Urban Transport Benchmarking Initiative

Annex A3

City Logistics

Working Group Report

July 2004

Transport & Travel Research Ltd

THE REGIONAL ENVIRONMENTAL CENTER for Central and Eastern Europe

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City Logistics

Working Group Report

Prepared for

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by

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0. EXECUTIVE SUMMARY

The aim of the Urban Transport Benchmarking Initiative working groups was to try and identify interesting practices through the use of both quantitative data and qualitative analysis in order that the participants in the group may learn from each other's approaches to urban transport. This working group chose the theme which is reflected in the working group title "City Logistics".

The following cities and regions participated in the group; Aalborg, Bristol, Genoa and Rome. The site visits to Aalborg, Bristol and Rome provided an opportunity for the working group to witness each other's city logistics challenges and practices.

The following research question was developed by the group at the Aalborg site visit; ***"How can cities, operators and customers work together towards improving the collective transport of goods?"*** Following this, the thematic data indicators were defined and the data was collected by the working group. The following interesting conclusions can be drawn from the analysis of the data;

- Because of the low number of working group participants it has been difficult to draw in depth comparisons between the various cities in the group. It is hoped that with more cities in the group for year two of the Urban Transport Benchmarking Initiative, the city logistics working group will be able to present a more thorough quantitative analysis.

- The concept of the target area worked well, this allowed the cities to focus on the area that was most significantly impacted by actions of city logistics. In all the cases where complete data was provided this area was 1% of the total area of the city and each cities target area represented the site for the concentration of retail businesses.

- Very similar levels of access restriction, such as pedestrianisation, exist in the cities of Bristol and Aalborg. All of the cities in the group have implemented some form of limited access for commercial vehicles. The majority of the cities in the group have limited access by time of day, while several offer varying levels of access according to the type of vehicle. Bristol is unique in specifically outlining times where it is permitted to unload.

- The benchmarks related to type of business vary significantly according to city. There is no clear way to explain this using the data. The only variation that can be explained is the type of shops present in each of the cities. In Bristol, for example, there is a high proportion of department stores and in Genoa there is a higher than average proportion of cafés. These findings indicate the nature of goods movement and freight deliveries in each of the cities target areas, which is of great use to any city seeking to implement a goods management system such as that being trialled in Bristol.

- The number and density of businesses in the target area of each city in the working group also varies significantly. In Bristol there is a higher proportion of large shops compared to the other cities in the working group. This pattern appears to have emerged because of the planned nature of the Central Business District (CBD) compared with those in other cities. In the other cities in the working group a large section of retail establishments are operated on a much smaller scale by families and individuals. This is very important, because the different ways these firms operate significantly affects the number and scale of deliveries that are received on a daily basis. This finding is highly significant and is likely to have a major influence over the degree of impact that deliveries and freight movements will have in

a city. This is therefore an ideal topic for further analysis in year two of the Urban Transport Benchmarking Initiative.

- The number of vehicles entering the target area is naturally very important to benchmark from a city logistics perspective, but presented one of the toughest challenges in terms of collecting data. The difficulty encountered was primarily due to the different sizes of the participating cities as well as problems with measuring the data. As a result, the information that has been gathered may not truly reflect the situation in each of the participating cities. Several of the cities had problems identifying a suitable location for counting vehicles. Key problems encountered stemmed from trying to ensure that all of the vehicles being counted were entering the target area. Further difficulties arose from not being able to verify whether all of the vehicles entering the target area are actually making deliveries, passing through the target area, or accessing the city centre for alternative reasons. In year two of the project the process of traffic counting will need to be refined if it is to be successfully implemented.

The following general conclusions and recommendations can be made from the data analysis;

- The group travelled to 3 different cities and were able to visit schemes that were of interest to the group. The most interesting of these practices was the Freight Consolidation Centre established in Bristol to enable the efficient movement of freight to retailers in the city centre. When the group visited the city the project was still in development, but a presentation was given to the group by EXEL Logistics to explain how the project is intended to work. This is an exciting development which is being pioneered in Bristol and has never before been attempted in an Urban City Area. As a result all of the participating cities were excited by the potential of this scheme and further research could focus upon its transferability to other cities seeking a solution to freight congestion in the city centre.

- Aalborg also displayed a range of interesting practices, which involve a much smaller financial, and infrastructure outlay, but which appear to be highly effective. The city of Aalborg created a forum ("Beer and Sandwich Evening") which enabled delivery drivers who operated in the city centre to meet and discuss their operations. This "Beer & Sandwich Evening" has helped the drivers become familiar with each other and now means that the drivers have a more communicative working environment. Aalborg City also circulated a pamphlet with a drivers' code of conduct and map showing the recommended delivery routes of the city centre. Both of these are cost effective, simple measures to implement which have greatly improved communication and flexibility in the delivery of goods within the city centre. Both these exciting practices are demonstrations of the cities, operators and customers working together in order to improve the transport of goods into the city centre. These ideas could be readily transferred to other cities seeking to establish better lines of communication among urban logistics stakeholders and have the added attraction of requiring only modest financial outlay.

- Indicators proposed for consideration in year two would provide greater background depth to the data and should help identify which types of business generate the most freight traffic. Most of these suggested indicators would undoubtedly lead to a better understanding of the information already gathered in year one. The suggestions included:

  - Standard retail time (shop opening hours).

  - Distribution of stops per vehicle (average mixes 1 stop of independent shop owner with 10-12 stops of larger operator)
  - Traffic counts would need to be matched with what vehicles are actually doing, e.g. deliveries/pick-ups, excluding thoroughfares, garbage disposal, cleaning vehicles etc.
  - Distribution of deliveries over business types (main drivers/demands for deliveries)
  - Indicators regarding the economy of the system

- A final recommendation from the working group suggested that the working group should try to identify a simpler question that can be answered using simpler data. The group was slightly over-ambitious in year one of the initiative and the consensus of the group is a simpler approach to year two, based on available data, will offer more meaningful results.

1. INTRODUCTION

1.1 Project background

The Urban Transport Benchmarking Initiative has sought to apply the concept of benchmarking to the urban transport systems present in cities across the EU, including the New Member States. This is in keeping with the European Union's policy approach which places considerable importance upon the role attractive, efficient local and regional transport systems can play in the economic development and social cohesion of the EU. In the field of urban transport the exchange and promotion of best practices is one of the main policy tools that the European Commission possesses. The Urban Transport Benchmarking Initiative has therefore compared the differences between the participating cities' transport systems in order to identify and promote interesting practices in urban transport.

The benchmarking concept has great potential when applied to urban transport systems. A range of previous initiatives have provided this project with the opportunity to deepen the focus of the benchmarking process and, by learning from previous experiences, provide more comparable results. The development of more practical data indicators has aided the learning process for the organisations involved in the project and this has greatly helped to improve the robustness of the data collected for the project.

The Urban Transport Benchmarking Initiative has adhered to the European Commission's subsidiarity principle by including as many urban transport stakeholders as possible. The process of the Urban Transport Benchmarking Initiative has been a fluid one, responding to the issues which were raised by participants in the project, rather than following a rigid, predetermined process. In this way the subsidiarity principle has been fulfilled, because the recommendations of interesting practices are coming from a network of urban transport operators, user groups, local authorities and municipalities, rather than a single centralised institution. It is therefore hoped that the project's findings will provide a useful resource for other urban transport stakeholders and help them to implement innovative solutions to commonly experienced urban transport problems.

The Urban Transport Benchmarking Initiative has been based around 5 themes, for which data has being collected by the participating cities. These themes have been organised as working groups and these are listed below:

- Behavioural and Social Issues in Public Transport
- City Logistics
- Cycling
- Demand Management
- Public Transport Organisation and Policy

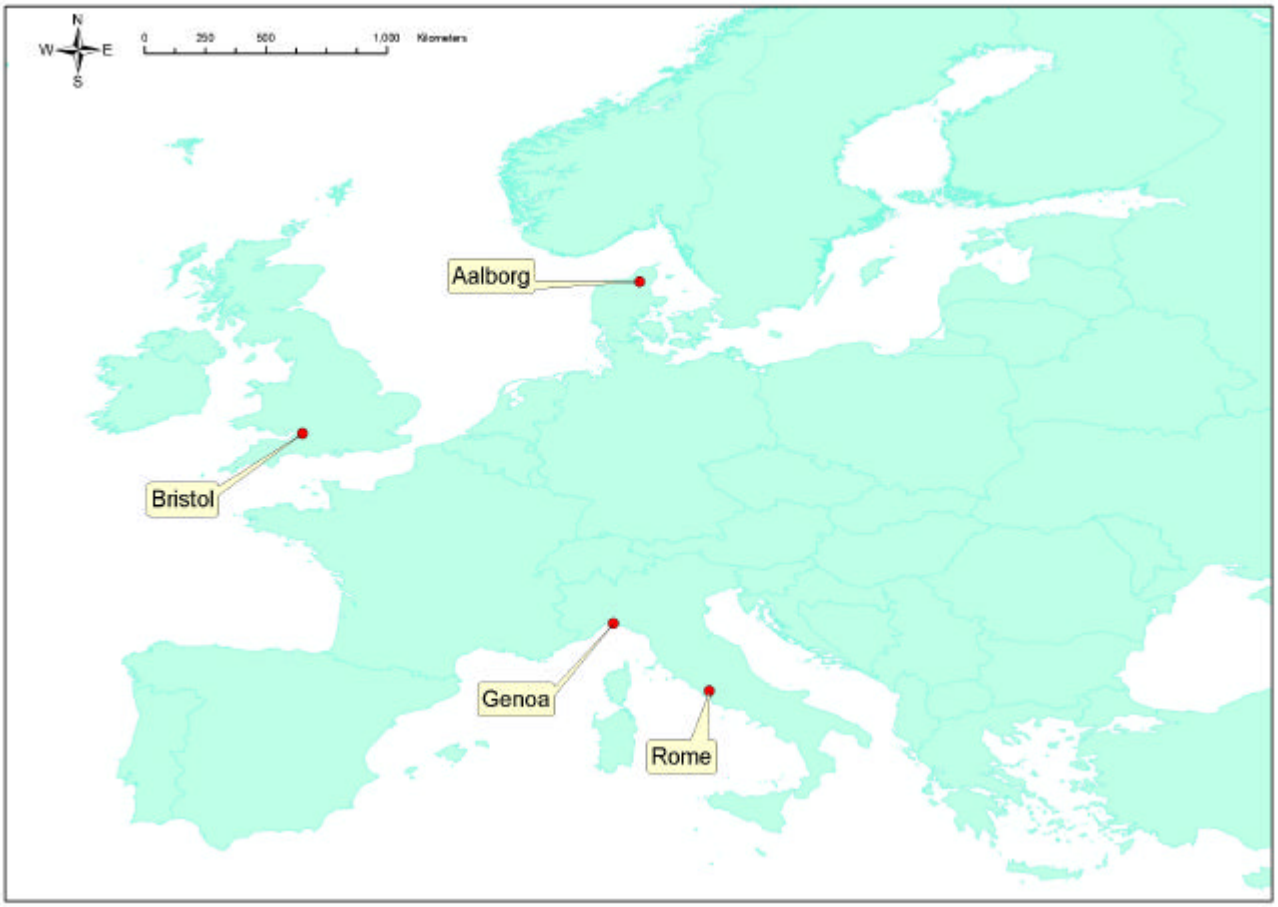
This report presents the findings of the city logistics working group, outlining the methodology used by the working group, the data collected and analysed and the recommendations emanating from the analysis. The Urban Transport Benchmarking Initiative will be re-launched for a second year in September 2004 and it is hoped that more cities will become involved in the city logistics working group in order to benefit from the benchmarking process. The recommendations at the end of this report illustrate the ideas currently being developed for year two of the Urban Transport Benchmarking Initiative.

