Stakeholder Consultation and System Performance Scenarios
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## Glossary of abbreviations used

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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AVL</td>
<td>Automatic Vehicle Location (vehicle tracking system)</td>
</tr>
<tr>
<td>BB</td>
<td>Black Box</td>
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<tr>
<td>ERG</td>
<td>European Reference Group</td>
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<tr>
<td>FDMS</td>
<td>Freight/Fleet Distribution Management System</td>
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<tr>
<td>GPRS</td>
<td>General Packet Radio System</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>GSM</td>
<td>Global System for Mobile communications</td>
</tr>
<tr>
<td>HD</td>
<td>Handheld Device</td>
</tr>
<tr>
<td>HGV</td>
<td>Heavy Goods Vehicle</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communications Technology</td>
</tr>
<tr>
<td>ITS</td>
<td>Intelligent Transport Systems</td>
</tr>
<tr>
<td>LGV</td>
<td>Light Goods Vehicle</td>
</tr>
<tr>
<td>LTL</td>
<td>Less-than-full Truck Load</td>
</tr>
<tr>
<td>PDA</td>
<td>Personal Digital Assistant (palmtop computer)</td>
</tr>
<tr>
<td>RDS-TMC</td>
<td>Radio Data System – Traffic Message Channel</td>
</tr>
<tr>
<td>RFID</td>
<td>Radio-Frequency IDentification</td>
</tr>
<tr>
<td>Satnav</td>
<td>Satellite Navigation (system or device)</td>
</tr>
<tr>
<td>SCOOT</td>
<td>Split Cycle Offset Optimisation Technique (traffic signal control system)</td>
</tr>
<tr>
<td>SMS</td>
<td>Short Messaging Service (mobile phone text)</td>
</tr>
<tr>
<td>TRG</td>
<td>Transportation Research Group (University of Southampton)</td>
</tr>
<tr>
<td>UTMC</td>
<td>Urban Traffic Management and Control</td>
</tr>
<tr>
<td>UTMS</td>
<td>Urban Traffic Management System</td>
</tr>
<tr>
<td>UTC</td>
<td>Urban Traffic Control</td>
</tr>
<tr>
<td>VMS</td>
<td>Variable Message Sign</td>
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</table>
Executive Summary

The stakeholder consultations have highlighted the key issues described below.

**Which vehicles/goods should be eligible for priority access to an urban centre?**
There was no consensus of opinion here, as several classes of vehicle or goods were suggested by different stakeholders as meriting priority access, e.g. vehicles delivering from or to a consolidation centre and clean, environmentally-friendly vehicles. Restricting access for older, more polluting vehicles, was generally accepted as being desirable but is being done through other measures (e.g. Euro emissions standards) anyway. Schemes that aim to restrict the largest or heaviest vehicles may be counter-productive as they tend to be the most efficient. Priority according to loading factor was considered to be difficult to implement and would need to bear in mind that all vehicles are empty at some stage of their trip. A fundamental perceived issue was in ensuring that any priority schemes are equitable.

**What UTMS information do freight distribution managers and drivers need?**
Delivery bay information and pre-booking options would be very useful. Statistical data on average transit times along street sectors, by time of year and day, would be most beneficial for scheduling purposes. Planned roadworks data would also be useful. Real-time traffic data is of rather limited use for FDMS as schedules are usually planned a day in advance and rescheduling may not be feasible. Traffic information is of more use to drivers but only if the data is up-to-date and accurate and there is scope for rerouting.

**What FDMS data could urban traffic management systems benefit from?**
Freight vehicle data were considered to be of most value for planning/modelling purposes. Real-time tracking data are not useful for most UTMS as they do not try to actively control freight vehicles. However, information about HGV breakdowns could be useful for UTMS.

**What are the best methods for UTMS/FDMS/Vehicle communications?**
There was no consensus of opinion here, with various communications methods being suggested. The proliferation and diversity of mobile devices makes the market uncertain.

**What are the main barriers to sharing data between UTMS and FDMS?**
The main stated barriers were data privacy, cost, unclear benefits, technical and organisational issues. The large numbers of freight operators and traffic control centres, operating in a variety of ways, makes data sharing a highly challenging task.

System Performance Scenarios

This deliverable defines the meaning of “function”, “system”, “use case”, “situation” and “scenario” and presents some illustrative examples of scenarios that may be tested within SmartFreight. The scenario descriptions at this early stage of the project are necessarily at a high level. More detailed and concrete specifications will be made later in the project, reflecting the level of implementations to be tested and simulated in the SmartFreight test sites. These local scenarios will describe the functionalities made available at (or simulated for future use in) the test sites. These descriptions will be used for the work on proof of concepts and the verification of ICT solutions (WP6). They will also be the basis for formulating research questions and hypotheses, to be the used in the impact evaluation of the new concepts of SmartFreight (WP7).
1 Introduction

This deliverable describes the work that has been undertaken in Task 2.2 (Stakeholder Consultation) and Task 2.3 (System Performance Scenarios).

Stakeholder Consultations

The objectives of Task 2.2 (Stakeholder Consultation) were to:

- Prioritize the user needs that were identified in Deliverable 2.1 (User Needs Review)
- Identify future challenges associated with developing combined freight distribution management systems (FDMS) and urban traffic management systems (UTMS).

This was done through consultation with:

- European Reference Group - a panel of traffic management and freight distribution experts drawn from across Europe
- UK Reference Group - an invited audience of 26 people working in traffic management and/or freight distribution in the UK
- Various stakeholders in the SmartFreight partners’ countries.

The consultations with the European and UK reference groups were undertaken as one-day events involving a small number of presentations interspersed with extended discussion sessions. In addition to these two main consultation exercises, SmartFreight partners undertook consultation with various stakeholders in their own countries. These consultations were made in various ways including telephone interviews, face-to-face interviews and informal discussions at other meetings. A common questionnaire was used by partners to guide the interviews and to ensure that the partners asked stakeholders similar questions.

In addition, as part of the preparations for the stakeholder consultation, a small study was made to identify short term visions in the context of current investments in IT systems supporting FDMS operations in selected transport companies. This uses a case study approach and comprises three companies in Sweden. A short report is included here in Appendix 1.

System Performance Scenarios

The objective of Task 2.3 (System Performance Scenarios) was to identify scenarios that represent the ideal performance of the functionalities addressed by the SmartFreight project. At this stage of the project, the scenarios are specified at a high level; more detailed specifications related to the test site implementations (in real life in Trondheim and by simulations in Winchester and Bologna) will be made later in the project as part of WP6 and for use in the impact evaluation of the SmartFreight concepts in WP7.
2 Stakeholder Consultations

2.1 European reference group consultation

The SmartFreight project invited a number of people with expertise in either urban traffic management or freight distribution to join a ‘European Reference Group’ (ERG), who will act as independent ‘stakeholders’, providing guidance and advice during the project. The first meeting with the ERG took place on 17 June 2008 in Brussels. The members of the ERG who took part in this meeting were:

- Hervé Levifve (City of Paris)
- Toine Molenschot (City of The Hague)
- Magnus Jäderberg (City of Gothenburg)
- Dieter Wild (PTV)
- Eva Gelová (CDV)
- Zohra Roissac (Volvo)

In addition, Peter Sonnabend (DHL), a member of the ERG, was unable to attend this meeting but provided his comments by email, based on the briefing papers that were sent to the ERG in advance of the meeting:

- A note, outlining the purpose of the meeting and the desired outcomes (see Appendix 2).
- A questionnaire designed by TRG, University of Southampton, asking various questions relating to freight distribution and urban traffic management issues (see Appendix 3). The questionnaire was intended to give the ERG members an indication of the questions that we were seeking to answer. Although they were not explicitly asked to complete the questionnaire prior to the meeting, two members did so - these responses were included in the summary of the discussion below.
- Deliverable 2.1 (full version and summary version).
The meeting agenda was:

**Presentation of the SMARTFREIGHT project** - Hans Westerheim (SINTEF)

**Purpose of the SMARTFREIGHT Reference Group** - Gabriela Barrera (POLIS)

**Presentation of WP2 preliminary results on analysis of urban freight transport challenges & requirements** - Tom Cherrett/Fraser McLeod (TRG)

**WP2 discussion** (facilitated by TRG)
- current & future freight transport needs for the various users involved (e.g. city authorities, freight distributors, freight owners, lorry drivers);
- problems encountered by users;
- ICT solutions to these problems, with particular emphasis on sharing data and information between the various users;

**Presentation of WP6 ‘Proof of Concepts and Verification of ICT Solutions’** - Stig Franzén (Chalmers University)

**WP6 discussion** (facilitated by Chalmers)
Local scenarios for the services to be provided

**Conclusions** - Gabriela Barrera (POLIS)

Tom Cherrett (TRG), Brussels, 17 June 2008
The WP2 discussion was led by Tom Cherrett (TRG) and was based around the following six fundamental questions:

1. What types of freight vehicle (or goods/services) should receive priority access to an urban centre?
2. What traffic information do freight distribution management systems need?
3. What traffic information do lorry drivers need?
4. What data from freight distribution management systems (or individual freight vehicles) could urban traffic management systems benefit from?
5. What are the best methods for UTMS – FDMS and UTMS – individual vehicles communication?
6. What are the main barriers to sharing data between the UTMS and FDMS?

The ensuing discussions surrounding each question are summarised here:

**What types of freight vehicle (or goods/services) should receive priority access to an urban centre?**

Firstly, it was considered that freight vehicles may deserve some form of priority over cars, on the basis that the freight sector is more consolidated than private traffic in terms of the utilization of space (i.e. many cars contain only one person, whereas a lorry may contain lots of goods). However, from the point of view of equity, the city authority representatives considered that it could be unfair to decide that one type of service or goods type should receive priority over another one, as they have to guarantee accessibility. The usual way to discriminate is by the characteristics of the vehicle, for example, priority may be considered for electric delivery vehicles and there are several existing examples (e.g. in Germany, The Hague, London) of restricting access by the engine standard. Providing priority for individual freight vehicles is not undertaken at present.

City authorities have to balance the needs of the various users and they may use carrots (e.g. incentive schemes) or sticks (e.g. penalty charges) to achieve their goals. One of the city representatives considered that incentive schemes rarely worked very well and that sticks tended to be more effective. Some cities (e.g. in Sweden) are considering allowing freight vehicles to use existing or new bus/freight lanes, in particular for high technology environmentally-friendly vehicles. Using bus lanes for freight priority was considered to be out of the question in The Hague, since it could have an impact on the efficiency of the public transport system, though it was mentioned that some shared lane use schemes had appeared to be successful (e.g. in Newcastle, UK).

Although it was considered that priority according to loading factor was desirable, this could be difficult to implement. A scheme in Gothenburg, under the START project, which sought to give priority according to loading factor, was reported to be unsuccessful in increasing loading factors.

Enforcement of restriction schemes is necessary: a scheme in Paris which sought to restrict freight vehicles by engine class could not be controlled effectively and was widely abused. Schemes that aim to restrict the largest vehicles (generally on the grounds of safety, noise or environmental reasons) may be counter-productive as they tend to be the most efficient vehicles and perhaps the most deserving of priority.
There seems to be an increase in the number of smaller delivery vehicles being used within cities due to tight time delivery windows, accessibility (e.g. narrow streets) and a shortage of HGV drivers.

The concept of consolidation centres and giving priority to consolidation centre vehicles (preferably environmentally-friendly vehicles) or penalizing freight companies not using the consolidation centre was suggested and was thought to be an interesting idea. Other vehicle types that were suggested for priority included hazardous goods and vehicles that have to access restricted areas such as pedestrian zones.

**What traffic information do freight distribution management systems need?**

Delivery bay information and pre-booking options would be very useful for drivers. Trials have been undertaken in Germany, Paris and a trial is due later this year in London under the CVIS project. Cost is an issue as, for example, in Paris there are 10,000 delivery bays which would be expensive to equip with the loading bay detection and other equipment needed.

Statistical data on average transit times along street sectors would be highly beneficial for improving scheduling, where it is estimated that around 80% of potential efficiency gains are won or lost. While routing/scheduling software employ advanced optimization algorithms they tend to make very basic assumptions about road speeds. A major step forward would be to incorporate UTMS traffic data, collated by time of day, time of year etc., with non-recurring incidents like accidents or roadworks filtered out, into the scheduling models. Additionally, information about planned events such as roadworks would be useful to allow the freight manager to take these into consideration.

Real-time traffic information cannot normally be used for scheduling as it comes too late. It is not normally easy to reroute or reschedule dynamically in response to traffic conditions. There may also be limited scope for changing schedules as customers will be expecting deliveries at the times which have already been specified. Providing route guidance information within an urban setting was considered to be rather limited in scope, except for the case of dangerous goods, for which personalized routing for different future scenarios is relevant.

Freight navigation systems should be improved to include better information, including preferred lorry routes, location of facilities, regulations (e.g. loading restrictions) as well as information about traffic congestion and best times of day to enter the city.

It was noted that in the Netherlands, traffic data (e.g. accident locations) tends to be provided by private service provider companies who obtain traffic information from traffic management centres and provide it to end users in whatever formats they desire.

**What traffic information do lorry drivers need?**

These were considered to be more or less the same as those for FDMS. It was considered that there is a tendency from the logistics sector towards centralized systems to carry out their activities. New drivers or drivers from abroad on a single visit may benefit the most from traffic information. In addition, they would benefit from having a single window virtual information desk (regulations, access times, service points, local routing, alternative delivery schemes, e.g. Aalborg possibility to drop shipments at other forwarders’ terminals if receiver in centre is not accessible when vehicle arrives outside access hours).
What data from freight distribution management systems (or individual freight vehicles) could urban traffic management systems benefit from?

Freight vehicle destination information could be useful for traffic management. For example, where cities operate an environmental zone they might want to direct lorries around the zone and there might be different routing options (e.g. going clockwise or counter-clockwise on a ring road).

It was noted that freight vehicle data is available from some electronic toll collection systems.

Freight vehicle data, particularly origin-destination data, are needed for freight modelling and planning purposes. At present, in modelling work it is often assumed that the traffic stream contains a fixed proportion of freight vehicles (e.g. 20%). Obtaining real data from freight vehicles could help to improve these models.

Information about lorries accessing certain parts of the city would be beneficial in terms of enforcing regulations. For example, automatic signals from vehicles to loading bay wardens could be used, as is being tested in the PARFUM project (www.parfum-life.eu).

What are the best methods for UTMS – FDMS and UTMS – individual vehicles communication?

One person thought that the cheapest methods are the best! Another considered that city authorities should not be directly involved in this role but that traffic information should be an added value service provided by private service providers. Where UTMS data are to be fed to FDMS, one questionnaire respondent thought that this should be done using a single communications channel. The great number of individual freight owner/drivers or very small fleets without a central FDMS would suggest that communication with individual vehicles would also be needed. One problem in communicating with vehicles that has arisen is the proliferation of use of mobile devices (phones, PDAs) as opposed to fixed, in-cab systems. This has led to uncertainty about the future direction of fleet management systems. There seems to be a trend towards developing open systems architecture. At present there are many different systems available (Dynafleet etc) and different interfaces have to be developed, which is very expensive. When communicating with vehicles, messages need to be very simple and easy to understand, especially bearing in mind the large number of driver nationalities.

What are the main barriers to sharing data between the UTMS and FDMS?

Data privacy/confidentiality was considered to be one of the main barriers. Some companies might not want to divulge some sensitive information to another organisation. It may also be difficult to obtain data from the large number of small operators. These problems might be ameliorated where there are good working relationships forged between the partners involved and where secure data capture, storage and use can be demonstrated.

Cost (and benefits) were also highlighted: who pays for the system and who gains from it?

Organisational issues were also raised: who owns the data?; who is responsible for what?

