

North Sea Freight Intelligent Transport Solutions NS FRITS

WP5 Final Report

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Report overview

WP5 undertakes all aspects relating to piloting the system, analysing the results of the pilots and justifying investment in terms of system capability and results obtained. WP5 is divided into eight activities:

Task	Report	Activity
WP 5.1	BC	To establish and justify investment in the ITS including operational and maintenance costs
WP 5.2	WP2/4	To liaise with and provide feedback to the system designers (WP2 / 3 / 4)
WP 5.3	WP3	To liaise and negotiate with stakeholders and other external bodies over local agreements which facilitate the pilot projects
WP 5.4	A	To document the processes and systems involved in the 3 PP's for inclusion in the final NS FRITS report
WP 5.5	Various	To organise and manage meetings, seminars specific to the PP's location(s)
WP 5.6	A	To identify and resolve all technological challenges in order to provide a robust system
WP 5.7	B	To interface with other ITS solutions and contribute to other Interreg / EU RTD / National programmes and objectives
WP 5.8	BC / B	To compare the NS FRITS solution against other ITS systems for compatibility and data sharing for future EU rollout

There is a certain amount of overlap between tasks and outputs. For example WP5.1 implies future investment potential, which is demonstrated by provision of a business plan (separate document) whereas WP5.8 will also highlight the competitive advantages of NS FRITS as well as investigating its potential compatibility with other existing systems. For this reason the reporting of work undertaken in WP5 is not done on a task by task basis as defined above but rather on the basis of this report and one other:

Business Case for Future Investment - this is a stand-alone report written for potential investors in a possible second-phase development of the NS FRITS concept. Covers aspects coded "BC" in the table above;

WP5 Final Report is split into two sections. All aspects relating to the pilot trials, their results and conclusions drawn from the results are coded "A" in the table above and cover various aspects of WP5.1 to WP5.6.

Some of the aspects are also covered by other reports and will therefore not be repeated here; for example arrangements for procurement of required data sources and the necessary agreements with data providers are covered within WP 3, whilst the liaison with the system developers both before and during the trials are covered by the system development report in WP 4.

The second section of the WP5 Final Report describes how the NS FRITS system relates to other existing systems in terms of functionality and compatibility. This section covers aspects coded "B" in the table above, mainly covering the deliverables for WP 5.7 and WP 5.8 of the NS FRITS project. The stated aims are "*To interface with other ITS solutions and contribute to other Interreg / EU RTD / National programmes and objectives*" and "*To compare the NS FRITS solution against other ITS systems for compatibility and data sharing for future EU rollout*".

Section A - Summary of system trials

In testing or trialing any complex system, particularly where results from the trials may feedback or inform subsequent system development, it is prudent to progress in a number of stages, commencing with simple tasks and progressing to more complex real-world tests. The NS FRITS system design is critically dependent upon real-world functionality in the very demanding and cost-conscious road freight sector. It was therefore essential to engage with road freight operators and drivers from a very early stage of the project. Activities were therefore divided into a number of phases covering system concept verification, simulations, partner-based trials and real-world road freight trials.

Major activities and timescales

The main activities may be grouped into seven phases, each of which will be described in the following sections. The timescales for implementation of each phase are:

Phase 1: NS FRITS concept verification September 2010 - November 2010

- Bremerhaven role-play simulated trial
- Nordic Stakeholder day system simulation
- Stakeholder Workshops (Hull and Rotterdam)

Phase 2: System simulations December 2010 - March 2011

- (Proposed) Simulator-based evaluation (TIR)
- Simulator -based evaluation (Volvo)

Phase 3: Pilot trial preparation activities January 2011 - August 2011

- Agreement on Pilot trial specification
- Agreement on data sources for use
- Engagement of pilot participants
- Elicit real scenarios from Participants

Phase 4: Partner pilot trial activities January 2011 - August 2011

- Avonwood Field Engineers tests
- Humberside Police system tests
- KLPD system tests