1.2 Methodology of the working group

The "City Logistics" working group was initially formed at the launch conference of the Urban Transport Benchmarking Initiative under the title of the "Freight" working group. The following cities and regions have participated in the working group throughout the course of the first year of the project.

- City of Aalborg, Technical Department.
- Bristol City Council, Transport Initiatives Team.
- Municipality of Rome - ATAC SpA.
- Genoa - Unità di Progetto Piano Urbano Mobilità e Trasporti.

Figure 1.1: Locations of the cities participating in the city logistics working group



The working group has broadly followed the timetable that has been adhered to by the Urban Transport Benchmarking Initiative working groups (see Table 1.1 below) and has used the meeting time at each of the three site visits to discuss each stage of the benchmarking process. The aim of the working group has been to try and identify interesting practices through the use of both quantitative data and qualitative analysis in order that the participants in the group may learn from each other's approaches to city logistics and the organisation of urban freight delivery procedures.

Table 1.1: Working group time-plan

Event	Date	Progress
Launch Conference	Brussels November 6th 2003	Discuss themes and indicators
Site Visit 1	Aalborg January 8th & 9th 2004	Ratify indicators and define research questions. Agree a plan for data collection and agree units that are comparable within the group.
Site Visit2	Bristol March 15th & 16th 2004	Collation of data and identification of any problems at this stage. Discussion of problematic indicators.
Site Visit 3	Rome May 10th & 11th 2004	Interpretation and presentation of data, working towards group's findings in preparation for the final conference
Final conference	Brussels June 15th 2004	Presentation of final results

Peter Sonnabend (DHL Express Deutschland) is the expert for the working group and he has been responsible for overseeing the discussions at each of the working group site visits as well as assisting the group with technical issues such as the data collection and analysis processes. The group has also been supported by Katherine McWilliam (TTR) who, as the rapporteur for the group, has been responsible for the organisation of site visits and other administrational issues such as the preparation of reports and co-ordination of the working group.

1.3 Definition of the working group's theme

At the launch conference in Brussels in November 2003, the participants present identified the following key issues that were deemed important in the context of studying freight in the urban environment.

- Freight tends to be seen as less important issue compared to some of the other themes that are being presented at this conference.

- There often appears to be conflict between passenger and freight usage of urban transport infrastructure.

- The aims of the Urban Transport Benchmarking Initiative raised issues concerning the recovery of data. This is because freight indicator data is more likely to be commercially sensitive for larger companies and may not be available at all for smaller companies.

- Freight is important to the economic and commercial viability of a city.

It was also suggested at the launch conference that the 'Freight' Working Group should be renamed as the 'City Logistics' working group. This did not represent a significant change in direction but was a change of emphasis, to focus on the movement of goods into cities, for example the

movement of goods to retailers and service providers rather than the movement of freight through urban areas.

This change of emphasis was reflected in the questions that the group defined at the launch conference as possible areas of study. These research questions are listed below:

(i) How can cities build good relationships with operators? What are the benefits of doing this?
(ii) How can cities balance passenger and freight demands on limited road space?

During the Aalborg meeting these questions were amalgamated into one question, which covers both areas of interest and was chosen as the focus for the research of the working group:

"How can cities, operators and customers work together towards improving the collective transport of goods?"

1.4 Site Visits

As described above, the working group attended a total of three site visits over the course of the first year of the Urban Transport Benchmarking Initiative. Site visits were held in; Aalborg, Bristol and Rome.

These visits provided a very useful insight into the practices applied to city logistics in cities from within the working group. Full details of these site visits have been presented as case studies of the interesting practices the group experienced and are available in Annex A3.2, which accompanies this report. A summary of these visits is also available on the project website www.transportbenchmarks.org.

1.5 Learning from the Citizen's Network Benchmarking Initiative

In the case of the City Logistics working group there are no indicators which can be compared with the Citizens' Network Benchmarking Initiative. The Citizens' Network project did not have a working group dedicated to freight and none of the common indicators are specifically relevant to the topic of city logistics.

1.6 Contents and purpose of this report

This report is Annex A3 of the Urban Transport Benchmarking Initiative's final report and describes the City Logistics working group's approach to the benchmarking process. In addition the findings from thematic data indicators that the participants collected are presented and analysed in order to present the recommendations of the working group.

The remainder of the report consists of a description of the cities and regions that participated in the working group accompanied by relevant background statistics derived from the common indicators (section 2). Section 3 of the report outlines the methodology for defining the thematic indicators and the process of data collection and section 4 of the report contains the analysis of the thematic indicators. The final section of this working group report contains the conclusions from the analysis and makes recommendations for the development of the city logistics theme into year two of the Urban Transport Benchmarking Initiative.

Two annexes support this document. Annex A3.1 contains the full list of indicators collected by the participants and Annex A3.2 details in full the site visits attended by the working group and the case studies of interesting practice each city has submitted.

2. WORKING GROUP PARTICIPANTS

2.1 Working group members

The working group was relatively small with four active members with the working group. The participating cities were:

- Aalborg
- Bristol
- Genoa
- Rome

At various times during the year the cities of La Rochelle and Warsaw also expressed an interest in the group although neither was able to attend any meeting or present thematic data.

2.2 Description of cities represented

The following descriptions were taken from reports provided by the working group participants. The reports focused upon the existing city logistics situations within their own city and are documented fully in the case study section of Annex 3.2

Aalborg

Aalborg is the fourth largest city in Denmark and is situated along the banks of Limfjorden in the north-western part of Denmark. Aalborg has around 162,000 inhabitants and, being located in the centre of the county, a further population of 65,000 persons in the neighbouring areas form part of the daily activities in Aalborg. These include working, shopping, visiting public service facilities and making use of the recreational attractions in the city. Most of the commercial service and office activities are found in the City Centre.

Freight transport arriving in Aalborg city centre is concentrated upon the pedestrianised area, primary formed by 4 roads. Approximate 220 shops are located in this area and the majority receive goods on a daily basis. However, the quantity and types of goods delivered depends on the size and type of shops. Figure 2.1 illustrates the target area in Aalborg.

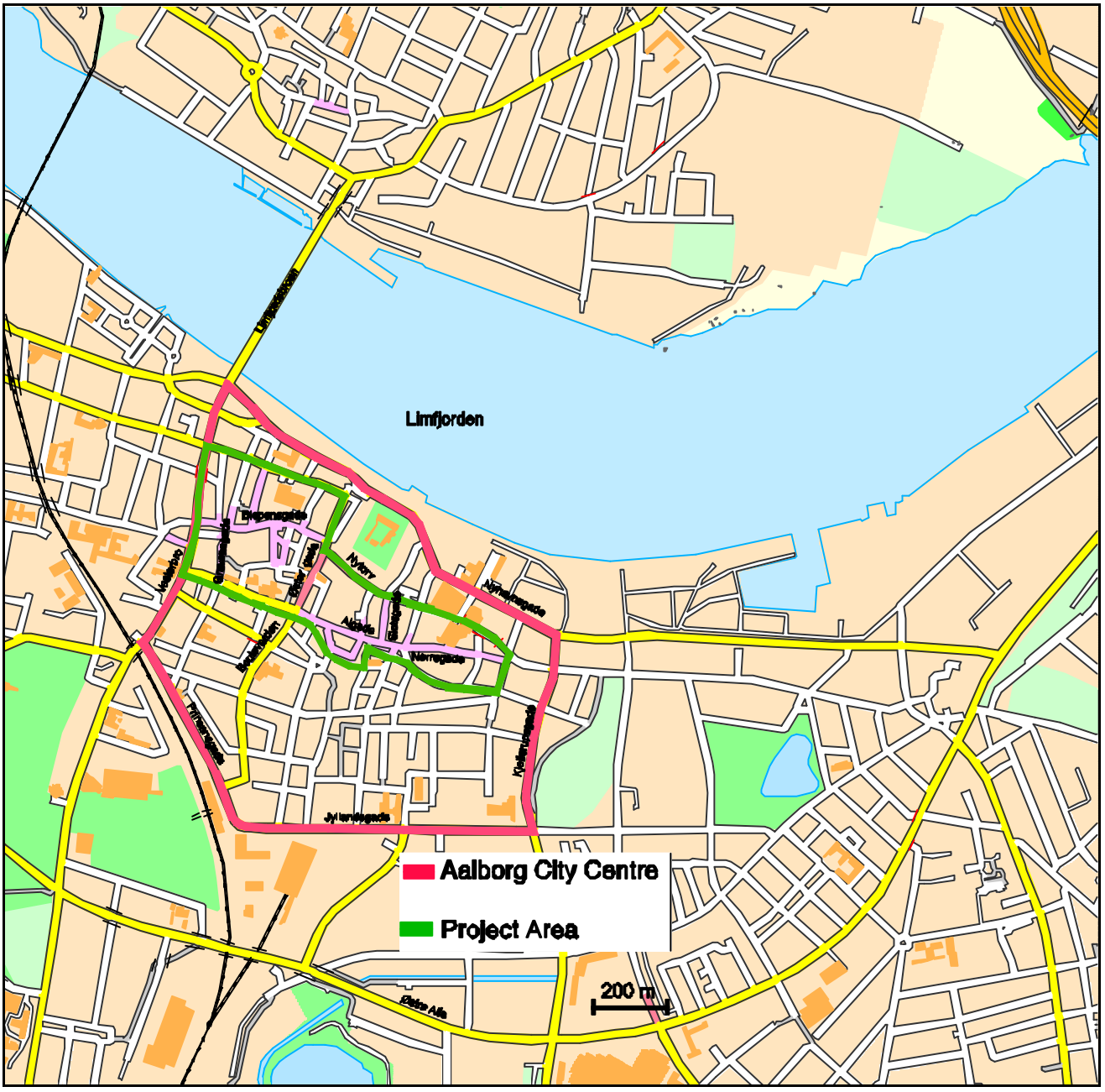
In excess of 80% of the freight delivery in this area is performed by 4 distributors. Previously freight delivery was spread across a greater number of distributors, which caused congestion in the narrow roads and irritation among the drivers.

In the pedestrian area access restriction declares that freight distribution should be undertaken between 5 and 11 a.m. Some types of freight delivery require special conditions for delivery e.g: outside the access restriction for which in most cases permission is granted. In order to reduce the disturbance freight delivery causes to people living in the area, as well as visitors / consumers, and thereby improve their quality of life, Aalborg has implemented several measures to make freight distribution more efficient. These measures include:

- The creation of loading and unloading zones;
- Minimum of two persons in each vehicle;
- Creation of a consignment note among the distributors;

- Change of driving direction in pedestrianised area;
- Coordinated freight delivery among the distributors;
- Electric powered vehicles;
- Regulation and access restriction for freight transport in the pedestrianised area;
- One shop functions as the drop zone for deliveries to nearby shops.

Figure 2.1: Aalborg city centre and the area considered for data analysis in the project



The aforementioned measures have been successfully implemented and have resulted in a 5 minute reduction in average delivery times in the city centre. In addition the access restrictions have greatly improved the quality of life for residents of the city centre.

Bristol

Bristol is the largest urban area in the South West region and provides a centre of industry, commerce, education and culture. Bristol City Council is a local authority with responsibility for transport, planning and other public services over an urban area with a population of some 400,000. The administrative area is 110 sq km, the city is split East-West by the river Avon, and the city is quite hilly.

Bristol, like many other European cities, suffers from urban congestion, pollution and a constrained road network. However it also has a transport strategy that aims to support the economy of the city and create a city centre which is attractive to both business and the people who work, live and visit the city. For business to flourish the effective delivery of the goods they require is essential, but at the same time there a need to minimise the impact of freight distribution on the area it is serving. Goods distribution is not always a top priority within cities. However city logistics initiatives could help alleviate some of the problems found in city centres.

