transport, because a ton of goods going from *zone i* to *zone j* may be transported as a single payload in a direct trip with a heavy goods vehicle or as one hundred small parcels, some of them being delivered direct to the recipient and others delivered in complex rounds with light goods vehicles (vans).

In order to observe the different ways in which goods vehicles are organised on the road, other statistical units may be considered: monitoring of *a street segment* during a defined period may provide the parking place and time and the moving of the goods vehicles working on this segment. Surveying the *routes* of the goods vehicles provides a thorough description of the stops as they occur. Through surveying *the shippers* all pick-ups and deliveries could be registered. Each of those observation approcahes have drawbacks:

- The rules of sampling of street segment are difficult (it is not possible to understand the link between congestion caused by these vehicles and the economic activities that attract these vehicles);
- The routes may not be settled into the land use characteristics,
- Shipper surveys do not provide easily the characteristics of the routes.

Further problems include: rules for ensuring the representativeness of the sample, opportunities to link the observation with known urban statistics.
Taking into account these constraints, a receipt or a shipment or both, carried out by a vehicle making a pick up from or a delivery to an establishment named *movement* seems, for us, as being the most relevant unit for the survey. This choice also allows us to circumvent the difficulties inherent in identifying the origin/destination flows which are one of the priority aims of the models usually encountered. Although goods have an identifiable origin and destination, the same is not true of the vehicles which transport them. In urban areas vehicles carrying goods tend to follow complex routes, involving a large number of movements in a single round. This is one of the main problems of designing models relating to urban goods transport.
An additional driver survey can be calibrated on the traffic generator (establishment) survey in order to have a comprehensive description of urban logistics and transport condition.
A driver survey is very useful (time and parking place, link between activity and type of parcels and packaging…and itineraries followed).

4.1.4. Addressing gaps in urban freight data collection

A wide range of urban freight data gaps have been identified by the freight experts participating in BESTUFSII WP3 study (see Deliverable 3.1 - 2006). The most commonly mentioned data gaps include:
Data about :
light goods vehicle activity (generally vehicles below 3.5 tonnes gross vehicle weight)
the supply chain as a whole
freight and logistics infrastructure to and from which urban freight activity takes place

- loading and unloading operations and infrastructure for goods vehicles
- geographical data about goods vehicle trips in urban areas
- trips carried out by consumers for the purposes of shopping
- speed and route data for goods vehicles
- non-road modes

Sometimes surveys provide other data. Some of them can be directly useable for the urban goods transport analysis, for example: traffic counts, loading/unloading/parking infrastructure data for goods vehicles, port, rail, or inland waterway freight traffic inside the urban area, airport freight traffic data inside the urban area, land use databases for town/city needed for freight modelling, aerial photographs, freight informatics data (from cameras, sensors & other automatic data capture devices). Other data concern the transport sector, such as : goods vehicle fleet licensing data, data on road accidents involving goods vehicles, employment surveys in freight transport and logistics industry, vehicle safety and maintenance. Few of these approaches are able to reveal links between logistics activity and the generation of UGM flows. The surveys able to provide a more global diagnosis about urban logistics are large scale, complex and costly.
We presented arguments about a partial knowledge (essentially limited to French surveys and modelling). The reason is we did not find papers or reports which make a thorough description of relationship in data collection and models according to weighting of data and calibration of the equations of models.

4.2. State of the art about urban freight modelling in Europe

4.2.1. Methods to calculate Urban Goods Movement (UGM)

Four approaches of UGM calculations or methods are generally used (see table 8). The levels range from flat-rate addition to the individual traffic, calculation based on traffic counts, surveys in city areas with traffic problems, to model calculations of complete O/D matrices. According to the aims of the BESTUFS project only policy-oriented models (POM) in use should be included in the European survey.

Method	Advantages	Disadvantages
Flat-rate addition to the values of individual traffic	Cheap, quick	Very rough
Calculations based on traffic counts, e.g. inner city road crossings	Good for evaluation of hotspots	Personnel intensive, no information about behaviour and O/Ds
Surveys in city areas with traffic problems	Measure-oriented approach (e.g. traffic regulation, technical measures)	Only suitable for small areas
Model calculations	Complete O/D matrices, policy-oriented models (POM)	Need a lot of data

Table 8: main approachs for UGM modelling

According to many authors, the model calculation approaches of UGM can be divided according to the following factors:
- the scale: international, interurban and urban,
- the main unit used for estimation: in the commodity-based models aim to calculate the movement of goods, in the truck-based models, the movement of vehicles is directly modelled.

Beside this, also the differentiation of input and output of the models is a suitable characterisation to divide the model approaches.

4.2.2. Survey of European UGM models

Before the European survey of UGM models was carried out, BESTUFS experts identified numerous reasons for the failing of urban goods modelling:

- There is a lack of data because it is difficult to capture the complexity of the logistic chains. Most tours are pick up and delivery tours (trip chain pattern).
- There is also a large diversity of behaviour of the industrial branches concerning the generation of traffic and their trip chain pattern.
- Urban modelling is usually focused on the O/D approach. The current four step passenger models enforce a framework inappropriate to describe the rounds.

In the course of the survey, a questionnaire was submitted to 46 European experts in order to collect, compare and describe different data collection approaches, transport models and transport modelling use cases with respect to UGM. Finally, we gathered 15 answers from 7 countries (Italy, Spain, UK, Belgium, The Netherlands, Germany and France) and 13 models were identified. All models are deterministic ones; no more sophisticated approaches like multi-agent models could be detected. The analysis of the completed questionnaires suggest that three main types of modelling approach can be identified:

- UGM econometric models to compute figures without spatial distribution (e.g. for a whole city-region),

- UG Transport Demand Models to compute traffic volume per zone,
- UGM Transport distribution models to compute complete O/D matrices.

The description of each model examined during the task consisted of the following items:

- general information: country of origin, name of the model, provider, aim of the model (development, planned application cases, e. g. reflection on the current situation, prognosis modelling of certain measures etc.),
- model concept: calculation approach, basic assumptions, used mathematical model, definition of activity and stakeholder groups, gravity, logit or estimation model, mathematical method only or software tool,
- restraints: regarding model design, significance, discriminatory power and spatial aspects,
- calculation limitations; i.e. number of trip purposes, number of sectors and technical requirements,
- required inputs and sources of information: i.e. national statistics, regional statistics, own survey, degree of difficulty to acquire the necessary input,
- model resolution and output resolution,
- consideration of other transport modes, considered types of urban/regional goods vehicles,

known applications of the model.

Most of the modelling approaches have been developed in Germany, Italy, France and the Netherlands. The case of the Netherlands is described in the Visser (2007) paper. Therefore it is not taken into account here.

German models

In Germany the first approach to calculate UGM on the basis of an O/D model for a complete region with 300 zones was made by Sonntag (1985). The development was fostered by the raised awareness of cities regarding the high share of commercial and goods transport both in the complete urban transportation scheme and in the pollutants generation. The model called WIVER model has been developed to produce O/D matrices for the road based UGM and other commercial related activities.
WIVER is a behaviour-oriented simulation model, which is able to consider explicitly the complexity of urban trip chain pattern. Therefore, the model can focus on four types of vehicle classes: commercially used cars, vans/transporters ≤ 2.8 tons, trucks > 2.8 tons and trucks > 7.5 tons. To mirror the different behaviour of logistic activities in different economic sectors (branches) the model is able to compute traffic values for 10 branches separately. The WIVER model is steered by behavioural data, which show considerable differentiation between branches and types of vehicles, and statistical data:

Behavioural data (per branch)

- number of tours and destination distribution per vehicle type and day,
- purpose of trips,
- distance and structural parameters for modelling source-destination interactions,
- degree of efficiency of tours per branch and vehicle type (”level of savings”),
- distribution of trips over time.

Structural data (per zone)

- distances in the area to be investigated to other zones,
- calculation of the potential of each zone as a source (data: number of employees and number of traffic related employees per branch),
- calculation of the potential of each zone as a destination.

The <u>calculation</u> of the O/D matrices consists of a four step analysis:

- 1st step: Calculation and/or description of: number of tours; number of stops per tour; tour purposes per branch, vehicle type, and zone (total traffic volume of each sub-group). This volume is further divided by traffic volume per zone (source and destination).
- 2nd step: Determination of the destinations and the modelling of source-destination interactions and single trips.
- 3rd step: Simulation of transport chains by combining single trips into tours. The combining of trips to a tour is steered by the "savings function" (equitation 1). In the surveys carried out to analyse the different transport behaviour of different branches one can find several connection trips in trip chains with the home zone k, connecting zone i and j. We take the saving of the direct trip from i to j in relation to the return trip from i to k plus the additional trip from k to j into account. This relation is defined as the "saving function" and delivers values between 0 % and 100 %. A high value means a high effect by the connection of the destinations into one tour:

$$\frac{dist(i,k) + dist(k,j) - dist(i,j)}{dist(i,k) + dist(k,j)} \quad (1)$$

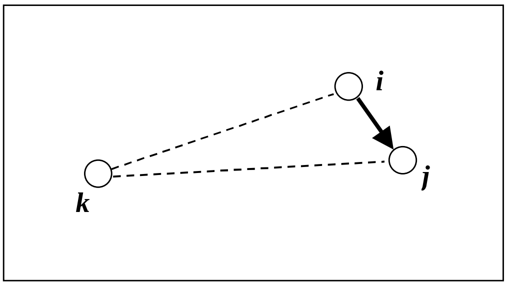


Figure 1 : High savings effect

- 4th step: Allocation of each traffic volume and its distribution into hour groups.

WIVER is suited to model urban freight traffic or urban goods movements. The modelprovides information regarding total mileage, number of trips, number of tours, traffic distribution over time (day course), subdivided into vehicle type and branches (economic sectors). Furthermore, source/destination relations and transport- or trip chains can be modelled. Fields of applications can be: detailed analyses and support of planning steps in a specific city or region like truck guidance networks, action plans regarding commercial transport as well as calculation basis for the pre-test of traffic organisation and fiscal measures.
WIVER was applied in the following German and European traffic planning processes:

- Hamburg 1993,
- Berlin 1994 (Sonntag et al., 1995),
- Within the framework of the European project COST 321 - URBAN GOODS TRANSPORT for the cities Munich ,Nuremberg, Augsburg, Hanover and Trier 1995 – 1997 (COST, 1998),
- Within the framework of the European project REFORM - Research on Freight Platforms for the regions Rome and Province Latium, Madrid and Brussels Capital Region 1997 (REFORM, 1998),
- Berlin 1998: Investigation of the effects of logistic nodes (Meimbresse et al., 1998),
- Hansestadt Rostock 1999 and Berlin 2000 (evaluation of a truck guidance system).

Using the main approach of WIVER, Lohse (2004) developed a model called VISEVA - W to compute simultaneously and interdependently the traffic volumes of different branches and vehicle types. The model starts with rates for mobility, modal split and affinity to vehicle

classes/transport modes (behavioural data) as well as spatial data of the involved traffic zones, networks and conditions. After the generation of O/D relations the trip generation is calculated on the basis of a series of interdependent equilibrium formulas. By this, the model avoids the complex process of calibrating the savings functions used in WIVER.
In the course of the improvement of their urban transport planning software VENUS (Janssen and Vollmer, 2005) the company IVV Aachen developed the included functionalities by the integration of a part model “goods transport and special transports”. This model is also differentiated by vehicle types but the differentiation of the trip reasons is based on “trip purposes” e.g. industry-trade connections, trade-end user. The approach originates clearly from the calculation of individual traffic. The trip allocation is carried out by a gravity model. The modal split (only applied for cars used for commercial purposes) is based on network and spatial resistance. Available time budgets, distribution of stop time lengths and number of stops are used for the generation of trip chains.