Phase 5: Main NS FRITS pilot trials September 2011 - November 2011

- Rotterdam-based trials
- Humber-based trials

Phase 6: “Nordic” system trial October 2011

- Nordic trial planning
- Nordic trial execution

Phase 7: Pilot trial evaluation July 2011 - December 2011

- Evaluation data sources
- Evaluation methodology
- Feedback during trials
- Final reporting and conclusions

Phase 1: NS FRITS concept verification

An initial simulation of the operation of the NS FRITS system was carried out successfully by ISL in Bremerhaven on 17th June 2010 with the participation of a number of German logistics operators. Realistic role-play simulations using real NS FRITS software running on a PC-based emulator were delivered to stakeholder groups in Hull (12th October 2010) and Rotterdam (13th October 2010). The stakeholder groups included representatives covering a range of aspects of road freight transport: Managers, fleet operators, drivers and representatives of industry bodies such as the Road Haulage Association. In all cases there was agreement that the NS FRITS concept was useful and valid and suggestions were made as to practical aspects of implementation which were fed into the system design.

The Bremerhaven trial took place on schedule in months 18 to 21 (June to September 2010). The activity took the form of a simulation using role-play involving real Logistics companies. Much work was done to make the tasks to be undertaken as realistic as possible and one key feature was the inclusion of operational data (OD) as well as driver environment data (DED). Output data from the trial (to be discussed) will help to refine the detailed specification of the Rotterdam / Humber trials.

Phase 2: NS FRITS System simulations

Two activities were originally planned to test the way that the driver will interact with the NS FRITS system in order to have a safe, legal and effective interaction during the main road-based systems trials. The use of driving simulators was considered as mistakes could be made without compromising the safety of either the drivers themselves or that of other road users.

4.1 Driver interface evaluation using the TIR Simulator

Plans were made to work with TIR who were evaluating the use of a truck simulator for various aspects of driver training. It was suggested that this simulator might be used to evaluate the interface between the driver and the NS FRITS system under simulated driving conditions. A proposal was made and TIR agreed in principle to collaborate on this activity.

The outline proposal was as follows:

- Set up a simple scenario – a driver route / task
- Set up a number of driver interactions
- Include if possible predefined hazards
- Assess driver interface - distraction?
 - How does the driver interact with the system?
 - What is the preferred interaction method?
 - Options include voice activation / voice recognition
 - How can the driver provide feedback?

In the event, only limited testing was carried out, as it proved very difficult to coordinate the apparent location of the vehicle (as reported by the NS FRITS device) with the route information available in the TIR simulator. Some valuable experience of issues relating to in-cab mounting and visibility of the NS FRITS terminal was, however, gained.

4.2 Driver interface evaluation using the Volvo Simulator

A demonstration of the Volvo simulator was made to WP5 meeting participants in Gothenburg on 10th December 2010 where the value of such an approach was apparent. Subsequent simulations were carried out.