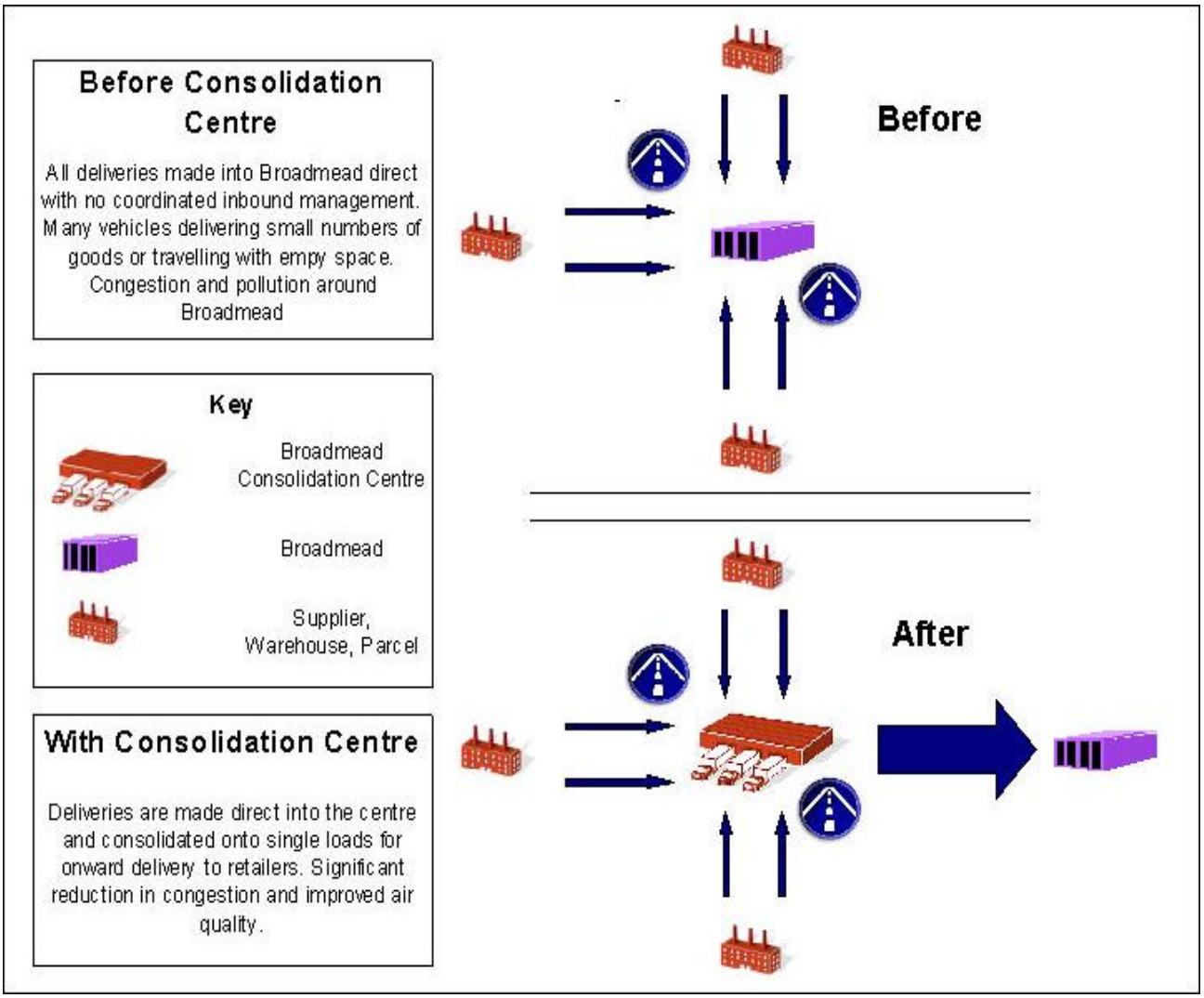
Measures implemented in Bristol to try and improve the conditions for goods distribution have been introduced as part of the VIVALDI project and include:

- The **Commercial Vehicle Drivers Atlas**, which was designed to help drivers of commercial vehicles find the most appropriate routes to main freight delivery destinations in Bristol and its surrounding urban areas in the neighbouring districts of Bath & North East Somerset, North Somerset and South Gloucestershire. The atlas includes route information specifically relevant to commercial vehicle drivers, such as restrictions on vehicle weight, height and width and has become a nationally recognised resource.

- The City Council has been working alongside Royal Mail to help implement a number of delivery solutions aimed at improving home delivery services and reducing unnecessary vehicle trips. These include **Community Delivery Points** and have been installed to try and prevent repeated delivery attempts which often occur when an individual is not at home. To try and circumvent this problem undelivered items are now sent to the local post office, rather returned to the postal depot, which is generally more convenient for the intended recipients. In addition, postal wards in the centre of Bristol have received secure locker banks, where undeliverable items are stored for collection at the individual's convenience. For maximum flexibility these lockers are allocated dynamically and residents are notified electronically (via e-mail or SMS) when they have something to collect. This is currently still on trial, but in its first 6 months of operation the scheme attracted 450 users in the city.

- Another trial scheme in Bristol is the Exel-managed freight consolidation scheme, which aims to minimise freight traffic in the city centre by directing all freight deliveries to an out of town consolidation centre. Figure 2.2 illustrates the difference between the "before" and "after" scenarios for the Bristol freight consolidation centre. Although only a trial scheme, similar projects led by Exel in Sheffield and Heathrow airport have led to 50% reductions in freight traffic flows. It is hoped that similar outcomes will be achieved in Bristol.

Figure 2.2: "Before" and "After" the consolidation of freight deliveries in Bristol



Genoa

Genoa is the capital of the Genova provincia and the Liguria regione and is located in the centre of the Italian Riviera. The historic walled city is located on Italy's North coast and is Italy's busiest sea port, with a population of approximately 650,000 inhabitants. Genoa is also a major centre for finance and commerce, offsetting the steadily declining manufacturing industries in the area.

Tourism

Genoa has spread outwards from the original old town which surrounds the port and is made up of a mixture of alleyways and squares, which create a unique challenge for urban transport and freight movement within the city. At the waterfront, the Piazza Caricamento is a busy square which is fringed by café-restaurants and the stalls of the market. Genoa's modern commercial nucleus, with big department stores and pavement cafés in the arcade extends mainly along Via XX Settembre, which has been greatly extended to incorporate two pedestrianised areas, Quadrilatero and San Vincenzo. A second shopping area is in the heart of the historical centre. These areas represent the target area for the data submitted by Genoa and are the prime areas for the delivery of goods in the city.

Transport

Genoa is linked with the major cities of Italy, France, and Switzerland by railway and highways. Its port serves as the chief outlet for the agricultural and industrial products of northern Italy and much of central Europe.

The transport system is strongly influenced by several historical features. These include the overcrowded and congested urban structure, the presence of a heavy industrial area within the city limits and an extended historical centre (considered to be the widest in Europe) that separates the town into two separate parts.

Access to traffic is very difficult in the historical centre, and as a result traffic is constrained to a limited number of routes that cut across densely populated areas.

Private transportation consisting of 392,000 cars - 32,000 small trucks - 67,000 motor bikes is characterised by one of the slowest average speed in Italy (12.6 km / h). The urban public transportation system relies on buses (over 600 vehicles circulating during peak hours) and trains. A very small metro system which incorporates just 3 stops, taxis and the cities "mountain lift" only make a small contribution to urban transport.

The city's inhabitants have been encouraged to use public transport through the creation of "Park and Ride" (10 car parks provide a total of 1000 vehicle spaces). In addition segregated bus lanes and the integration of bus and train ticketing (0.45 Euros for 90 minutes of travel), enable people to travel by public transport.

Transport Development

The city's metro system (presently 3 stops and known as "The shortest metro in Europe") is in the process of being extended to connect the harbour and the main train stations and further possibilities to link the most densely populated valleys with the centre by shuttle train lines are under analysis. A more radical long term scenario relates to improvements in the inland motorway system and / or the construction of a new coastal fast route which could make use of reclaimed industrial land which would need to be linked by one or two bridges or a tunnel. Early estimates cost these schemes at approximately €350 million for the bridge solutions, and €200 million for the tunnel scheme.

Rome

Rome, the capital of Italy, covers an area of 1,290km^2 and is located in the region of Lazio, on the west coast of the country. The metropolitan area of Rome, instituted by law 142/90, covers 5,352km^2 and 3,981,000 inhabitants. Rome's main activities, as capital city, are in the administrative, political, and service sectors. The tourist sectors, including transport, hotels and others, are also an important asset of the city: these economic activities are generally concentrated in the geometric centre of Rome, especially in the historic part.

The ancient centre of the Roman Empire, the city of Rome dates back to 750 BC and remains steeped in historical architecture and monumental buildings which intensify the logistical challenge for the city. Home to the Vatican City and the Pope, Rome is a very unique city and therefore difficult to draw comparisons with the other cities in the working group. Similar urban transport problems to those explained above for Genoa are experienced in Rome, although on a much larger scale. The historic centre of Rome is closed to most vehicular traffic, although traffic congestion is a major issue for the city and access to the centre is a major problem for urban freight operators

seeking to make deliveries. The large number of vehicles in the city (approximately 1.8 million) and a lack of central parking places contribute to the issue of congestion. The dominance of the private car is particularly difficult to manage given the urban fabric of Rome, which was not designed to accommodate cars, with roads narrow, uneven, and not forming a grid pattern. Notwithstanding, through the development of sustainable mobility policies and the use of ITS systems, the City Administration is trying to reduce congestion, the impact of air pollution, long trip times, and high transportation costs.

2.3 Background data from the common indicators

This section of the report uses data from the common indicators in order to provide some basic information and comparisons for each of the cities / regions represented in the working group. Table 2.2 outlines some of the key statistics for each of the cities / regions in the working group.

Table 2.2: Background statistics for cities in the working group

Statistics *(2002 unless stated)*	**Aalborg**	**Bristol**	**Genoa**	**Rome**
Area of city km^2	53	110	NS	1290
Population of city	120000	380615	700000	3723649
Population density (people per km^2)	2264	3460	NS	2887
GDP per capita in €	25200	25691	NS	25591

- Data relates to 2002, except for Bristol's population figure (2001) and the surface area of Bristol (2000).
- Common indicator data was not submitted by Genoa, so figures have been sourced from www.nationmaster.com.

The four cities compared throughout this report range widely in terms of size and population, although all display broadly similar levels of GDP per capita (approximately €25,000).

Rome displays a much larger surface area than any of the other cities in the working group and is also the largest city in the group in terms of population. In stark contrast the city of Aalborg covers a much smaller 53 km^2 and has a population of 120,000 inhabitants. Despite this the cities of Rome and Aalborg display similar levels of population density, although it must be remembered that the density figure for Rome is averaged over a much larger area. Bristol displays the highest level of population density in the group. Due to the fact that the figures for population density represent the average across the whole urban administrative area it is important to consider that central Rome is more than likely more densely populated than the centre of Aalborg.

Figure 2.3 illustrates the modal split of private motorised modes in each of the cities in the working group and Figure 2.4 displays the modal split for the cities in the group including walking and cycling trips. Modal share data was not available for Genoa and therefore only Aalborg, Bristol and Rome have been displayed.