Technical issues: there may be issues associated with proprietary, non-interoperable systems.
2.2 UK reference group consultation

Objectives
The key objectives of the consultation meeting held on 27 May 2008 at TRG, University of Southampton were to:

1. Disseminate the goals of the SmartFreight project
2. Introduce the concept of joint urban traffic management system (UTMS) and freight distribution management system (FDMS) co-ordination
3. Gauge opinion on the key user needs of UTM and FDM systems

The meeting was chaired by Steve Norris, Chairman of the ITS (UK) Freight Interest Group and President of ITS (UK) (see Appendix 4 for his biography).

Approach
Members of the ITS (UK) Freight Interest Group and Local Authority/Urban Interest Group were invited to attend, representing an excellent cross section of members from the freight logistics and local authority (traffic management) sectors (see Appendix 5 for delegate list). A total of 26 people attended plus Tom Cherrett and Fraser McLeod, representing the SmartFreight project.

The event was centred around a keynote presentation on the goals of SmartFreight in which the concept of ‘air traffic control’ for smarter urban goods management and delivery was proposed. Linked presentations on the EU ‘START’ project and the work of the South London Freight Quality partnership, particularly focussing on innovative urban goods management systems were then heard, followed by an operator’s perspective (Royal Mail) on the problems currently experienced by a large fleet operator running time-dependent logistics in an urban setting. The meeting ended with a visit to the ROMANSE Office, Southampton’s traffic control centre.

The speakers were:

- **Presentation of the SMARTFREIGHT project** - Tom Cherrett and Fraser McLeod (TRG)
- **START project experience: managing freight in urban areas** - Tim Hapgood (Bristol City Council)
- **South London Freight Quality Partnership – Issues with setting up a freight consolidation centre** - Alan Lewis (Transport and Travel Research Ltd)
- **Fleet management in an urban centre** - Alex Luckman (Royal Mail)
- **Guided tour of the ROMANSE traffic control centre** in Southampton - Nic Burns and Martin Wylie (ROMANSE)

Discussion sessions were held after each presentation which generated some lively debate. The main points which came from the presentations and discussions are summarised below. A questionnaire was also handed out during the meeting which sought delegates views on UTMS/FDMS issues - the questions asked and responses received are also described below.
TRG, University of Southampton, 27 May 2008

ROMANSE Office, Southampton, 27 May 2008
Discussion Summary

1. Barriers to greater UTMS & FDMS co-ordination
The discussions started around the potential difficulties in data dissemination between FDMS and UTMS and the role of a third-party controller in such an operation. From a public policy perspective, one needs information that can be freely disseminated but this often conflicts with the private sector generators whose customers want to protect their competitive advantage which is partially derived from the data itself.

For such a ‘3rd party freight traffic controller’ to function within a local authority, the local traffic authority would have to sit at the centre and ‘own’ the data. Issues then arise of how this data source would be made available, to whom and at what charge? Sheffield City Council has decided not to go down this route of trying to monetize data. They treat both public and private data sources the same, under the requirements of the Traffic Management Act.

2. UTMS needs for FDMS data/systems
Other needs identified, in addition to those highlighted in Deliverable 2.1, were accurate and timely information from FDMS on vehicle breakdowns on the network and what recovery options were required. As only specialist vehicles are capable of HGV recovery, their deployment and management need to be closely monitored to ensure the efficient operation of the network.

3. FDMS needs for UTMS data/systems
Could delivery vehicles use bus lanes during off-peak periods in the timetable? The argument was put that any coherent urban freight strategy should address the issue of co-existing infrastructure. Some members of the group felt that the current priority lanes in London were a sub-optimal use of road space.

The ‘3rd party freight traffic controller’ concept could work and could potentially earn money if operators viewed it as a ‘value added’ service. If freight operators can gain tangible benefits (e.g. reduced journey times) from the use of such facilities (e.g. shared freight/bus lanes) then they would be prepared to pay a premium for such services.

The issue of night time deliveries was raised and whether UTMS could aid in the monitoring and control of such a system, which could be part of a co-existing infrastructure (different access rights for different vehicle groups by time of day). Noise pollution and the overtime costs associated with store operation out-of-hours were mentioned as key restrictive factors.

Specific user needs identified by Royal Mail were:
- Accurate road closure lists and road ‘open’ lists detailing when roadworks were due to start and end.
- Regular updates to FDMS of the future roadworks schedule
- Preferential access through habitually congested routes (where priority public transport lanes exist)
- Traffic delay forecasts to help in route/collection/delivery scheduling
4. Drivers for change

The UK has many Victorian town centres with no ‘rear-of-store’ delivery facilities. Given that the latest planning policy guidance advocates the use of brownfield land for the development of dwellings to revitalise urban centres and curb urban sprawl, goods and service vehicle access will steadily get worse. As a result, there could be a natural driver from the industry for greater involvement of UTMS in the management of delivery bays and vehicle access on behalf of logistics providers to help meet the tight delivery windows dictated by retailers.

The issue of whether freight consolidation scheme participation (using Bristol as an example) should be made compulsory was raised as a way to force a step change in urban delivery practices. In the case of the Broadmead centre in Bristol, of the 63 retailers currently in the scheme, a 75% reduction in delivery vehicle movements has been realised over the traditional store delivery methods previously used. Planning regulations could be used to stipulate that vehicles must use the consolidation centre unless they are more than 90% full. (Issues related to the Goteborg scheme (START project) were highlighted which required a minimum 65% load factor before goods delivery vehicles would be allowed preferential access to inner city loading bays. The scheme failed due to difficulties in checking the load factor of vehicles coupled to the fact that a significant proportion of hauliers were under the minimum limit.)

A need was identified to design consolidation initiatives into all new retail developments and a good mechanism to enable this would be through property leasing arrangements. It was noted that large retailers, with their own networks of distribution centres, effectively already carry out their own consolidation of loads at their own premises. It was also noted that another potential barrier to the use of a consolidation centre is the fact that distribution costs tend to be only a relatively small proportion of overall supply chain costs, so making changes in distribution methods may be relatively unimportant to a large company.

Questionnaire findings

The stakeholders were asked to complete a questionnaire during (or after) the meeting. Ten completed questionnaires were received. The questions that were asked are shown in blue italics below. Analysis of the responses and comments received are shown in black text.

Q1a. Freight priorities

The SmartFreight project is considering providing preferential treatment (e.g. improved access) for certain categories of vehicle that are perceived as being ‘green’; conversely, increased restrictions may be applied to other vehicles that are perceived as less ‘green’. Various categorisation methods have been suggested. Please rate the categorisation methods in the table below in terms of:

- **Positive impact for the city as a whole** (1=negative impact very likely; 2=negative impact possible; 3=neutral; 4=positive impact possible; 5=positive impact very likely)
- **Feasibility of introducing such a scheme successfully** (1=highly unlikely; 2=doubtful; 3=not clear; 4=likely to be feasible; 5=straightforward)
### Table 1 - Freight priority scores (UK)

<table>
<thead>
<tr>
<th>Categorisation of lorries by</th>
<th>Positive impact</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fuel types (e.g. ‘clean’ fuels preferred)</td>
<td>4.2</td>
<td>3.5</td>
</tr>
<tr>
<td>2. Engine standard (e.g. Euro IV)</td>
<td>4.4</td>
<td>4.0</td>
</tr>
<tr>
<td>3. Gross vehicle weight (e.g. very heavy lorries may be restricted)</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>4. Number of axles</td>
<td>3.0</td>
<td>3.3</td>
</tr>
<tr>
<td>5. Vehicle fill (e.g. full vehicles preferred)</td>
<td>3.7</td>
<td>2.1</td>
</tr>
<tr>
<td>6. Goods/service types (e.g. essential services such as waste collection may be preferred)</td>
<td>3.2</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Note: the average scores from the responses received are shown here for convenience

### Analysis

From the above scores it can be seen that the engine standard was considered to have the most positive impact for the city as a whole; however, it was noted that these standards are being introduced and enforced through other measures anyway so there is perhaps no need to provide incentives such as priority access to vehicles with the lowest emissions.

Priority access according to vehicle fill (=load factor or saturation rate) was considered to be the most difficult to implement, with by far the lowest feasibility score.

### Stakeholder comments

**Fuel type**
- Electric and hybrid vehicles should be encouraged
- There is no clear picture about which routes to clean fuel are best.
- The benefits provided by biofuels and LPG (liquefied petroleum gas) are questionable; fiscal incentives are not strong enough.
- Priority access by fuel type may be difficult to enforce.

**Engine standard**
- Vehicle engine improvements are happening anyway so all vehicles will be compliant.
- The benefits may be small and the high operating costs to enforce this may lead to low value for money.
- Priority access by engine standard may be difficult to enforce (TRG note: London’s low emission zone, described in Deliverable 2.1, provides an example of enforcement by engine standard.)

**Gross vehicle weight**
- Weight at what point on the route? Would need to know the average weight for the vehicle’s route. Also, vehicle may be heavy as it is full and therefore more efficient.
• It would only be appropriate to discourage heavy vehicles in historic city centres or other areas with poor access and where loading causes congestion.

• Reducing numbers of very heavy vehicles would lead to more lighter vehicles, which may lead to an overall negative effect (this comment, or similar, was made by three respondents).

**Number of axles**

• Similar to the weight of the vehicle, larger vehicles may be more efficient so should not necessarily be disadvantaged through access restriction measures.

• With more axles the weight is spread between the axles, giving better road wear, so not necessarily a bad thing.

• It may be difficult to enforce. [TRG note: Dublin scheme provides an example.]

• I am not sure what this would achieve (two respondents).

**Load factor**

• I am not sure if priority according to load factor would be sensible as every vehicle is empty at some stages of its journey.

• At what point on the journey would this be measured?

• It could be difficult to measure load factor. [Note - in his presentation, Tim Hapgood (Bristol City Council) mentioned that, as part of the EU-funded START project, Gothenburg had undertaken a trial of using load factors for priority access. In this case, freight distributors were required to register their vehicle fill via a website. Tim did not know if any form of enforcement or checking was undertaken to ensure that the figures provided were accurate and suggested that the information would be available on the START website: http://www.start-project.org/]

• It may be difficult to enforce.

• It may lead to uneconomic routing

**Goods/service type**

• Consolidation service vehicles should be prioritized along with other "green" initiative and council services.

• Prioritizing according to goods or service could be commercially unfair.

• It may be difficult to enforce.

• This would be worth looking into as part of a wider study looking at prioritization of road space.

• Waste vehicles tend to be noisy so giving them priority treatment may have a negative impact.

**Q1b. Freight priorities**

*Are there any other vehicle groups which you think should receive preferential treatment?*

**Responses**

• All HGVs over 7.5T

• Commercial vehicles delivering or collecting on pre-determined routes servicing the city

• Electric vehicles

• Emergency service vehicles only
- Vehicles equipped with automatic vehicle location (AVL) which can be controlled in terms of access times and locations
- Consolidation centre fleets
- Different delivery and service vehicles have different characteristics and different movement, loading/unloading and parking requirements.

Q2. Freight Distribution Management Systems (FDMS)/lorry drivers needs for traffic-related information

Please rate the information items in the table below in terms of:

- Usefulness for freight distribution companies and their drivers (1 = not at all useful; 2 = not very useful; 3 = neutral; 4 = useful; 5 = very useful)
- Feasibility of providing the required information accurately and quickly within an urban setting (1=highly unlikely; 2=doubtful; 3=not clear; 4=likely to be feasible; 5=straightforward)

<table>
<thead>
<tr>
<th>Information item</th>
<th>Usefulness for the freight distribution manager</th>
<th>Usefulness for the lorry driver</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Location of lengthy traffic queues (head of queue, back of queue, queue length)</td>
<td>3.3</td>
<td>4.5</td>
<td>3.4</td>
</tr>
<tr>
<td>2. Estimate of how long it will take to get back to normal</td>
<td>3.5</td>
<td>4.0</td>
<td>3.3</td>
</tr>
<tr>
<td>3. Reporting when a lengthy queue has actually cleared</td>
<td>3.4</td>
<td>4.2</td>
<td>3.9</td>
</tr>
<tr>
<td>4. Location of roadworks</td>
<td>4.1</td>
<td>4.1</td>
<td>4.4</td>
</tr>
<tr>
<td>5. Estimates of journey times on recommended lorry routes</td>
<td>4.1</td>
<td>4.2</td>
<td>3.8</td>
</tr>
<tr>
<td>6. Estimates of delays on recommended lorry routes</td>
<td>4.0</td>
<td>4.3</td>
<td>3.6</td>
</tr>
<tr>
<td>7. Information tailored to the individual vehicle (e.g. according to the route being driven)</td>
<td>3.9</td>
<td>4.6</td>
<td>3.3</td>
</tr>
<tr>
<td>8. Route guidance in the case of an incident (route only)</td>
<td>3.1</td>
<td>4.6</td>
<td>3.3</td>
</tr>
<tr>
<td>9. Route guidance in the case of an incident (route plus reason for diversion)</td>
<td>3.1</td>
<td>4.6</td>
<td>3.3</td>
</tr>
<tr>
<td>10. The ability to pre-book a loading bay slot, operated by a combined UTMS/FDMS</td>
<td>4.3</td>
<td>4.3</td>
<td>3.2</td>
</tr>
</tbody>
</table>

Note: the average scores from the responses received are shown here for convenience.
Analysis

From the responses it can be observed that:

- Nearly all of the information items were considered to be more useful for the lorry driver than for the freight distribution manager. With an average score of 4 or more, all of the information items were considered to be useful for the lorry driver, whereas with some average scores of only 3 (e.g. route guidance), the usefulness for the freight distribution manager was not so clear.

- There was considerable uncertainty about the feasibility of being able to provide some of the above information items. In particular, some respondents doubted that queuing information, tailored information for the driver, route guidance information and loading bay information could be provided. This was reflected in the average scores of only just above 3 (=not clear).

Q2b. FDMS/lorry drivers needs for traffic-related information (for those working directly in freight distribution, others skip to Q3)

Do you currently use any traffic information? If so, what sources?

Only three responses were received to this question - in all cases the freight distributor (or their lorry drivers) did use traffic information obtained via the internet, radio or RDS-TMC.

Do you have any existing needs for traffic information that is not available to you? If so, what are they?

Stated needs were:

- We need to be able to generate accurate expected times of arrivals for the next delivery part and subsequent stops based on live traffic information.

- We need accurate in-cab routing information in real time; we need to feed live traffic delay information into a lorry-based satellite navigation device.

Q3. Urban Traffic Management Systems (UTMS) needs for freight-related information (for those working directly in urban traffic management, others skip to Q4)

Do you currently use any freight-related information? If so, what sources?

Only two responses were received to this question - in both cases the UTMS manager did not use any freight data.

Do you have any existing needs for freight data or information that is not available to you? If so, what are they?

A stated need was:

- Information about HGV breakdowns, e.g. when they occur, an estimate of when they might be cleared (the freight distribution manager should know about recovery procedures and availability of recovery vehicles) and when they are actually cleared.

Q4. Communications media

Which communications media do you think are best for delivering traffic data from UTMS to FDMS (Email, Internet, Phone/SMS text, Radio broadcasts, RDS-TMC, Other (please state)?)

The responses were quite varied with all of them being selected by at least one person. One respondent suggested that email would be best for smaller operators while direct links, using principles laid out by the Travel Information Highway (described in D2.1), would be best for
larger operators. These findings reflected the findings of a survey in Ireland (reported in D2.1) which suggested that various communications media may have to be used.

**Q5. Barriers to implementation**

*There to seem to be few, if any, good examples of data sharing between UTMS and FDMS. What are the key barriers to this?*

- costs (data collection, equipment etc)?
- unclear that significant benefits will accrue for either side?
- complexity?
- security / privacy of information?
- any other issues?