Italian models

In Italy, Russo and Carteni (2006) propose a regional modelling procedure based on the simulation of the dependence existing between successive trips of the same distribution channel. They make the distinction between trip-based and tour-based modelling. In the first case, the choice for each trip between two transhipments is independent of the choice carried out for other possible trips belonging to the same journey. In the second case, the choice for each trip affects the other trips belonging to the same journey. The authors have a preference for the tour-based modelling approach. In order to match with the various types of origin, transit and final destinations, five commodity classes are defined (Foodstuff and agriculture products, Energy products, Minerals and metals, Chemical and pharmaceutical products, other). Commodity types (perishable, non perishable, high/low value, volume, hazardous/non hazardous), company classes (large-medium-small) and manufacturing process (just in time/in stock) are defined.
The proposed freight distribution model consists of three macro-models:

- the simulation macro-model determines the trips set for a given distribution channel strategy (DSM). For each manufacturer market and customer market, a distribution channel is chosen (e.g. manufacturer-logistic centre-wholesaler-retail-customer),
- the simulation macro-model of the first trip (FTM: choice of the first transit destination d1, of the loading unit u1, of the departure time h1 and of the freight mode m1),
- the simulation macro-model of the subsequent trips (STM: choice of u2, h2, m2 from d1 to d2, etc).

Theoretically, this model is a modal choice model, including train, barges and trucks. As the share of road transport is about 90 % at the region scale, only two loading units were taken into account: LGV (max loading < 3.5 tons) and HGV (max loading > 3.5 tons).
Those three models are specified by a nested logit model which brings into play various local socio-economic data (time, population, employment, number of firms of each zone, …). According to loading units o-d_i demand, a loading unit choice model allows to convert tons/year to vehicles/day. The greater probability of choosing LGV is for short distance trips, the greater probability of choosing the HGV is for long distance trips. The aggregated data from a transport national count (2001) demand matrix by province and 41 traffic counts (2002) is used for calibration of the demand function and of the assignment matrix estimation for each loading unit.
This model was applied for the simulation of freight distribution within Campania region (gathering 5 provinces of Southern Italy), comprising a total of 551 municipal districts, with 62,516 firms. The model system allows to estimate: the origin-destination choice probability matrices, the O-D freight matrices referred to a fixed period time, the vehicle link flows on the network through an assignment model.

In order to integrate the consumer behaviour in the supply chain, Russo and Comi (2004) propose a simultaneous analysis of the end-consumer movements between the shops zone (*d)* and the consumption zone (*o*) on the one hand, and the movement between retailer and warehouses (*w)* (re-stocking) on the other hand. This approach might be useful to analyse freight mobility in a global planning process in two parts. The first one may be carried out by a round trip or a trip chain. The second one may be performed through a supply chain or tour-based approach (see above). The authors propose a model structure divided in an attraction model (demand in freight quantity for each *o-d* (end-consumer) and an acquisition model (demand in freight quantity for each *d-w* (logistics). The latter is composed of a channel choice model (probability to choose a channel to bring freight for restocking in zone *d* and a stock model (probability that a retailer take the freight sold in his shop, arriving from the zone *w*). This approach is promising because the link between passenger and freight models is made. Nevertheless, it seems that the results of such a modelling approach have not yet been available.

Based on the results of thorough establishment surveys coupled with driver surveys, this model estimates the goods movements of town zones (occupancy of the roads, just as by vehicle flows as by on-road parking vehicles) according to the logistic strategy of the shippers and of the hauliers, the environment and the characteristics of the establishments and the urban land use.

In the City Goods modelling framework**,** Gentile and Vigo (2006) develop a prototype demand model which is in test on several cities of Emilia-Romagna. According to the authors, two problems must be solved:

- a given activity (a fortiori a given zone) generates movements belonging to different supply chains,
- a vehicle performs many deliveries or pick-ups in a tour.

The objective is to build a demand generation model in order to estimate the yearly number of operations generated by each zone.
Field and data collection: in the years 2003-2005 an extensive survey of City logistics was carried out for all cities of Emilia-Romagna according to the same survey model (CityPort EU project, 2005). Three main surveys: demand generation, attraction, flows per operation. This is a unique opportunity for modelling.

The demand generation is using directly the ATECO/NACE classification of activity units (establishments). The main hypothesis is that logistic characterisation of towns is based on the construction of a “Zone-Supply Chain” grid (ZS matrix). The model explicitly uses a fine grained classification system of local units (establishments). Each Supply Chain (SC) is defined in accordance with a classification tree of the NACE.
The overall model defines the total number of operations of a SC as a function of the NACE code and the number of employees in each establishment. Survey data are used to calibrate the model and to obtain the distribution of parking time, time of service, etc. for each SC.
Supply chains are fresh, dry, frozen foods, garments and other stuff. A Supply Chains generation matrix is calculated in various cities of Emilia-Romagna.
A distribution and network assignment model is in progress. The preliminary results are of good quality and the model is easily transferable to different towns without specific additional surveys, like in the French FRETURB approach from which it is inspired (see below).

French model

In France the urban freight model FRETURB has been developed by the LET, (Routhier et al., 1999, 2007). It is a land use and tour-based model of urban goods transport. It consists of three modules which interact with each other: - a "pick-up and delivery model" including commodity flows between all the economic activities of a town; - a "town management module", consisting of transport of goods and raw material for public and building works, urban networks (sewers, water, phone), and removals; - a "purchasing trips model", modelling shopping trips by car, which represents the main last kilometre trips to consumers.
The pick-up and delivery model is a regression-based model fed by thorough coupled 4,500 establishments and 2,200 drivers surveys carried out in three different sized towns. Those surveys brought to light relevant relationships between the behaviour of the shippers (spatial and economic data) and the behaviour of the hauliers (operations of transport). The

modelled data is the movement of goods (defined as a delivery or a pick-up associated to a given establishment, vehicle size, mode of management and logistic behaviour). It is derived from the empirical survey data resulting from statistical validation.
The average number of truck movements (deliveries and pick-ups) is a function of 45 industry types *a*, the nature *p* of the premises (store, warehouse, office, headquarter) and the number *o* of jobs of the establishment. With the help of the national public registers of establishments, each zone is informed about the various types of generators according to its size (number of jobs) and its industry category. The number N_z of movements in a zone z is given by equitation 2:

$$N_z = \sum_{e \in z} n_e\,(a, p, o) \qquad (2)$$

where n_e is the number of movements (deliveries, pick-ups and mixed operations) each week in the establishment *e*.

For each industry category *ε* based on *a, p, o,* three parameters are calculated: the share of *v* types of vehicles (LGV, HGV - rigid and articulated); the share of *m* operators (third party and own account - forwarder and consignee -); and the share of *r* direct routes and of various size rounds (the latter consist of starting, ending trips and connecting trips). The number of goods movements balances the number of trips ensuing from the transport logistic behaviours defined above for each category, so that:

$$N_z = \sum_{\varepsilon} N_{\varepsilon,z}\,.\,f_{v,m,r}\,(\varepsilon) \qquad (3)$$

where *f* is the frequency of *v, m, r* for the category *ε* and $N_{\varepsilon,z}$ is the number of movements of the establishments of the category *ε* in *z*.

At this stage of the modelling procedure, a trip distances estimation is done. The length of connecting trips is log-linear function of the number of stops per round, differentiated according to the vehicle, public transport and own account, the activity density of the zone and the distance from the city centre. The length of starting / ending trips is based on the distance of the loading/unloading point from city centre.
In the European dense areas, road occupancy by running vehicles is only half of the delivery time (on roads double parking). Thus, double parking time calculation is essential in the road congestion of freight traffic. Parking time of a delivery is a log-linear function of the number of stops per round, differentiated per vehicle and type of activity. The part of double parking in each zone is a function of a density indicator (including goods movement and population).

As regards the flows distribution, the aim is to build a non-oriented O-D matrix of goods transport. A macro-network is performed between the centroid of the zones. The average speed on each link between adjacent zones depends on a density indicator (average of population and employees of zones i and j) and on the road performance between i and j. A typology of routes is performed (25 types) in order to match the delivery stops of each zone, according to the type of vehicle, the type of connecting trip, the type of operator (public transport, haul by forwarder or consignee) and the number of stops of the round. An average distance and an average time are allocated to each type of trip. The choice of the itinerary is obtained by the "shortest path" Dijkstra algorithm. A probabilistic method is implemented in order to calculate the distribution of the flows between i and j.

At last, a trip assignment can be carried out in order to calculate the total distances for a given state of the network.

The model performs the traffic volume in and between each zone, according to three types of vehicles, the type of haulier and the type of activity delivered. The road occupancy is not only calculated for the running vehicles, but for the double-parked delivery vehicles. It is easy to apply the model to towns without local additional surveys. The model allows a simulation of various logistic schemes like new activity location, new behaviours of shippers, operators and consumers. Thanks to the current developments the simulation of the role of the shippers and operators on energy consumption, nuisances and greenhouse gas can be implemented, as well as the total goods and passenger traffic modelling (Land Use and Transport model SIMBAD applied in the town of Lyon, 2007).

Since 1995 the model has been increasingly improved. It has been available as software since 2000. It is implemented in about 20 French towns (among which Paris, Lyon, Lille, etc.). The FRETURB model is using widely accurate rules and laws on logistical behaviour of the different stakeholders of urban goods movement proved by appropriate surveys. It works with numerous and homogeneous industry categories permitting a thorough description of the urban logistics in a French town. It requires a local establishment database but no large local surveys. It allows also to implement prospective schemes (Ambrosini, Routhier, 2004) in order to assess the impact of logistics, regulation and industry location measures on traffic flows of persons and goods (e.g. -come-back of supermarkets in the town centre- new urban distribution centres, with or without a co-operative organisation). The software is provided to several local authorities which use it for diagnosis and simulation in their Master plan. In order to increase the model accuracy, several parts could be developed. Trips time optimisation is currently calculated on an average weekday. It could be refined by taking into account time-of-day periods. Moreover, the only local part of the traffic generated by the outlying platforms is currently taken into account.

4.2.3. Conclusion

In the methodological aim for modelling, several difficulties remain to be overcome.A good urban freight model needs to be consistent, measurable and relevant (it is difficult to meet all three of these conditions and there are often contradictions between them).

- There is no standard urban freight model today – we need to consider many different models proposed by various groups (consultants, universities etc).
- Some models in other fields have become more standardised and have been adapted to cope with the complexities noted above.
- Models discussed in the workshop have a variety of constraints and limitations (this is to be expected).
- Methodological innovation is desirable in this field – perhaps this will occur through looking in more detail at the unit of movement (individual flows) compared with the 4 step OD type approach.