The modal split data for private motorised modes (Figure 2.3) indicates that in Aalborg, Bristol and Rome the car is the dominant mode of transport. This is particularly noticeable in Aalborg and Bristol, while the figures for Rome indicate the public transport is reasonably well used, accounting for 25% of all motorised trips and motorcycles account for almost 14% of motorised trips. These data indicate that in each of the cities car use is high, which holds specific implications for the delivery of goods and urban freight movements. The delivery of goods in the urban environment is likely to be much more challenging in a congested city centre, while the process of loading and unloading can also exacerbate congestion on urban roads. This highlights a conflict between private car use and the movement and delivery of freight in the urban administrative area. Figure 2.4 illustrates that, even with walking and cycling figures included, car trips still account for more than 80% of all trips in Bristol. This implies that the city with the greatest absolute level of car use, and potentially the greatest potential for conflict between freight and private car use, is Bristol.

Figure 2.3: Modal share of private motorised modes in the working group cities

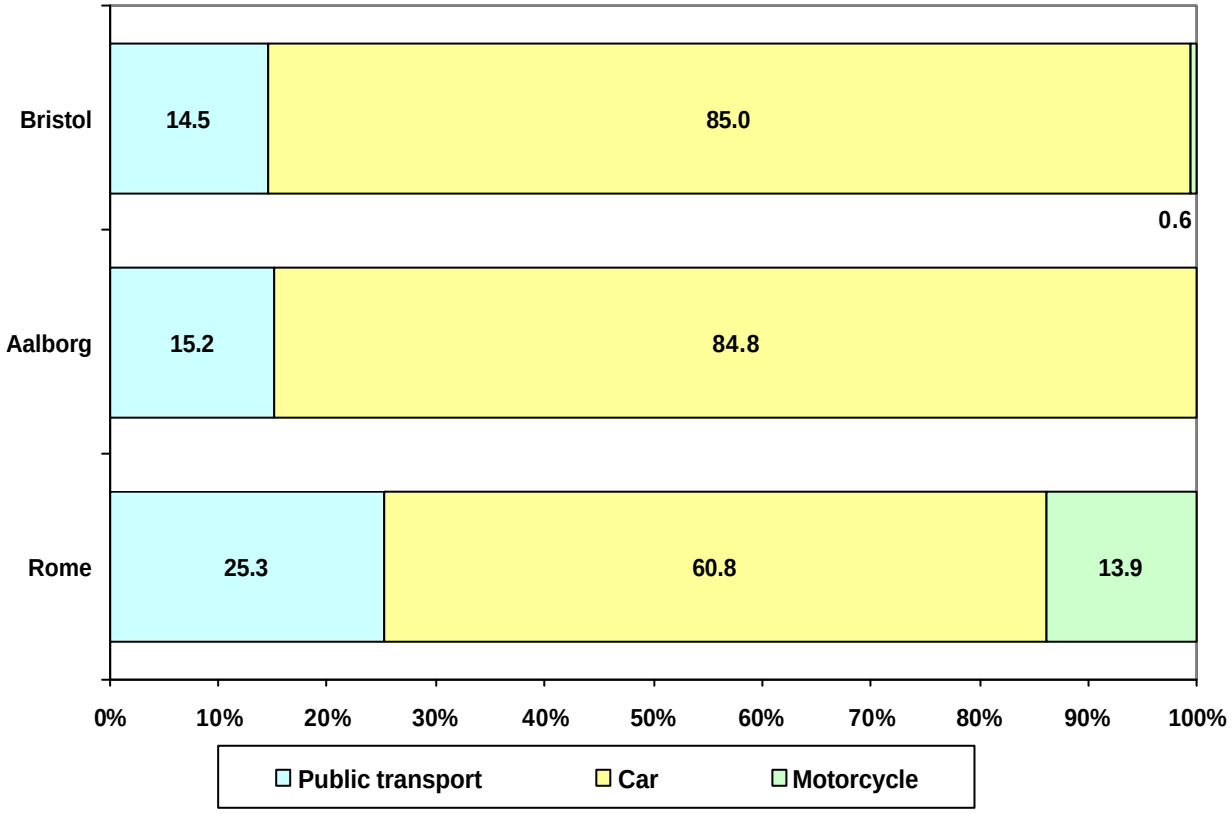
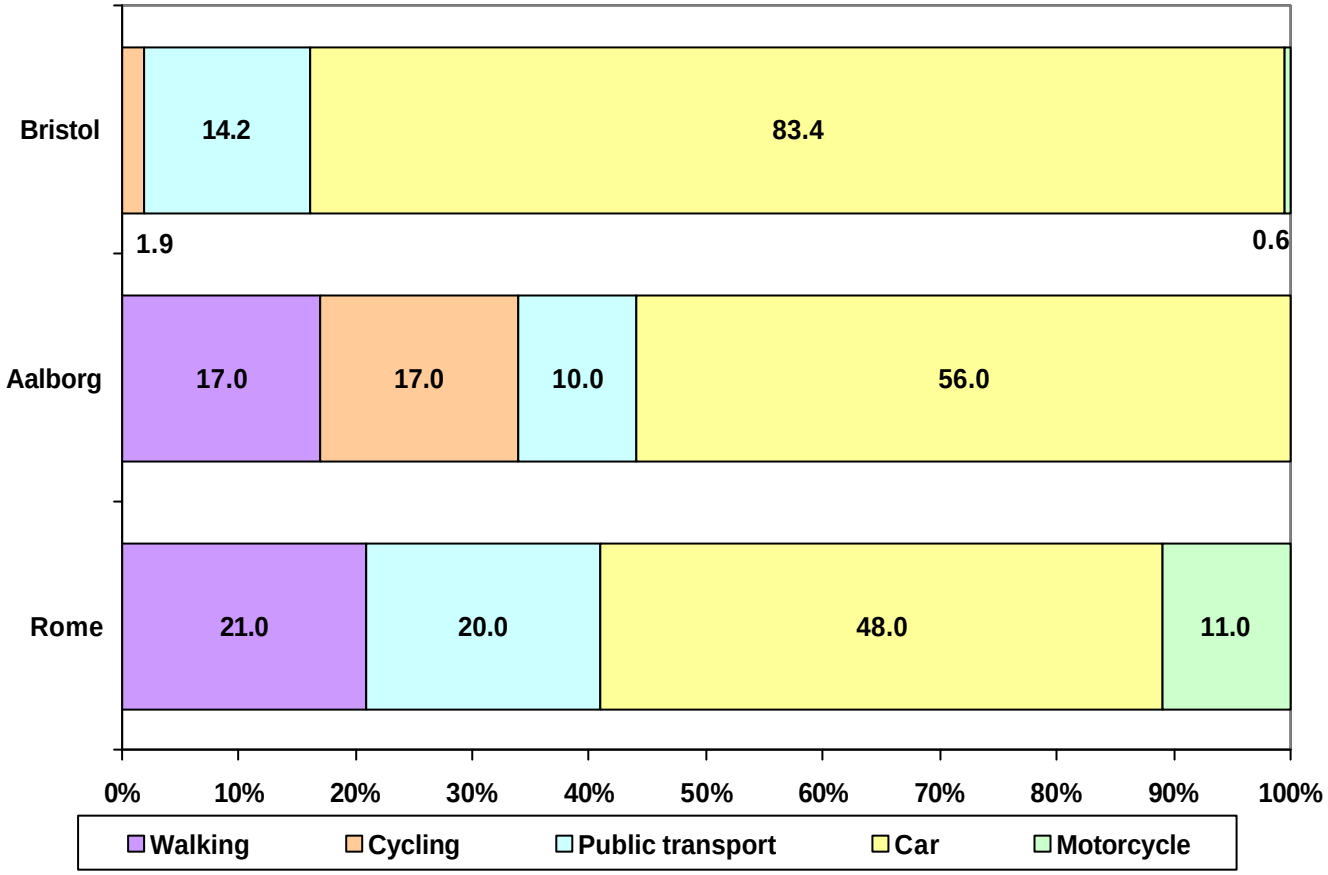


Figure 2.4: Modal share of all modes in the participating cities



3 DEFINITION OF THEMATIC INDICATORS

3.1 Research question / working group focus

The following research question was defined in Aalborg meeting in January 2004:

"How can cities, operators and customers work together towards improving the collective transport of goods?"

The group agreed that this question covered the main areas of interest co-operation between stakeholders, increasing the load factor in vehicles and generally reducing the negative externalities of the necessary transport of goods.

3.2 Methodology for indicator definition

The group decided that, in order to look closely at the topic of city logistics, it was necessary to focus upon a narrow target area in each of the cities. Thus all of the indicators defined by the working group relate to this specific target area, which generally refers to the city centre / CBD.

The expert for the group; Peter Sonnabend, assisted heavily in the process of indicator definition and guided the selection of indicators based upon the availability of data and the suggestions of the participants. Much of the discussion time was allocated to the topic of indicator definition and all of the participants in the group were able to give their input to the process. After an initial brainstorming session the participants each rated the data indicators that had been formulated in order to decide whether the data was relevant, available and collectable. The indicators that satisfied these criteria were then refined by the working group and finalised in order that the participants could collect data for their city / region.

In addition to the topic-specific indicators the working group selected, five background indicators were collected. These enabled the group to make some general comparisons to add context to the theme of city logistics.

3.3 Data collection and analysis

Data Collection

The bulk of the data was collected in January and February 2004 in the gap between the first and second site visits. In order to make the collection of data easier and to ensure that data were submitted in a standardised format a data entry form was created. In addition some general principles were established tom ensure the collection of data was as straightforward as possible. The two key issues in terms of the collection of data were:

1. The recommended study year for the project was 2002, based on the assumption that very little data would be available for 2003. It was recognised that cities have varying levels of data. Where cities did not have data for 2002 they were asked to supply data for the nearest year for which data were available. This was not a particular problem because the participants were encouraged to explain specifically what year data referred to if it was not for the study year of 2002.

2. The cities provided most of their data focusing on 'target area' of the city, which is the focus for retail and hence has a large number of vehicles accessing this area and making deliveries.

The working group meeting in Bristol (March 2004) was used to discuss the data submitted and the approach to analysing the data. Following this meeting several indicators were refined and data was re-collected in order to try and improve comparability between the cities and regions represented in the group.

Data analysis

The process of analysis commenced after the third site visit in Rome (May 2004) at which the data was ratified by the participants in the group and some small amendments were made. The group decided upon an approach to analysing the data which involved the expert and rapporteur undertaking an initial analysis of the submitted data and circulating the suggested findings and analysis for the group to consult upon. This process continued with the participants making suggestions about the analysis and presentation of data until everyone was satisfied with the recommendations.

The main aim of the data analysis was to look for best practices and try to establish reasons for variations between indicators for which data are collected. In order to achieve this in a meaningful way the participants have been involved in this process in order that the outcome is a set of findings that are supported by reasoned analysis rather than a collection of statistics. Throughout the analysis process the limitations of the data have been respected in order that misleading conclusions are not developed into recommendations.

3.4 Definition of interesting practice

The process of data analysis adopted by the Citizen's Network Initiative has greatly influenced the approach to this project. The aims of the Urban Transport Benchmarking project's data analysis were clearly defined at the outset and these remain unchanged now:

- To look for best practices and try to establish reasons for variations between indicators that data are collected for.
- To encourage all participants to take part in this process in order that we end up with a set of findings that are supported by reasoned analysis rather than a collection of statistics.

The term "Best Practice" has been heavily debated over the course of previous benchmarking projects. The major problem is that there is no all-encompassing definition which clearly states what a best practice actually is. In the case of this benchmarking initiative the term "Best Practice" is applied more loosely to include interesting practices that are displayed in the operations of the participating cities' urban transport systems.