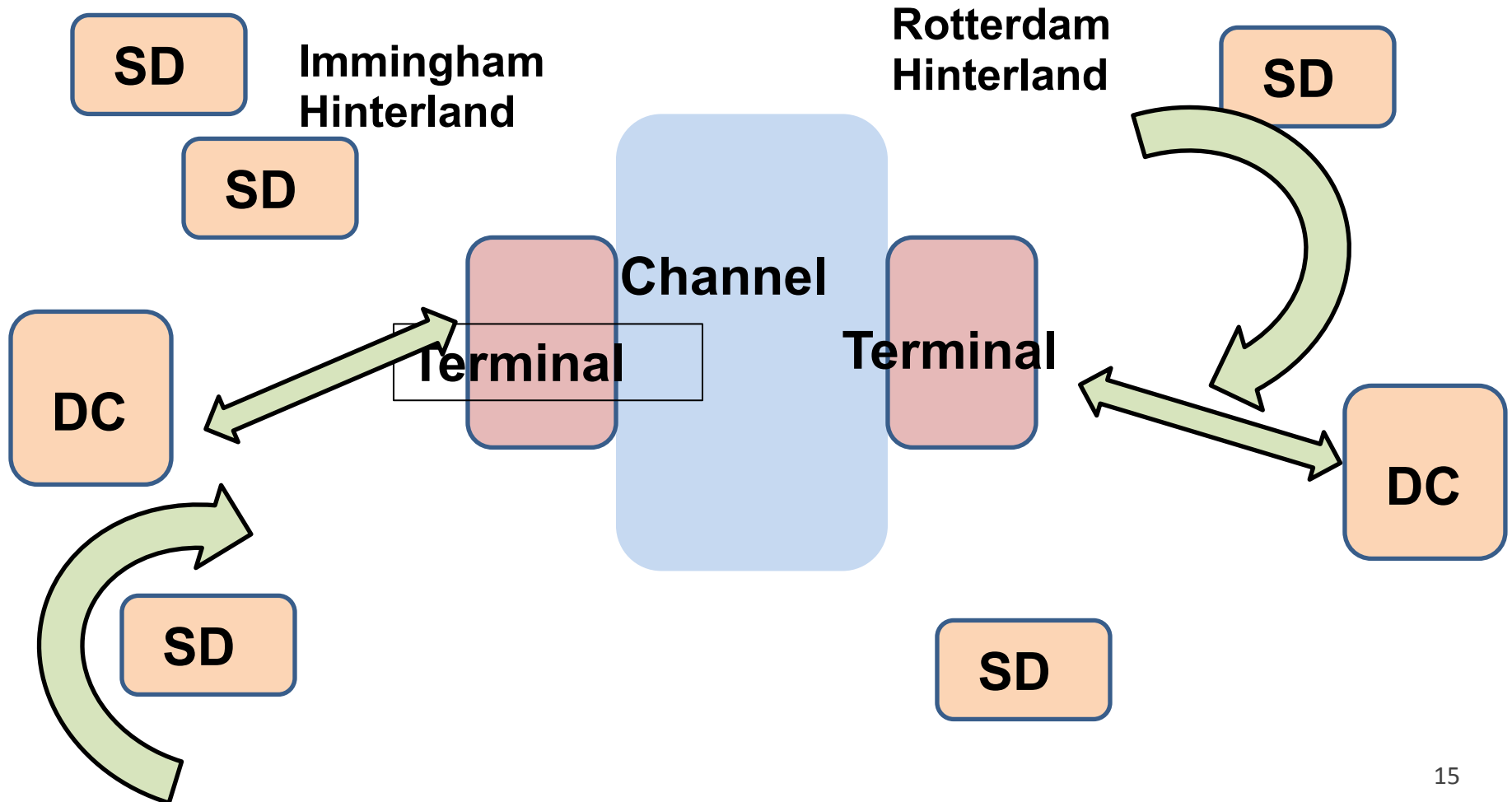
Phase 3: Pilot trial preparation activities

Some of the key decisions and issues which were addressed in designing the real-world trial of the NS FRITS system are as follows. These are termed “Pilot Trials Requirements”:

1. What handset should be used and how many of them?
2. Which data sources should be available?
3. Which companies should be involved?
4. What geographical deployment should be attempted?
5. How will the drivers be trained for participation in the trials?
6. How will the multi-lingual aspects of NS FRITS be tested?
7. Should infrastructure be provided aboard Ferries?
8. What end-to-end radio connections should be used?

An overview of the trials organisation is shown in the following diagram. In brief, logistics operators were chosen who operate within the hinterlands of both the Port of Rotterdam and of the Humber Ports and traffic across the P&O North Sea Ferries link the two.

Humber trial Architecture



Handsets

Three types of terminals (“handsets”) were discussed: Hand-held android smart phone; tablet-style smart phone and built-in terminal. The trials concentrated on use of the tablet-style smart phone (Samsung Galaxy Tab).

