

**Workshop:**  
**Delivering the best information**  
**to all in-vehicle Satellite Navigation users**

**Tuesday 6 March 2012**

**Opened by Norman Baker MP, Under Secretary of State for  
Transport**

**Department for Transport, Great Minster House,  
33 Horseferry Road, SW1P 4DR**

## Executive Summary

1. DfT's 2011 Consultation on the Classification of Roads contained a section on satnavs. Respondents referred to missed opportunities for cooperation between local authorities and satnav companies, as well as problems caused by HGVs not using satnavs correctly. Based on these findings, DfT invited ITS (UK) and ADEPT to organise a workshop for satnav providers, highways authorities, the freight industry, satnav service providers and map providers to develop actions for improvement.
2. All the above players – and more – attended the summit, and so discussion was extremely well informed. This report relays the important facts established during the summit, the ideas and suggestions put forward, and ends with the action list .
3. There is no doubt that satnav has been one of the great innovations of the last couple of decades. It has fundamentally changed how drivers use the road, and enables drivers to use faster, greener or more suitable routes. Combined with freight management systems, it has revolutionised multidrop deliveries and multi-site repair and maintenance services.
4. The summit showed that the map used by any sat nav- either in the vehicle or a central computer, is the key to appropriate routing. The unit itself is not as critical. So, if a satnav with a map designed for cars is used by drivers of larger vehicles, or if the maps used by the satnav are allowed to get out of date, satnav can also create problems. By unthinkingly following the satnav, an HGV driver may find himself on a route which is permanently unsuitable, for instance due to a narrow bridge, or one which was suitable when the satnav was last updated. This problem peaked several years ago, and has decreased following the introduction of special freight sat navs, but there is still much that can be usefully done to drive improvements further.
5. A key area is improved communication- so local authorities know how to contact map makers and vice versa, and so that many of the myths about sat nav can be clarified. This is the first key action from the day – a central list of contacts and ways
6. Satnav map makers have processes for making sure that their maps are as accurate as possible. Their maps are updated by new surveys, by direct reporting by highways authorities, and by reports from users. But these are often felt to be cumbersome due to different map makers requiring data in different forms and via different routes. A more streamlined approach across the industry – report once, update many – would be valued. Map-makers in turn valued the idea of local authority data coming in one standardised format, which they could process rapidly. But both of these were ultimately dependent on users to updating their maps – for some newer systems this is done automatically and for free, but for older systems it will still be a challenge.
7. It is anecdotally reported that some freight vehicles, particularly foreign ones, have inappropriate or grossly outdated satnav. This could encourage poor decisions, ignoring road signs and the driver's own common sense. Information campaigns via freight associations throughout Europe, on board ferries, and at British ports, pointing out the pitfalls of using poor satnav on an unfamiliar road network, would help
8. Satnav can clearly be a force for good. By working effectively with satnav providers and with mapping companies, highways authorities can mould how freight moves around their network. This will benefit not just the authority, but also the hauliers, who get to use the most suitable roads, and local residents, who will welcome consistency in how their road network is utilised.
9. DfT, ADEPT and ITS (UK) will work together with satnav and mapping companies and freight industry representatives, to address these issues further, build on the contacts and ideas created at the summit..

## Introduction by the Minister

Norman Baker MP, Under Secretary of State for Transport, introduced the summit and opened by stressing that he was looking for positive outcomes from the day. He believed that it was in everybody's interest to have credible satellite navigation; and that this applied equally to satnav users, providers, map providers, Local Authorities and the Department for Transport. He described vehicle satnav devices as "one of the most innovative and iconic objects of our time". Satnav had democratised maps, making mapping information available without the need for possessing map-reading skills.

However, there was still a gap between expectation and actual performance. The trust placed in satnav devices meant that the product has to be excellent and this is not yet the case in all situations. Inappropriate routing is a challenge to local communities.

Because of the Government's consultation on road classification, three relevant actions had been taken. These are the approval of a new "not suitable for heavy goods vehicles" road sign, work to be done to reduce bridge strikes, and this summit. The objective of this day was to come up with actions for how satnav processes can be improved, and to make the most out of the potential of satnav for reducing the inappropriate routing of HGVs and congestion.