From the outset it has not been the goal of the Urban Transport Benchmarking Initiative to create a competitive atmosphere among the participants and at the launch conference it was clearly stated that this is not a competition with "winners" and "losers". Promoting interesting practices, through the use of benchmarking, so that a wide audience of cities, operators and local authorities may benefit from them is a concept with huge potential. Creating a set of "winners" and "losers" does not help to achieve this, because it may dishearten those perceived to have "bad practices", yet these groups of participants probably have the most to gain from this type of project.

The aim of the project is therefore to try and offer the participants the chance to get the most out of the project by presenting a set of findings that will interest all of the participants. Disseminating a range of interesting practices is also likely to be of wider interest beyond those participating in the project.

3.5 Data limitations and barriers to data collection

The main limitation to data collection was the lack of data that is collected by the cities on the topic of city logistics. All of the cities involved in the working group felt that that their involvement was only possible due to their participation in other projects examining city logistics in their city.

The indicators selected by the working group were chosen because the participating cities already possessed the data, or because the data was easy to obtain. Due to the time constraints of the project and the lack of resources to carry out surveys with a common methodology this is inevitable.

4. ANALYSIS OF AND FINDINGS FROM THE THEMATIC INDICATORS

4.1 Analysis of results from data indicators

The analysis of the working group's indicators has been presented as a review of the data collected by the participating cities. Where relevant, comparisons have been drawn with other indicators collected by the working group and with common indicators collected by all of the participants in the Urban Transport Benchmarking Initiative.

The analysis has been broken down into key topic areas for clarity of presentation and analysis of data. What follows is a list of the indicators that were identified by the group during the first site visit as those most likely to be of value and interest. In addition these indicators were selected based upon information availability and comparability in order that the group could use the statistics for the basis of meaningful comparisons. The 'raw' data as collected by the cities is as follows, the boxes in Tables 4.1 to 4.4 outlined in bold denote where it has not been possible to get data:

Table 4.1: Raw Data for the City Logistics working group – Target Area

I.	Target Area	Unit	AALBORG	BRISTOL	GENOA	ROME
1a	Area size	km^2	0.5	1.4	1.5	17.5
	Area Name		Pedestrian area	Broadmead	Historical centre	ZTLM
1b	Road network	km	4.1	2.2	35.0	318.0
1c	Pedestrianised roads	km	0.9	0.5	35.0	318.0
1d	Roads with other access restrictions	km	0.4	0.2	0.0	0.0
1e	Time restrictions		11-5 no access to pedestrian zone	18-8 no on street loading 10-17 and 19-7 pedestrian area closed	eco 17-7:30, 13-15 others 11-7:30	<3.5t 10-14 16-8 >3.5t 7-19
1e *	Access hours		6	5/10	4/8	11/16
1f	Capacity of loading zones	vehicles	6	30	21	200

Table 4.2: Raw Data for the City Logistics working group – Key businesses

II.	Key businesses	Unit	AALBORG	BRISTOL	GENOA	ROME
2a	Bank & Insurance Offices	%	3	4	1	3
2b	Kiosks	%	7	1	4	3
2c	Shoes, Leather, Clothes	%	43	31	30	40
2d	Gift & Hardware Stores	%	8	12	8	6
2e	Watches, Jewelers & Opticians	%	12	10	6	3
2f	Pharmacy & Chemists	%	3	2	2	1
2g	Music Store, telephone Shop & Photo shops	%	5	6	5	2
2h	Café, restaurant, pubs, bars, fastfood, hotels	%	6	12	23	13
2i	Bookshop & Hobby Stores	%	6	4	3	3
2j	Electrical & White Goods Stores	%	3	5	1	**15**
2k	Department Store	%	2	4	2	
2l	Other	%	2	9	16	11
3	Total businesses	no.	214	324	1,954	15,000
4	Total households	no.	5,300	0		150,000
5	Commercial operators	no.	4	31		10-15

Table 4.3: Raw Data for the City Logistics working group – Vehicles

III.	Vehicles	Unit	AALBORG	BRISTOL	GENOA	ROME
6	Vehicles entering or exiting target area (Tu or Th 6-20)	Car	435	3,049	90	5,250
		LDV	548	534	35	6,750
		HGV	125	94	10	3,000
7	Vehicle dwell time inside target area	minutes	48	35	180	
8	Average no. of stops (week aggregate)	no.	2	0.6	30	13
9	Average total stop time (week aggregate)	minutes	14	17	60	

Table 4.4: Raw Data for the City Logistics working group – Background Indicators

IV.	Background Indicators	Unit	AALBORG	BRISTOL	GENOA	ROME
A	Businesses in wider area	no.	310		2	
B	Roads with access and/or time restrictions	network %	20	10		40
		Type	time	time, weight		time, weight
C	Roads accessible for commercial vehicles	network %	98	96	100	
D	Average speed of commercial vehicles	km/h	25	15	23	8
E	Registered commercial vehicles in wider area	no.	9,300	19,750	35,000	153,000

4.2 City Logistic Data: target area

The working group decided to allow an in-depth analysis of city logistics and that they would identify a defined target area to compare. This target area is in all cases the area with a predominance of retail establishments in the city and which already has some form of access restrictions imposed on the area, normally time related restrictions, but in some cases vehicle type restrictions as well. In all cities except Bristol this area corresponds to the historic centre of the town and this means that these areas are not necessarily suitable for modern traffic and particularly the larger vehicles associated with deliveries. The target areas of the working group cities are displayed in Figure 4.1.

Figure 4.1: Target areas of cities in the working group

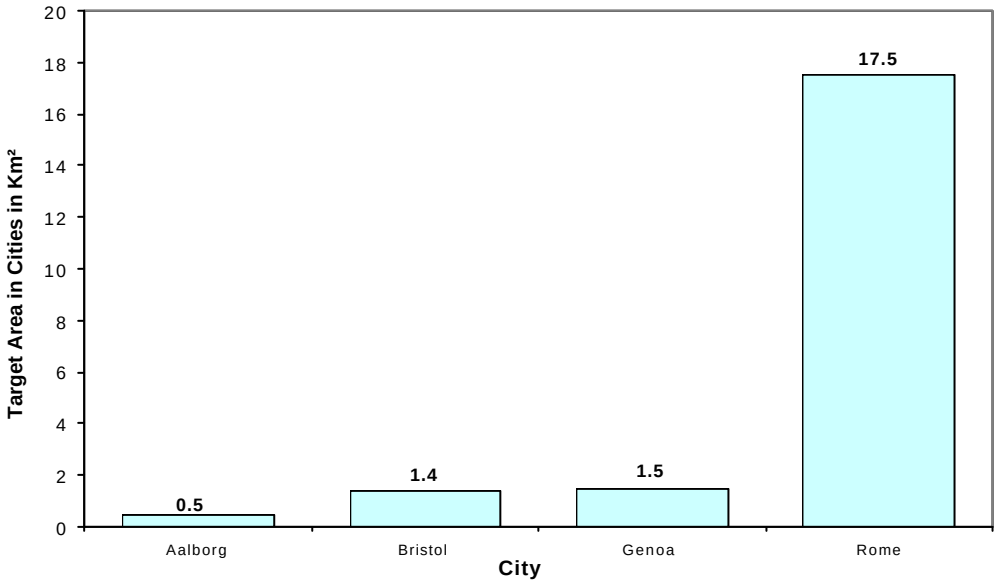
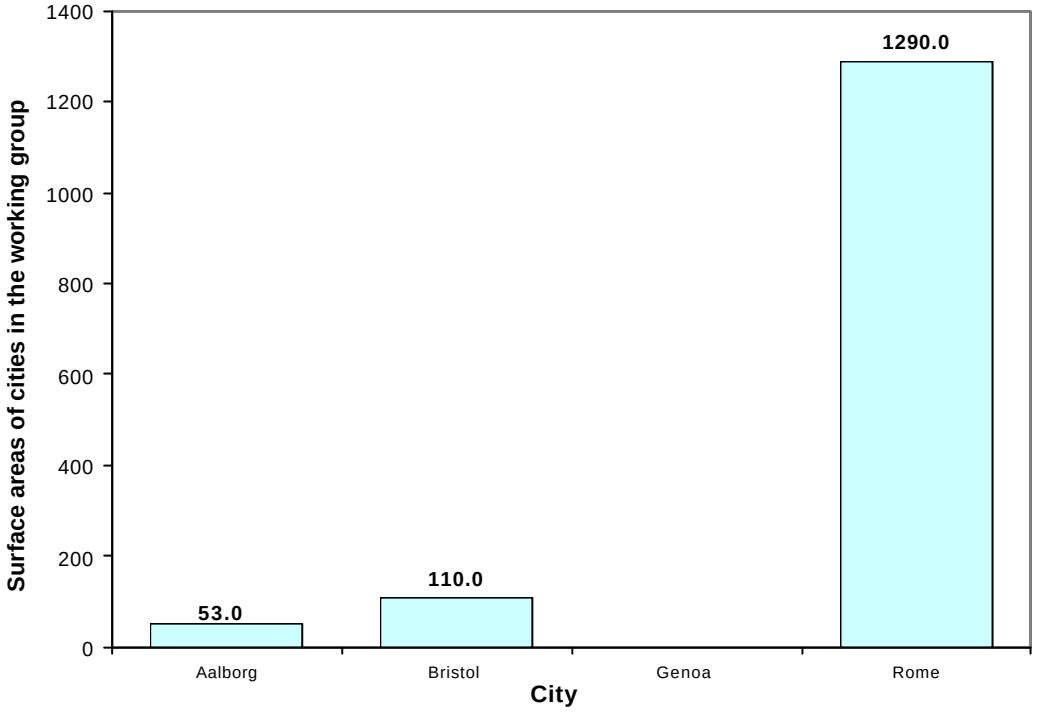
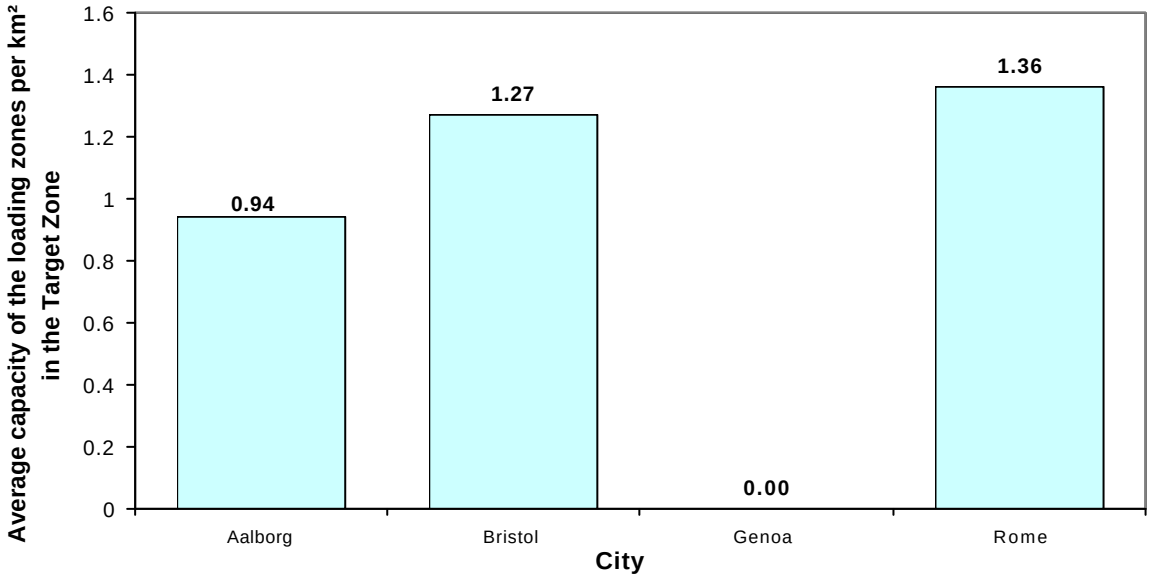


Figure 4.2: Surface areas of cities in the working group



*Genoa was not able to provide information on the total area of their city.