We are not ready for a standard model of urban freight due to the complexity – many different policy-oriented urban freight models may be required (and developed) rather than a single model

It is clear that two main distinct approaches have been developed: the first one is based on the optimisation of the logistic process, including the total supply chain channel, usually by means of Operational Research (OR) procedures. Several objective functions are implemented and calibrated on macro-economic data and traffic flows data.

The second approach is based on a thorough analysis of the behaviour of the local units (or establishments) by means of Statistical and Probabilistic (SP) adjustment methods, through profound surveys on establishments and carriers to have an accurate disaggregation according to the industry and the size of the establishments. Moreover, in this case, it is not necessary to convert the commodity flows in vehicle flows.

The first OR approach is as said in Taniguchi *et al.* (2006): “It is essential to forecast the commodity flows and freight transport activities for identifying the pattern of logistics activities and understanding the issues of urban freight transport”, while the SP approach firstly describes the behaviour of logistic generators in order to explain the traffic flow generation.

In France, data collection and modelling approach are simultaneously designed at national level because of a centralised custom, because there are large registers (SIRENE) of establishments and because the funding of large surveys is possible due to the support of

the State. But that is not the case in most of other European countries. However in recent years, an increasing harmonisation as regards the terms, the concepts and the methods used can be noted; hence, data collection and modelling tend to come closer, at least at the European level.
Furthermore, apart from the operational short term assignment models (e.g. TLUMIP, in the USA), the only applied policy-oriented models (i.e. published software for local authorities) are based on well fitted collected data (VISEVA-W and FRETURB). Other models, like the Italian models, are, for the time being, essentially experimental.
However, it is urgent to tackle the current stakes related to a sustainable development. In this way, the knowledge field regarding the features of the flows must be enlarged. These features greatly exceed questions of infrastructure and speed constraints, and have to include basically the spatial components (density and urban patterns), just as the global logistics changes (just-in-time, decrease in stocking, ITS, last mile optimisation), in the context of the globalisation of the economic activity.
Moreover, current urban data collections focus at most on land use and transport indicators with insufficient description of goods management. For that reason it is difficult to explain why the flows are as they are, so that the power of prediction of current models is limited.
There is always an imperative need to integrate goods transport in a systemic approach towards urban logistics as a whole. Indeed, on the one hand goods transport is subject to competition due to consignor pressure and globalisation, and on the other hand distribution conditions worsen because of an increasing traffic congestion leading to negative environmental impacts.

The next table shows the list of the 14 models described by the experts.

Each model (column 1) is analysed in accordance with 6 criterion :
Who is initiator?
What type of data collection for the model?
Who is developing the model?
Who is implementing it?
What maturity degree?
What method?
The number in each square corresponds to the legend (below table 9).
The number in bold? within the legend is the total of occurrence.
? : indicates the lack of answer.

Name of the 14 models:	initiator	data collection	carrying out		funding		maturity	Method
			development	implement	development	implement		
VISEVA (Ge)	4	1	1 / 4	4	2	2	4	probabilistic "tour based model"
FRETURB (F)	3	1	1	2 / 4	3	2	4	statistic descriptive (regression) and probabilistic beavioural "tour based model"
MODUS (F)	2	2	2	2	2	2	3	gravity (generalised cost)
GOODTRIPS (NL)	1	1	1	nc	1	nc	1	probabilistic ?
GENMOD (NL)	2	?	2	2	2	2	3	?
OMNITRANS (NL)	2	1	4	4	2	2	4	macroscopic dynamic modelling
CITYGOODS (It)	2	1	2 / 4	2 / 4	2	2	4	statistic descriptive and probabilistic beavioural
FRESCRA (It)	2	1	1	1	2 / 4	2 / 4	1	statistic descriptive and probabilistic beavioural "tour based model"
FRCA (It)	1	1	1	1	1	1	1	probabilistic behavioral model. Commodity pull modelling of consumer on production (connexion of retailer and warehouses
EUNET (UK)	3	2	4	4	3	3	3	monetary value of commodity Input/output model
UK National Model (UK)	2	2	4 / 1				3	commodity flow gravity model (operating costs) from international to local sequences
IRIS (B)	2	1	4	4	3	3	3	gravity (cost)
SEVILLA (Es)	1	2	1	nc	1	nc	1 or 3	entropy maximisation
ZARAGOZZA (Es)	1	2	1	1	1	2	1	?
Legend	1 : academics **4**	1; specific (primary data) **8**	1 : academics **8**	1 : academics **3**	1 : academics **4**	1 : academics **1**	1 : prototype **5**	commodity flow gravity **3** monetary value I/O **1**
? : unknown	2 : local authorities (social demand) **7**	2 : secondary data **5**	2 : local authorities **3**	2 : local authorities **3**	2 : local authorities **6**	2 : local authorities **8**	2 : in progress	probabilistic (behavior) **6**
nc : aimless	3 : country level **2**	3 : both	3 : national authorities	3 : national authorities	3 : national authorities **3**	3 : national authorities **2**	3 : implemented one shot **6**	entropy maximisation **1**
	4 : both (2 releive 1) **1**		4 : consultancy **5**	4 : consultancy **6**	4 : Europe **1**	4 : Europe **1**	4 : several implementations **4**	

Table 9: Urban freight models collected in the countries surveyed

4.3. Application field, examples and opportunities

There were 22 completed responses to the third questionnaire from a total of 7 different countries. A typology of urban freight models was presented according to the country, its financier, owner, developer and responsible party.
We give bellow a short overview of the results of the responses on the questionnaire "Application field, examples and opportunities" together with the findings stated in the third Roundtable BESTUFS II at Brussels, 4th and 5th of May 2007.

4.3.1. Methodology

As noted above, a short questionnaire was sent to European experts dealing with urban freight transport to describe several urban freight cases (urban freight model/data collection). The questions did not deal with the content of the urban freight case, but rather with the expectations, involved partners and overall judgement and application of the selected projects. The questions dealt with:

1. Objectives and questions addressed in the urban freight case
2. The involved actors: financer, developer, owner, responsible, other involved actors and their role
3. The integration of urban freight case in overall urban transport plan and model (if applicable), and the integration of the model (if applicable) in other regional, national or international freight models
4. Frequency use and validation of the selected project
5. Satisfaction about the applied data collection/model
6. Experienced problems (particular and general problems when there are)

4.3.2. Results

The respondents came from 7 European countries (United Kingdom, France, The Netherlands, Belgium, Germany, Italy and Spain) with different selected cases (figures 1 & 2).

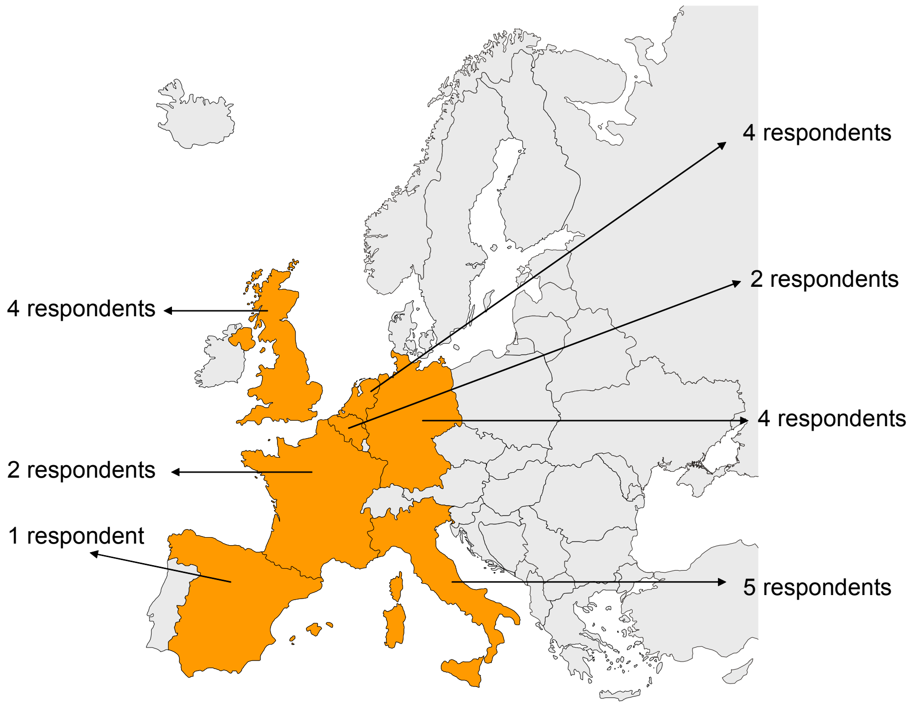


Figure 2: Respondents to the questionnaire about applications and examples

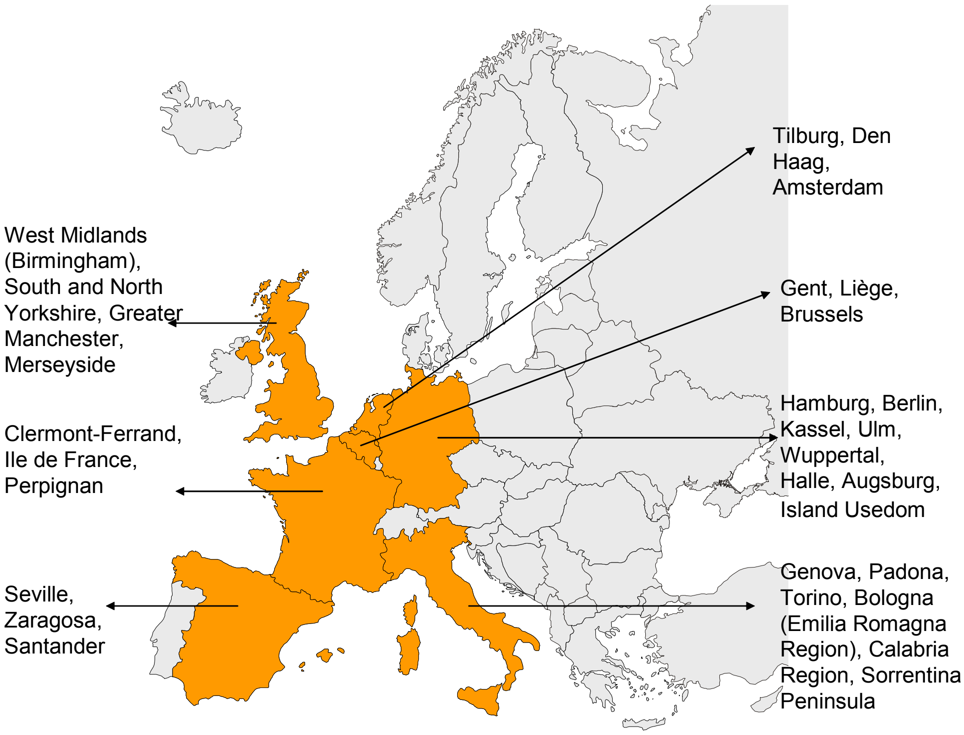


Figure 3: Respondents to the questionnaire about applications and examples

The analysis of the responses refers to the reported cases. So this overview does not consider all present experience with urban freight transport in European cities. The cases were described by those who had collected the data, carried out the analysis or applied the model for the selected cases (referred to as *performers*)or by neutral experts (non-performers). In most cases only one point of view has been obtained.