**Stakeholder comments**

**Costs/benefits**

- No common system is used in all vehicles, therefore there would be high costs in trying to achieve standardisation.
- It is unclear if benefits would outweigh costs.
- Costs could be relatively small if direct transfer of data between systems is used - but standards would be helpful.
- The market may be too small.

**Complexity**

- Simplicity is a key requirement; would need a solution flexible enough to work in hired vehicles.

**Security / Privacy of information**

- There could be concerns about commercial sensitivity.
- Confidentiality of customers’ addresses may be an issue.

**Other comments**

- Would need a national solution.
- We need to see a working proven system; we (a freight distribution company) don’t want to spend significant resources in developing this.

**Q6. What opportunities are there for UTMS to benefit from FDMS data?**

**Stakeholder comments**

- Gaining an understanding of the effect of freight deliveries and collections on traffic networks.
- Gaining an understanding of the time needed by freight vehicles, both for travel and for loading and unloading.
- Identification of potential causes of delay (i.e. the vehicle/delivery requirements).
• Avoiding blockages because of breakdowns or vehicles arriving at locations that do not have sufficient capacity.
• Validation of modelling assumptions with respect to freight vehicles.
• Floating vehicle data.
• Track and monitor vehicles; location of large vehicles.
• Support enforcement.
• Gain statistical information; gain a better picture of the volumes of freight, their origins, destinations and routes taken by time of day.

Q7. What opportunities are there for FDMS to benefit from UTMS data?

Stakeholder comments
• Improved accuracy and timeliness of the traffic information received
• Improved efficiency, reduced costs and maximising vehicle/driver utilisation.
• Improved customer service (provision of accurate expected delivery times).
• Improved planning and anticipation of delays/problems.
• Dynamic rerouting.
• Guaranteed unloading bays would be useful.

2.3 Other stakeholder consultations

In addition to the main European Reference Group meeting (Section 2.1) and the main UK consultation (Section 2.2), the SmartFreight partners undertook various consultations, as described in this section.

2.3.1 TRG (UK)

In addition to the main UK stakeholder consultation which was described in section 2.2, Fraser McLeod and Tom Cherrett (TRG) attended a number of freight or traffic management related seminars/conferences which allowed them opportunities to discuss SmartFreight concepts with various interested people. These events are described here (in reverse chronological order), in terms of the presentations made and the discussions which took place which have some relevance to SmartFreight.

10 June 2008, Sustainable Freight meeting, organized and hosted by innovITS, in London (attended by Fraser McLeod)

The theme of this event was “sustainable freight” and was attended by 15 people (see Appendix 6 for delegates list). [Note: The organisers (innovITS) were disappointed by the low attendance and attributed this to a clash with another event on the same day about the plans to introduce congestion charging in Manchester.] Five presentations were given (available within the members’ area of the innovITS Knowledge Transfer Network website: http://www.innovits.com/its-ktn/member/home/index.html) interspersed with open forum debates about the challenges associated with sustainable freight. The meeting agenda is shown below.
Sustainable Freight: Résumé of the last meeting - Tony Wyatt (innovITS)

Mapping For Freight - Chris Greenwood (Map Mechanics)

Logistics & Supply Chain Management - Jeremy Hammant (LCP Consulting)

The Case for Telematics - Jonathan Chadburn (DHL)

Open Forum
What do we need to do with logistics planning to deliver more sustainable freight delivery?

Chartered Institute of Transport and Logistics - Richard Ellithorne (CILT)

Logistics and Route Optimisation - Vince Darley (Eurobios UK)

Open forum
What are the challenges to move sustainable freight management forward?

• What does industry wants to see?
• How can industry plan for change?
• What is needed to move this forward?

Challenges to be addressed at the next meeting

The most interesting points which came out of the meeting were:

• **Freight mapping** - the talk by Chris Greenwood (Map Mechanics, who provide maps for sat-nav and other applications, using Navteq data) outlined current freight mapping capabilities. This echoed the information which was reported in Deliverable 2.1. It was admitted that freight mapping for sat-nav is relatively new and there is scope for substantial improvements. Current information collected by Navteq comes from surveys of existing road signs; clearly, one issue is whether these signs are adequate in terms of describing hazards to freight vehicles. Future development plans may include provision of:
  (i) **preferred lorry routes**, which may be available from road authorities or city authorities
  (ii) **journey time data**, which may be available from private companies (e.g. ITIS Holdings - described in Deliverable 2.1) or from public authorities. A current criticism of sat-nav is that most of the current information contained within it is static in nature and does not represent journey times very well. Incoming journey time estimates could be derived from a mix of current and historic journey time data.

A perceived difficulty, also raised in section 2.2, was the business model associated with a system which uses public authority data (e.g. who pays for what?). Existing costs of purchasing privately collected traffic data were considered to be too expensive.

• **Drivers for sustainable freight transport** - Jeremy Hammant (LCP Consulting, in association with Cranfield University) considered the main drivers to be:
  (i) Corporate social responsibility obligations
  (ii) European and UK legislation
  (iii) Cost of oil

Ways to improve freight distribution may include:
(i) Negotiating with retailers, and other goods owners, to examine their real requirements for deliveries. Fewer deliveries may result in improved vehicle load factors. It was considered that some existing delivery requirements may be in need of review.

(ii) Reversing the trend of centralisation of distribution centres to reduce secondary transport.

(iii) More sharing of freight distribution between competitors.

• **In-cab telematics** - Jonathan Chadburn (DHL) described the telematics that DHL currently use and may like to use in the future, if available. The main existing applications they use are for engine and driver performance management, locating vehicles and communicating with drivers (as described in Deliverable 2.1). They tended to shy away from using sat-nav as they had found that their own scheduled routes (which drivers are supposed to adhere to in normal circumstances) tended to be quicker than those proposed by sat-nav. He also considered existing traffic information (e.g. reported on radio or on variable message signs) to be too unreliable to be of any practical use. Jonathan considered that future telematics systems should see better integration between component parts (e.g. between phones, mobile units, in-cab units etc.).

• **What does the freight industry want to see happen?** The following suggestions were made in the open forum discussions:

  **Confidentiality** - To maintain a competitive advantage, many freight operators will not be inclined to divulge any information about their operations unless there is a clear benefit to be obtained from doing so.

  **Incentive schemes** - government freight grants may be needed to ask as incentives for freight companies to take some risks in making changes to their operating methods. Existing profit margins are so small (Richard Ellithorne (CILT) stated that the average is around 4%; while the DHL representative said theirs was between 2% and 3%) that most freight distribution companies are highly averse to taking any risks or being innovative. It was suggested that most freight distribution companies are reactive to events rather than proactive.

**10 June 2008, presentation by Stephen Greaves, University of Sydney to TRG**

Stephen Greaves (University of Sydney, Australia) visited TRG and gave a presentation on some GPS studies he was involved in. The most interesting study for SmartFreight was the use of GPS to monitor the routes taken by freight vehicles. Raw GPS data were obtained over a 7-day period from 30 trucks in Melbourne, Australia, that were equipped with a passive GPS device which plugged into the cigarette lighter. Data were stored on the device and were subsequently downloaded and processed into meaningful trip information. The 30 trucks belonged to a number of different companies involved in delivering office supplies, paper, food to restaurants, quarry materials and general freight. The companies agreed to be involved on the understanding that their data would not be divulged to anybody else and that the researchers would provide them with feedback about their findings.

The study found that meaningful trip information could be extracted from the raw GPS data but this required a significant amount of effort and intelligence, particularly when dealing with missing data due to signal drop-out. Such origin-destination data could be useful for freight modelling purposes, as was suggested by the European Reference Group (section 2.1). It was agreed that many freight operators are sensitive about providing data that may be commercially sensitive. Stephen Greaves believed that changing this perception is reliant on
convincing freight operators that there is value to them in providing their data to researchers and to policy-makers in order to improve their operations.

Other applications for GPS and freight that were envisaged included derivation of freight vehicle speed-time profiles, which are useful for obtaining accurate fuel consumption and emissions estimates, and integration with weigh-in-motion data, which could be useful for tracking payload information and recording empty running.

15 May 2008, EPSRC Green Logistics consortium meeting in Lancaster (attended by Tom Cherrett)

Green Logistics (http://www.greenlogistics.org.uk/) is a 4-year research programme, involving six UK universities, addressing a range of sustainable distribution measures that are attempting to cut the economic and environmental costs associated with current distribution and logistics operations. The project is made up of 12 work modules with modules 6 (vehicle routing and scheduling), 8 (E-commerce, E-logistics and the environment), 9 (urban distribution) and 10 (reverse logistics) being particularly relevant to SmartFreight. This meeting involved all the core partners and their researchers (Appendix 7) and a presentation was made by Tom Cherrett discussing the work being undertaken in work module 10, looking into new approaches and technologies for improving the movement of waste products and returns through the retail supply chain. Using case studies in Southampton and Winchester, the research is focusing on opportunities for harmonising reverse logistics and waste management processes to improve recycling and reduce wasted mileage across retail supply chains. At present, such processes often operate in isolation with little co-ordination between the numerous supply chains providing core goods and services to businesses on a typical high street.

In the following discussions, the links between the objectives of Green Logistics and SmartFreight were recognised:

- There is a lack of understanding related to the collective impacts of transport operations for both forward and reverse logistics across retail supply chains.
- Green Logistics modules 8, 9, 10, and to some extent module 6, are investigating the potential benefits in terms of reduced transport impacts (environmental and economic) of greater cross-supply chain collaboration in the areas of core goods, and service provision to retailers. This is through a range of measures (out-of-town consolidation centres, local groupage activities, communal testing and take-back schemes etc.)
- The Green Logistics research is not directly addressing the role that a UTMS could play in aiding freight movements into and out of a central business district as a complementary part to any consolidation initiatives. It was felt that the SmartFreight concept of 3rd party control and management of vehicles across-supply chains was very laudable.
- Work module 9 in the Green Logistics project is specifically addressing the impacts of light goods vehicles (LGVs), i.e. goods vehicles less than 3.5 tonnes gross vehicle weight. LGVs are of ever-greater importance in terms of the final delivery of many time-critical, high value goods and are also widely used in industries that provide a wide range of critical support services. There are almost five times as many LGVs as there are HGVs (goods vehicles over 3.5 tonnes gross vehicle weight) currently licensed in Britain. The LGV fleet in Britain is growing at a faster rate than the HGV fleet, and the LGV fleet travels more than twice as many vehicle kilometres each year than the total HGV fleet. LGVs perform a far greater proportion of their total distance travelled in urban areas than HGVs, and consume 25% of the total diesel and 3% of the total petrol used by all motorised road transport vehicles in Britain. Through SmartFreight, the potential benefits...
of better managing the movement of these vehicles will be determined and the merits of joint FDMS and UTMS operation quantified.

15-16 May 2008, ‘Successful Cooperative Intermodal Transport Strategies and ICT Systems’, PROMIT Workshop, hosted by TRG, University of Southampton

This event was co-organised by TRG, University of Southampton, TNO (Delft), TREDIT (Athens) and the Institute of Shipping Economics and Logistics (Bremen) and was held at the University of Southampton. The workshop was organised on behalf of the PROMIT project (www.promit-project.net), whose goals are to promote and disseminate information about intermodal freight transport. The presentations will be made available on the project website.

Day one: Introduction (chair Fraser McLeod, TRG)

- **Keynote speech: Sustainable development and multi-modal strategy of the port of Southampton** Steven Young, Southampton Deputy Port Manager, Associated British Ports

- **Introduction to the PROMIT project and the workshop** Antti Permala, VTT, Finland

- **Successful intermodal organisation and business models** (chair Gerwin Zomer, TNO)
  - Example of intermodal transport successfully applied in national distribution strategy -Coca Cola Drikker Nordic distribution Idar Brunvoll, Coca Cola Drikker, Norway
  - UK Customs perspective on the SAFE PORT Act Mike Weeding, Drugs and Border Security, H M Revenue and Customs, London, UK

- **Integrated Transport Process for International Rail Freight Traffic in Corridors** Wilfried Strothmann, International Transport Consultant, Germany

- **Successful application of ICT in Port Community Systems (PCS)** (chair Constantinos Antoniou, TREDIT)
  - SPIN - the PCS of Southampton Sue Garstone, SPIN Manager, CNS, UK
  - PortNet – Finland’s maritime operations service portal Rolf Bäckström, Deputy director Finnish Maritime Administration, Traffic Dept., Telematics, Finland
  - MOSES - Cluster- and corridor- centric soft infrastructures: Beyond operator-centric and integrator-centric models Dag Atle Nesheim, MOSES Project, MARINTEK, Norway

Day two: Successful intermodal security and policy (chair Marcus Engler, ISL)

- **Security Standards by TAPA EMEA** Julian Hansen, Policy Adviser, Vereiniging TAPA EMEA, Amstelveen, The Netherlands

- **ContainerProbe / ContainerNet for 100% Risk Screening** John Sved, CEO NSD-Fusion GmbH, Delmenhorst, Germany

- **RETRACK – a unique cooperation model for a new rail freight service** Nathan Bowden, TNO, The Netherlands
Of most interest to SmartFreight was the presentation by Steve McCrindle (SCT) on the vehicle booking system (VBS) they use. VBS used at ports are relevant to urban traffic management systems as they influence when lorries travel within cities, or their environs, to arrive at ports to collect (or deliver) goods. If a port does not use an effective VBS then this may lead to peaks of lorry demand and may result in lorries being unable to enter the port and spilling over onto the public road network, creating problems for the UTMS manager.

The VBS used in Southampton is designed to achieve a more consistent flow of truck arrivals (reducing the sizes of peaks), improve truck turnaround times and to provide a simple system which is fair, flexible and easy to use for all users. The effect of introducing a simplified VBS on vehicle arrivals is shown in Figure 1. This shows how truck arrivals have become smoother, particularly during the peak period between 2pm and 6pm.

Figure 1 - VBS impact (source: Steve McCrindle, SCT)

Their system is mandatory ("no booking – no entry") and charges are applied for booking peak time slots and for appointments that are missed (to prevent block bookings ‘just in case they can used’). Port security is improved as all hauliers must register to use the system, must provide bank account details and a VBS security number is needed to gain entry to the port. Bookings are made over the internet (www.sct.uk.com/portuserzone.aspx). This website also allows hauliers to:

- Find out about any issues that are affecting the terminal operation (e.g. high winds or fog), which could allow them to make alternative plans
- View ‘live’ performance at the terminal through web based reporting
1 May 2008 - National Traffic Control Centre, Birmingham (attended by Fraser McLeod)

This event was designed to give visitors the opportunity to hear about the work done at the National Traffic Control Centre (NTCC). The NTCC is run by a company called SERCO on behalf of the Highways Agency. They are responsible for managing and controlling all motorways and trunk roads in England. They work alongside 7 regional traffic control centres in England. Further information about the role of the NTCC and the services they provide was reported in D2.1. Presentations about the NTCC were given on the day by Pete Smith (Highways Agency), Paul Burton and David Lettice (both SERCO). The following information was gained from these presentations and from the ensuing discussions:

- Traffic congestion on motorways and trunk roads was reported to be 65% due to traffic volume, 25% due to accidents and 10% roadworks.
- The motorway and trunk road network in England (~6500km) represents only 2% of all roads but carries one third of all traffic and two thirds of all freight.
- The NTCC provides advice on traffic conditions that could affect movements of abnormal loads (e.g. very wide or long loads, hazardous goods etc.). For example, they can advise of events which could impede the progress of such a vehicle. When an abnormal load is being moved, the NTCC can track its progress and provide updates to interested parties as required.
- In liaison with port authorities and the police, the NTCC provides support for the strategy of queuing lorries on motorways (Operation Stack) when there are problems in moving goods and vehicles through the port.
- Dissemination of traffic information is a fundamental activity of the NTCC. This is done in various ways, including variable message signs (around 350 VMS are mainly used out of the total of 2200 VMS that are available to them and to the regional traffic control centres; journey time estimates on road sections are provided among other information); internet (Traffic England website: http://www.highways.gov.uk/traffic/traffic.aspx); and direct links with interested professional users (e.g. radio stations, motoring organisations, freight distribution companies etc.). They also maintain the Travel Information Highway website, a repository of information for the travel information community (http://www.tih.org.uk/index.php/Main_Page).