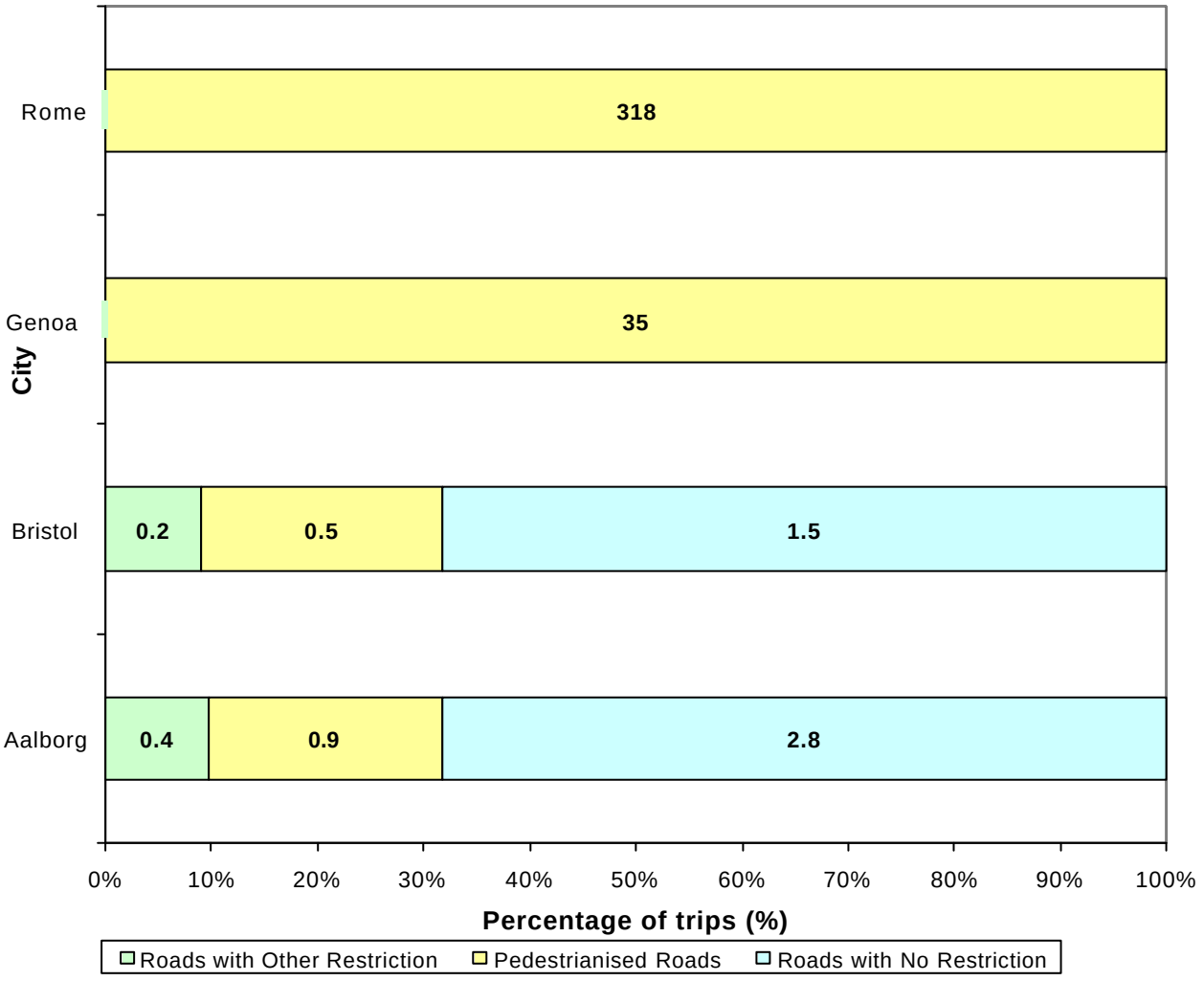
Figure 4.3: Average capacity of the loading zones per km² in the Target Zone



* Genoa was not able to provide information on the total area of their city.

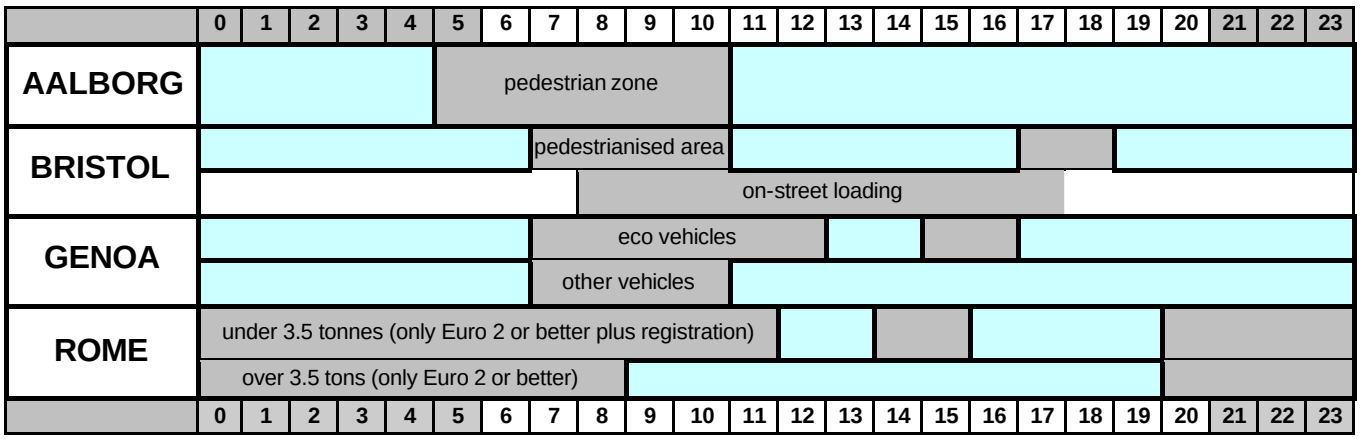
Although the size of the target areas and size of the cities varies dramatically, the proportion of the cities in the target area is on average just over 1% of the area of the city (Figure 4.3). However this measure does not show the whole picture as in fact, the layout of access to these areas varies dramatically, in Aalborg and Bristol the study area is fundamentally a linear street, with varying levels of access from the rear of retailers who face on the street. The Rome and Genoa target areas are a dense network of streets with no rear access to the building.

Figure 4.4: Proportion of road network in target area with restrictions



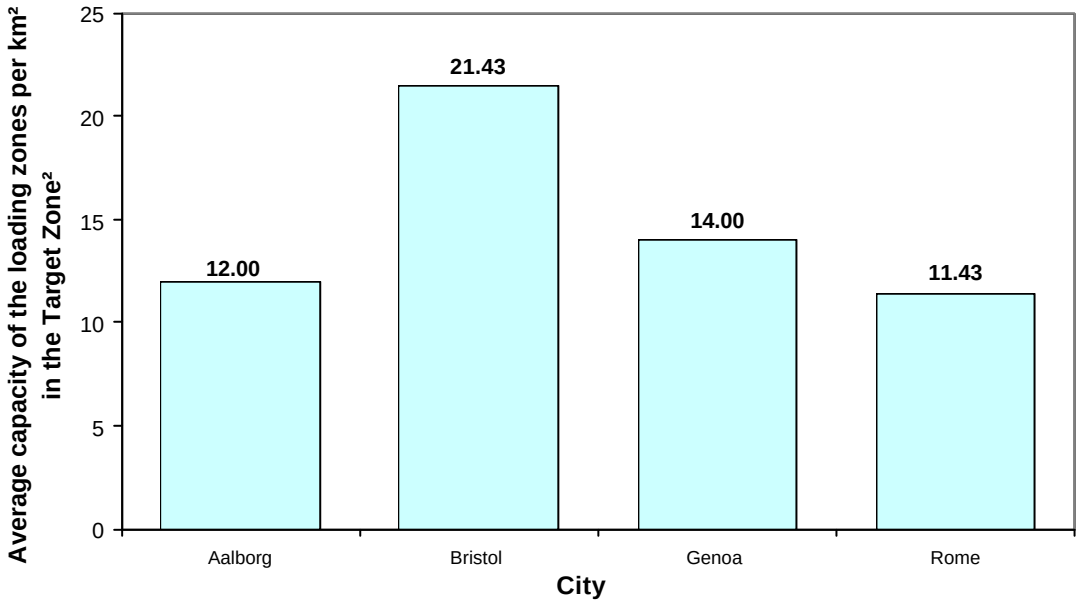
The proportion of streets with different types of access restrictions is very similar in Aalborg and Bristol (Figure 4.4). They are similar types of areas as they are both the city's major retail areas, which attract a lot of shoppers who walk between shops on foot. The Italian cities in the group both stated one hundred percent of the streets in their area are pedestrianised. This is likely to be due to the different understanding of pedestrianisation as there are some pedestrianised roads which have access for vehicles.

Figure 4.5: Access restrictions imposed in the working group cities



This diagram (Figure 4.5) shows the variety of different types of access restrictions that are imposed across the cities. All of the cities have imposed restriction on access to their target areas, in all of these cases, the time that goods vehicles are able to access these areas are in the early morning and the late afternoon. Aalborg is unique in that it has only one access period in the morning and Rome is unique in allowing access throughout the night to the target area.

Figure 4.6: Average capacity of the loading zones per km² in the target zone



Aalborg, Genoa and Rome have similar numbers of loading bays per km²; these vary between 11.43 and 14 vehicles per km² (Figure 4.6). Bristol has a much higher capacity; this is because the target area in Bristol; Broadmead, is a far more modern area of the city which was planned to be used as a retail centre.

4.3 Businesses in the target area

The proportion of different types of business varies across the different cities. In all of the cities the largest single type of business was shoe, leather and clothes outlets (Figure 4.7). In Genoa there was a lower than average proportion of shoe, leather and clothing stores but higher proportion of Cafés, etc. Bristol also had a lower than average number of these stores but had a higher number of department stores that traditionally also sell clothes.

It is hoped that this information will be expanded in future studies where investigations will be conducted into what type of stores handle the most goods and how this compares to the numbers of deliveries. These variations across Europe can be explained by the variations in the different retail and shopping habits that are practiced.