It was suggested that a total of 23 terminals should be available for the Pilot trials: 3 for use in Phase 4; 10 for each main region (Humber and Rotterdam) for use in Phases 5 and 6.

Data sources

A minimum complement of data sources was required to allow realistic trials to be carried out. The minimum list needed to contain data sources equivalent to the following and a cut-off date of Dec.2010 was agreed for data to be included in trials. The definitive list of data sources is in the WP 3 report:

- VBS
- Hull / Immingham ‘Agents on line’
- Highways Agency data – weather, traffic etc
- AVCIS crime
- Parking
- TDS
- Google maps (as background not an application)
- Participants’ own operational data
- Phone / comms (again background)

Work was carried out with the participants in advance of the trials (phases 5 and 6) to define the participants’ own scenario which they actually operate on a day-to-day basis and then to populate this with appropriate data sources in a manner similar to the role-play simulations used to date in various workshops.

Trials participants

The choice of suitable participants for the trials was crucial to its success and the following desirable complement of types of trucks and logistics operators was sought to carry out the trials:

- Trailer / container operators
- General cargo / pallet within Hinterlands

For each of these generic carrier types the trial organisers attempted to engage companies of various sizes. This was seen to be a very key point of the trials as around half of trucks on the road in the UK today are operated by owner/drivers who do not have direct access to large corporate transport planning systems. These are seen to be the main target sector for the NS FRITS system which has the advantage of ease of access for individual drivers.

In each of the above three categories, therefore, we attempted to engage the following company types, with an emphasis on medium-sized operators:

- Large companies using OD (Indicative company: DSV)
- Medium sized company (Indicative company: Hurst Transport)
- Small owner / operator using DED only

Geographical extent of pilots

The geographical scope of the pilots was to include supply routes to and from the Ports of Rotterdam, Hull and Immingham and include the ferry crossings between those ports. Routes involving driving with these area (“hinterlands”) was part of the trial, as was special routes outside these areas where there was the possibility to make use of certain types of data. An example of the latter would be routes involving visits to the Port of Felixstowe where the VBS data/system was intended to be trialed.

Training of participants

Training was recognized as essential and use was made of on-line manuals and do-it-yourself tutorials as well as a “quick user guide”. Keeping driver time to a minimum was regarded as essential. It was also recognized that drivers might find their own ways of using the system rather than bias towards fixed predetermined methods.

Testing the multi-lingual aspects of NS FRITS

Drivers were chosen who will make use of at least three languages. Suggested two languages in each region: Humber will use English and another to be agreed; Rotterdam will use Dutch and another.

Phase 4: Partner pilot trial activities

Extensive trials of early versions of the NS FRITS system were carried out by KLPD and Humberside Police with limited use of system by Avonwood staff. Much valuable feedback was obtained from these initial tests.

Phase 5: Main NS FRITS pilot trials

In total, thirteen companies initially agreed to participate in the trials, although practical considerations reduced the number of actual on-the-road results obtained:

- DHL
- DSV Road Ltd
- John Truswell & Sons
- NYK Logistics (UK) Ltd
- GE Equipment Service/TIP Trailer Services
- GTO Group
- Hoving Transport BV
- Jan de Rijk Logistics
- Post Kogeko
- Van Swieten Air Cargo
- Cool Solutions
- Nestle Operations

Trials were carried out based on the Humber region (coordinated by Humberside Police) and in the Rotterdam region (coordinated by KLPD). Whilst the focus of the trials was to assess driver reaction to the system, in several of the participating companies the dispatcher version of the system was also used, allowing the utility of the task allocation and fleet tracking aspects of NS FRITS to be evaluated.

The device chosen for implementation of the cab-mounted version of the NS FRITS system was the Samsung Galaxy Tab which is a large format android smartphone with a 7" touch screen. 23 of these devices were purchased by four project partners (Hull University (7), Avonwood (6), Volvo (4) and Avanti (6)) along with appropriate SIM cards, data provision and roaming contracts. These devices were subsequently allocated to the trials participants according to the trials schedules.