29 April 2008 - 'Urban Traffic Management - Future Developments and Applications', organized and hosted by Scott Wilson Ltd in London (attended by Fraser McLeod)

This event attracted 36 delegates (Appendix 8). A number of presentations were given on the themes of existing UTMC (Urban Traffic Management and Control) - an open standard for the development of intelligent transport systems in the UK - and future transportation technologies that could potentially extend the current architecture, and improve the performance of traffic management systems. The programme also included lengthy discussion sessions. The meeting agenda was:
Welcome and Introduction  Jem McCluskey (Scott Wilson)

Urban Traffic Management and the UTMC Open Standard  Mark Cartwright (Centaur Consulting)

The Roles of Transport Technologies and ITS in the Process of Transport Planning  Alan Carter (Transpomatica)

Traffic Modelling and Real-time Simulation for Urban Traffic Management  Yuelin Liang (Scott Wilson) and Frank Offermann (PTV)

Pervasive and High Performance Computing – Opportunities for Better Traffic Management  Jeremy Cohen, (Imperial College, London)

Future Network Management Challenges  Neil Hoose, (Bittern Consulting)

Integrated Technologies and 3rd Generation Road Side Equipment  Steve George (Efkon)

Discussion 1: Local authorities' experience of current UTMC systems  (Chaired by Alan Carter)

Discussion 2: Potential applications of Urban Traffic Management to facilitate transport planning  (Chaired by David Chen, Scott Wilson Ltd)

Discussion 3: Making better decisions on traffic management – a wish list for the future UTMC  (Chaired by Simon Beasley, Reading Borough Council)

Conclusions  Jem McCluskey (Scott Wilson)

The most interesting points from a SmartFreight perspective which came out from the presentations and discussions were:

- UTMS are becoming increasingly sophisticated in terms of functions undertaken and communications methods used.
- Jeremy Cohen's presentation provided some information about wireless communication methods capabilities and limitations for use in UTMS:
  - GPRS generally provides good coverage, but is slow
  - 3G provides better performance but coverage is not so good
  - mobile broadband gives very good data rates in urban areas and prices are dropping rapidly
  - WIFI (802.11 a/b/g/(n)) coverage is increasing, especially in urban areas, is generally cheaper and faster than mobile; the range is short but there is potential for moving between access points in well covered areas to provide continuous connectivity; there is potential for problems with interference as more services are deployed
  - Peer-to-peer technologies can allow increased range and lower costs; using wireless mesh network technologies to hop between devices until a node within range of an access point is reached; there are latency and reliability issues, however
  - WiMAX (based on IEEE 802.16 standard) provides long-range, high bandwidth wireless data
- Neil Hoose presented the following needs for existing and future UTMS:
**Vehicle drivers:**
- To be able to accurately plan their journeys.
- To understand the impact of their choices.
- To travel safely, predictably and reliably.
- To be kept informed.
- To understand how to respond to information.
- To understand and accept control where required.

**Network operators:**
- To know accurately what is happening on the road network
- To understand the impact of the interventions they can make.
- To estimate the future impact of any interventions.
- To balance between the needs of different users and policies.
- To manage the trade-off between user and network optimal interventions.

**Vehicles (all modes) are:**
- Integrated into the management systems.
- A continuous source of information.
- Capable of being controlled if required.

**Technology is:**
- Used appropriately.
- Pervasive and non-intrusive.
- Highly reliable and trusted.
- Affordable and maintainable.

- Freight vehicles did not feature highly, if at all, during the presentations reflecting the fact that UTMS tend to cater for non-specific private transport (mainly cars) and for public transport (mainly buses). Fraser McLeod asked various delegates working in UTMS about:
  (i) How they currently manage and control freight transport - in all cases, they said that they had no freight-specific measures in place (excluding vehicle restriction regulations and London’s low emission zone scheme, which was described in Deliverable 2.1)
  (ii) What their views are about data sharing between UTMS and FDMS - generally speaking, traffic managers said they were interested in freight vehicles and that knowing about lorry movements in the city could provide them with potentially useful information. Only one traffic manager was doubtful whether this information would be of any practical use.

21 April 2008 - BESTUFS II UK national seminar, University of Westminster, London (attended by Fraser McLeod)
The agenda for this UK national seminar was as shown below - presentations can be downloaded from the website (http://www.bestufs.net/seminars/2008-04-21_uk.html) or by clicking on the hyperlinks below. A total of 45 people participated in this event, coming from a wide range of sectors involved with freight, including government, local authorities, consultancies, universities, freight distributors and other practitioners (see Appendix 9 for delegates list).
Welcome and introduction to the BESTUFS project
Mike Browne, University of Westminster  Download

The Transport Green Paper - the Challenges for Freight
Duncan Buchanan, Head - Sustainable Distribution Branch, Dept. for Transport  Download

The London Construction Consolidation Centre
Gary Sullivan, Wilson James Ltd  Download

Servicing London's 24 hour Economy - the Role of Out-of-Hours Deliveries
Chris Douglas, TTR  Download

Freight Best Practice - Government Helping the Freight Industry to Help Itself
Jonathan James, Faber Maunsell  Download

The Freight Operator Recognition Scheme
Glen Davies, Transport for London Freight Unit  Download

Solving Urban Freight Issues in West London
Kevin Ratnasingam, MVA  Download

The Role of Rail in Urban Freight Transport
Phil Mortimer, University of Newcastle  Download

Final discussion and closing remarks

As came be seen from the agenda, the presentations covered a wide range of freight issues, including UK government policy and schemes to aid the freight industry, rail freight, out-of-hours deliveries (e.g. at night time) and the use of a consolidation centre for the construction industry. The presentation on the London Construction Consolidation Centre was particularly interesting. It highlighted the substantial differences between the construction industry and retailing, in terms of freight distribution and other factors. This is something which the SmartFreight project will need to bear in mind when considering its options for combined UTMS/FDMS systems. Interesting UK statistics from the presentation included:

- 68% of construction deliveries do not arrive on time
- 30% of scheduled deliveries do not arrive on the specified day
- 20% of the UK’s waste comes from construction (only 8% from domestic refuse)
- there is a 15% over-ordering of materials

The consolidation centre approach was reported to be particularly effective in construction with:

- 95% improvement in the right materials being delivered to the right place and at the right time
- 68% reduction in vehicles travelling to the construction site
- 25% reduction in accidents and injuries
- 15% reduction in materials wasted
• 47% increase in site productivity
• 75% reduction in CO2 emissions

This meeting was also useful in the new contacts that were established, which included:

• Simon Woodward (formerly Christian Salvesan, now DHL Exel Supply Chain), Julian Richardson (Clipper Logistics) and Nick Deal (Road Haulage Association) - they all confirmed that while real-time traffic information is of potential interest to them it does not tend to be used in day-to-day freight operations. Both Simon and Julian subsequently attended the stakeholder consultation meeting on May 27.

• Ian Wainwright (Transport for London, Freight Unit), who provided contact information for colleagues working on freight initiatives in London. Of particular relevance to SmartFreight is an upcoming trial of the use of loading bays in London, as part of the CVIS project, scheduled for later this year.

• Freddie Talberg (P.I.E. Enterprises) - P.I.E. produce ‘Smart Maps’ in both online and paper formats. Smart Maps have been produced to aid parking in London and travel by motorbike. Freight mapping is another area of interest. See http://www.thepieguide.com/

14 February 2008 - ITS UK Local Authority/Urban Interest Group conference (attended by Fraser McLeod)

This conference brought together 86 people working or having an interest in urban traffic management (see Appendix 10 for delegates list). Ten presentations were given (available within the members’ area of the ITS (UK) website: http://www.its-uk.org.uk/):

Towards a sustainable transport system - ‘How ITS can support Department for Transport strategy’ Abs Dumbaya (DfT)

Managing the network to support road policy objectives Liz Saville (Essex County Council)

Delivering a UTMC project - the Coventry way! Gary Marshall (Coventry City Council)

Worcester UTMC - flood event lessons John Duckworth (Worcestershire County Council) and Mark Percival (Tenet Technology)

Lessons from Sat Nav - how UTMC shows the way forward Andy Graham (White Willow Consulting)


The urban to inter-urban interface - developments in Wales Mike Evans (Traffic Wales)

Managing fixed assets and faults in the transport network Hamilton Purdie (Glasgow City Council) and Elaine Rodgers (Mott MacDonald)

Advanced traffic and travel information for mobile users - the Italy experience Giacomo Grisanzio (01design)

Practical steps for ITSO smartcards and Local Authorities David Hytch (LogicaCMG)

As can be seen from the list of presentations above, a broad range of UTMS topics was covered by this conference. The topics of most interest to SmartFreight were:
1. **Satellite navigation**

Andy Graham’s presentation provided a lot of useful information - much of this was reported in Deliverable 2.1. Key comments made in this presentation were:

- Urban traffic managers should be able to influence routes chosen by sat-nav devices as a traffic management tool. They can do this by providing up-to-date information about incidents, roadworks, road closures etc. and by providing advisory routes, particularly for freight vehicles.

- Other information items which sat-nav technology should embrace include parking spaces, park and ride, congestion charging.

- Navigation information should be made available via other media (e.g. mobile phone, personal digital assistant (PDA) etc.)

- User surveys have indicated that dynamic guidance is a key “must have” and systems should be able to avoid guiding drivers into traffic jams and be able to guide drivers to car parks with spaces.

- Providing such intelligent navigation remains tricky but is a lot easier technically than 10 years ago, say; there is an established UTMC user base; people now understand sat nav; service providers, broadcasters (DAB) and equipment manufacturers are all interested in these systems - it us up to local authorities to provide the information required by these systems.

2. **Use of VMS for quick response to emergencies**

Worcestershire County Council (and a system provider called Tenet Technology) reported how they had used variable message signs (VMS) to respond quickly to flooding that had taken place in Worcester and surrounding areas during July 2007. VMS were used to:

- Inform about road closures and other hazards and about when these problems had cleared; respond in ‘real time’ through contact with engineers on the ground; warn travellers about problems some distance away on the network; alert drivers to an emergency flood park&ride facility that had been made available; advise on routes to take across the river.

This emergency situation had demonstrated the usefulness and versatility of VMS, which had not been fully realised before. It also highlighted the need for imaginative and reliable detection: in this situation, traffic engineers were employed on the ground to determine what was happening - more diverse, and less labour-intensive, detection methods were considered to be needed. The lessons learned here included adopting a more proactive approach in planning for such events rather than responding to them when they happen.

3. **Traffic and travel information for mobile users**

Giacomo Grisanzio, from an Italian company called 01design (who develop multimedia B2B and B2C applications and content for Mobile and Internet communication) presented their system for providing people in Rome (and other cities) with information about public transport (routes, bus stops, location of buses on route), traffic information (camera views, traffic bulletins, delays on certain routes) and general news and other useful information. The main form of information delivery proposed was via mobile phone. Although their applications are targeted at individual citizens it is easy to envisage how similar applications could be of benefit to freight distribution companies and their drivers.
2.3.2 Chalmers (Sweden)

The approach taken by Chalmers was to contact three companies in Sweden (Schenker, DHL and Posten Logistik) to gain an in-depth understanding of the state-of-the-art and their short term visions for IT use in FDMS. A full report is given in Appendix 1. The main conclusions drawn from the report are repeated here for convenience.

- Although heavy investments in IT systems offering new functionalities are currently made by most large actors, there is no mention of communications with UTMS, not even among the options. The reason is probably that what has been offered so far from the UTMS is perceived as uninteresting. Since these investments are of short term nature; less than three years, this should not be understood as lack of interest in totally new concepts that involve both UTMS and FDMS, and represent a longer term perspective.

- The major highway transport operators used to have a common standard for communication and functional support. In the present generation now being developed, communication is based on the use of established digital 3G or GPRS standards, sometimes supplemented by WLAN at terminals. The functional software, on the other hand, is neither based on common nor open standards and is delivered by different small suppliers.

- Thus the need for creating an open standard according to SMARTFREIGHT intentions seems to be evident. Since the global players currently seem to prefer go their own way, SMARTFREIGHT may, in the demonstration phase, prefer looking for cooperation with independent specialists in particular segments of the transport market, or segments where the public interest regulation already have a strong influence, such as in the transport of dangerous goods.

2.3.3 COBO (Italy)

**Approach**

Three freight operators, representing around 100 small operators and working in intermodal logistics, were interviewed by phone. The interviews were based on the questionnaire from the UK survey (see Appendix 2). In addition the Bologna UTMS manager was asked about their needs for freight data. The questions asked and responses received are described below.

**Barriers to greater UTMS & FDMS co-ordination**

All of the stakeholders contacted agreed that the level of co-operation between UTMS and FDMS is low and it should be increased. One operator said that this is due to the complexity of the architecture and the communications that are needed to create a data flow between the entities: data should be standardised and easily usable but the transport companies normally do not have technical people able to manage and maintain such systems. Stakeholders say that such co-operation would be sensible, nevertheless they do not foresee a need to acquire competence in the field of ITS. For other operators the cost is also a barrier, this means that they probably do not foresee the potential benefit as a cost-reduction factor. None of the operators considered security as a potential problem, because a centralised (and public) traffic control centre would act as a collector of anonymous traffic.
data coming from operators and as a public provider of real-time generalised data (traffic flow and congestion/accident events).

**UTMS needs for FDMS data/systems**

Real-time traffic data (such as journey times, accident events) could be provided from FDMS to UTMS. The main obstacles until now for this process were considered to be:

1. The UTMS were not ready to accept external data. For example, the traffic control model used in Bologna and in many big cities in Italy, Utopia, is based on a delicate balance and on an automated optimisation process: external data needs to be validated and there is also the risk that they are redundant. The new UTMS model (recently deployed) will accept external data, so this process will be possible in the future. Generally speaking, this co-operation (from FDMS to UTMS) needs to be deeply studied and projected in order to avoid negative effects on the traffic light automated management systems.

2. There are many different FDMS (every big or medium operator has its own system), each with different architecture models: normally the investment of a public institution is addressed to create a specific traffic detection network and not to collect data from external sources.

**Questionnaire findings**

Three completed questionnaires were received. The questions that were asked are shown in blue italics below. Analysis and comments received are shown in black text.

**Q1a. Freight priorities** [Note: As for the UK survey (see Table 1), positive impact, for the city as a whole, was scored as: 1=negative impact very likely; 2= negative impact possible; 3=neutral; 4=positive impact possible; 5=positive impact very likely. Feasibility of introducing such a scheme successfully was scored as: 1=highly unlikely; 2=doubtful; 3=not clear; 4=likely to be feasible; 5=straightforward.]

**Table 3 - Freight priority scores (Italy)**

<table>
<thead>
<tr>
<th>Categorisation of lorries by</th>
<th>Positive impact</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fuel types (e.g. ‘clean’ fuels preferred)</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>2. Engine standard (e.g. Euro IV)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>3. Gross vehicle weight (e.g. very heavy lorries may be restricted)</td>
<td>2.6</td>
<td>2.3</td>
</tr>
<tr>
<td>4. Number of axles</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5. Vehicle fill (e.g. full vehicles preferred)</td>
<td>4.6</td>
<td>3</td>
</tr>
<tr>
<td>6. Goods/service types (e.g. essential services such as waste collection may be preferred)</td>
<td>2.6</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Note: the average scores from the responses received are shown here for convenience.
Analysis

The engine standard is becoming the effective norm that regulates the feature of the vehicles and allows a good vehicle renewal policy. Several access policies based on this categorisation have been implemented and they seem to run well.