Figure 4.7: Proportion of different types of businesses in target areas

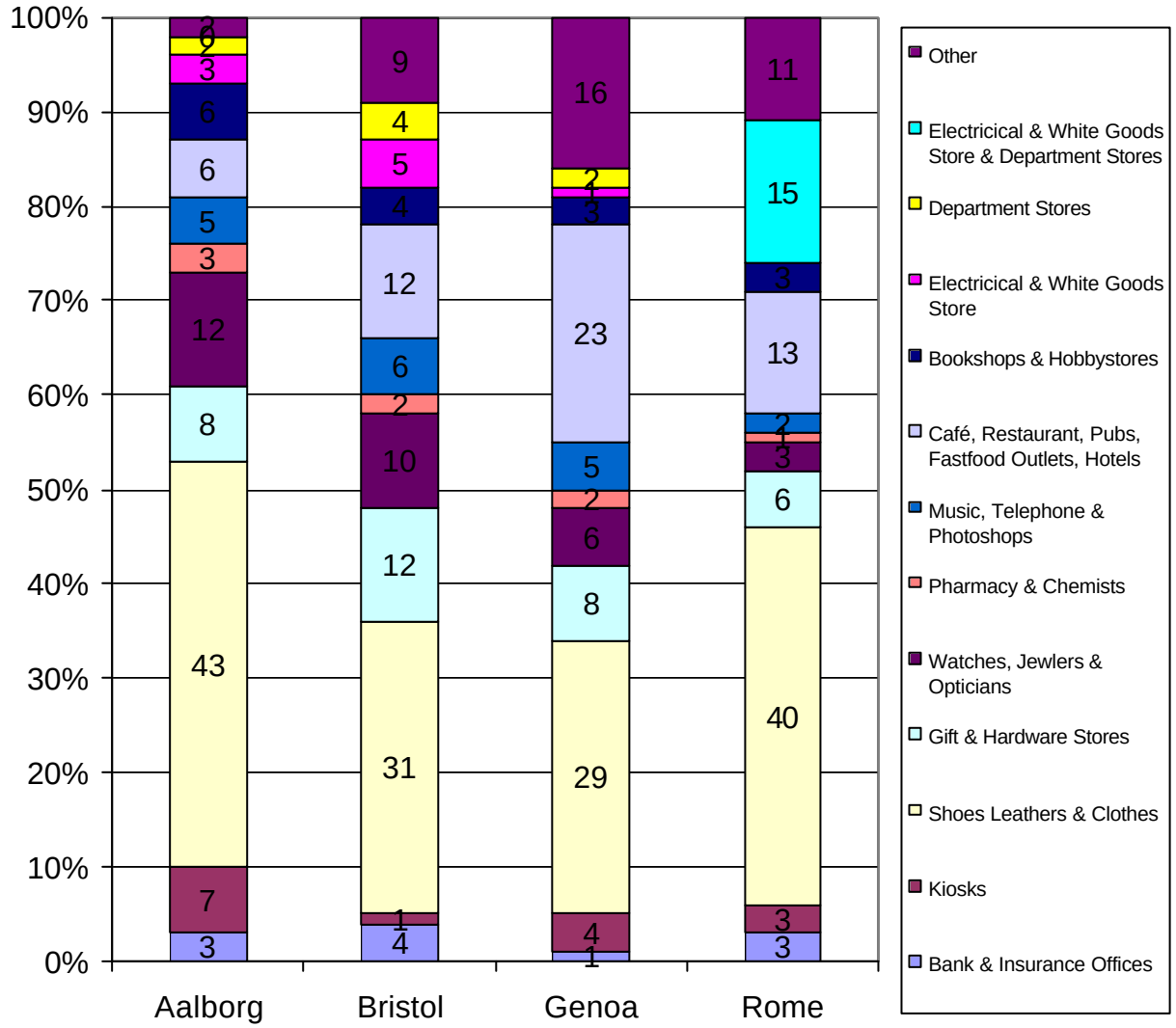
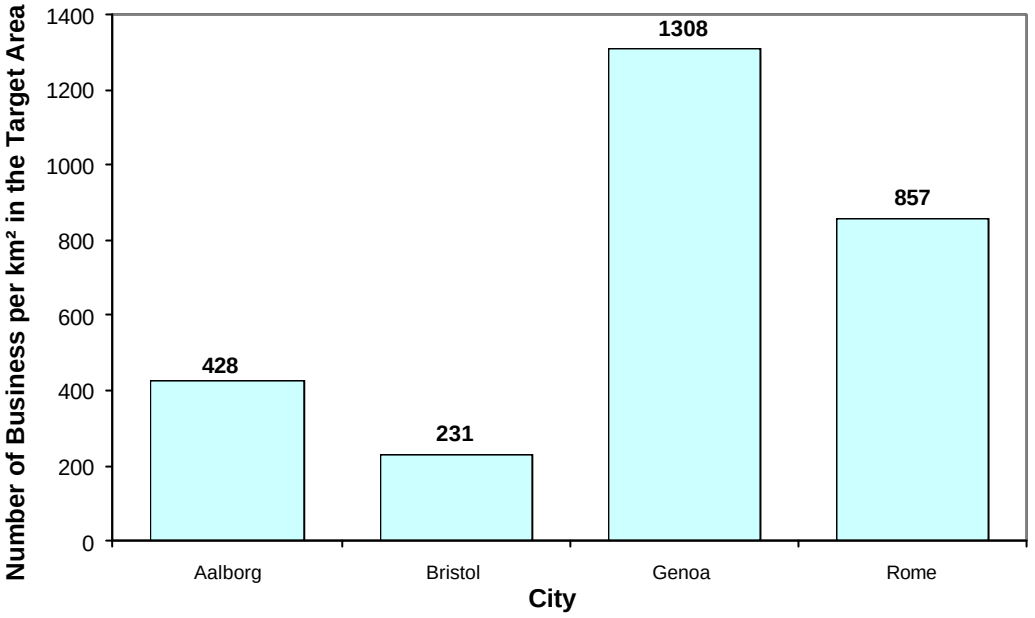


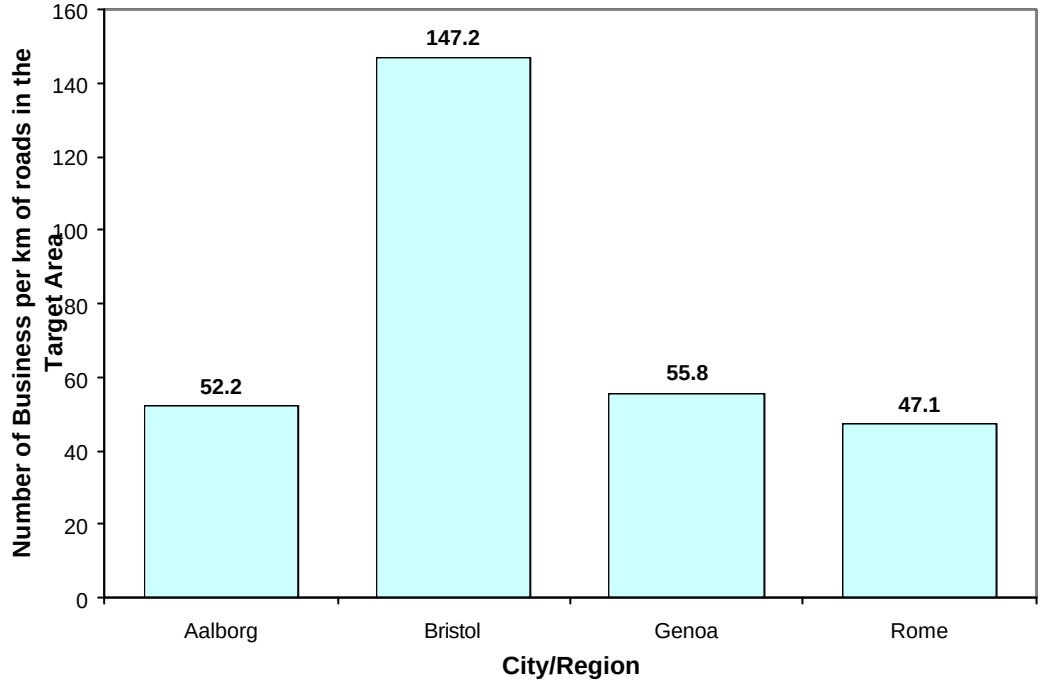
Figure 4.8: Number of business per km² in the target area



The number of businesses per km² differs significantly between the different cities (Figure 4.8). It is lowest in Bristol, this is because the target area is characterised by wide pedestrianised streets with predominately large retail store. The other cities have much higher density of business, this could because they have a mix of different types of businesses and are not so retail focused and those retailers that are present are less uniformly large.

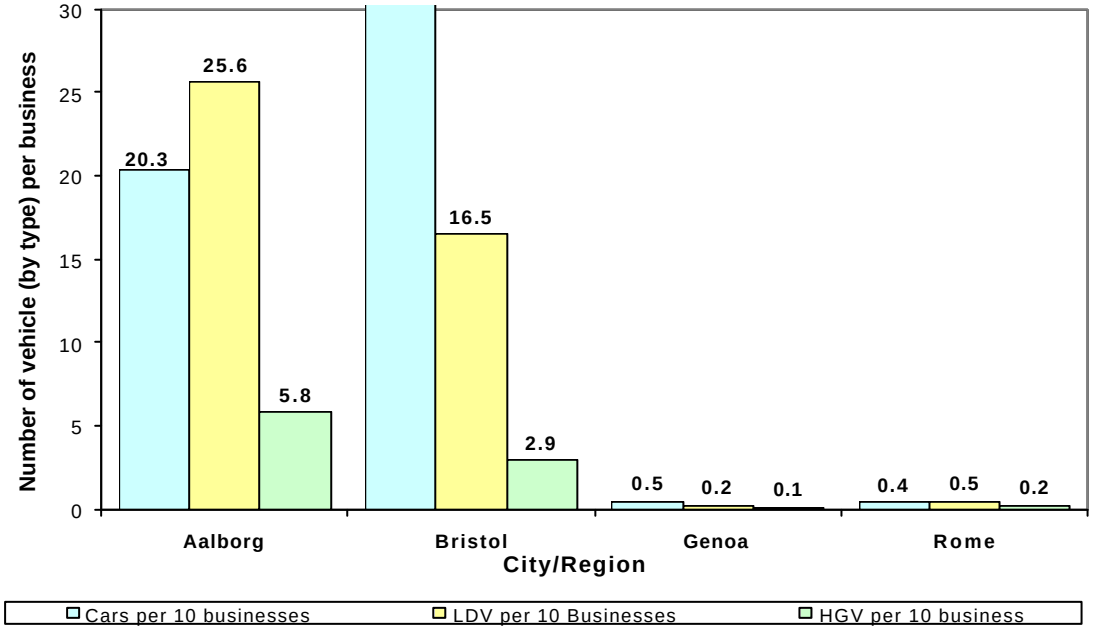
The cities of Aalborg, Genoa and Rome each have a similar number of businesses per kilometre of road space (Figure 4.9). Bristol has a much higher number of businesses per kilometre of road space than the others, this is likely to be because there are many retailers located in shopping malls that are included in this area but are not counted as road space. However, the other cities have similar levels of traffic accessing the businesses along similar road lengths.

Figure 4.9: Number of businesses per km of roads in the target area



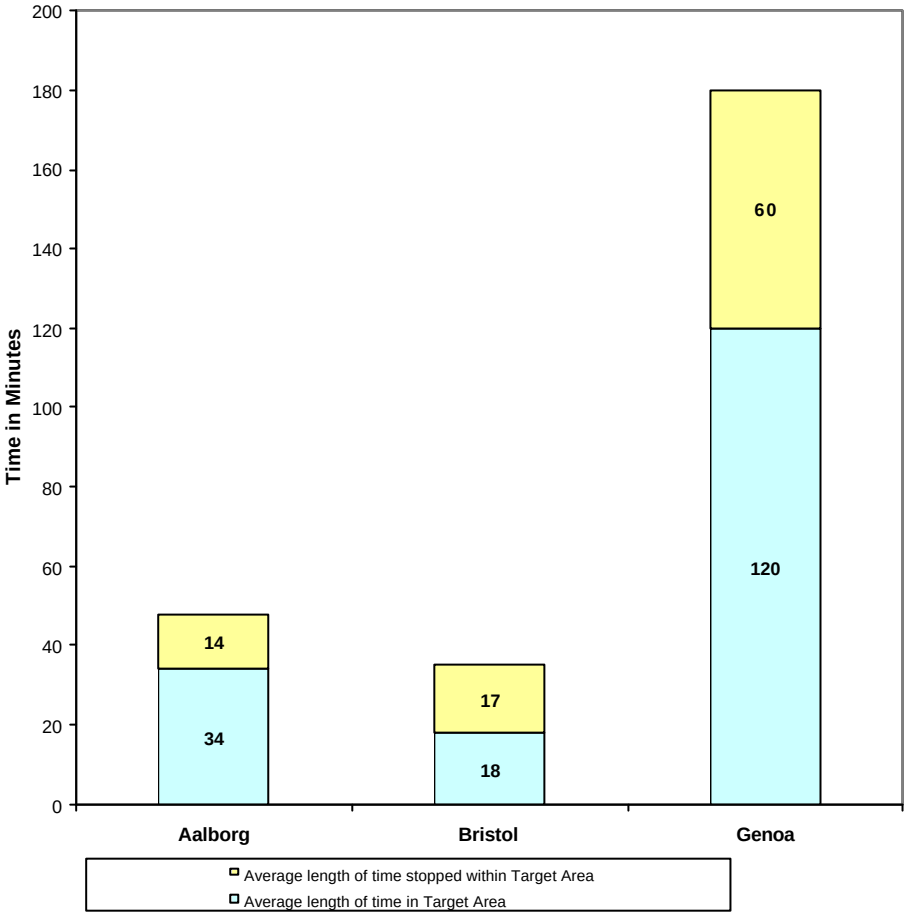
4.4 Vehicles in Target Area

Figure 4.10: Number of vehicle (by type) per business



The number of vehicles that gain access to the target area per business, this was felt by the group to be one of the most problematic indicators despite being potentially of great value and interest to the study (Figure 4.10). The fundamental flaw in this study is that the cities all had problems with the location of the counters so as to include only those vehicles that were accessing the area to load or unload vehicles. This is particularly the case for Bristol and Aalborg who included some traffic that drove through the target area.