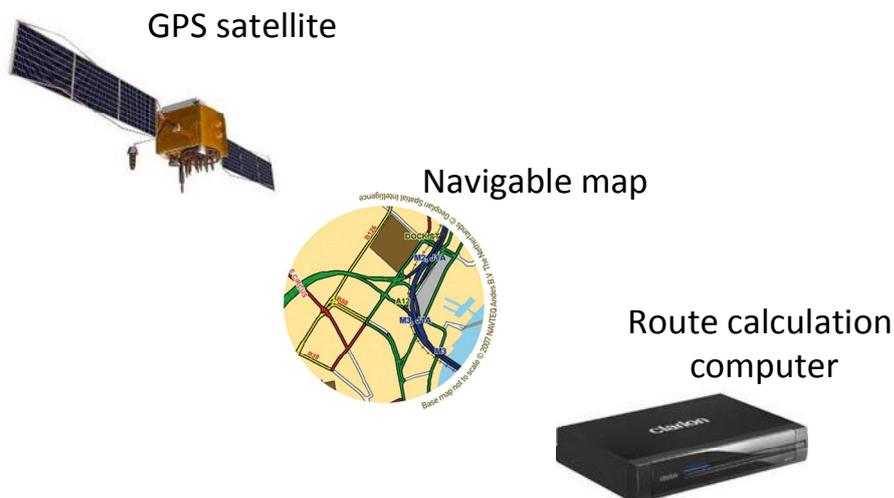
The Minister was aware that since the road network constantly changes, all maps have to be updated constantly, and the maps used by satnav devices especially so. These processes need to be made quicker and more consistent.

He noted that with representatives of all relevant sectors present at the summit, the scene was set for establishing a new and more effective way of working. Collaboration is the only sensible way to address these issues and make the ubiquity of satnav devices in the UK vehicle fleet work to route all vehicles appropriately.

## How does satnav really work?

David McClure of SBD Ltd provided a detailed description of the components of a satnav and how they are integrated to produce the services used by drivers. There are many myths and misunderstandings about the roles of satellites, maps, communication systems and route calculation software, which need to be overcome prior to a serious discussion about how to improve the use of satnav.

### The 3 basic components of sat nav



Graphic courtesy of SBD Ltd

UK satnav services use the GPS system of satellites. In satnav systems, the device receives timed signals from the satellites it has in view, and uses this time information combined with mapping information, to calculate where it is. The satellite does not “see” the vehicle or driver; it is in effect just a “clever clock” for the satnav device to refer to. GPS usually provides accuracy of position to about ten to fifteen metres. By adding map matching systems, this can be refined to greater accuracy. Map matching also helps to keep the device informed of its location where there are canyon effects, in tunnels, in the hold of ferries and so on.

Using a navigable map, the satnav calculates the “cost” of the available routes to the desired destination and selects the “best” route. The “cost” and the “goodness” can be defined by a variety of criteria: time, distance, fuel consumption, class of road, etc. The system will route via the highest class of road available, according to the criteria set. For instance, if “no motorways” has been pre-selected, then the system will not route via motorways even if using a motorway would be the quickest, shortest, and most fuel efficient option. If no type of road has been pre-selected, and an A and a B road would be equally “good” in terms of time, distance, etc., then the system will select the A-road. The way that the satnav’s map classifies the roads is key.

The key to good satnav is the quality of the navigable maps. These can be held once on a central server by the satnav service provider and be continually updated, or be installed on every device in the vehicle. The latter is by far the most common arrangement but means maps go out of date very quickly. The facility of course exists for users to update their satnav maps, but it is common for this not to happen, or to happen very infrequently. This is sometimes due to cost but most often probably due to a lack of understanding, or inertia on part of the user.

It is very much the norm for the mapping information to be held on the device and for the calculation to happen there rather than centrally. This has come about since satnav developed while mobile communications were unreliable and expensive, and before it became the norm for at least high end vehicles to have their own communications system built in. While the “connected car” concept will take decades to work its way through the UK fleet, the ubiquity of smartphones offers an opportunity to now move quickly to remotely held maps and routing selection software. It is likely that the “wired in” type of satnav device which forms part of the in vehicle equipment will give way to the driver’s portable smart device. This will make obsolete maps a much less widespread problem.