The fuel type categorisation sometimes matches with the engine standard (e.g. at local policy level, methane fuel has been made equal to Euro IV) and it is also considered as a good possibility.

The load factor is also considered to give a very positive impact, but the feasibility is still very low: problems would derive from the real possibility to check the load factor and to realise a well balanced policy.

Categorisation by size of vehicle (e.g. by weight or by number of axles) or by goods/service type were not favoured.

Q2. Freight Distribution Management Systems (FDMS)/lorry drivers needs for traffic-related information  [Note: As for the UK survey (see Table 2), usefulness was scored as: 1 = not at all useful; 2 = not very useful; 3 = neutral; 4 = useful; 5 = very useful. Feasibility of providing the required information accurately and quickly within an urban setting was scored as 1=highly unlikely; 2=doubtful; 3=not clear; 4=likely to be feasible; 5=straightforward]

Table 4 - FDMS/lorry drivers needs scores (Italy)

<table>
<thead>
<tr>
<th>Information item</th>
<th>Usefulness for the freight distribution manager</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location of lengthy traffic queues (head of queue, back of queue, queue length)</td>
<td>4.6</td>
<td>4.6</td>
</tr>
<tr>
<td>Estimate of how long it will take to get back to normal</td>
<td>4</td>
<td>4.3</td>
</tr>
<tr>
<td>Reporting when a lengthy queue has actually cleared</td>
<td>4.6</td>
<td>4.6</td>
</tr>
<tr>
<td>Location of roadworks</td>
<td>5</td>
<td>4.6</td>
</tr>
<tr>
<td>Estimates of journey times on recommended lorry routes</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Estimates of delays on recommended lorry routes</td>
<td>3.3</td>
<td>3.3</td>
</tr>
<tr>
<td>Information tailored to the individual vehicle (e.g. according to the route being driven)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Route guidance in the case of an incident (route only)</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Route guidance in the case of an incident (route plus reason for diversion)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>The ability to pre-book a loading bay slot, operated by a combined UTMS/FDMS</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

Notes: - the average scores from the responses received are shown here for convenience
the usefulness of traffic-related information here is considered for FDMS only, as the three operators did not consider the specific usefulness for lorry drivers to be applicable.

Comment
The co-operation between UTMS and FDMS is considered very important, freight operators would use real time traffic information and they are ready to support efforts in this direction.

Q2b. FDMS/lorry drivers needs for traffic-related information (for those working directly in freight distribution, others skip to Q3)
Do you currently use any traffic information?
Someone uses traffic information (mainly related to the accidents events)
If so, what sources? derived from communication between vehicles and centre
Do you have any existing needs for traffic information that is not available to you? If so, what are they? At the moment the operators don’t use other traffic information

Q3. Urban Traffic Management Systems (UTMS) needs for freight-related information (for those working directly in urban traffic management, others skip to Q4)
Do you currently use any freight-related information?
Response by Municipality (manager of UTMS): not at the moment but we will try to use such information in the future. It is important to pay attention to traffic model and data integration (see paragraph above on UTMS needs).

Q4. Communications media
Which communications media do you think are best for delivering traffic data from UTMS to FDMS (Email, Internet, Phone/SMS text, Radio broadcasts, RDS-TMC, Other (please state))?
The situation seems to be quite unclear for operators, because the responses were almost all (email, internet, radio, RDS-TMC, phone), depending on the operators and the respective architecture considered. This means that there is the availability to consider every solution, but it is needed to agree a common model for communications.

2.3.4  SINTEF/NPRA (Norway)

Approach
Four representatives from the local and national freight logistics sector were interviewed by phone. Two are employees in major international companies, one in a local company, and one driver is currently in the Transport Labourers' Union. The interviews were based on the questionnaire from the UK survey (see Appendix 3). The questions asked and responses received are described below.

Questionnaire findings
Four interviews were conducted by phone. The questions that were asked are shown in blue italics below. Analysis of the responses and comments received are shown in black text.
Q1a. Freight priorities  [Note: As for the UK survey (see Table 1), positive impact, for the city as a whole, was scored as 1=negative impact very likely; 2= negative impact possible; 3=neutral; 4=positive impact possible; 5=positive impact very likely. Feasibility of introducing such a scheme successfully was scored as 1=highly unlikely; 2=doubtful; 3=not clear; 4=likely to be feasible; 5=straightforward.]

Table 5 - Freight priority scores (Norway)

<table>
<thead>
<tr>
<th>Categorisation of lorries by</th>
<th>Positive impact</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fuel types (e.g. ‘clean’ fuels preferred)</td>
<td>3.5</td>
<td>2.8</td>
</tr>
<tr>
<td>2. Engine standard (e.g. Euro IV)</td>
<td>4.3</td>
<td>3.5</td>
</tr>
<tr>
<td>3. Gross vehicle weight (e.g. very heavy lorries may be restricted)</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>4. Number of axles</td>
<td>3.0</td>
<td>3.5</td>
</tr>
<tr>
<td>5. Vehicle fill (e.g. full vehicles preferred)</td>
<td>3.5</td>
<td>2.3</td>
</tr>
<tr>
<td>6. Goods/service types (e.g. essential services such as waste collection may be preferred)</td>
<td>3.8</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Note: the average scores from the responses received are shown here for convenience

Analysis

From the above scores it can be seen that the engine standard was considered to have the most positive impact for the city as a whole. This is in line with the findings from the UK survey.

Priority access according to vehicle fill (=load factor or saturation rate) was considered to be the most difficult to implement, with by far the lowest feasibility score. This is also in line with the results from the UK survey.

The Norwegian respondents tend to be less enthusiastic than the UK-participants about impacts and feasibility of categorisation by fuel types, but more optimistic about impacts and feasibility of categorisation by vehicle weight and goods/service types.

Stakeholder comments

Fuel type

- The feasibility will depend on the control effort put in action. References given to the situation in Norway with red diesel (low tax, for farming purpose).
- Difficult to control. To label/tag the vehicle may be a possible solution.

Engine standard

- The disc/tag system in Austria was referred to, and with appurtenant reading/control difficulties.
- Necessary with online control (vehicle register). The transport buyer, the order function, must make demands concerning engine standard.
Goods/service type

- Service vehicles must be easy to identify.
- Utilise wider part of the day for special deliveries/pick-up (e.g. for waste management).

Q1b. Freight priorities

Are there any other vehicle groups which you think should receive preferential treatment?

Responses

- Important to make categorisation it is possible to control. And, be aware of the creativity concerning "smart approaches" of the transport industry.
- Important to be aware of the market situation, and avoid distortion of competition.
- Distinguish between delivery van and truck.

Q2. Freight Distribution Management Systems (FDMS)/lorry drivers needs for traffic-related information  
[Note: As for the UK survey (see Table 2), usefulness was scored as: 1 = not at all useful; 2 = not very useful; 3 = neutral; 4 = useful; 5 = very useful. Feasibility of providing the required information accurately and quickly within an urban setting was scored as 1=highly unlikely; 2=doubtful; 3=not clear; 4=likely to be feasible; 5=straightforward]

Table 6 - FDMS/lorry drivers needs scores (Norway)

<table>
<thead>
<tr>
<th>Information item</th>
<th>Usefulness for the freight distribution manager</th>
<th>Usefulness for the lorry driver</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location of lengthy traffic queues (head of queue, back of queue, queue length)</td>
<td>4.0</td>
<td>5.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Estimate of how long it will take to get back to normal</td>
<td>4.3</td>
<td>4.8</td>
<td>3.8</td>
</tr>
<tr>
<td>Reporting when a lengthy queue has actually cleared</td>
<td>4.3</td>
<td>5.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Location of roadworks</td>
<td>4.8</td>
<td>4.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Estimates of journey times on recommended lorry routes</td>
<td>4.8</td>
<td>4.3</td>
<td>3.8</td>
</tr>
<tr>
<td>Estimates of delays on recommended lorry routes</td>
<td>5.0</td>
<td>4.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Information tailored to the individual vehicle (e.g. according to the route being driven)</td>
<td>3.8</td>
<td>4.3</td>
<td>3.8</td>
</tr>
<tr>
<td>Route guidance in the case of an incident (route only)</td>
<td>4.5</td>
<td>5.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Route guidance in the case of an incident (route plus reason for diversion)</td>
<td>4.3</td>
<td>5.0</td>
<td>4.0</td>
</tr>
<tr>
<td>The ability to pre-book a loading bay slot, operated by a combined UTMS/FDMS</td>
<td>4.5</td>
<td>5.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Note: the average scores from the responses received are shown here for convenience.
Analysis
From the responses it can be observed that:

- Nearly all of the information items are considered to be more useful for the lorry driver than for the freight distribution manager. With an average score of 3.8 or more, all of the information items were considered to be useful for both the lorry driver and the freight distribution manager.
- The feasibility of providing the information was considered quite "likely to be feasible" for all the information items in question. The average scores were 4 or just below.
- The Norwegian respondents are with few exceptions more optimistic than the UK respondents about the usefulness and feasibility of providing the information items.

Stakeholder comments

Location of lengthy traffic queues
- Such information becomes more useful for the distribution manager as more of all traffic deviations/incidents are reported.
- Depending on how real time/online.

Information tailored to the individual vehicle
- E.g. weight/height restrictions.

Route guidance in the case of an incident
- Integrate with GPS.

Pre-booking of loading bay slots
- Handling of unexpected incidents puts pressure on the control function (for the loading bays).
- Can be useful for deliveries which take time to load/unload.
- Useful for long distance freight, not so much for local distribution (which is exposed to changes and incidents). For deliveries which comply with the planned route.

General comments to Q2
- Be aware of the "tension"/ conflicting interests between the distribution manager (effectiveness) and the driver (minor level of strain).
- From a drivers point of view; the first action to take when delays occur is to call/inform the customer.
Q2b. FDMS/lorry drivers needs for traffic-related information (for those working directly in freight distribution, others skip to Q3)

Do you currently use any traffic information? If so, what sources?

Responses
All interviewees stated current use of traffic information. The sources were (no. of respondents):

- Phone 175 (1)
- Internet (TMS) (2)
- Radio (2)
- "Jungle telegraph" (i.e. informal communications between people) (3)
- Internal communication (1)
- GPS with traffic information (1)

Do you have any existing needs for traffic information that is not available to you? If so, what are they?

Responses
All interviewees stated current need for traffic information not available. The information needed was (n. of respondents):

- Travel times (3)
- Queue alerts (2)
- Road closures (1)

Q4. Communications media
Which communications media (Email, Internet, Phone/SMS text, Radio broadcasts, RDS-TMC, Other (please state)) do you think are best for delivering traffic data from:
- UTMS to FDMS?
- UTMS to lorry drivers?
- FDMS to UTMS?

Table 7 - Communications media preferences

<table>
<thead>
<tr>
<th></th>
<th>UTMS to FDMS</th>
<th>UTMS to lorry drivers</th>
<th>FDMS to UTMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Internet</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Phone/SMS text</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Radio broadcasts</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>RDS-TMC</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>VMS</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>
Analysis
As in the UK survey, the responses were quite varied with all of them being selected by at least one person. Number of respondents for each combination of communication flow and media is given in the table above.

- For communication between UTMS and FDMS, email and Internet-base information media are preferred.
- Phone/SMS text are the preferred media for providing drivers with traffic information.

Stakeholder comments
- Existing versions of delivery scheduling/route planning tools have web-/internet-access. Through PDAs (connected to those tools) drivers also can have access to web/internet.
- Depending on system available (and on whether the FDMS is based on Inter- or Intranet)
- Drivers subscribe to SMS-notifications
- Information to drivers using voice-mail and PDAs with self-opening SMS
- Information should be imported directly into the FDMS.
- The trucks/vans more-and-more tend to be online with the FDMS (through PDA)
- Suggestion to (further) develop a (web-)platform with FDMS integrated.

Q5. Barriers to implementation

Costs/benefits
- Costs stated as an obstacle by two respondents,
- Unclear benefits stated as an obstacle by one respondent
- Costs primary obstacle
- Costs clearly a barrier, but not insurmountable
- A matter of the benefit of the information element, and to whom?

Complexity
- Complexity stated as an obstacle by two respondents
- The simplicity/readability of the information/data is of significant importance.
- It is necessary to identify what information is useful and needed, and for whom: Tonnage, Dangerous goods, number of units, etc.
- Be aware of the driver interest (with availability to a certain extent).

Security / Privacy of information
- Security / Privacy stated as an obstacle by two respondents
- Concerns about what information to send via FDMS

Other comments
- Concern about driver’s privacy, and EHS (Environment, Health and Safety).
- Important to push attitudes concerning exchange of information.
Q7. What opportunities are there for FDMS to benefit from UTMS data?

Stakeholder comments

- Large potential.
- Travel times.
- Queue alerts.
- All traffic information is positive, as long as they are delivered JIT and with the sufficient quality.

General comments and viewpoints

In general for all questions:

- Concerning situations with predefined routes, there is a difference between the possibilities to adjust for the distribution manager and the driver. To the degree that delivery schedules can handle dynamic elements, real time information also will be of value for the distribution manager/planner.
- There is a balance between flexibility and fixed elements concerning route scheduling (for the distribution manager) and the freedom to act/to carry out the duty (from the driver’s point of view).
- It tends to be a problem that the forwarder/carrier does not re-invoice increased costs, to the full extent, towards the transport buyer. The value chain philosophy (with the total set of actors/roles and the real decision makers) is not applied when development of environmental sound solutions and management principles are considered. Each decision maker sub-optimises his own part of the chain.
- There is a balance/“area of stress” between the role of the distribution manager and the driver.
- Information brought forward to the distribution manager/planner must be just in time and sufficiently accurate.

2.3.5 DTO (Ireland)

The Dublin Transportation Office (DTO) attended a freight meeting in Dublin on 6/7 May 2008, where they made a presentation to attendees on the SMARTFREIGHT project. The meeting was attended mainly by academics and consultants, and the DTO promoted awareness of the project among the group. The DTO had hoped that a large number of freight distribution practitioners would have been in attendance, and had intended to conduct a stakeholder consultation with these people. However, practitioner attendance was very low, so the planned detailed consultation was not possible on this occasion.

The DTO intend to reconvene the Greater Dublin Area Freight Working Group in the coming months and hold regular meetings with respect to production of the new land use and transportation strategy for the Greater Dublin Area. It is envisaged that this group will also provide information and feedback for the SMARTFREIGHT project.
2.3.6 ADL (Spain)

Approach
ADL sent a questionnaire to 18 of their member companies who specialize in transport. Useful responses were received from 7 of these companies. In addition, ADL met and spoke with around 12 people from different companies at a freight workshop, which provided further useful information.

Findings

Questionnaire survey

The ADL member companies that participated in the survey are all involved in urban transport and distribution services, providing local and international services, most of them using several means of transport: road, sea or air. Most of the companies interviewed are planning their growth by increasing their international services instead of local or domestic services. Regarding their needs for the immediate future, most of them say they will require more quality in the services, the size of deliveries will become smaller but they will increase direct deliveries to the final consumer due to the growth of internet sales. None of them think about big volumes or weight by client, but all of them think about the use of several freight and parcel systems.

When asked about the weak points of their distribution system, most of them say in the first place: the status of transport network, secondly, the age of the systems and their own capacity and lastly, the infrastructures for transport.

The survey asked for an evaluation (from 1- least important to 5- most important) of various areas where a lack of a standard might be considered to be a problem. The highest score (average of 4) was obtained for “manipulation and loading of equipment”. Secondly, the lack of a standard in other factors like transport equipment, logistic operators, laws, bureaucracy and logistic platforms was considered an important problem (with an average of 3). Of least importance (average of 2) was the lack of a standard on the different means of transport.

Regarding the means of transport: 94% of the companies used the road; 7% used sea; and only 1.2% used air; none of the companies surveyed were using rail.