Figure 4.11: Average time spent within target area and average time stopped in target area



The total length of time that vehicles spend in the target area varies considerably (Figure 4.11). In Bristol the vehicles spend the shortest amount of time on average in the target area and the time spent is the most efficient as there is an almost equal ratio between the time spent in the area moving and stopping to unload. Aalborg has a much lower ratio; this is because the vehicles get funnelled into a narrow street, which limits the possibility of over-taking other vehicles. This effect has been tackled through the introduction of the 'Drivers Agreement'.

4.5 Background indicators

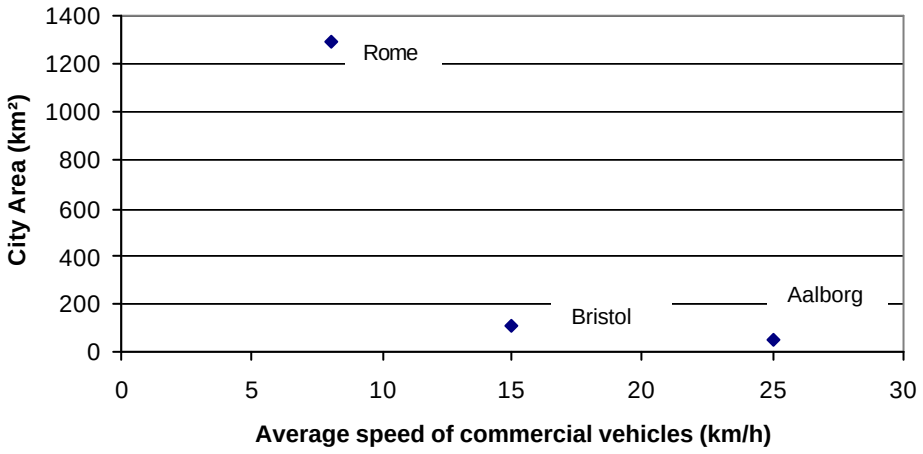
All of the cities provided further data that, although of not direct relevance to the city logistics situation, show some interesting results when compared to data gathered from the common indicators. These findings are outlined in Table 4.6.

Table 4.6: City logistics background data compared to common indicator data

Background Indicator	Aalborg	Bristol	Genoa	Rome
No. Businesses in the wider area	310			
% Road with access and/or time restriction	20 (time)	10 (time / weight)		40 (time / weight)
% Roads accessible for Commercial vehicles	98	96	100	
Average speed of Commercial vehicles (km/h)	25	15	23	8
Common indicators				
City Area (km²)	53	110		1,290
Length of Road Network (km)	778	1,204		32,744

The table compares some of the more relevant benchmarks gathered by the city which show some interesting results. In particular there is a relationship between the size of the city and the average speed of goods vehicles movements which shows that the largest cities have a far lower average speed of vehicle. This relationship could be further investigated when additional cities join the city logistic working group.

Figure 4.12: The average speed of commercial vehicles in relation to the area of the city



In addition, it was found that of the cities that provided data, 96% of the city roads are accessible to commercial goods vehicles, whatever the size of the city.

The rest of the data collected by the working group for the common indicators has been analysed and is displayed in full the Common Indicator Report (Annex A1) and the headline findings are summarised in the final report.

5. CONCLUSIONS

5.1 Introduction

This section of the report summarises the key findings from the quantitative aspect of the benchmarking exercise. The qualitative information from the three site visits attended and sample case studies from the working group are documented in Annex A3.2.

Section 5.2 is a review of general conclusions from the data collected by the working group. These conclusions are applied, in section 5.3, to suggest a series of general recommendations for cities seeking to learn from the outcomes of the research. In addition recommendations have been made regarding the process of benchmarking, based upon the group's collective experiences after year one of the project.

The final section (5.4) outlines the next stage of the benchmarking process and the future intentions of the city logistics working group.

5.2 Conclusions

The main findings of the city logistics working group were twofold; the main conclusion relates to the importance of the area of study and the second was that it is very difficult to obtain data for the city logistics theme unless the participants had previously been involved in a project about city logistics. Thus, without any previous studies of city logistics it is difficult to recognise the negative effect city logistics is having on urban transport infrastructure. Without any awareness of the problem there is unlikely to be the desire to complete a study and so the aim is that the research of this working group has helped to raise the profile of city logistics and the need for urban freight management. The main conclusions of the city logistics working group are outlined below:

- Due to the low number of working group participants it has been difficult to draw in depth comparisons between the various cities in the group. It is hoped that with more cities in the group for year two of the Urban Transport Benchmarking Initiative the city logistics working group will be able to present a more thorough quantitative analysis.

- The concept of the target area worked well; this allowed the cities to focus on the area that was most significantly impacted by the actions of city logistics. In all of the cases where complete data was provided this area was 1% of the total area of the city and each city's target area represented the site for the concentration of retail businesses.

- Very similar levels of access restriction, such as pedestrianisation, exist in the cities of Bristol and Aalborg. All of the cities in the group have implemented some form of limited access for commercial vehicles. The majority of the cities in the group have limited access by time of day, while several offer varying levels of access according to the type of vehicle. Bristol is unique in specifically outlining times where it is permitted to unload.

- The benchmarks related to type of business vary significantly according to city. There is no clear way to explain this using the data. The only variation that can be explained is the type of shops present in each of the cities. In Bristol, for example, there is a high proportion of department stores and in Genoa there is a higher than average proportion of cafés. These findings indicate the nature of goods movement and freight deliveries in each of the cities' target areas, which is of great use to any city seeking to implement a goods management system such as that being trialled in Bristol.

- The number and density of businesses in the target area of each city in the working group also varies significantly. In Bristol there is a higher proportion of large shops compared to the other cities in the working group. This pattern appears to have emerged because of the planned nature of the Central Business District (CBD) compared with those in other cities. In the other cities in the working group a large proportion of retail establishments are operated on a much smaller scale by families and individuals. This is very important, because the different ways these firms operate significantly affects the number and scale of deliveries that are received on a daily basis. This finding is highly significant and is likely to have a major influence over the degree of impact that deliveries and freight movements will have in a city. This is therefore an ideal topic for further analysis in year two of the Urban Transport Benchmarking Initiative.

- The number of vehicles entering the target area is naturally very important to benchmark from a city logistics perspective, but presented one of the toughest challenges in terms of collecting data. The difficulty encountered was primarily due to the different sizes of the participating cities as well as problems with measuring the data. As a result the information that has been gathered may not truly reflect the situation in each of the participating cities. Several of the cities had problems identifying a suitable location for their traffic counters. Key problems encountered stemmed from trying to ensure that all the vehicles being counted were entering the target area. Further difficulties arose from not being able to verify whether all of the vehicles entering the target area are actually making deliveries, passing through the target area, or accessing the city centre for alternative reasons. In year two of the project, the process of traffic counting will need to be refined if it is to be successfully implemented.

5.3 Recommendations

The group travelled to three different cities and each one had established schemes that were of interest to the group. The most interesting of these practices was the Freight Consolidation Centre established in Bristol to enable the efficient movement of freight to retailers in the city centre. When the group visited the city the project was still in development, but a presentation was given to the group by EXEL Logistics to explain how the project is intended to work. This is an exciting development which is being pioneered in Bristol and has never before been attempted in an Urban City Area. As a result all of the participating cities were excited by the potential of this scheme and further research could focus upon its transferability to other cities seeking a solution to freight congestion in the city centre.

Aalborg also displayed a range of interesting practices, which involve much smaller financial, and infrastructure outlay, but which appear to be highly effective. The city of Aalborg created a forum ("Beer and Sandwich Evening") which enabled delivery drivers who operated in the city centre to meet and discuss their operations. This "Beer & Sandwich Evening" has helped the drivers become familiar with each other and now means that the drivers have a more communicative working environment. Aalborg City also circulated a pamphlet with a drivers' code of conduct and map

showing the recommended delivery routes of the city centre. Both of these are cost effective, simple measures to implement which have greatly improved communication and flexibility in the delivery of goods within the city centre. Both of these good practices are demonstrations of the cities, operators and customers working together in order to improve the transport of goods into the city centre. These ideas could be readily transferred to other cities seeking to establish better lines of communication among urban logistics stakeholders and have the added attraction of requiring only modest financial outlay.

During the final meeting of the city logistics working group in Rome, potential indicators for the second year of study were identified. It is hoped that some of these indicators will help to fill the data gaps and assist in answering the research question originally posed by the working group. The indicators proposed for consideration in year two included:

- Standard retail time (shop opening hours).
- Distribution of stops per vehicle (average mixes 1 stop of independent shop owner with 10-12 stops of larger operator)
- Traffic counts would need to be matched with what vehicles are actually doing, e.g. deliveries / pick-ups, excluding thoroughfares, garbage disposal, cleaning vehicles etc.
- Distribution of deliveries over business types (main drivers / demands for deliveries)
- Indicators regarding the economy of the system

These additional indicators would provide greater background depth to the data and should help identify which types of business generate the most freight traffic. Most of these suggested indicators would undoubtedly lead to a better understanding of the information already gathered in year one.

A final recommendation from the working group was that the working group should try to identify a simpler question that can be answered using simpler data. The group was slightly over ambitious in year one of the initiative and the consensus of the group is that a simpler approach to year two, based on available data, will offer more meaningful results.

5.5 Next steps and future intentions for the working group

The city logistics working group was in a relatively unique position compared to the other groups participating in the Urban Transport Benchmarking Initiative. While the other themes presented by the project have been reasonably well documented, virtually no comparative work has previously been undertaken in the field of city logistics. This in itself is an important finding, because it suggests that the data gathered by the working group has the potential to develop into an important baseline for future studies. The group was keen to build on the study initiated in the first year of Urban Transport Benchmarking and hopes to be able to attract new participants to the working group for year two of the initiative.

The immediate next steps for the city logistics working group include:

- Dissemination of year one results as widely as possible.
- Attract a greater number of participants to the working group to add value to the process of benchmarking.
- Review the working group theme and research question in order to try and narrow the focus of the benchmarking exercise for year two of the Urban Transport Benchmarking Initiative.

- Continue the Target Area" concept which was very successful for the collection of city logistics data during year one of the initiative.