The cases Brussels (Belgium), Emilia Romagna Region (Italy) and Zaragosa (Spain) presented at the 3rd Roundtable in Brussels were presented by two involved actors (the performer and the client of the selected case). Besides these 3 cases also urban freight models in the Netherlands and the case Stuttgart (Germany) have been presented at the 3rd Roundtable at Brussels, but only from one viewpoint (performer).

Objectives, questions addressed in the reported cases.

The reasons why urban freight transport has been studied in the reported cases are:

- Quantative and qualitative diagnostic: Understanding of urban freight transport patterns (now and in the future) due to congestion, accessibility problems, …
- Impact simulation: Policy measures and decisions (regulations, town planning, etc.) and new (logistic) concepts (City Box and Underground logistics, UDC) are simulated and evaluated.
- Other sustainable aspects, especially environmental aspects are studied in order to reduce noise and pollutant emissions.

Although specific objectives in the selected freight cases are quite common, it is also important to stress the fact that the questions of policy makers change. In the Emilia Romagna Region for example,the goal in the beginning was to judge the feasibility of the implementation of Urban Distribution Centres in different cities in the Region. During the process the focus changed with the help of the results of the urban freight model developed (CItyGoods). The policy makers are considering nowadays limitations/restrictions for goods vehicles in the cities (due to the lack of possible recuperation of money investments in urban distribution centres). Also in the Dutch (recent) cases for example,the attention is now more focused on more to the environmental impacts of urban freight transport.

Involved actors in the urban freight projects

Different actors are involved in the urban freight exercise (e.g.):

- Financer of data collection or model
- Owner of data collection or model
- Developer of data collection or model
- Responsible of the project
- Advisor/consultant

The different roles in the project can be performed by consultants (private consultancy bureaus, research institutes or universities), local, regional, national or international authorities, private companies, etc.

The following tables give an overview of the different actors for the different relevant roles in urban freight projects (with or without modelling exercises).

City (country)	Financer	Owner model	Developer	Responsible
Tilburg (NL)	local authority	consultant	consultant	local authority
Amsterdam (NL)	local authority	local authority	local authority	local authority
Brussels (B)	regional authority	consultant	consultant	regional authority
UK (EUNET, GBFM)	national authority	national authority	national authority	national authority
UK (GBFM)	national authority	national authority	national authority	national authority
Birmingham, UK (PRISM)	local + national authorities + 3rd party users	consultants + local + national authorities	consultant	local and national authorities
Seville (E)	started as research project	university	university	university
Santander (E)	university	university	university	university
Zaragosa (E)	university	university	university	university
Halle (D)	national authority	research institute	research institute	research institute
Berlin (D)	regional authority	consultant	consultant	consultant
Wuppertal (D)	local and regional authority, EC	local authority	consultant	public authorities
Emilia Romagna Region (I)	regional authority	university	university	regional authority
Sorrentina Peninsula (I)	regional authority	university	university	regional authority
Reggio Calabria (I)	university	university	university	university
Clermont-Ferrand (F)	local authority	university	university	local authority
Perpignan (F)	local authority	consultant	consultant	consultant
Ile de France (F)	national authority	national authority	national authority	national authority

Actor is financer, responsible, owner and developer of the model

Table 10: Different actors and their role in the urban freight modelling

: The reality is even more complicated than table 1 shows because developers of models often use data from existing data collections (other owners, financers, etc.) or get specific funds for a part of the project (European contribution for the data collection in Emilia Romagna Region e.g.).

City (country)	Financer	owner data collection	Performer data collection	Responsible
Den Haag (NL)	GOVERA *	not specified	consultant	local authorities
Amsterdam (NL)	local authority	local authority	local authority	local authority
Gent (B)	local authorities	local authorities	Consultant	local authorities
Liège (B)	local authorities	local authorities	Consultant	local authorities
Hamburg (D)	local authorities	not specified	consultant (university)	local authorities
	national authority	national authority	consultant (university)	national authority
Augsburg (D)	national authority	national authority	research institute	local authority
Island Usedom (D)	national authority	national authority	consultant	local authorities
Genova (I)	local and national authorities, EU	local authority	university and consultant	local authorities
Padova (I)	local authorities	local authorities	consultant	local authorities
Torino (I)	local authorities	local authorities	consultant	local authorities

* (freight organisation with national, regional, local and professional partners)

Table 11: Different actors and their role in the urban freight data collections

The tables above show that a lot of different partner structures have been set up in urban freight projects. Sometimes an organization combines the role of financer, owner, developer and responsible for the project while in other examples many partners are involved. For the (simpler) data collections fewer (different) partners are in general involved. Different structures lead by consequence also to different objectives, views, approaches, priorities and results so that it could be very difficult to compare different exercises. Projects at national level e.g. are more difficult to extract city level information. And in general it was not the first goal of such exercises to obtain freight information at city level. Data collections should be adapted to obtain better information from the model application at local level because at higher (regional, national or international) level data are rather available in an aggregated way.

Data collections at national level are often a legal obligation, while local initiatives are rather an attempt to respond to a problem. Available funds to realise projects differs according to the present partners and partner structure.

Besides the above mentioned partners also regional and national experts (e.g. PSD: Platform Stedelijke Distributie, The Netherlands), chambers of commerce (e.g. Brussels, Transport and industry federations, Public transport operators, port authorities are consulted (eventual membership in a following-up committee), but this is certainly not the case for all cases.

The following figure shows, for the different approaches for financing (as example) the modelling or data collection exercise.

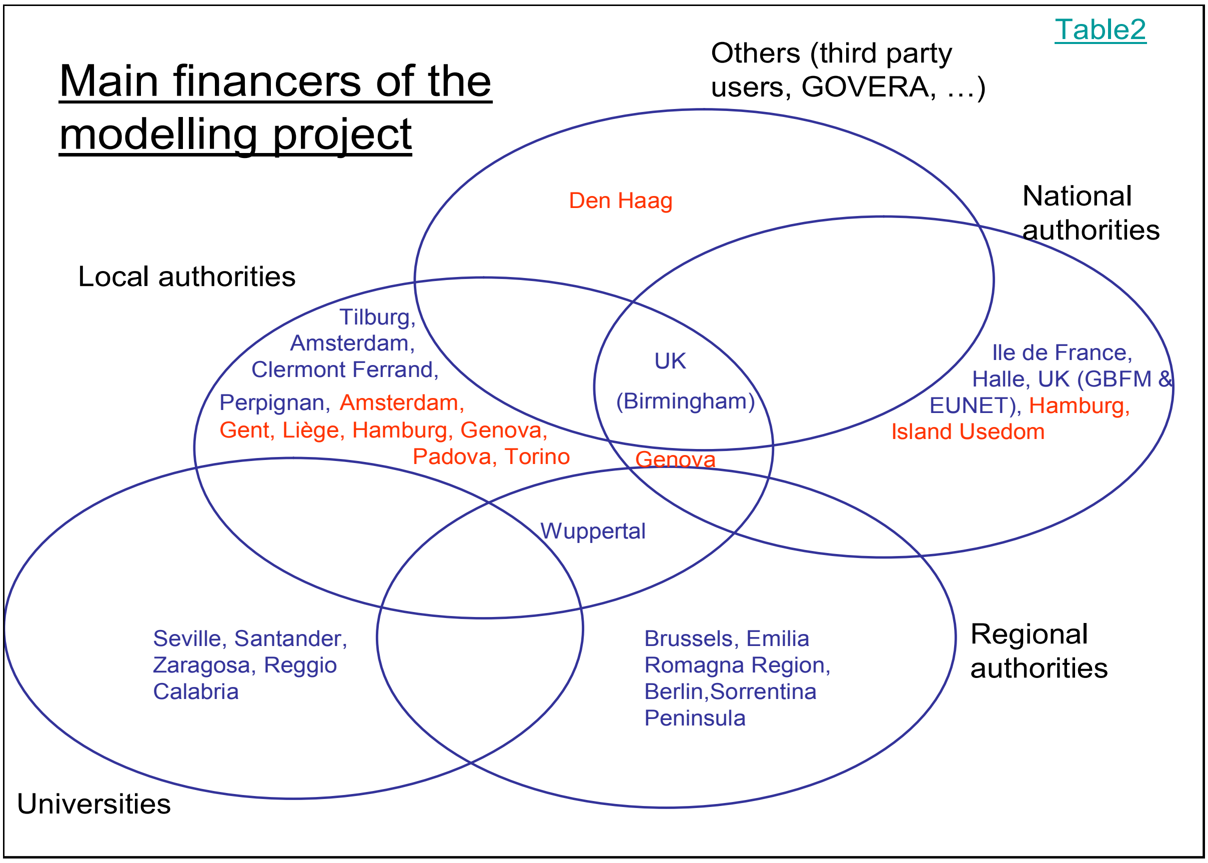


Figure 4: Main financers for the different urban freight cases

Blue: modelling exercises
Red: pure data collections
It has also been stated at the 3rd Roundtable, that the partner structure could be problematic for the use of the model. To solve this, the model should e.g. be accessible (different from owned) by other parties than the developers.

The integration of urban freight case in overall transport plans and models, frequency use and validation

Next table shows that (for modelling exercises):

- There is in general no (very poor) integration with an overall urban freight transport plan. Only for 2 of the reported cases, integration with the current transport plan was found.
- Most models include passenger transport (+ 50% of reported cases).
- There is a poor integration with regional and national transport models.
- Most cases are one shot operations (but many models are recently developed or are under construction). No update of the results has been foreseen besides the UK Great Britain Freight Model (national model with possibility to make local simulations).

City (country)	Model/ software used	Is the model part of an overall urban freight transport plan	Is the model integrated in an overall urban model also including passenger modeling	Is the model integrated within regional/national/international transport model	Regularly used?
Tilburg (NL)	omnitrans	no	yes	yes, regional transport model	one shot operation
Amsterdam (NL)	Unknown	no	yes	yes, regional transport model	one shot operation
Brussels (B)		yes	yes	no	one shot operation (freight part)
UK (EUNET, GBFM)	EUNET	no	yes (not the current eUNET 2.0 version)	no	demonstration study
UK (GBFM)	GBFM	no	yes	yes, national transport model	regular, new version soon
UK (PRISM)	PRISM	no	yes	yes, regional transport model	one shot operation
Seville (E)		no	yes, running on EMME/2 software	no	no estimation yet
Santander (E)	Unknown	no	no	no	one shot operation (under construction)
Zaragosa (E)	Unknown	no	no	no	one shot operation
Halle (D)	Unknown	no	yes	no	one shot operation
Berlin (D)	WIVER/VISUM	no	used together with individual car transport model in allocation phase	no	one shot operation
Wuppertal (D)	Unknown	no	no	no	one shot operation
Emilia Romagna Region (I)	CityGoods	no	no	no	one shot operation
Sorrentina Peninsula	Unknown	no	yes	no	one shot operation
Reggio Calabria (I)	Unknown	no	yes	no	one shot operation
Clermont-Ferrand (F)	FRETURB	yes	no	no	one shot operation
Perpignan (F)		no	no	no	one shot operation
Ile de France (F)		no	no	no	one shot operation

Most cases: no integration with overal urban freight transport model!