With regards software and other technologies there are several different systems used by the companies interviewed, mainly developed for each company attending to their specific requirements. Integral management systems are developed to respond to the company needs.

The advantages of customized systems are clear to their own management but as they are not standardized, they are unable to connect with systems of other agents in the transport chain. This connection or standardization could be a plus in the efficiency of the transport system, which normally includes several agents or companies.

The main problems detected for transport operators are:

For long distance transport
- Lack of real-time information
- No coordination between different agents in the transport chain
- Lack of standardization in administrative documents

For the last mile or urban areas
- Not enough loading/unloading areas in urban areas and regulation of existing ones.
- Small or inexistent flexibility in timetables of use for loading/unloading urban areas
- Lack of information concerning restricted ways or restricted traffic areas
- In case of unloading at night (important for many sectors in commercial areas) the noise produced by the truck unloading systems.
- Loading/unloading areas are too small for some truck models (trailers don’t enter and they cannot park in city towns to deliver)

Some solutions proposed to resolve the difficulties described in the last mile for long distance transport are:
1. More cooperation between different entities (e.g. public administrations in charge of urban traffic and transport companies) to share information about the state of the roads, traffic etc.
2. Permanent follow-up of the load during all the route

**Workshop**

The suggested methods for improving deliveries in urban areas, especially in commercial city centres are:
1. To be able to access information (by mobile phone or GPS systems) about the roads status, existing works on streets, inaccessible roads or streets, traffic smooth flows, etc.
2. A booking system for loading/unloading areas in the city.
3. Identification systems incorporated on the vehicles and restriction systems in pedestrian streets to regulate the entry.
4. System information should include detailed information about load/unloading areas in cities and any existing special regulations.
5. Special restrictions to access the city centres are often not known by the driver, nor the transport company, and more especially in international deliveries. For example: local calendar with local bank holiday days, street restrictions because of works or other causes. The conclusion was that it would be very interesting if new technologies could be able to provide this kind of information to the driver in real time.
3 System Performance Scenarios

The objective of Task 2.3 (System Performance Scenarios) was to identify scenarios that represent the ideal performance of the functionalities to be developed in the SmartFreight project. At this stage of the project, only some illustrative examples of scenarios are presented, and as such, at a rather high level. More detailed and concrete specifications will be made later in the project, reflecting the level of implementations to be tested and simulated in the SmartFreight test sites. These local scenarios will describe the functionalities made available at (or simulated for future use in) the test sites. These descriptions will be used for the work on proof of concepts and the verification of ICT solutions (WP6). They will also be the basis for formulating research questions and hypotheses, to be the used in the impact evaluation of the new concepts of SmartFreight (WP7). Based on condensed experience in the area of impact assessment (as found in the FESTA Handbook, 2008 - see [http://www.festaproject.eu](http://www.festaproject.eu)), the following definitions have been applied:

**Function**
- implementation of a set of rules to achieve a specified goal
- unambiguously defined partial behaviour of one or more electronic control units.

**System**
- a combination of hardware and software enabling one or more functions
- set of elements (at least sensor, controller, and actuator) in relation with each other according to design:
  - An element of a system can be another system at the same time. Then, it is called a subsystem which can be a controlling or controlled system or which can contain hardware, software and manual operations

**Use Case**
- target condition in which a system is expected to behave according to a specified function

**Situation**
- a combination of certain characteristics of a use case. Situations can be derived from use cases compiling a reasonable permutation of the use cases characteristics

**Scenario**
- a use case in a specific situation

In this section, some assumptions are made for the “higher level” approach, e.g. that a system for vehicle service level classification exists and is in operation. This means that apart from the vehicle itself, other information items such as the type of goods, the destination of the cargo and the load factor of the vehicle are also known and used for the service level classification. Furthermore, it is assumed that traditional UTMS and FDMS functionalities, which are implemented, are the most modern and based on state-of-the-art solutions in the two areas addressed. The vehicles are equipped with the latest accomplishments in the areas of navigation support and route guidance and are equipped with hands-free mobile phones and other radio and data communication facilities.

The “ideal” functions/systems described below are perceived to be the backbone of an ideal future situation in a “co-operative” UTMS and FDMS environment. They follow closely the list of potential functions/systems presented in the SmartFreight project description, and they
address the Extended UTMS, the Extended FDMS, and “Onboard support and control” functionalities respectively.

A. Extended UTMS functionality

Function A1: Traffic control depending on service level
The traditional actions initiated from a traffic control centre are extended by means of the concept “service level” in the criteria used for traffic signal control, VMS messages, access control, incident handling, etc.

Function A2: Conditional route assignment (incl. Green areas, and Access control)
The extension to traditional services (of providing a map of recommended/mandatory routes for specific types of goods, etc.) is made as a dynamic element can be included. The new options emerge because of access to specific areas/lanes, etc. now can be allowed (in certain situations) for vehicles of a specific minimum service level. The route assignments overall are in principle made on the basis on the classification of individual vehicles and on the origin and/or destination of the vehicle.

Function A3: Tracking of dangerous goods.
Existing functions for the tracking of dangerous goods are extended to include functionalities similar to those used in public transport (AVL systems) for a continuous feedback of the vehicle position in real-time in the urban street network.

Function A4: Incident management support
This function is included in traditional traffic control operations and its possible extensions are included in Functions A1, A2, and A3.

Function A5: Data collection for statistics and planning
The extension here is the availability to a large database where also data related to all types of vehicles moving in the traffic system are stored. As O/D-matrices very often already exist for urban passenger transport, a similar data collection process is created for urban goods transport (or city logistics). The combined use of these two types of data clusters will improve the possibility of calculating travel/journey times and the need for and use of “probe vehicles” as sensors in the traffic system will be extended.

Function A6: Enforcement
Many new functions will, for their successful implementation, be dependent on the compliance of users to follow existing (or new) regulation, etc. And this will be influenced by measures introducing “carrots and sticks”. The possibility to check the assigned service level of vehicles, especially in relation to access control and other restrictions, is one example of new functionalities needed for enforcement.

Function A7: Provision of traffic data to FDMS
Depending on how advanced the fleet management tools in operation are, different types of traffic data could be provided. This function is more about the opening of a communication channel between the two worlds UTMS and FDMS. In an ideal situation, as is considered here, full information about the traffic systems status is made available for the FMDS decision-making process. This will lead to a better possibility for optimal resource management for the FDMS operators involved.
### B. Extended FDMS functionalities

Function B1: New data exchange with the UTMS

This function will, in the ideal case, provide the UTMS with access to all existing and planned use of the vehicle fleet, including O/D-matrices for the freight movements, types of vehicles used, disturbances in normal flows of goods and incidents reported from vehicles in the field.

Function B2: Return load co-ordination

This function implies, in the ideal case, that the position and status of all freight vehicles (from all operators in the city area) are made available to a specific unit, where a co-ordination of return loads is accomplished. Either by using dedicated vehicles for that service or by means of information about position/load factor/home base/etc. of every vehicle, a choice of vehicles for return loads will be made.

Function B3: ‘Shared use of vehicle’ co-ordination

This function has some similarities with B2, but considers both inward and outward transport services and the possibilities of shared use of vehicles for delivery as well as for return loads.

Function B4: Planned use of loading/unloading area

This new function is related to Function A2, where access control in general is addressed from a UTMS perspective. Depending on the service level assigned and on the time window needed for the delivery, certain load/unload areas/bays are made available on the basis of a schedule. The actual reservation of a time slot can be made, with different levels of guarantee for the UTMS (comparable to travel guarantees applied in public transport operations).

Function B5: Load unit tracking and monitoring

Based on new and future sensor technologies, a container, a load unit and/or a parcel can be identified when on the move in a similar way as vehicles are today. The term “intelligent goods” is used in on-going R&D projects to highlight the possibilities now examined to let “individual” load units be equipped with advanced ID tags (advanced RFID) with processing and memory capacities for automatic control of how different load units are loaded and transported most efficiently to meet the demands of delivery time slots in combination with access control based on vehicle service levels, etc.

### C. “Onboard support and control” functionalities

Function C1: Routing support

In principle this function is composed of traditional navigation and dynamic route guidance functionalities, where the use of the onboard unit will include highlights related to traffic control actions based on the service level of the vehicle in question.

Function C2: Service level

A feedback to the driver about the service level assigned to the vehicle will be designed. Also the possibility of dynamic service level assignments will be included.

Function C3: Transport operation planning support

This is a function which is FDMS-based. The onboard functionality is related to feedback to the driver about specific issues, which might influence the journey in progress, and might require extraordinary actions from the driver.

Function C4: Time slot allocation for loading/unloading area

This feedback to the driver is essential for the access control schemes for loading/unloading areas to function in a smooth way. The function must ideally be bi-directional and also
include advice on when a request for access is denied or changed. This can be caused by 1) factors in the traffic system itself or 2) by the driver being delayed for whatever reason.

Function C5: Load/unload tracking/status information
This function is related to C4 and highlights the possibility to extend the information flow to the driver with transparency on what the situation at loading/unloading stations look like.

Function C6: Efficient communication with distribution centre
This function is related to the need to establish a two-way communication link between the driver (the vehicle) and the FDMS operators. It is probably not feasible to fully automate the functionalities listed above and exclude the human being from the decision-making loops. Even advanced and high technology equipped complex systems like nuclear power plants will still have human operators on board for supervision and for actions in case of severe incidents or accidents. A similar rationale can be applied in the area of urban transportation for both traffic and transport operations.

As the functions are not yet defined in detail at the test sites, the scenarios to be developed in this section are, as mentioned earlier, defined on a rather high level. The most important part of this section is therefore the examples listed, where the process from functional description, use cases, situations and scenarios is applied. It should be noted that in the preparation of the impact assessment work in WP7 the following states in the procedure must also be addressed: research questions, hypotheses, indicators, measures, sensors, and finally the study design itself (FESTA Handbook, 2008 - see http://www.festaproject.eu).

These steps are not covered in this section as more of the work of WP6 must be performed to establish a detailed enough functional description. First when the functions to be tested at the test sites are defined, local scenarios can to be developed. These local scenarios will be adapted to the concrete functions/systems which are made available for the technical feasibility tests in Trondheim as well as for the impact assessment work to be addressed at the other test sites.

As high level examples, a “combination” of the functions A2, B4, and C4 are used, all more or less related to the general functionality: “Access to loading/unloading areas”. These functions (A2, B4, C4) capture the three main perspectives of the functions/systems, i.e. the perspectives of UTMS, the FDMS and the onboard unit on “Access to loading/unloading areas”.

Examples

*Function A2: Conditional route assignment (incl. Green areas, and access control)*

The extension to traditional services (of providing a map of recommended/mandatory routes for specific types of goods, etc) is made as a dynamic element can be included. The new options emerge because of access to specific areas/lanes, etc. now can be allowed (in certain situations) for vehicles of a specific minimum service level. The route assignments overall are in principle made on the basis on the classification of individual vehicles and on the origin and/or destination of the vehicle.

*Use cases A2:*

- Access control of loading/unloading areas
- Access control of public transport and/or HOV lanes for freight vehicles
- Access control of environmental zones
- Priority in traffic signal controlled intersection
**Function B4: Planned use of loading/unloading area**

This new function is related to Function A2, where access control in general is addressed form a UTMS perspective. Depending on the service level assigned and on the time window needed for the delivery, certain load/unload areas/bays are made available on the basis of a schedule. The actual reservation of a time slot can be made, with different levels of guarantee for the UTMS (cp. travel guarantees applied in public transport operations).

**Use cases B4:**
- Identify available loading/unloading areas \((x, y, z, \ldots)\)
- Booking of time slot in area \(x\)
- ...

**Function C4: Time slot allocation of loading/unloading area**

This feedback to the driver is essential for the access control schemes for loading/unloading areas to function in a smooth way. The function must ideally be bi-directional and also include advice on when a request for access is denied or changed. This can be caused by 1) factors in the traffic system itself or 2) by the driver being delayed for whatever reason.

**Use cases C4:**
- Booking confirmed in area \(x\)
- Booking denied in area \(x\),
- Alternative time slot offered in area \(x\)
- Alternative time slot offered in area \(y\)
- ...

As the functions A2, B4, and C4 would appear “together”, a number of situations are identified that might have an influence on how the overall functionality is affected. The situations listed are just a few (on a general level) like time of day, time of year (also weather related), street type dominating the test area, etc.

**The following situations are identified:**
- Time of day
  - Rush hours morning (flow in)
  - Daytime (no congestion)
  - Rush hours evening (flow out)
  - Night time (noise regulation)
- Time of year (also weather related)
  - Spring
  - Summer
  - Autumn
  - Winter
- Street type
  - Ordinary two-lane street – bi-directional
  - One-way streets
Depending on which stakeholder interests are relevant, different combinations of use cases and situations can now be identified for further development into a scenario. The following scenarios will then be the basis for the definition of research questions, hypotheses, indicators, etc. for the impact assessment work.

As stated above Functions A2, B4, and C4 are all related to “Access control and loading/unloading areas”. The following scenarios have been created following the procedure of FESTA and the work has resulted in some examples which (depending on the overall problem or need addressed, and relevant links to different policy objectives) reflect one approach to the overall problem area of sustainable urban mobility.

In relation to the Function A2: “Conditional route assignment (incl. Green areas and access control)”, the use case “Access control of loading/unloading areas” is addressed. The main interest here is on impacts from access control schemes on traffic-related issues (being the UTMS perspective applied):

- **A2-related scenario no. 1**
  - Access control of loading/unloading area, during rush hours (morning), in the spring and mainly on low-speed streets

- **A2-related scenario no. 2**
  - Access control of loading/unloading area, during daytime, in the spring and mainly on low-speed streets

- **A2-related scenario no. 3**
  - Access control of loading/unloading area, during rush hours (evening), in the spring and mainly on low-speed streets

When the FDMS perspective is applied the Function B4: “Planned use of loading/unloading areas” and the use case “Booking of time slot in area x” is applied. The main interest here is whether the use of pre-booking of slots will improve the efficiency of how a fleet of vehicles for urban freight distribution is used, and the following scenarios are identified:

- **B4-related scenario no.1**
  - Booking of time slot in area x, during rush hours (morning), in the spring and mainly on low-speed streets

- **B4-related scenario no.2**
  - Booking of time slot in area x, during daytime, in the spring and mainly on low-speed streets

- **B4-related scenario no.3**
  - Booking of time slot in area x, during rush hours (evening), in the spring and mainly on low-speed streets

With the perspective of the Driver (vehicle on-board unit) the Function C4: “Time slot allocation of loading/unloading area” is addressed and the following use case is identified:
“Booking confirmed in area x”. The problem addressed here for the assessment could be the
time spent in the urban environment during a delivery. The scenarios could be:

- C4-related scenario no.1
  - Booking confirmed in area x, during rush hours (morning), in the spring and
    mainly on low-speed streets

- C4-related scenario no.2
  - Booking confirmed in area x, during daytime, in the spring and mainly on low-
    speed streets

- C4-related scenario no.3
  - Booking confirmed in area x, during rush hours (evening), in the spring and
    mainly on low-speed streets

Final remarks

This section should be seen as a rather detailed introduction to the preparatory work for the
impact evaluation of SmartFreight concepts to be performed in WP7. The idea has been to
present, in a rather general way, a systematic approach to create relevant hypotheses for the
assessment. However, as SmartFreight is in its very first phase (only half a year into the
work) the more detailed scenarios necessary for the impact evaluation work (also called local
scenarios) cannot yet be created. They must be directly related to the functions made
available at the test sites, and incorporate all details of the specifications of importance for
the SmartFreight functionalities to be studied.