Typical mapping errors, whether through wrongly recorded or out of date information, include roads being recorded in the wrong class, and errors on height and width restrictions. The use of inappropriate maps also causes problems, e.g. if HGV drivers use a satnav service meant for cars, which will route them through spots where for instance height restrictions will get them into difficulties. Problems also arise if the user has pre-set the satnav inappropriately, for instance by selecting the shortest route on every occasion, which may take them down unsuitable roads, or by deselecting all motorway options. For satnav to work at its best, users must have a reasonable level of competence in using their devices, and take responsibility for updating the map regularly.



### The Local Authority perspective

Photo courtesy of Hampshire County Council

Andy Wren of Hampshire County Council described the immediate problems caused to LAs by bad routing for HGVs. Lorries get stuck between buildings and under and on top of bridges, structures are damaged, and local residents complain about noise and pollution nuisance, as well as poor road safety. The problems are sometimes caused by poor satnavs, sometimes by drivers ignoring road signs, and sometimes by a combination of the two.

LAs have to find a sensible middle way between on the one hand protecting structures and providing a good living

environment, and on the other with ensuring that access requirements are met for all types of traffic. An example would be that the desire to keep village shops and pubs open, unavoidably means large delivery lorries making trips into the same village. Similarly, a dairy farm cannot function without large milk trucks coming and going no matter how narrow the track to the farm is.

While farms and villages have usually been located in the same spot for centuries, there are more recent examples of problems where more sensible planning decisions would have helped. An example is a large and busy industrial estate where all the surrounding roads except one have weak bridges, meaning that what may have looked like a well connected location for the estate, actually only has one useable access road. Better research at the time could have avoided this situation.

LAs can try to mitigate the problems in various ways. Hampshire, for example, has done so by setting up a routing agreement with a large distribution centre, but such agreements do not feature in commercial satnav services and so a driver who relies on his satnav system may drive in breach of these agreements. LAs counter this by detecting HGVs using other routes using ANPR and levying punitive fines, as high as £500, which act as a deterrent by word of mouth as well as formally.

LAs are keen to help themselves by reporting changes to map providers, but can find this difficult. Examples are: some reporting sites default everything to the US, meaning that it takes lots of effort to persuade the site that you mean Birmingham, UK; and the terminology is different in the reporting systems of the different map providers, causing confusion and leading to erroneous reporting. There are often poor feedback and confirmation arrangements, so the LA officer cannot know whether their change reporting has actually been noted at all.

An LA wish list for satnav would include: better mechanisms for transferring data, better map update processes, better penetration by HGV specific satnav services, better links with local yards and individual hauliers.



Photo courtesy of Hampshire County Council

### The Freight Industry perspective

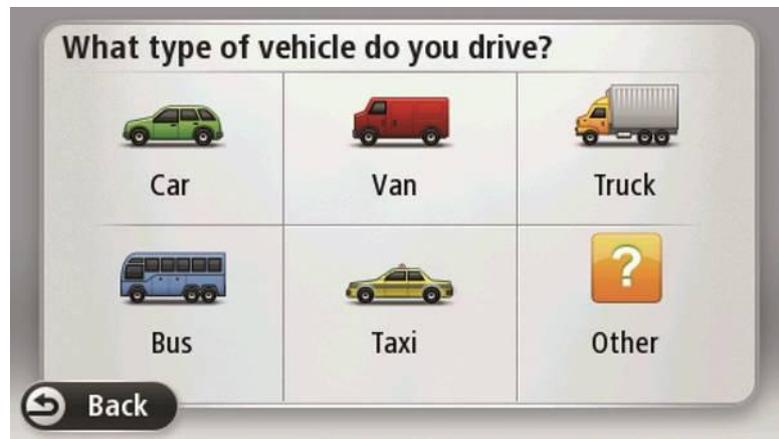
The FTA has been active in promoting good satnav services for hauliers since 2007. This was the time when satnav-induced accidents and mishaps for lorries were weekly news stories. At that time, the problem was simply caused by there only being satnav systems for cars on the market, and HGV drivers found these better than having to read a paper map, but were not always mindful that these services would select routes suitable for much smaller vehicles.