Most models also include passenger transport (+ 50% of cases)

Poor integration with regional and national transport models

Most cases: one shot operation (but also many recent models or models under construction)

Table 12 : Integration of freight transport models and frequency of use

For the pure data collections similar conclusions can be made. As for the modelling exercises there is poor integration with transport plans (but yet more in comparison with the model exercises) and most exercises are one shot operations. No specific ex-post evaluation has been found (calculated versus measured effects).

City	Is the study part of an overall transport plan	Regularly used?
Den Haag (NL)	no (delivery profiles)	one shot operation
Amsterdam (NL)	no	regular
Gent (B)	no	one shot operation
Liège (B)	no	one shot operation
Hamburg (D)	no	
	no	first of its kind (KID survey)
Augsburg (D)	no (part of envrionmental concept)	one shot operation
Island Usedom (D)	yes (regional transport plan	preliminary survey, main work in progress
Genova (I)	yes	one shot operation
Padova (I)	yes	
Torino (I)	yes	

Table 13: Integration of urban data collection in transport plan and frequency of use

Experts argue that results of models are valid for between two and five years. So it is important to update the information obtained. Although some exercises are (very) recent, some exercises are rather old (e.g. freight model Brussels).

As results from task 3.1 have shown that the interest in urban freight transport is growing in many European countries, there is still a long way to go. Urban freight transport is more complicated than regional, national or international transport. It is e.g. quite difficult to know a lot how trips within cities are organized. Besides the development of data collections and models also an update of obtained information is needed.
Funds are indeed an important aspect, because they are needed for collecting and updating the data. This could be problematic because for the development, sometimes particular budgets (European contributions) e.g. are foreseen while for updating the data such contributions can't be expected. Special occasions like the Olympics in London 2012 could be an opportunity to collect certain data. Investments are then easier to find. It is obvious that available funds for urban freight transport analyses vary widely in Europe (depending on interest, involved partners and partner structure, political interest, etc.). Simpler data collections are cheaper and definitely interesting at short term, but for a mid and long term vision on urban freight transport tools like urban freight models could be more interesting. It is evident that this also depends on the complexity of the experienced problems.
Also the expectations of the final customer (of urban freight exercise) should be taken into account. A lot of money could be invested in the development e.g. in a model and could be invested in an even better urban freight model, but it has poor added value when clients don't take into account the results from the obtained exercises or when the this model does not provide a better insight in urban freight transport for the customer itself. The urban freight model is a tool, not a final goal.
It is also obvious that the goals of city logistics models used by private companies for optimizing their routes are different with models developed by public authorities, etc. They are not (or less) willing to disseminate results due to commercial purposes.
It has also been stated at the roundtable in Brussels that more detail about the followed methodology for the collection of data is needed (random samples, interviews, questionnaires, etc.).
New technology could give new possibilities to gather information (cameras, RFID-technology), but the appliance of these instruments could also be problematic (respect of privacy, commercial interests, etc.).
Dissemination of results and experiences is important. Companies or institutes are not always aware of the on going projects that could be similar. Nevertheless it has also been stated by some experts that the diffusion of expertise is not that simple. Objectives, available funds and data, involved partners, etc. differ. Results could e.g. rather be transferable, but it's more difficult to transfer models e.g.

4.3.3. Why local decision makers are so reluctant to support urban freight modelling and data collection?

While traffic and its impacts in urban areas has received attention in recent years, much of this attention has been directed at passenger transport. Relatively little attention has been paid to urban goods transport.
Integration between passenger and goods transport is often difficult, since urban goods transport operate within integrated supply chain management whereas passenger transport serve individual needs. Ruled by the "Goods do not vote, passengers do" principle, passenger transport has received attention and priority in policy-making when competing for limited funds. Moreover, there is also severe competition between various means of passenger transport and goods transport because the limited space available in urban areas.

Countries are clearly in different phases concerning public policy development regarding urban freight transport. For instance, in France and there is a strong emphasis on research and analysis, while Belgium and Spain are in a more experimental phase.
The intensity of the policy initiatives and the research programs are closely related to the perceived urgency of the problems of transport in urban areas. Very often, urban goods transport tend to be seen merely as a cause for problems in cities, and the awareness of its importance seems to be low, not only among the general public but also among governments and city planners. If urban freight transport is responsible for negative impacts on traffic and environment (contributing to congestion, noise, pollution, fuel comsumption…), it is also a very important factor of the urban economy. This side of consideration is often neglicted by local governments and city planners.
Why urban freight transport does not seem to be a top priority item in the mobility research program and in the transport policies ? The previous round tables have shown that the lack of interest and use on urban freight data collections and models are related with methodological, intrinsic and political reasons. Related with the non use of urban freight data collection and modelling, the most common reasons which have been cited could be categorized as following:

- Common goals, different policies
- Link between urban deliveries and the whole logistical chain
- Multiplicity of stakeholders
- Freight transport in the hands of the industry
- Lack of awareness and knowledge
- Poor data collection on local level
- Costs of data collection and modeling
- Short term vision versus long term approach

Some of these points have also been identified as relevant to the conclusions and recommendations that result from the completion of Workpackage 3 and are therefore also noted in section 4 where recommendations are also made (for example the issue of the lack of awareness and knowledge).

Common goals, different policies

Despite the variety in size, population and circumstances surrounding each city, there are some common challenges. Several surveys in different European cities show that urban freight transport accounts for about 10-15% of total urban traffic in terms of number of vehicles, and 20-25% in terms of car-equivalents vehicle-km. The significant contribution of freight transport to total traffic and moreover the contribution of freight transport to problems of accessibility, congestion, environment and safety is leading to growing awareness of the importance of urban goods transport policies.
The main policy objectives for each country, region or municipality are not identical. Although the reduction of local traffic, the reduction of pollutant emissions and a better quality of urban lifestyle are important in all of them, there is a difference in emphasis.
The concerns about environmental issues and the quality of urban life are growing up. 20 years ago, the concerns about environmental impacts of urban transport activities on the quality of life in urban areas were not so present as today. The specific need for a reduction in acoustic pollution or in CO_2 and others pollutant emissions in built-up areas emerged in all cities.
Traditional urban freight models cannot reflect these environmental issues currently under discussion. That means that urban freight models should be completed with other models to give researchers and technicians an integrated tool and to give the policy makers a global solution.

Link between urban deliveries and the whole logistical chain

Urban freight transport is more complicated than regional, national or international transport. It is important to bear in mind that delivery of consumer goods is only part of the whole logistics chain. Measures concerning delivery in city areas have inter-related effects in other areas of freight transport and should therefore be considered from a broader systems perspective.

In spite of the fact that in many cases, goods often come from other regions or countries and therefore urban freight transport is more and more integrated with long distance exchange of goods outside urban areas, some models and current measures often only take account of the urban area itself. Little attention is paid to the supply chain as a whole which extend beyond urban areas.

Because the logistical chain do not stop at the urban frontiers, that means that local authorities and decision makers should have a common approach with their regional and national colleagues. Some countries have not only local initiatives but also national government initiatives for urban freight data collection and policy. It is the case of the United Kingdom and the Netherlands. But, in general, it is still a long way to a better communication between central and local governments, and between public and private actors.

Multiplicity of stakeholders

An important feature of urban freight deliveries and transport is their complexity and the multiplicity of stakeholders. Policy makers have to cope with a lot of different actors (more than for passenger transport), all with their own specific goals. The different users of freight services have different requirements and different goals, some of them are even contradictory. What is good for the industry and urban freight transport sector may be wrong regarding public and environmental issues.

The policy makers have to manage with all theses stakeholders and to arbitrate the potential conflicts existing between.

Freight transport in the hands of the industry

Very often urban freight transport is only perceived as prejudicial to the urban environment. It is viewed as a problem rather than an essential activity to the economical and social functioning of towns and cities.

So the policy makers and some technicians also, only react taking action to oppose the bad effects of urban freight deliveries. The urban freight policy they build-up is often only a reaction to problems, usually apearing with complaints made by residents.

If very few of them have a proactive position with a real urban freight strategy, it is also because a lot of decision makers and authorities consider that freight transport is in the hands of the industry world. Freight and logistics activities is not a domain in which all urban policy makers feel they should be involved.

Urban freight transport is mainly perceived as a pure commercial and business activity, and is not considered as something which should be featuring high on the political agenda.

It is difficult to convince public actors that urban deliveries have to be optimized and that they can contribute on it.

Lack of awareness and knowledge

There is a general feeling that within public local authorities there is not a good level of understanding about urban freight transport and deliveries. The business world thinks that the local authorities do not have a good understanding of modern logistic systems. According to the actors of the industry, that leads public authorities and decision makers to take policies and restriction rules without taken their requirements into account.

In the administrations, most cities are not adequately equipped to analyse and prepare for the challenges of the urban freight deliveries. There are very few specialists of freight transport in the administrations and the local authorities in charge of the mobility policy. For example, although municipality of Paris has two hundred specialists dealing with passenger transport and traffic planning, the first specialist in urban freight was appointed to the office in

March 2002. This may reflects the relatively limited interest about urban freight deliveries in comparison with passenger transport but also the lack of training and of information for technicians. There are a very large scale of different training programs in transport and mobility for engineers, economists …but very few of them are focusing on urban freight transport.

Because this lack of expertise, modeling is often considered by local authorities and decision makers as a “black box” they can not use it. So they refuse to investigate in modelling which requires a lot of time and investments.

Dissemination of results and experiences is important to develop the expertise. Companies or institutes are not always aware of the on going projects that could be similar. Nevertheless it has also been stated by some experts that the diffusion of expertise is not that simple. Objectives, available funds and data, involved partners, etc. differ. Results could rather be transferable, but it’s more difficult to transfer models..

Poor data collection on local level

In most cities, city planning and traffic surveys are based only on passenger transport. This lack of awareness and knowledge has often led to transport policies being planned mainly from the passenger transport perspective, without adequate consideration of the needs of freight transport.

Adequate data is missing. In some cases statistics could be used to know more about freight transport within cities, but often these data collections are not executed with that purpose so that interesting/important data are missing in the data collection.

Some national initiatives exist to collect specific freight data but from these projects at national level, it is more difficult to extract city level information. In general it was not the first goal of such exercises to obtain freight information at city level. Data collections should be adapted to obtain better information from the model application at local level because at higher (regional, national or international) level data are rather available in an aggregated way.

Moreover, data collections at national level are often a legal obligation, while local initiatives are rather an attempt to respond to a problem. If the principal objective to make a diagnosis of urban transport is to fulfil legal requirements, there is not always a real motivation of the local authority behind the initiative.

New technology could give new possibilities to gather information (cameras, RFID-technology), but the appliance of these instruments could also be problematic (respect of privacy, commercial interests, etc.).

Costs of data collection and modeling

Costs and funding are important aspects. Collecting and updating the urban freight data required for the models are sometimes very expensive. Available funds to realise projects differs according to the partners and partner structure. In general, local authorities have very limited means and traditional data collection and modelling are too expensive for them.

Sometimes particular budgets (European contributions) e.g. are foreseen while for updating the data such contributions can’t be expected. Special occasions like the Olympics in London 2012 could be an opportunity to collect certain data. Investments are then easier to find. It is obvious that available funds for urban freight transport analyses vary widely in Europe (depending on interest, involved partners and partner structure, political interest, etc.). Simpler data collections are cheaper and definitely interesting at short term, but for a mid and long term vision on urban freight transport tools like urban freight models could be more interesting.