As the resulting scenarios (see the examples above) are on a very high level, only these
scenarios have been included in this section. The main reason is that the local scenarios to
be developed in WP6 will provide enough information of what functions are really to be
tested and for what kind of impact or impacts. The final impact evaluation work will be
performed and reported as part of WP7 in the later phases of SmartFreight.
Appendix 1 - IT support in FDMS

The state of the art and short term visions in three Swedish companies

The company Bilspedition was founded by Swedish truckers more than half a century ago and, over time, became the major actor in Swedish domestic general cargo Less-than-full Truck Load (LTL) transport. It still has the largest market share, but today it is part of the German Schenker Group, which, in turn, belongs to the DB (Deutsche Bahn). It operates under the trade name Schenker.

ASG is almost as old as Bilspedition. It was founded as daughter of the Swedish State Railways (SJ) when SJ realised it was quickly losing market shares to Bilspedition. Over time, ASG became the second largest operator in this market segment. It is now part of DHL, which, in turn, belongs to the German Deutsche Post group. It operates under the DHL trade mark.

In both companies the domestic general cargo LTL segment is slowly integrated with other market segments but still enjoys rather high independence because of its specific organisation and technology. They both operate 24-25m long lorry and full trailer combinations and make extensive use of the EUR standardised exchange pallets. This is not possible in most other countries because of restrictions in length. Both use 18m long tractor and semi-trailer combinations and either one-way pallets or no pallets in their international operations. Like everyone else, they use various types of small trucks for their local pick-up and delivery operations.

It is interesting for SMARTFREIGHT to look at the use of IT for the domestic LTL market segment in these companies. Both implemented first generation operational information support systems for their above-mentioned market segments in the eighties and nineties. At the time, the Swedish forwarders had a competition-neutral working group that agreed upon common guidelines for information systems called PHAROS.

These systems used batch processing and were built on the MS-DOS operating system. For communication they used LAN-Net plus the MOBITEX package switching network that is now gradually phased out.

After both companies got German owners this cooperation ceased. Today they have independent ambitious projects for a new generation of IT support systems under development. These are briefly described below. For simplicity they are referred to as the Schenker and DHL projects, respectively.

Some information will also be provided on the daughter company Posten Logistik of the Swedish Mail. Their traditional segment is parcels but during the recent decade they have expanded into the general cargo segment.
The Schenker project Mobile Data

*Information source: Mr Gunnar Ahldén, Schenker*

The purpose of the Schenker project is to increase the quality of the information exchanged between the Schenker dispatching centre, the individual haulier’s home base, and the driver of a freight vehicle. The dispatching centre and the hauliers’ home bases are here seen as different parts of an FDMS. The project also serves to enable improved planning for the transport process. The project will lead to lower costs for the hauliers and also reduce the environmental effects while providing them with tools for economic driving.

The requirements established by the project are the following:

- **Customer needs/requirements**
  - Tracking in real time,
  - Alerts - deviation registration in real time
- **Production requirements**
  - Planning, optimizing, utilization of resources
  - Reduce administration
- **Quality**
  - Correct invoices, faster invoices, correct information, correct time, follow-up, control
- **Environmental effects**
  - Eco-driving, less distance for vehicles
- **Requirements from the European Network**

The project goal is to deliver:

- Mobile communications for order management and registration of tracking events for domestic traffic
- New mobile platform with additional functionality, e.g. positioning, eco-driving and time reporting

The vehicle equipment consists of two separate hardware components; the Handheld Device (HD) and the Black Box (BB). The HD is a Motorola MC75, which belongs to the vehicle and is placed in a docking station onboard when not used by the driver. There the batteries are automatically charged. Schenker pays the costs for providing a HD to each of the 4,050 vehicles used for transport between terminals, or for local distribution to and from the terminals, at a total investment cost of around € 6 million including the software installed in the HD. The haulier pays for the installation in the vehicle and for additional functions such as personal alarm and freight alarm.

All communication to and from a HD or BB uses 3G or GPRS technology and is routed through the “PreCom-platform”, developed by the Swedish company Pocket Mobile Communication as illustrated below.

The HD has a touch-screen graphical interface used both for input and output, a scanner and a camera. The camera will presently not be used. The unit communicates digitally online with the FDMS, which automatically registers all transactions involving the HD. The HD can also be used as a telephone. However, this is currently not allowed, as with the current state of the technology the analogue signal negatively interferes with the digital communication of the HD. Thus the drivers will continue to use normal mobile telephones for voice communications.
Initially the following functions of the HD will be implemented:

- Events, such as registration of tracking events, pickup, delivery and returned goods
- Order handling including bookings
- Digital signature for confirming delivery
- Messaging to and from vehicles

The BB supplements the HD. It focuses vehicle-related information that is primarily of interest to the haulier and the driver. Thus Schenker does not pay for this unit and its use and installation is therefore up to the individual haulier to finance, install and use. It is expected that a large part of the heavy lorries used in the lorry and full trailer combinations will be fitted with a BB, but that the interest to use them in the distribution vehicles will be much smaller.

The following functions will be included as standard in the BB:

- Vehicle economy and eco-driving
- Time reporting
- Position information
- Navigation

The BB is permanently installed in and bolted to the vehicle. It can communicate with onboard OEM (original equipment manufacturer) equipment, but only through the Fleet Management System (FMS) gateway. Most European lorry manufacturers recommend avoiding direct connection to such equipment, since this may have an impact on the warranty. The FMS standard is an open standard for transmission of vehicle data via the CAN bus to external units. A Controller-Area-Network - CAN or CAN bus - is a computer network protocol and bus standard designed to allow microcontrollers and devices to communicate with each other without a host computer. It is frequently used in vehicles. The FMS standard is currently supported by the lorry manufacturers: Daimler, MAN, Scania, DAF.
Trucks, IVECO, Volvo Trucks and Renault Trucks. For the full information set, additional Electronic Control Units (ECU) may be required. (Source: http://www.fms-standard.com)

Similar to the HD, the BB communication with the outside world is through the PreCom-platform. Of special interest is the one-way internal communication between the BB and the HD. When the HD is docked to the vehicle it can receive relevant information that is needed for its own functions, such as position information and navigation. Since the BB lacks its own user interface, the HD provides this utility on behalf of the BB, e.g. to give the driver feedback on his driving characteristics.

The project is currently in the definition and planning phase (January to August 2008). In the implementation phase (from September 2008 to June 2009), approximately 80 internal and 50 external “Super-users” will be educated. These Super-users will then be responsible for the education of the drivers.

The DHL project: TrueMobile

Information source: Mr Ulf Dahlbäcker, DHL

The new DHL system is built around a HD similar to the Schenker HD. It communicates digitally online by means of GPRS, but switches to use WLAN at terminals. There is no BB in the project, but of course the contracted hauliers are free to purchase similar equipment in the market on their own initiative. Out of a total of about 2,500 lorries only the 1,400 used in pickup and delivery have presently been fitted with a HD.

The HD uses the Microsoft Mobile operating system and has a graphical icon-based user interface. In addition is has a scanner, a camera and capacity to handle digital signatures.

Functionally, the DHL project has several phases with new functions added in each phase. It is now in phase 2. The phases comprise:

- Phase 1
  - Out of delivery; this means that a consignment has been booked for delivery by a specific vehicle. The driver is also given a Consignment Note, which is still printed on paper. (Compare phase 3!)
  - Proof of delivery –digital signature
- Phase 2
  - Exception handling
  - Order handling
- Phase 3
  - Electronic Consignment Note including signature capture on screen

Possible functionalities to be added later relate e.g. to navigation and eco-driving.
Comparison between Schenker, DHL and Posten Logistik


The table below is translated from Westberg’s paper, which was published after the research for this paper was finished.

<table>
<thead>
<tr>
<th>FDMS characteristics</th>
<th>DHL</th>
<th>Posten Logistik</th>
<th>Schenker</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD</td>
<td>Motorola HCe 700</td>
<td>Intermec 761</td>
<td>Motorola MC 70/75</td>
</tr>
<tr>
<td>Platform for HDs</td>
<td>True Mobile</td>
<td>PDS - Posten’s Distribution System (internally developed software)</td>
<td>Precom</td>
</tr>
<tr>
<td>Number of HDs</td>
<td>1 400</td>
<td>2 700</td>
<td>4 000</td>
</tr>
<tr>
<td>Supplier of HDs</td>
<td>Optidev</td>
<td>Intermec</td>
<td>Pocket Mobile</td>
</tr>
<tr>
<td>Number of lorries</td>
<td>2 800, of which 400 under 3.5 tonnes (mostly owned by subcontracted hauliers)</td>
<td>2 800, 900 of which so called distribution lorries</td>
<td>4 000 (owned by subcontracted hauliers)</td>
</tr>
<tr>
<td>Electronic signature</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Uses eco-driving</td>
<td>Not presently, but a time plan for implementation will be decided upon in the fall of 2008</td>
<td>Yes, has during several years worked with Greater Than Lean Driving driver education with technical support for eco-driving. The daughter company owning the trucks has 250 units/smart boxes that circulate among 50 facilities</td>
<td>Yes, provided the hauliers choose to install the Black Boxes</td>
</tr>
<tr>
<td>Uses navigation/positioning</td>
<td>Not presently, but a time plan for implementation will be decided upon in the fall of 2008</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Integration with business system</td>
<td>Yes, via the Hogia EMI/Mobilast software</td>
<td>Yes, via the PDS system</td>
<td>Yes, via the Hogia EMI/Mobilast software</td>
</tr>
<tr>
<td>Uses route optimisation from vehicle data</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Some conclusions

While the DHL project solely concentrates on functionalities that are relevant to the forwarding role, the Schenker project addresses both the forwarding role and the haulier role. However they do not invest themselves in functionalities belonging to the haulier role, i.e. how to get from A to B. With their historical background of being owned by hauliers, it is natural that Schenker (Sweden) takes a responsibility to develop information systems that are important for their subcontracted hauliers and therefore indirectly are useful to them.

Although developed independently, the forwarding functionalities in the two systems are very similar. This is natural. Beginning about ten years ago, the forwarding and transport sector has implemented a consistent work flow philosophy. This has, industry-wide, led to more or less standardised core work routines. This is good for SMARTFREIGHT, where we assume that it is possible to provide standardised object-oriented software building blocks that can be combined in a flexible way in order to meet local preferences in the design of future cooperating UTMS and FDMS.

Navigation is on the list of functionalities to be addressed by both projects, but is not given high priority. This indicates that the systems available in the market today do not provide sufficient value-added in relation to their cost.

During the post world war two era, Swedish industry has had a tendency to develop oligopolies with three major actors. The Swedish transport industry is no exception. Together the three companies have a dominating domestic market share. Two of them are owned by globally-active, very large transport companies. It is therefore believed that the technologies briefly described in this paper well represent the state-of the art.

The distribution of food and other daily products in Sweden has a similar oligopolistic structure with three major actors as the domestic transport industry. A large part of the transport from warehouse to shop is carried out on own account. It is likely that a study of the use of IT support for these transports would show a similar picture as described in this paper.

From the perspective of SMARTFREIGHT the following conclusions are of specific interest:

- Although heavy investments in IT systems offering new functionalities are currently made by most large actors, there is no mention of communications with UTMS, not even among the options. The reason is probably that what has been offered so far from the UTMS is perceived as uninteresting. Since these investments are of short term nature; less than three years, this should not be understood as lack of interest in totally new concepts that involve both UTMS and FDMS, and represent a longer term perspective.

- The major highway transport operators used to have a common standard for communication and functional support. In the present generation now being developed, communication is based on the use of established digital 3G or GPRS standards, sometimes supplemented by WLAN at terminals. The functional software, on the other hand, is neither based on common nor open standards and is delivered by different small suppliers.

- Thus the need for creating an open standard according to SMARTFREIGHT intentions seems to be evident. Since the global players currently seem to prefer go their own way, SMARTFREIGHT may, in the demonstration phase, prefer looking for cooperation with independent specialists in particular segments of the transport market, or segments where the public interest regulation already have a strong influence, such as in the transport of dangerous goods.
Appendix 2 - Briefing note sent to the European Reference Group

First SMARTFREIGHT Reference Group Meeting
Brussels, 17 June 2008, 11.00 – 17.00
POLIS Offices, Rue du Trône 98 – 1050 Brussels

The SMARTFREIGHT project wants to make urban freight transport more efficient, environmentally friendly and safe by answering to challenges related to traffic management, freight distribution management, and a better coordination between the two. The main aim of SMARTFREIGHT is to specify, implement and evaluate Information and Communication Technology (ICT) solutions that integrate urban traffic management systems with the management of freight and logistics in urban areas. The actual transport operations carried out by the freight distribution vehicles will be controlled and supported by means of wireless communication infrastructure and on-board and on-cargo equipment.

The European Reference Group has been established to provide input and feedback on the project’s progress and activities, and to validate preliminary and final results. During this first meeting, two aspects of the project will be discussed:

1. WP2 ‘Analysis of urban freight transport challenges & requirements’ (University of Southampton –TRG)
2. WP 6 ‘Proof of Concepts and Verification of ICT Solutions’ (Chalmers)

OBJECTIVES AND EXPECTED RESULTS OF THE SESSION: Analysis of urban freight transport challenges & requirements

The Technical Annex (WP2, D2.2) states that the consultations should “prioritize the identified user needs and identify future challenges associated with developing combined FDMS and UTMS”. In addition, “the consultations will generate a future vision of (and define the characteristics of) an effective urban delivery and service system where on-board ITS technologies can be integrated with traffic management technologies in an open architecture”.

With this in mind, the questions we would like to be able to answer as a result of the consultations include:

1. Which types of freight vehicle or goods, if any, should receive preferential treatment (e.g. priority access)?
2. a) What are the main FDMS needs for traffic information and what benefits may accrue?
   b) What are the main lorry driver needs for traffic information and what benefits may accrue?
3. What are the main UTMS needs for freight vehicle data and what benefits may accrue?
4. What are the best methods for UTMS/FDMS/Vehicle communications?
5. What are the main barriers to sharing data between UTMS and FDMS?
These questions are expanded upon in our questionnaire (Appendix 2)

<table>
<thead>
<tr>
<th>DISCUSSION POINTS AND QUESTIONS PRIOR THE MEETING</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Current &amp; future freight transport needs for the various users involved (e.g. city authorities, freight distributors, freight owners, lorry drivers);</td>
</tr>
<tr>
<td>o Problems encountered by users;</td>
</tr>
<tr>
<td>o ICT solutions to these problems, with particular emphasis on sharing data and information between the various users;</td>
</tr>
<tr>
<td>o Link with WP 7 impact evaluation (problem areas, indicators, research questions)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BACKGROUND DOCUMENTS INCLUDED: Analysis of urban freight transport challenges &amp; requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. D 2.1-User Needs Review, Full version (TRG, Southampton): just in case further detail is needed</td>
</tr>
<tr>
<td>3. Freight questionnaire, stakeholder consultation meeting (TRG, Southampton)</td>
</tr>
</tbody>
</table>
Appendix 3 - Questionnaire sent to the European Reference Group (based on UK questionnaire)

Q1a. Freight priorities
The SmartFreight project is considering providing preferential treatment (e.g., improved access) for certain categories of vehicle that are perceived as being ‘green’; conversely, increased restrictions may be applied to other vehicles that are perceived as less ‘green’. Various categorisation methods have been suggested. Please rate the categorisation methods in the table below in terms of:

- Positive impact for the city as a whole (1=negative impact very likely; 2= negative impact possible; 3=neutral; 4=positive impact possible; 5=positive impact very likely)
- Feasibility of introducing such a scheme successfully (1=highly unlikely; 2=doubtful; 3=not clear; 4=likely to be feasible; 5=straightforward)

<table>
<thead>
<tr>
<th>Categorisation of lorries by</th>
<th>Positive impact</th>
<th>Feasibility</th>
<th>Please provide comments to explain your scores.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fuel types (e.g. ‘clean’ fuels preferred)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Engine standard (e.g. Euro IV)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3. Gross vehicle weight (e.g. very heavy lorries may be restricted)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Number of axles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Load factor (e.g. full vehicles preferred)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6. Goods/service types (e.g. essential services such as waste collection may be preferred)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q1b. Freight priorities
Are there any other vehicle groups which you think should receive preferential treatment?
Q2. Freight Distribution Management Systems (FDMS)/lorry drivers needs for traffic-related information

Please rate the information items in the table below in terms of:

- Usefulness for freight distribution companies and their drivers (1 = not at all useful; 2 = not very useful; 3 = neutral; 4 = useful; 5 = very useful)
- Feasibility of providing the required information accurately and quickly within an urban setting (1=highly unlikely; 2=doubtful; 3=not clear; 4=likely to be feasible; 5=straightforward)

<table>
<thead>
<tr>
<th>Information item</th>
<th>Usefulness for the freight distribution manager</th>
<th>Usefulness for the lorry driver</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Location of lengthy traffic queues (head of queue, back of queue, queue length)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Estimate of how long it will take to get back to normal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Reporting when a lengthy queue has actually cleared</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Location of roadworks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Estimates of journey times on recommended lorry routes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Estimates of delays on recommended lorry routes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Information tailored to the individual vehicle (e.g. according to the route being driven)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Route guidance in the case of an incident (route only)</td>
<td></td>
<td></td>
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<tr>
<td>9. Route guidance in the case of an incident (route plus reason for diversion)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. The ability to pre-book a loading bay slot, operated by a combined UTMS/FDMS</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q2b. FDMS/lorry drivers needs for traffic-related information (for those working directly in freight distribution, others skip to Q3)
Do you currently use any traffic information? If so, what sources?
Do you have any existing needs for traffic information that is not available to you? If so, what are they?