The FTA responded to this by challenging satnav providers to provide specific products which were capable of calculating routes suitable for HGVs. They also challenged highways authorities to provide positive input on which roads they *did* want lorries to use. The first to respond effectively was TomTom and the FTA proceeded to endorse their lorry satnav product and indeed to sell it in their shop. They now promote other makes too.

Photos courtesy of TomTom

Now, satnav systems are available which allow the user to pre-set perimeters for weight, height and width, and even provide route selection specially for various types of dangerous loads. The FTA argued that this had made a major difference to the problem, with all of the twenty 'satnav blackspots' identified in 2009 being partially or fully solved by the new technology. The persisting satnav-related problems for HGVs are believed to be almost wholly caused by drivers using systems which are intended only for cars, and the FTA was trying to encourage greater uptake.



For the future, the next generation of digital tachographs will have a GPS element which will offer opportunities to integrate the satnav.

### Bridge strikes

Bridge strikes had attracted a large amount of publicity in the early days of satnav, and it still seems that each time an HGV hits a bridge or gets stuck on a humpback bridge, the media turn it into a satnav related story. This is even though the number of strikes has actually gone down year on year all the time that satnav has been available. It was reported that currently, of the vehicles involved in bridge strikes, only 8% actually have a satnav device on board.

Recent case law appears to clear the way for Network Rail to recoup losses through bridge strikes from the operator of the vehicle which struck the bridge. Since the compensation agreements between Network Rail and the Train Operating Companies (TOCs) mean that the cost to Network Rail can be millions of pounds, this seems likely to concentrate the minds of hauliers on avoiding railway bridge strikes altogether.

As well as using inappropriate satnav, there are examples where the HGV driver has ignored correctly placed highways authority signage, and gone on to strike a bridge. While this cannot be said to be the fault of the Local Authority, there are probably gains to be made by reviewing the signs themselves and how they are placed, in order to produce guidelines for more effective signage. This has been suggested by the UK Bridges Board.



Photo courtesy of Hampshire County Council

Another suggestion could be for all Local Authorities to nominate a Bridge Strike Champion, whose job should be to keep in regular contact with Network Rail and with satnav mapping providers, in order to provide up to date information.

There are examples of Local Authorities which are reluctant to publish their data relating to restricted access. This seems peculiar since the legally required signage is on the roadside for all to see in any case.

### Map Data and Routeing

Map data should of course ideally reflect reality at the time the map is used. However, the many steps and actors involved between the obtaining or correction of the data and its eventual use in calculating routes for satnav users, mean that even with excellent processes in place, the data will sometimes be out of date or wrong. And currently, not all processes are excellent.