In both regions the main elements of the road-based trials included:

- Training of participants, including production of a quick-reference guide to NS FRITS
- Pre-trial participant questionnaires
- Trials route definition and scheduling
- Weekly trials evaluation during the trials period
- Post-trials participant questionnaires
- Real-time systems support

The main trials commenced on 19th September 2011 and covered a period of approximately five weeks although in the UK some trials were carried out in June. The reporting format and interview schedules were the same for both sets of trials.

Humber trials

The following table provides a summary of the companies, drivers and times of the Humber-based trials:

Company name	Start date	Finish date	Operator?	No of drivers
DHL	19/09/2011	16/10/2011	Yes	2
DSV Road Ltd		16/10/2011	Yes	2
John Truswell & Sons	N/A	N/A		0
George Smedley Transport	20/09/2011	16/10/2011	Yes	2
Nestle Operations	22/09/2011	16/10/2011	Yes	2
Cool Solutions	30/09/2011	16/10/2011		2
Kazemier Transport	16/06/2011			
Cool Solutions				
Nestle Operations	01/07/2011	12/08/2011		2
UK total	06/06/2011	29/08/2011		8

Trials participants included eight drivers and four operators. The results from trials are embodied in the following documents:

- Two NS FRITS IMG preliminary presentations
- Overall weekly trials schedule
- Nine pre-pilot driver questionnaires
- Four pre-pilot operator questionnaires
- Four driver weekly interviews
- Five post-pilot driver questionnaires
- Four post-pilot operator questionnaires
- Overall summary of driver “wants”

These detailed documents are available within the overall NS FRITS documentation. Most of the driver feedback both during and after the trials was concerned with detailed operation of the prop

Netherlands trials

The following table provides a summary of the companies, drivers and times of the Rotterdam-based trials:

Company name	Start date	Finish date	Operator?	No of drivers
GE Equipment Service/TIP Trailer Services	N/A	N/A		0
GTO Group				1
Hoving Transport BV	16/09/2011		Yes	4
Jan de Rijk Logistics				
Post Kogeko				
Van Swieten Air Cargo	21/09/2011		Yes	2
Kazemier Transport	16/09/2011			
KLPD				1
NL total	16/09/2011			8

Trials participants included eight drivers and two operators. The results from trials are embodied in the following documents:

- Two NS FRITS IMG preliminary presentations
- Overall weekly trials schedule
- Five pre-pilot driver questionnaires
- Five driver weekly interviews
- Seven post-pilot driver questionnaires
- One post-pilot operator questionnaires
- Overall summary of driver “wants”

Results from Humber and Rotterdam trials

The results documents mentioned above are available within the overall NS FRITS documentation.

Driver feedback

The drivers participating in the trials were generally enthusiastic about the NS FRITS system concept and were very willing to participate in the system trials. However, they were undertaking these tests whilst trying to carry out their everyday work and any delays to their work which resulted from operation of the prototype system would naturally be viewed fairly negatively. For this reason most of the driver feedback both during and after the trials was concerned with suggestions for improvements to the detailed operation of the prototype system and thus do not reflect the potential benefit of the NS FRITS concept. An attempt has been made to filter out the comments which relate to the validity of the NS FRITS system concept and these are summarised as follows (all relevant driver comments included in each box):

1. How many weeks did you use the NS
2. FRITS system? How frequently did you use it and what were the main reasons why you used it?

I used it at least a dozen times maybe as many as twenty as far South as Portsmouth and the North Wales area.

8 or 9 days use around Scotland and Leicestershire areas.

Used every day except Saturday/Sundays

Used every day except Saturday/Sundays

3 weeks, used every day that I was at work. It would be about 12 days in total.

3. What did you find most helpful about the NS FRITS system?

Crime hotspots, traffic updates. They didn't always come up quick enough, but I could zoom out and could see them more in advance.

The actual map being able to view more than anything.