Short term vision versus long term approach

The policies currently in place focus quite strongly on short-term problems and solutions. Little or no attention seems to have been paid to long-term problems. Modeling does not fit

the short term local problems. Modeling takes a lot of time to collect the required data, to build and to calibrate the model, to give the decision makers an answer.
Current policies are dealing only with current conditions, and the expected effects of proposed measures on future situations are often missing. Few attempts seem to have been made to provide forecasts for future developments or to develop long-term policy options.

Problems experienced with urban freight data collections and models

The lack of interest and use on urban freight data collections and models are related with methodological, intrinsic and political reasons. Found problems, cited in the responses on the questionnaire are told in the discussions were:

- Difficult to model urban freight (too complex)
- Adequate data is missing. In some cases statistics could be used to know more about freight transport within cities, but often these data collections are not executed with that purpose so that interesting/important data are missing in the data collection.
- Urban freight models deal mostly with the whole city area while most problems related with urban freight transport are found in well defined city areas
- Energy problems are not enough important at local level,
- Lack of solutions provided by researchers due to the direct conflict with commercial interests of shippers and hauliers,
- Problems are not big enough to justify large investments in model development and data collections,
- Policy makers and staff change (elections) so a short term vision is emphasized while models are useful for mid or long term visions
- Organisational problems and difficulties to implement measures (lack of willingness to take unpopular measures like fining offenders)
- Lack of competence about urban freight transport at local level (poor knowledge of urban freight transport)
- The principal objective is to make a diagnosis of urban transport to fulfil legal requirements (France), so there is not always a real motivation of the local authority behind the initiative.
- It is difficult to convince actors that urban deliveries have to be optimized.

4.4. Integration of urban goods movement into the whole urban transport system

Urban goods movement is a new and very specific component of the urban transport system. The reason is:

- the wide variety of stakeholders, vehicles and organisations,
- the necessity to abandon the isometry between goods origin-destination and vehicles origin-destination (diversity of trip chain pattern)
- the converse causal relationship between urban goods movement and the other urban components (national freight traffic, individual traffic, purchase trips, land use and road use conflicts).

It is the reason why it is very important to make sure the good integration of urban goods movement data collection and modelling approaches with their environment.

4.4.1. Urban goods and passengers data collection integration

As purchase is the last link from production to consumer, it is important to make possible a simultaneous goods commercial transport and purchasing trips. As shown in the Issue n°3 of the 4th roundtable (methodology for data collection), several experts consider that urban goods data have to be collected by a very specific way: a establishment survey (to make possible the generation of vehicle flows) linked with a driver survey (to offer a description of the different trip chain patterns according to the various types of generators). Carrying out

such surveys puts the question of their integration into the current individual trips data collections.
Individual trips are collected by the way of household surveys which are weighted on the place of residence. It is not possible to have a unbiased appraisal of the purchasing trips generation by the trade system. On the other hand, a survey realised on the purchasing trips at the place where they occur could make possible the understanding of the links between the shops logistic behaviour (upstream logistic chain) and the purchasing behaviour (downstream or last link to consumer). It is then possible to integrate home deliveries, emerging ways of delivery.
In the same way, home-work shuttles and business trips (except goods transport) may be a good addition in order to measure the whole traffic generated by economic activity. It is a way to attempt to get a comprehensive understanding of economic, logistic and behavioural characteristics of all the actors.

4.4.2. Urban goods models and passenger models integration

There are more and more opportunities to substitute purchasing trips for home deliveries through e-commerce. In order to measure the impact of the shift between purchase and home deliveries, integration of goods models and passengers models becomes a necessity. Urban Transport models on which we focus are policy-oriented models (data-adjusted model, oriented towards policy analysis) i.e. to explicitly simulate freight distribution within the urban areas for evaluation, control and design of urban freight transport system. It means that the study area where the data collection and modelling are carried out is generally the town and its suburbs. Current models on purchasing trips are considered as from a household point of view because they are calibrated on data collected from household surveys. It means that trips are observed considered and weighted from the place of residence. It was observed that the estimation of the trips generated at the shops place are biased, so that it is necessary to build a distribution model for the purchasing trips which is calibrated on the shops specificities. This approach was experimented in France.
Another way could be to build a purchasing trips model calibrated on data coming from thorough surveys based on interviews of the customers when they leave the shops. They describe the amount of their purchase, the trip and the mode used (car, walk, bus,…). If the sample is representative of the whole of the stores (small and large distribution, according to the location in urban area), it is possible to calibrate such a model. In that case integration of goods commercial models and goods individual trips models is easy because the statistical unit is in both cases the operation of pick-up of goods in the establishments. In the Bestufs review it was not observed such modelling systems.

4.4.3. Space and time connection

Another issue is the interaction between urban goods transport models and current passenger traffic four step models (generation, modal choice, O/D distribution, and assignment). As urban goods transport models are not standard four step models, the integration of them in the global traffic models need some precautions:
Space connection : the study area and the zoning of analysis for the data aggregation must be compatible (subset of each other). Especially, the network loading zones have to be also compatible).
Time scales must also be compatible. The rhythm of delivering of an establishment is often the week or (less often) the month, with seasonal swings. In that case, surveys observe the logistic behaviour and policy oriented models describe the traffic for a week, or a current day. Traffic models are often calibrated on the peak hour (on morning or evening or both), because they use often Wardrop method or micro-simulation for traffic assignment. As peak hours of delivering and of individual traffic are not the same; this approach may be discussed.

4.4.4. Is traffic simulation needed?

According to the reference paper of H. Sonntag, we can consider two (I thought it was three?) main approaches for freight transport modelling: Operational Research (OR) models and statistical and probabilistic models (SP). Both are considered as macro-economic models, in order to calculate the global impacts of UGM on congestion.
Another approach is promising. It is micro-simulation modelling. The latter make possible to consider the behaviour of each establishment, include the interactions between the different freight agents (shippers, hauliers, customers), micro-simulate the movement of shipments through the behaviour of each establishment. So, the description of the logistic practices of each agent may be simulated.
Usually, traffic simulators take into account the behaviour of each goods vehicles in tours inside the whole traffic on a theoretical network. That way, it is possible to show the fine reality of the behaviour of each vehicle and of each generator of movements along the day. But, in order to implement it on the whole urban area, its needs a thorough knowledge of the behaviour of each type of agent (generators and transport operators), what is difficult and costly to gather in a comprehensive way. So, traffic simulators are used as a general rule in local or theoretical cases to simulate changes to improve the efficiency of the transport system (objectives for round optimisation, time and cost saving, energy consumption and local environment improvement) all things being equal. Macro models are efficient for the description of UGM traffic generation in the whole urban area. Micro-simulation make possible to be closer to the reality of the behaviours of agents. Integration of macro UGM models and micro simulation models should be a promising and useful track for improvement of modelling.

4.4.5. Land use and transport modelling

The location of industry activity (especially shops and great distribution location, warehouses and platforms location) and household location (final consumers) are very important in the traffic generation. That is the reason why integration of land use models and goods traffic models is extremely important. The inertia of land use compared to the speed of changes of logistic and transport system limit the room for manoeuvre of transport policy measures. Land availability, land cost, population density, need of space for each activity type, are conditions for the possible changes of urban pattern. It is important to estimate the impacts of land use policy on the goods vehicle traffic and also car traffic for purchasing (length of trips, speed, congestion). Urban goods Transport and land use models have to be integrated in order to make an efficient simulation of the future towards the sustainability of the city.

4.4.6. Compatibility of optimisation of sustainability and optimisation of firm

Is there a gap between the external effects of policy and the results of the firm's micro-economy optimisation? If a measure leads to time saving for the transport operators but also leads to more long trips, the environmental effect may become negative. In other words, can we consider a win-win strategy towards sustainable development? The simulation tools have to provide a large range of indicators which make possible the comparison of impacts of the various measures and scenarios (micro and macro-economy, social issues, environment).

4.4.7. Need of case studies about modelling

Too few put in practice of models => no comprehensive comparison and evaluation of models and results. In the third roundtable, we made the statement that there is a lack of case uses of UGM models, and also of results of surveys.
The data collection methods are scarcely described, the results are often partial. The statistical unit, the scale of space and time of the indicators provided are different a case study one another. That is the reason why it is difficult to compare the different results.

Nevertheless, it is possible to propose an outline of rules towards a harmonisation of the data collection:
in terms of method of data collection (which statistical units, which survey method for which objectives)
in terms of scale: what to include inside the town area? Which flows to take into account?
a list of indicators to estimate according to the objectives,
In order to evaluate UGM model, it is necessary to have a good description of the input data we need to feed and calibrate each model, to have a thorough description of the method for modelling and to know the conditions and the results of its implementation on one or several city (including comparison of the results of the model with actual situation). The comparison of models is difficult, because the different case uses are generally not similar: modelling methods are different, data are different, cities are different). Only an implementation of models in the same city may be a promising action to compare their efficiency, their measurability and their ability for prediction.

4.4.8. Timing :

Short term solutions are required by policy makers but modelling takes time and is costly. More widely, there is a gap between the concerns of the decision makers and the ability of the modellers to answer them. Data collection, implementation of the model, discussion about the objectives, and about the ability of the model to answer these objectives take time and often don't fit into the schedule and the term of the proposal.
Short term solutions are sometimes opposite with long term effects. It is possible to change a local situation thanks to a new infrastructure or a new regulation, but it is difficult to estimate the impact of the latter on the whole land use and transport system. For example, in order to limit congestion of goods traffic, a new road infrastructure is efficient in the short term, but as it serves to a lot of road users, it improves the accessibility of the whole transport system and favour in the long term urban sprawl (involving traffic increase and congestion). Do the models integrate such contradictions?
Part of answer of the issue of short term and long term concerns may be also in solving the interaction between users and builders of models.

4.4.9. Interaction between user and builder of models

Models are often considered by decision makers as black boxes, difficult to implement and which output are difficult to interpret or don't fit the objectives. To propose a model of Urban goods movement do not escape from this opinion. Some rules may make integration more easy:
To integrate the objectives of users in the input and output of the model;
To describe the flows on a good scale, in the usual unit, with the usual segmentation of activity, vehicles, …);
Input data and output results have to be in accordance with the culture of the users, not in the modeller's language.
To explain step by step the process of calculation for a better understanding of the way to obtain the results.
To integrate UGM models into the global urban traffic models (truck O/D matrix integrated in a traffic assignment model).
To make easy the simulation process, integrated into the decision making process.
To integrate the user's constraints into the simulation process.

Every issue presented above may become a topic of thought. Some of them could be gathered into two main topics:
Integration of UGM modelling into a global land use and transport interaction model
Integration of UGM into a process of simulation from the short term to the long term decision making towards sustainability.

5. Conclusions and recommendations

Each issue has been scored decreasing from 10 to 1 according to the blockage importance. Calculation for a scoring of total issues equal to 100/ person has been realised.
A table shows results in a classification of issues by addition of score (0 for non stated issues) and permits to establish a list of main issues which will be presented during the fourth round table in Roma. Five categories appeared. After breakdown of main issues classification, it appears 4 fields of issues: policy, methodology, data collection and integration.
The synthesis regarding those categories: is presented on the next table.