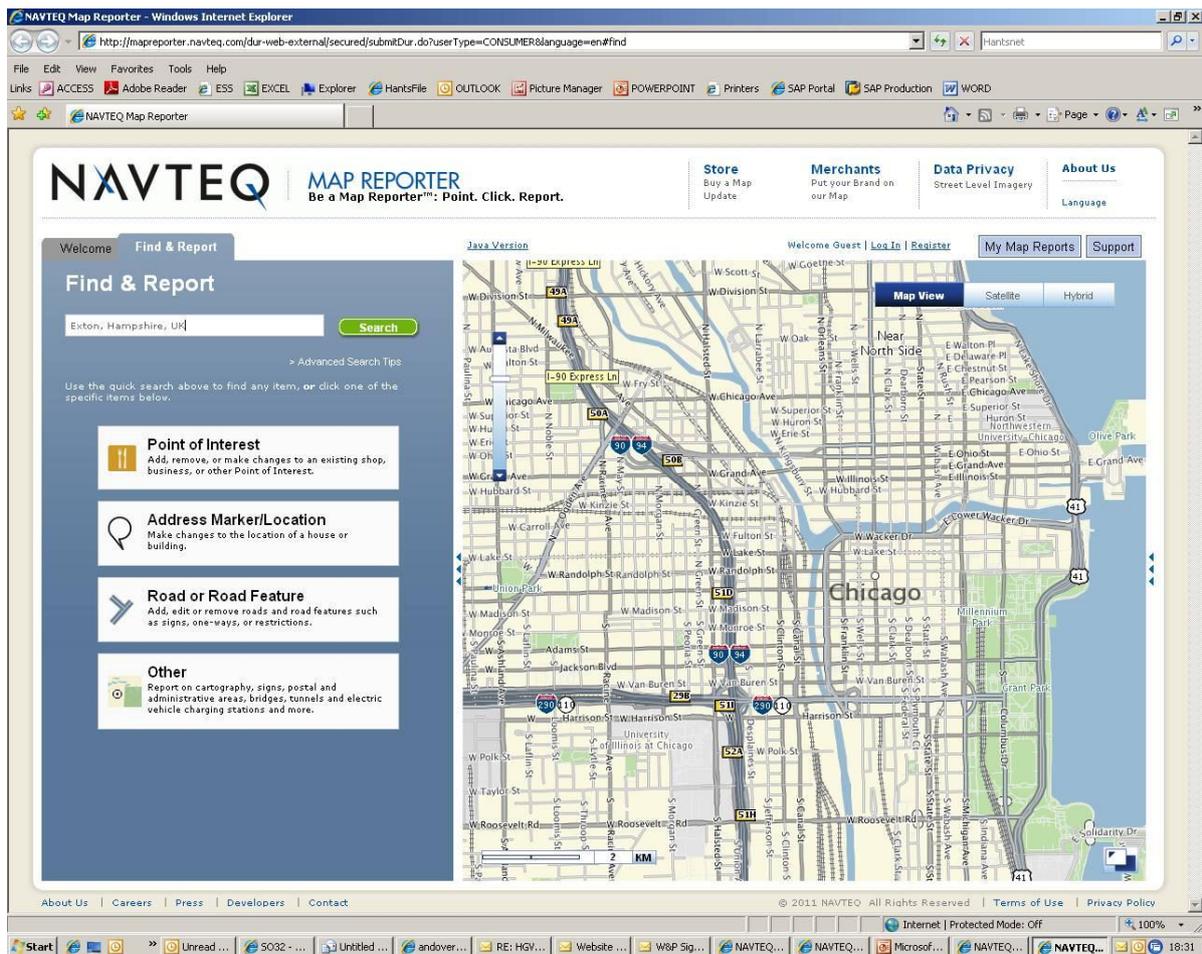
Information such as Traffic Regulation Orders (TROs), changes to road numbering, road layout changes, and route preferences by the highways authority, is essential to good maps but can sometimes be difficult to get hold of in a timely fashion. If this leads to situations where road signage and satnav information do not match, there can be a crisis of confidence for the user, who may decide to back the wrong horse and get into difficulties.

Highway Authorities vary widely in how effective they are at getting their new and changed map data through to mapping providers. The latter would ideally like to see a consistency of format and full openness in what is provided, i.e. no restrictions due to map licensing etc. All information should also be electronic; some authorities still communicate their map changes on paper.

To provide some scale, one map provider said that they processed 580,000 map changes in the UK in 2011. While before it sometimes took up to nine months for a change to be included in maps, now a two day turnaround is the norm.

Satnav devices fitted into cars are very expensive and cumbersome to update with new maps, since it has to be done with a DVD. As a consequence, these systems are frequently the most out of date. Satnav service providers now favour updates done over the internet as this is simple for the user, making it more likely that the updates will actually happen. They are aware that when the product underperforms due to not having been updated, the user routinely blames the service provider anyway. This also fits in with the expectation on the part of the service providers that fully portable smart devices will take over from specific satnav devices as the normal delivery mechanism.

Some map providers offer a self-service update function over the internet to “trusted partners” within Local Authorities, who can update certain pre-set features themselves. There is an issue over getting LAs to be proactive and nominate such people, but if possible, map providers would like to expand this approach. Again, openness is seen as key, and there should be very little map data which LAs can justifiably claim to be confidential. Map providers would very much like to see a standard way of geocoding all map data, which would speed up all update processes and make them more reliable. There was some suggestion that INSPIRE will fill this function.