Q3. Urban Traffic Management Systems (UTMS) needs for freight-related information (for those working directly in urban traffic management, others skip to Q4)
Do you currently use any freight-related information? If so, what sources?
Do you have any existing needs for freight data or information that is not available to you? If so, what are they?

Q4. Communications media
Which communications media do you think are best for delivering traffic from UTMS to FDMS?
- Email? - Internet? - Phone/SMS text?
- Radio broadcasts? - RDS-TMC? - Other (please state)

Which communications media do you think are best for delivering traffic data from UTMS to lorry drivers?
- Email? - Internet? - Phone/SMS text?
- Radio broadcasts? - RDS-TMC? - Variable message signs (VMS) by the roadside?
- Other (please state)

Which communications media do you think are best for delivering freight data from FDMS to UTMS?
- Email? - Internet? - Phone/SMS text?
- Radio broadcasts? - RDS-TMC? - Other (please state)
Q5. Barriers to implementation

There to seem to be few, if any, good examples of data sharing between UTMS and FDMS. What are the key barriers to this?

- costs (data collection, equipment etc)?
- unclear that significant benefits will accrue for either side?
- complexity?
- security / privacy of information?
- any other issues?

Q6. What opportunities are there for UTMS to benefit from FDMS data?

Q7. What opportunities are there for FDMS to benefit from UTMS data?

Many thanks for your comments.

Tom Cherrett (Tel. 023 8059 4657, Fax. 023 8059 3152, Email: t.j.cherrett@soton.ac.uk)
Fraser McLeod (Tel. 023 8059 3316, Fax. 023 8059 3152, Email f.n.mcleod@soton.ac.uk)
TRG, School of Civil Engineering and the Environment, University of Southampton, SO17 1BJ
Appendix 4 - Biography of UK consultation chairman, Steve Norris

Steve was the Conservative Party's candidate for London Mayor in 2000 and in 2004.

Steve is Chairman of the Prince Michael International Road Safety Awards Scheme and has pursued his long-standing interest in transport issues as President of ITS (UK) the national telematics industry and government forum and as a Patron of the national cycling charity, Sustrans. As someone who is committed to jobs and business in London and to cutting congestion and pollution, he has worked as Director General of the Road Haulage Association and is a Vice President of the National Society for Clean Air.

Beginning his career in the engineering and motor industry, Steve is one of the few politicians who is also a serious businessman. A founder of the drug rehabilitation charity, ADAPT, and a former Trustee of RADAR, the charity that helps people with disabilities, Steve has worked with people from across the political spectrum to help Londoners in need. He is a Trustee of the London Action Trust, which helps young offenders find their way back into employment. He has also been a long time supporter of the National Council for Civil Liberties.

Before standing as a candidate for London Mayor, Steve was a Conservative Member of Parliament for fourteen years and Minister for Transport in London for nearly five years.
## Appendix 5 - UK consultation, 27 May 2008 - delegates list

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tim Hapgood</td>
<td>Bristol City Council <em>(Speaker)</em></td>
</tr>
<tr>
<td>Julian Richardson</td>
<td>Clipper Logistics</td>
</tr>
<tr>
<td>Simon Woodward</td>
<td>DHL Exel Supply Chain</td>
</tr>
<tr>
<td>Grant Harrison</td>
<td>EC Harris</td>
</tr>
<tr>
<td>Graham Ellis</td>
<td>Ellis Transport Services</td>
</tr>
<tr>
<td>Bryan Jenkins</td>
<td>ESYL Ltd.</td>
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<tr>
<td>Geoff Clarke</td>
<td>Faber Maunsell Ltd.</td>
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<tr>
<td>Geoff Hobbs</td>
<td>Hampshire County Council</td>
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<tr>
<td>Jennie Martin</td>
<td>ITS (UK)</td>
</tr>
<tr>
<td>Rachael Louis</td>
<td>ITS (UK)</td>
</tr>
<tr>
<td>Owen Bond</td>
<td>Mott MacDonald</td>
</tr>
<tr>
<td>Caroline Bullock</td>
<td>Ordnance Survey</td>
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<tr>
<td>Mark Le Page</td>
<td>Ordnance Survey</td>
</tr>
<tr>
<td>Steven Norris</td>
<td>Park Place Communications <em>(Chair)</em></td>
</tr>
<tr>
<td>Martin Wylie</td>
<td>ROMANSE <em>(Speaker)</em></td>
</tr>
<tr>
<td>Nic Burns</td>
<td>ROMANSE <em>(Speaker)</em></td>
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<tr>
<td>Alex Luckman</td>
<td>Royal Mail <em>(Speaker)</em></td>
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<tr>
<td>Stephen Newcombe</td>
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<td>Peter Bull</td>
<td>Sheffield City Council</td>
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<td>Mark Bodger</td>
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<td>Nigel Weldon</td>
<td>Siemens Traffic Contols</td>
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<tr>
<td>Brendan Mason</td>
<td>TENET</td>
</tr>
<tr>
<td>Alan Lewis</td>
<td>Transport and Travel Research Ltd. <em>(Speaker)</em></td>
</tr>
<tr>
<td>Tom Cherrett</td>
<td>TRG, University of Southampton <em>(Speaker)</em></td>
</tr>
<tr>
<td>Fraser McLeod</td>
<td>TRG, University of Southampton <em>(Speaker)</em></td>
</tr>
<tr>
<td>Ian McGregor</td>
<td>T-Systems</td>
</tr>
<tr>
<td>Donald Chalker</td>
<td>University of Westminster/Central London FQP</td>
</tr>
<tr>
<td>Phil Cooper</td>
<td>Zircon Software</td>
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</table>
### Appendix 6 - InnovITS Sustainable Freight Workshop - delegates list

Event held on 10 June 2008

<table>
<thead>
<tr>
<th>First name</th>
<th>Last name</th>
<th>Organisation</th>
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<tbody>
<tr>
<td>Jim</td>
<td>Chappell</td>
<td>AEA Technology</td>
</tr>
<tr>
<td>Richard</td>
<td>Ellithorne</td>
<td>Chartered Institute of Logistics and Transport</td>
</tr>
<tr>
<td>Andrew</td>
<td>Palmer</td>
<td>Cranfield University</td>
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<tr>
<td>Jonathan</td>
<td>Chadburn</td>
<td>DHL</td>
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<tr>
<td>Vince</td>
<td>Darley</td>
<td>Eurobios</td>
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<tr>
<td>Lloyd</td>
<td>Amako</td>
<td>Eurobios</td>
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<td>Andrea</td>
<td>Lendak</td>
<td>IBI Group UK</td>
</tr>
<tr>
<td>Rob</td>
<td>Doherty</td>
<td>IBI Group UK</td>
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<tr>
<td>Tony</td>
<td>Wyatt</td>
<td>InnovITS</td>
</tr>
<tr>
<td>Richard</td>
<td>Kemp-Harper</td>
<td>InnovITS</td>
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<tr>
<td>Jeremy</td>
<td>Hammant</td>
<td>LCP Consulting</td>
</tr>
<tr>
<td>Chris</td>
<td>Greenwood</td>
<td>Map Mechanics</td>
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<tr>
<td>Rachel</td>
<td>Jelly</td>
<td>Technology Strategy Board</td>
</tr>
<tr>
<td>Chris</td>
<td>Peacock</td>
<td>Transport Research Laboratory (TRL)</td>
</tr>
<tr>
<td>Fraser</td>
<td>McLeod</td>
<td>University of Southampton</td>
</tr>
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</table>
## Appendix 7 - Green Logistics consortium meeting attendees

Meeting held on 15 May 2008

<table>
<thead>
<tr>
<th>Name</th>
<th>University</th>
<th>Roles</th>
</tr>
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<tbody>
<tr>
<td>Dr Tony Whiteing</td>
<td>Leeds</td>
<td>Principle Investigator, Chair of EMG</td>
</tr>
<tr>
<td>Professor Mike Browne</td>
<td>Westminster</td>
<td>Co-Investigator, Member of EMG</td>
</tr>
<tr>
<td>Professor Alan McKinnon</td>
<td>Heriot Watt</td>
<td>Co-Investigator, Member of EMG</td>
</tr>
<tr>
<td>Dr Tom Cherrett</td>
<td>Southampton</td>
<td>Co-Investigator, Member of EMG</td>
</tr>
<tr>
<td>Professor Richard Eglese</td>
<td>Lancaster</td>
<td>Co-Investigator, Member of EMG</td>
</tr>
<tr>
<td>Professor Mohamed Naim</td>
<td>Cardiff</td>
<td>Co-Investigator, Member of EMG</td>
</tr>
<tr>
<td>Katherine Head</td>
<td>Cardiff</td>
<td>PA</td>
</tr>
<tr>
<td>Dr Andrew Potter</td>
<td>Cardiff</td>
<td>Leader of WM1</td>
</tr>
<tr>
<td>Dr Christine Mumford</td>
<td>Cardiff</td>
<td>Leader of WM5</td>
</tr>
<tr>
<td>Tony Fowkes</td>
<td>Leeds</td>
<td>Reader</td>
</tr>
<tr>
<td>Vasco Rodrigues Sanchez</td>
<td>Cardiff</td>
<td>Research Associate</td>
</tr>
<tr>
<td>Julian Allen</td>
<td>Westminster</td>
<td>Research Fellow</td>
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<tr>
<td>Karen Ghali</td>
<td>Southampton</td>
<td>Research Assistant</td>
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<tr>
<td>Dan Black</td>
<td>Lancaster</td>
<td>Research Fellow</td>
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<tr>
<td>Alan Woodburn</td>
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<td>Senior Lecturer</td>
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<tr>
<td>Dan Johnson</td>
<td>Leeds</td>
<td>Research Fellow</td>
</tr>
<tr>
<td>Irina Harris</td>
<td>Cardiff</td>
<td>PhD Student/Researcher</td>
</tr>
<tr>
<td>Maja Piecyk</td>
<td>Heriot Watt</td>
<td>PhD Student/Researcher</td>
</tr>
<tr>
<td>Damian Stantchev</td>
<td>Leeds</td>
<td>Research Assistant</td>
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Note: EMG = Executive Management Group
**Appendix 8 - 'Urban Traffic Management - Future Developments and Applications', organized and hosted by Scott Wilson Ltd in London - delegates list**
Event held on 29 April 2008

<table>
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<tr>
<th>Name</th>
<th>Organisation</th>
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<tbody>
<tr>
<td>Alan Carter</td>
<td>Transpomatica</td>
</tr>
<tr>
<td>Andrew Thurston</td>
<td>Colin Buchanan and Partners</td>
</tr>
<tr>
<td>Andrew Wilson</td>
<td>Highways Agency</td>
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<tr>
<td>Bob Roth</td>
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<tr>
<td>Brent Collier</td>
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<td>Emma Jones</td>
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<td>Frank Offermann</td>
<td>PTV</td>
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<tr>
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<td>QinetiQ</td>
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<td>Graham Wright</td>
<td>Scott Wilson</td>
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<td>Jan Futcher</td>
<td>Highways Agency</td>
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<td>Jem McCluskey</td>
<td>Scott Wilson</td>
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<tr>
<td>Jeremy Cohen</td>
<td>Centre for Pervasive Sensing, Imperial College</td>
</tr>
<tr>
<td>John C Whittaker</td>
<td>Gloucestershire County Council</td>
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<tr>
<td>Keith Mortimer</td>
<td>Efkon UK</td>
</tr>
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<td>Marc Allen</td>
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<td>Isle of Wight Council</td>
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<td>Mason Communications</td>
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<td>Essex County Council</td>
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<td>Stephen Dapaah</td>
<td>Transport East Delivery Manager</td>
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<td>Steven George</td>
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<tr>
<td>Vijay Manro</td>
<td>Southampton City Council</td>
</tr>
<tr>
<td>Yuelin Liang</td>
<td>Scott Wilson</td>
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</table>
**Appendix 9 - BESTUFS II, UK national seminar - delegates list**

Event held on 21 April 2008

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<th>Organisation</th>
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<td>Julian</td>
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<td>University of Westminster</td>
</tr>
<tr>
<td>Stephen</td>
<td>Anderson</td>
<td>Peter Brett Associates</td>
</tr>
<tr>
<td>Tony</td>
<td>Bellia</td>
<td>Skills for Logistics</td>
</tr>
<tr>
<td>Mike</td>
<td>Browne</td>
<td>University of Westminster</td>
</tr>
<tr>
<td>Duncan</td>
<td>Buchanan</td>
<td>Dept. for Transport</td>
</tr>
<tr>
<td>Donald</td>
<td>Chalker</td>
<td>Central London Freight Quality Partnership</td>
</tr>
<tr>
<td>Francesca</td>
<td>Cignola</td>
<td>London Borough of Bromley</td>
</tr>
<tr>
<td>Glen</td>
<td>Davies</td>
<td>Transport for London</td>
</tr>
<tr>
<td>Nick</td>
<td>Deal</td>
<td>Road Haulage Association</td>
</tr>
<tr>
<td>Bob</td>
<td>Dempsey</td>
<td>Wilson James Ltd</td>
</tr>
<tr>
<td>Chris</td>
<td>Douglas</td>
<td>TTR</td>
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<tr>
<td>Jolyon</td>
<td>Drury</td>
<td>Surge Logistics Consultants</td>
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<tr>
<td>Ian</td>
<td>Foster</td>
<td>DHL Exel Supply Chain</td>
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<td>Liz</td>
<td>Halsted</td>
<td>London Borough of Camden</td>
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<td>Hills</td>
<td>Greater London Authority</td>
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<td>Dewan</td>
<td>Islam</td>
<td>Newcastle University</td>
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<tr>
<td>Jonathan</td>
<td>James</td>
<td>Faber Maunsell</td>
</tr>
<tr>
<td>Angela</td>
<td>Kimberley</td>
<td>The People Development Team</td>
</tr>
<tr>
<td>Andrea</td>
<td>Lendak</td>
<td>IBI Group UK</td>
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<td>Lucking</td>
<td>London Borough of Bromley</td>
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<td>McLeod</td>
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<td>McTigue</td>
<td>Newcastle University</td>
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# Appendix 10 - ITS (UK), Local Authority/Urban Interest Group meeting

Delegates list - event held on 14 February 2008

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