Gather	Numero corellat	Types	Key words	Name of the issue
1	1	General	d.m. don't know which is the goal ?	The decision maker must know in advance **which is the goal** of their decision/choice, in order to start processing data collection.
1	1	General	Lack of knowledge of d.m.	**Lack of knowledge** of UGM by the decision makers
1	1	General	Lack of expertise of d.m.	**Lack of expertise** in administration
1	1	General	Lack of competence	**Lack of competence** of local authorities
2	1	General	data for modelling	Fundamental issue is to know in advance which **kind of model** is requested to determine **data collection** (not vice versa)
4	1	General	nature of the demand	A **national approach** and research is required to collect comparable data and decrease the costs
6	2	General	harmonisation of modelling	Need of **harmonisation** : Competition between consulting, scientifics; Each promote his own **model** !
7	1	General	cost	**Cost** of the implementation
7	1	General	cost	**Cost** of data collection and modelling for local authorities
8	1	General	visibility	black box for users (softwere more than inhouse consulting model)
13	1	General	lack of case uses	Lack of exchange tests of modelling in european cities
14	1	General	different goals	difficult to compare the approaches because they differ widely
14	3	General	different goals	Too big segmentation of the public authorities departments
18	1	General	maturity of modelling	Lack of **maturity** of modelling
18	1	General	maturity of modelling	Freight is a new field in comparison with passenger modelling
19	1	General	benefits of modelling	It is not easy to be clear on **benefits** that can be derived from urban freight modelling
		General		
Gather	**Numero corellat**	**Types**	**Key words**	**Name of the issue**
2	1	interactions	data for modelling	opportunity issue : given **data avaialble** => which model could work with these data ?
4	3	interactions	geographic scale	modelling organisation : **local-regional-national** ?
8	2	interactions	visibility	Need of link between the **model** and the **urban planning**
9	2	interactions	traffic	Need of easy to use module of **trafic simulator**
9	3	interactions	traffic	limitation due to the separation of real **urban traffic and in/outbound traffic**
9	4	interactions	road sharing	better understanding of road/space allocation between different types of users
13	1	interactions	lack of case uses	Need of case studies about modelling
15	1	interactions	customers	integration into individual passenger traffic models is complicated
17	1	interactions	timing	**Timing** : short term solutions are required and modelling takes time.
18	1	interactions	maturity of modelling	too few put in practice of mofdels => no comprehensive comparison and evaluation of models and results
21	1	interactions	micro-macro simulation	Two complementary approaches : **macro** (contrib. to urban congestion)-**micro** (description of logistic practices) simulation
		interactions		
Gather	**Numero corellat**	**Types**	**Key words**	**Name of the issue**
1	1	Methodo	lack of interest of d.m.	survey focus : should the survey focus on vehicles or load units ? (interest of decision makers for vehicle trip chains or for load unit roads)
1	4	Methodo	complexity	**complexity** of implementation
2	1	Methodo	data for modelling	survey must be carreid out according to modelling structure
2	1	Methodo	data for modelling	need of **good surveys** for modelling
2	2	Methodo	data for calibration	lack of **calibration** of models
3	2	Methodo	land use and environment	Lack of modelling on new **land use** => traffic generation => air quality
3	2	Methodo	routing and environment	Lack of modelling on **environmental zoning** => vehicle routing
4	2	Methodo	nature of the demand	Modelling should be introduced with a **push** approach instead of waiting for the demand **(pull)**
5	2	Methodo	modelling of efficiency	Data coll : Need to discover the **efficiency** of urban freight operations (load factor, deliveries per trips)
5	3	Methodo	economy and modelling	Need models and data collection about **loading and unloading** activity
6	2	Methodo	harmonisation of modelling	need of **comparison** of UGM models
8	1	Methodo	visibility	little **visibility of the results** of the model and whose are used by the local authorities
8	1	Methodo	visibility	lack of dialogue between user and ddesigner of the model
9	1	Methodo	traffic	consideration of large **traffic** sources is often missing (trafic **data)**
10	2	Methodo	scenarios	policy measure : **limited access** : time windows vehicle restriction
11	1	Methodo	reliability	lack of **reliability** and rerpesentativeness of the results
12	1	Methodo	changes in logistics	Objectives and questions the models have to cope with are **changing**
12	2	Methodo	changes in logistics	It is hard to integrate the **logistic chains** in models due to the fast changes of the economy
13	1	Methodo	lack of case uses	lack of **validation** of modelling
13	1	Methodo	lack of case uses	lack of **validation** of results of the model

Table 14: Main issues in urban freight transport knowledge
in data collection and modelling

Statement 1. Specific urban data do not exist in most of European cities.
Statement 2 Local authorities consider UGM data collection too expansive regarding their usefulness.
Statement 3 Local authorities don't realise the benefits they could have in the understanding of the complexity of UGM and in decision making.
Statement 4 There are 2 types of models : proved by application and academics.

5.1. To give tools for decision makers

Regarding to 2 groups of models (i) proved by application (ii) more academic, they need the academics get out of ivory tower. Academics models are interesting for decision making if a calibration is possible. The time for decision makers is shorter than the time for academics (modelling is a long process and needs numerous checking)
To develop models more proved by application than academics, more simple and more intelligible models;

- Exchanges are necessary between academics (who build the model) and users all along the decision making process
- The necessary data to be collected have to be justified regarding their costs to decision makers
- Understanding of direct and indirect costs for freight is much less robust than for passengers, so they need to know Cost Benefice Analysis rules much more clearly.

5.2. Mission of the State?

Local authorities are not prepared to pay for data collection, so the State have to found a part of them

- The State has to co-ordinate and harmonise the methodology of data collection

e.g. in France, State has founded a national programme of data collection (surveys in 3 cities, with a similar methodology which permitted to prove a lot of functional rules : same functional links, same ratio. So it was possible to build a model in order to simulate the practices in others cities without new surveys,

- National level would like to organise systematically the provision of different experiences and assessments,
- Data collection and Policy making - must have specific periodic data collection to ensure the methodology is robust (P-Ms need to be local but co-ordinated?) to ensure comparability

Sometimes questions from policy-makers do not need too much accuracy.

- Models must be more adaptable to the data that exist and to cope with data from different sources and from smaller data sets.

Nevertheless the results of modelling are dependant on adapted data.

- It is better to have a budget adapted to the simultaneous data collection and modelling approach.
- It should be useful to identify approaches being made by the Commission through organsiations. An European data collection about UGM would be necessary in EUROSTAT (as other general data about freight).

5.3. Public Private Partnership

Useful data exist in private companies. PPP for data collection is very important given new technologies becoming available. Some method required to identify data structure that can be used in this context

- Data collection should be developed thanks to partnership with professional organisations.
- PPP is essential in order to obtain useful data and to involve the companies in return (win-win).

e.g. Cities too small (below 500,000) need full-scale freight model - they know their city and the carriers. PPP is used there to ensure that data is provided by private companies

5.4. Formation, information, training, convergence academics/planers

Few decision makers know UGM functioning. Local decision-makers need to see importance of the models. They consider the models as a “black box”.
e.g. In future environment and CO2 assessment will be very important, that’s need prospective modelling.

- Training and dissemination activities for city and regional planners (and chamber of commerce) delegates seems necessary in order to clarify the potential functions and application of urban freight models.
- At local level - systematic training for planers is useful to ensure they have sufficient knowledge about urban freight transport. Not just basic issues but also awareness of main models used in various countries.
- At national level - greater awareness of decision makers about this topic - training needs to be carried out but need lot of common elements for training.

This happened with an approved training but decision-makers did not take up the training.

- Need to build awareness among city authorities that this training is needed. Information on legislation and infrastructure for each country would be helpful.

Training exists but city engineers don’t consider it useful.

- Local authorities have to make training a priority.
- It should be more practical to have a toolkit approach as base level of modelling. Proposing that they should change their attitude towards modelling.
- The toolkit to be provided by national government.

5.5. Data collection and harmonisation

Several different issues need answers : units, indicators, harmonisation of collection, dissemination,

5.5.1. Harmonisation of collection

Many actors who could use the data need to collect same data for same use.

- Need of data collection harmonisation.
- Need of benchmarking/standard outputs that can be compared.

e.g. Bottom up approach as exemplified by the Netherlands where the basic information from the various cities can be combined to provide a much richer picture – this shows the value of a harmonised action/situation.

- Common ground for data collection indicators, approach/methodology should be specified by BESTUFS.
- Basic data have to be defined and harmonised at European level through **Eurostat.**

Table 2 shows indicators which result of data collected in complex surveys (each indicator permits to answer objectives of UGM management).

5.5.2. Harmonisation of units and indicators

Cities have to compare their urban goods flows

- Need to speak a same language. Need to produce a glossary in several languages.
- Need to observe same units – e.g.. number of trucks/day, trips, movements (delivery or pick-up), purchasing generation and trip for calibration.
- Need to give a good information about data collection method (sampling, way of capture, weighting and expansion of sample,..).
- Need to have unit for knowledge of small own account companies more than have large companies observation.

e.g. Less than 5 employees companies cause more than 50% of movements in the city.

- Need of down + bottom up data capture because of different levels, unit can change from global to local level.

5.5.3. Qualitative data collection

Decision makers are interested in qualitative data/info as well as quantitative
e.g. Good Practice Charter - many of the indicators are qualitative. City of Paris organise surveys every year; maybe useful to organise a technical guide to harmonise rules. this enquiry to allow co-operation with London, Rome, Madrid.

- All European cities need to consider the same approach about good practice charter.

Management of collected data

- To promote idea of one person being responsible for freight (transversal vision) to ensure dialogue between all the stakeholders.
- Even if the city centre manager exists, some greater harmonisation is needed to provide link to all the actors in the city.

5.5.4. Guidance

- A technical guide should be prepared with most important elements of data collection and modelling and should be same book in different countries.

5.5.5. Simulation

How can data collection help to support the simulation process?
e.g. stated preference surveys.
Data availability and data collection is limited in looking for simple models that can help support a culture of urban goods movement.

- Need to validate these models.
- Need guidelines on the use and structure of the models and the link to the data.
- Benchmark data are essential to support the models to show how well the model performs.

5.6. Integration

Main remaining open field is technology. Local authorities are providing real-time information and use operation data from companies that can be given in exchange.

- Need of benchmarking to converge about modelling in order to have an idea on traffic, noise…and for calibration
- Models need to describe how are the deplacement realised.
- Many other Integrations would be necessary :
  - commercial traffic, business traffic,
  - persons and goods,
  - land use,
  - external costs,
  - vans and LGVs
- and ensure that the models show impact on whole picture by making the model sensitive to switch to smaller vehicles.
- Need to consider the whole supply chain (not just commodity).

  City planning and logistics modelling - most of the models are dealing only with city planning need to integrate the logistics aspects.
- Need more integration of logistics.
- Need to bring actors together and look for win-win situations.
- Need integration individual purchasing trips.

5.7. Interest for modelling / simulation

5.7.1. for decision makers

- Need to link the local view with whatever exists for the national level - can then get common data useful at both levels.
- Modellers have to make their models sensitive to policy makers/policy decisions and accessible to those in the city. Also to describe fully how to they use the data in the model and calibration.

  e.g. In Italy need to create a kind of training to show use of models and value - needs to be done within the administrations.
- Need a map of where we are going.