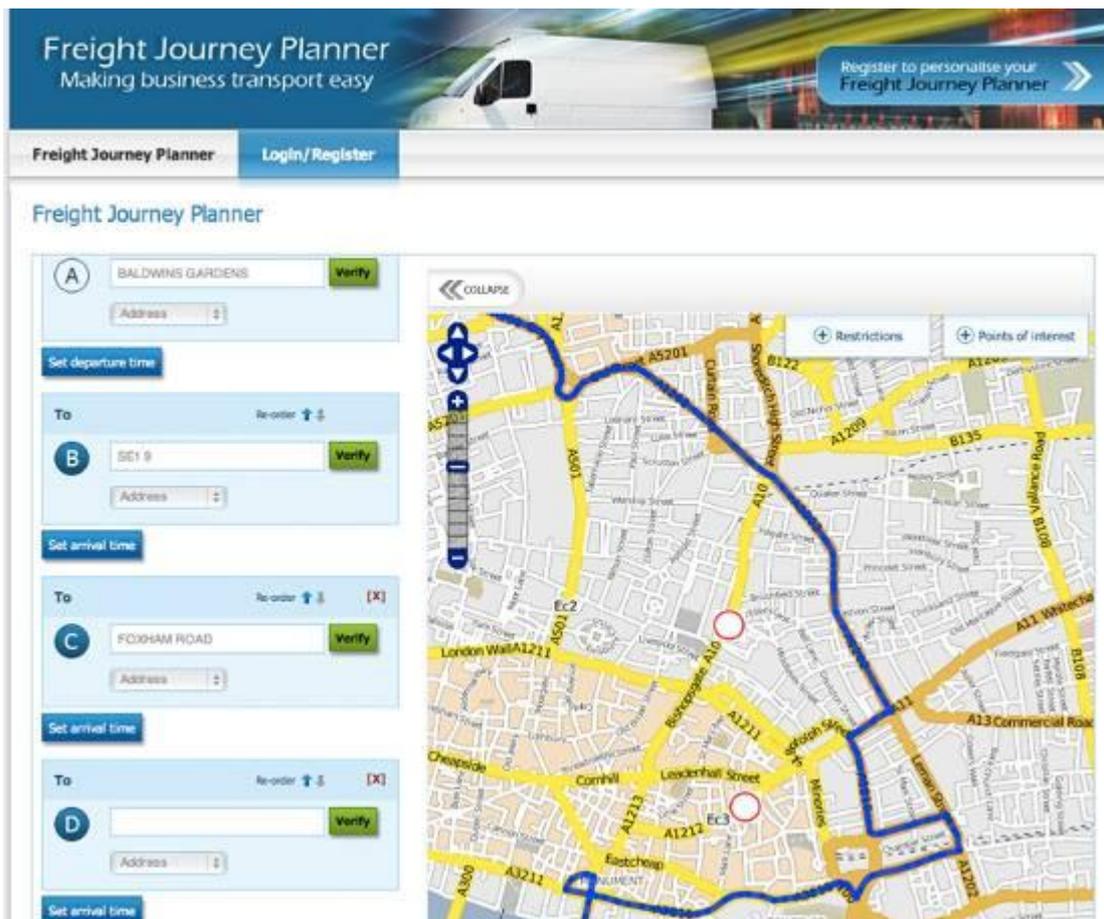


Screenshot of Navteq update page

Map providers also usually provide a method for users to feed in information about updates and errors. One provider noted that there are people who can be described as “hobby cartographers” who give a lot of time and effort in order to supply corrections and additions to satnav maps. The amount of input from users obviously varies with how many subscribers a services has, but one speaker said that his company would typically receive 50-100 “amateur” map corrections each day. The map provider has to employ a team of verifiers to check the input, but they still see this voluntary assistance as beneficial.

### Using routing to change behaviour

One organisation described its Commercial Vehicle Behavioural Change Strategy which it tailors for Local Authorities. An example is London, where night time HGVs traffic is routed along the streets preferred by the authorities, and fined if they are found to stray off these routes. In order to provide this services for the Transport for London freight journey planner, an enormous amount of effort has been put into digitising Traffic Management Orders (TMOs) and Traffic Regulation Orders (TROs), some going back as far as to the 1940s. Once these systems are in place, a highways authority is able to change the nominated routes for HGVs dynamically, for instance in response to weather conditions, essential work on the highway, or special events. The service includes a feedback tool for users to help improve it further.



Specialised HGV journey planner by PIE

## “Open Streetmap”

There are half a million users contributing to Open Streetmap, a web based, user created map which started in 2005. Parts of the data are very detailed, including things like speed limits and exact lane widths. The available information is increasing very fast and is in the main very accurate. Open Streetmap offers a different view of the future of mapping, directed more by the users and less by commercial providers.

## Workshop bullet points

Having heard experts explain the issues of HGVs using satnav from their perspective, the delegates broke into groups to discuss different thmes. They then came together and outlined their discussions and proposed actions:

### 1. Obtaining mapping updates from LAs:

- Clearer and better communications channels are needed
- Named points of contact should be provided both by LAs and by map providers
- There is already an understanding of what needs to change – it is leadership which is missing
- Questions of charging and funding are changing – the principle of open data vs. satnav as a commercial offer
- Who should carry the cost for processing the changes and maintaining the maps? Who benefits?

### 2. Maximising use of real time traffic information

- LAs must adopt common standards / formats for alldata and how it is exchanged.
  - Suggestions made were DATEX II and INSPIRE.

- LAs need to provide their data more with more precision and accuracy
  - – for instance, give specific times and dates for planned events
- LAs, the Highways Agency and the devolved administrations should adhere to the principles of open data also for their map information
- Satnav providers should be more specific about data they want but do not currently get

### 3. Opening up new data from LAs and the crowd

- There should be a single topographical data standard and geographical system – the National Street Gazetteer, for instance
- Each highways authority should name one person responsible for providing mapping information and each map provider the same for receiving the information
- New sources of data are only of interest if the data provided has commercial value
- Where OS data is expensive or cumbersome to obtain, new sources will spring up to fill the gap, such as Open Streetmap

### 4. Increasing use of HGV-specific Satnav

- Insurance could be packaged to encourage the use of appropriate satnav services eg to protect against cost of bridge bashing
- If businesses were held legally responsible for damage or nuisance caused by employees driving with inappropriate satnav, there would be a strong incentive for buying the right satnav
- The biggest challenge is foreign drivers, either driving without satnav as they see it as an unnecessary expense, or driving with a car satnav because it was cheaper or easier to obtain
- The biggest task is to communicate with fleet operators and drivers appropriately, reaching the right people with a message which they can accept
- Satnav use could be part of HGV driver training and testing

## Action points from the meeting

It was agreed that cooperation needed to be an ongoing process, led jointly by the satnav industry and by local authorities with support from DfT where appropriate. As a key step towards delivering these actions, ITS(UK) and ADEPT will organise regular meetings between local authorities and the satnav industry. This joint group will be the focus of stronger future cooperation.

### “ Communication

- . The Joint Group will provide a central contact list of map makers and LAs single contact points, based on the names gained today but sustainable long term
- . The Joint Group will also develop a newsletter with key information about sat nav for both sides, including:
  - “ Website addresses for map updates
  - “ New initiatives
  - “ Key changes in personnel

### “ Sharing existing data

- . Joint Group to work with DfT towards agreeing standard formats for exchanging data between local authorities and satnav companies, including:
  - “ one stop shop for contacts and data (one place, one format, drop once, read many)
  - “ Single topographical data set plus unique references eg INSPIRE? NSG , ELGIN and supporting processes
  - “ LAs collecting and consolidate on softer data eg road damage
  - “ Sharing more information on preferred routes and tactical diversions
  - “ Making road works data more precise
- . Highways Agency to make information on its Tactical Diversion routes available to sat nav companies
- . Joint Group to examine whether LAs depositories should adopt the EU standard DATEX II
- . System suppliers to provide greater feedback on the quality of data that is provided

### “ Promote freight sat nav

- . The Joint Group will act as a forum for freight groups such as the FTA to engage with the industry, and coordinate their actions on satnavs with government and possibly insurers.
- . The Joint Group will encourage insurers to promote the commercial benefits of HGV-specific satnav to drivers, particularly by communicating the costs of bridge strikes
- . The Joint Group and DfT will encourage ports authorities to inform arriving HGV drivers about correct satnav use, building on the work of Kent County Council
- . DfT will examine changes to Highway Code and CPC about freight satnav at their next revision.

### “ Wider Education

- . The Joint Group and DfT will push for further education of users about the benefit of timely updates at every point in the product cycle; and to encourage users to be more aware of the readiness with which their satnav updates.

### “ Research

- . ITS(UK) will lead research into how big and real the problems are

### Follow up contacts

If you have any questions or points you would like to make, please feel free to contact the organisers:

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