5.7.2. Simulation

- Need models to forecast the effects of policy changes. Can currently forecast social/environmental effects [pollution etc] but know very little about the economic effects (costs).

5.7.3. Harmonisation

There is no standard model, they correspond to the perception of the situation and secondarily their objectives of stakeholders. It depends on capacity to consulting and researcher actions, the financial means, often under estimated according to their needs.
There is not a standard model, but some of them could be transferred and used more widely providing there was clarity and agreement about the objectives and the units of measurement in respect of data requirements.

- Small number of sophisticated models in each country (maybe 1 or 2). These would link to simpler/cheaper models applied across many cities.
- Need to see a clear list of priorities (in order to have a reliable model?)
- Modelling of urban freight and impact analysis should become one element (unit).

For modelling, cities have various possibilities :

- For data, they need to differentiate between local/regional/through traffic etc.

Model itself: Urban Freight Models are still insufficient to support policy decisions.

- Funding should be available to develop the models and also local authorities should help by supporting use and trial of the models i.e. applying the models.

Have some best practice collection of measures:

- Policy makers need advice about how to approach the measures.
- Therefore need publication of guidance

e.g. In an other way, city of Paris, very interested in a common knowledge cannot justify lots of data for small projects - a database with common knowledge and typology of size of town/city. Exists at French level. Don't know the result of 20 cities using FRETURB - should be co-ordinated at national level.

Some of the objectives of the round table have been achieved but there remains the need for further discussion at the final round table that will be held in 2008.
The outcomes presented during the past two days indicate that decision-makers concerned with policy for urban freight do not make full use of the models that are available. There seems in that sense to be a mismatch between the supply and demand with regard to urban freight modelling. These issues will be the subject of further thought and discussion within the WP.

Adopting a typology of models (including who uses the model, where it is used, the units used, the characteristics etc). Then consider the objectives of models to see if it is possible to propose a type of model that is suitable for each objective. This will involve contacting model owners for additional information about their existing models where there are gaps in out current understanding.
Stakeholders and decision makers are not always making best use of the tools available. There is a need to better understand the barriers that prevent decision makers from using these tools and focussing on how best to overcome these barriers.

6. ANNEXES

Annex 1 – Referenced papers

Annex 2 - List of involved experts

Annex 3 - Common Glossary

6.1. Annex 1 – Referenced papers

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6.2. Annex 2 - List of involved experts

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6.3. Annex 3 - Common Glossary

The glossary is an attempt at harmonisation but that we are not yet at the stage where standards can be said to exist that precisely define the terminology. Therefore the context in which the term is used can sometimes be important - for example - the term journey is rather general or vague in English but if someone talks of the 'leg' of a journey then this is rather clear and means the individual link from one point to another on the journey

Terminology	**Definition**
stop	
English : stop	A point at which the goods distribution vehicle stops either for collection or delivery - including the point of departure and arrival of the route – or for a technical stop (meal, parking of the vehicle, compulsory rest period for driver etc.) without delivery.
French: arrêt	idem
Belgian: arrêt	idem
Italian: sosta / tappa/fermata	Each stop made by a freight distribution vehicle to delivery or collect a shipment/Stops for partial load/unload of goods between origin and destination.
Spanish: parada	A point at which the goods distribution vehicle stops either for collection or delivery - including the point of departure and arrival of the route – or for a technical stop (meal, parking of the vehicle, etc.) without delivery.
German: Stopp	interruption of trip with load
Dutch: stop	Stop to deliver/pick-up freight at the location of a receiver
transport for hire or reward	
English: public haulage	Goods vehicle operators who carry goods for other people for `hire or reward'. Also referred to as “public haulage” and "third party transport"..
French: compte d'autrui	Transport of goods belonging to a third party by a professional for remuneration.
Belgian: compte d'autrui	idem
Italian conto terzi	idem
Spanish: por cuenta ajena	idem
German Fuhrgewerbe oder Transporteur	idem

Dutch: beroepsvervoer	Goods vehicle operators who carry goods for other people for `hire or reward'.
own account	
English: own account	Goods carriage by the company sending or receiving the goods, by means of his own or rented vehicles
French: compte propre	idem
Belgian: compte propre	idem
Italian: conto proprio	idem
Spanish: por cuenta propia	idem
German: Werksverkehr	idem
Dutch: eigenvervoer	idem
heavy goods vehicles (HGV)	
English: HGV	Goods vehicle with a maximum permissible gross weight over 3.5 tonnes
French: poids lourd PL	idem
Belgian: poids lourd PL	Commercial vehicle of more than 3,5 tons (authorised total loading weight)
Italian: veicoli pesanti	Freight vehicle with maximum weight > 3,5 t
Spanish: vehículo pesado	More than 6000 kg gross weight and more than 3500 kg loading weight
German: Schwerlastverkehr	Goods vehicle with a maximum permissible gross weight over 3.5 tonnes
Dutch: truck, vrachtauto	commercial vehicle> 3500 kg GVW
Portuguese: veículo commercial pesado	Vehicle that has a capacity of more than 9 seats and a weight higher than 3500 kg.
German speaking Swiss: Lastwagen (LW)	Vehicles > 7.5 tonnes
light goods vehicle (LGV)	
English: LGV	Goods vehicle with a maximum permissible gross weight up to and including 3.5 tonnes (often referred to as a 'van')
French: véhicule utilitaire léger (VUL)	Goods vehicle with a maximum permissible gross weight up to and including 3.5 tonnes.
Belgian:	idem
Italian: veicoli leggeri / furgoni	Freight vehicle with maximum weight < 3,5 t

Spanish: vehículo ligero	Freight vehicle with loading weight up to 3500 kg
German: Kleintransporter	Goods vehicle with a maximum permissible gross weight up to and including 3.5 tonnes.
Dutch: lichte truck, bestelwagen	commercial vehicles, as light trucks or vans < 3500 kg GVW
Portuguese: veículo commercial Ligeiro	Vehicle exclusively or mainly used for goods transports and which weight is inferior to 3500 kg.
German speaking swiss: Transporter	Vehicles > 3.5 tonnes until 7.5 tonnes
journeys/rounds	
English: journeys/rounds	Journey is a vague term with no clear definition. Round implies a trip that starts and ends at the same place and has several delivery or collection points.
French: tournée	a journey with more than one delivery or pick up point including empty trip and technical stops (only the stops in urban area).
Belgian: tournée	Journey composed of more than one delivery and collection point.
Italian: giro	the route of a freight collection/distributiobn of a vehicle, often the same every day.
Spanish: ruta	a journey with more than one delivery or pick up point including empty trips and technical stops
German: Reihenfolge von Fahrtabschnitten / Fahrtenkette / Fahrt-verlauf	Course of trip / trip-chain: gang of different unloading / loading points at row, change of loading and unloading point within a course of trip.
Dutch: rit	Movement of freight vehicle along a set of receivers in an urban area.
single drop/direct trip/direct delivery	
English: single drop	Journey composed of one single goods delivery and/or collection point
french: trace directe/droiture	trip/journey from one origin to destination without intermediary delivery stop for 2 movements (1 pick up, 1 delivery) can hav more than 1 stop (empty trip for pick up)
Belgian: trace directe	Journey composed of one single goods delivery and collection point
Italian: consegna diretta	When the delivery route have a single destination (used in urban area)

Spanish: entrega directa	When the delivery route have a single destination
German: Direktfahrt	Course of trip / trip-chain: gang of different unloading / loading points at row, change of loading and unloading point within a course of trip
Dutch: directe levering	Journey composed of one single goods delivery and/or collection point
trip	
English trip	single 'leg' of journey (note in English 'trip' sometimes used interchangeably with the word 'round'
Français: trajet	Section of a journey included between two stops
Belgian: trajet	Movement from origin to destination
Italian: viaggio	
Spanish: trayecto	From one point to another point
German: Fahrt	From one point to another point
Dutch: verplaatsing	single 'leg' of journey
circuit	
English: round	Work carried out by goods vehicles from 'base to base' to make deliveries and/or collections (including empty journeys/trips for vehicles repositioning).
French: parcours	idem
Belgian: circuit	Work carried out by goods vehicles for deliveries and pick ups more than one point.
Italian: circuito	Work carried out by goods vehicles from 'base to base' to make deliveries and/or collections (including empty journeys/trips for vehicles repositioning)
Spanish: ruta	a journey with more than one delivery or pick up point including empty trips and technical stops
German: Rundlauf/Route	Row of trips which closes at that place where it was started
Dutch: rondrit	round trip
Portuguese: viagem	Movement from an origin to a final destination with one specific purpose, not depending if it is used more than one mode of transport.

agglomeration/connurbation/urban area	
English urban area	Urban areas are defined by the Office of the Deputy Prime Minister as settlements with a population of 10,000 or more residents
French: agglomération	An "agglomeration" is defined by the Institut National de la Statisitque et des Etudes Economiques (INSEE) as settlement of several communities who have a continuity of building.
Belgian: agglomération	Rules of the road definition:“agglomération” is an area wich has building continuities of which of the acces are appointed with F1 signal and the exit with F3 signal
Italian: area urbana	Area where urbanization and building can take place. It includes urbanized areas and areas that allow urbanization.
Spanish: área urbana	Urban areas are defined as settlements with a population of 10,000 or more residents
German: Städtisches Gebiet	
Dutch: stad en omgeving, agglomeratie, stedelijk gebied	City and small towns surrounding it. Urbanised area
Portuguese: Area Urbana	Area where urbanization and building can take place. It includes urbanized areas and areas that allow urbanization.
German speaking swiss: Städtisches Gebiet	Agglomerations are related municipalities with at least totally 20000 inhabitants. Each agglomeration consists of its core area and related municipalities. Municipalities belong to an agglomeration if they have more than at least 2000 workplaces and at least 85 workplaces per 100 employed inhabitants.
city	
English : city	Common definition is "large town" legal definition in UK is complicated and places having 'city' status range in size from 2000 to 7 million people.
French: ville	Municipalities with at least 2000 habitants
Belgian: ville	In Belgium, the city is a « commune » which has a honorific title given by royal decree.
Italian : città	large town
Spanish: ciudad	urban area with high population density
German: Stadt, City	large town

Dutch: stad	idem
Portuguese: Cidade	Area with a continuous population occupancy, with more than 8000 electors and that has at least half of these equipments: hospital facilities with permanent cares, pharmacies
German speaking swiss: Stadt	Municipalities with at least 10000 inhabitants
delivery	
English : delivery	A delivery is when a package or load is delivered to a receiver.
French: livraison	process for deliver to a receiver (parcel, load,,,) including the parking and handling from the vehicle to the receiver. Can be used as description of process including driving.
Belgian: livraison	A delivery is when a package or load is delivered to a receiver
Italian: consegna	Idem
Spanish: entrega	process for deliver to a receiver (parcel, load,,,) including the parking and handling from the vehicle to the receiver. Can be used as description of process including driving.
German: Lieferung, Zustellung, Bringen, Versand	dispatched transport service
Dutch: afleveren/ophalen, levering	Description of process including driving and physical handling of freight
German speaking swiss: Liefer, Zustellung	