The fact that it gave you all the crime hotspots, that was good and was about it really.

Crime hotspots. There are places I used to park that I don't park anymore because it's a crime hotspot.

The most useful point was the crime hotspots and the truck stops as well. There were one or two truck stops I wasn't aware of which was good.

Icons showing parking and roadworks.

4. What do you think are the main benefits NS FRITS brings to your job and your company?

Avoiding traffic congestion, improving delivery times and avoiding crime hotspots.

It makes it a lot easier, having set your route; you do not have to stop to read a map. If you just pull up and tap the screen and enlarge the map, you've got an even better view when you're in towns, seeing road by road.

Crime hotspots

Crime hotspots

The best thing for us considering we carry high value goods is the crime hotspots data especially in areas of the country we don't normally go to such as Portsmouth/Southampton.

5. How easy did you find the NS FRITS system to use (1= extremely easy, 10 very hard). Please give reasons for your response.

3 – Quite easy

3

2

1 – I thought I was going to have trouble but it was quite good.

The actual application – 3.

6. What are the biggest pressure points/difficulties you experience during your job? Did NS FRITS help you with any of these? Please give reasons for your response?

Keeping on top of your hours and your time. It could also be useful to have an audible and visual alert when your driving time was close to needing a rest break.

I suppose its being notified of job changes. An application like that would have been of benefit

Lack of facilities for drivers

Something that would be really good, which came with it but our manager didn't get the chance to use it which is the operator facility to give job changes. Quite often we will get a job change and the traffic coordinator will forget to tell us. I got sent to Birmingham from Leicester, when I got there I rang up for a reference number only to be told I should be in Pontefract. Things like that which can update automatically would be a great feature.

7. For what parts/stages of your journey do you think the NS FRITS system was most useful?

During the journey for the traffic and at the end to scan the area for parking and hotspots.

The main benefit for me was that I did have a couple of locations I had not been before and used a different route back in particular from Girvan and being able to enlarge the screen and zoom in to see corner by corner was particularly useful for me.

During the journey and not before or after especially the hassle of re-programming the device.

The crime hotspots area. I would be driving along and glance down and it would pick up a crime hotspot, most of the time I wouldn't realised it was a hotspot and one to avoid.

8. Is there any information the NS FRITS system does not include that you think or should be added in the future? (and if so what is this and why)?

Incorporate it into a sat nav to avoid running two systems side by side

The facility to warn you in advance of road closures and re-route you, would be useful. It also needs to warn you if you go off route.

Automatic updates and speed limits on temporary road works. Also:-

- Live traffic reports to get you around accidents and jams etc.
- Bridge heights that are use programmable.
- Display could be better utilised giving eta to destination.
- Local Police telephone numbers
- Ferry delay warnings

Programmed with fuel card stops

9. Is there anything else you would like to add or comment on about the NS FRITS system?

All drivers indicated willingness to trial again if project extended.

Operator feedback

A similar process was carried out to extract information on the system concept validity from operator feedback. The main points are summarised as follows (all operators included in each question, where data exists):

1. How many weeks did you use the NS FRITS system? How frequently did you use it and what were the main reasons why you used it?

About 2.5 -3 weeks, tablets used most days. Operator system was not used as much only every now and again as there were difficulties downloading the system.

2. What did you find most helpful about the NS FRITS system?

The crime hotspots were useful, but we would benefit most by the operator messaging system. The traffic hotspots are very useful, but they were coming on too late. James suggested a traffic light style warning system warning of the problem and its severity. Criminal hotspots are useful to us and advantageous.

3. What do you think are the main benefits NS FRITS brings to your job and your company?

The messaging system is the main benefit.
Proper traffic information and crime hotspots

4. How easy did you find the NS FRITS system to use (1= extremely easy, 10 very hard). Please give reasons for your response.

4 – Easy
3 or 4 – the system was user friendly and easy to use.

5. What are the biggest pressure points/difficulties you experience during your job? Did NS FRITS help you with any of these? Please give reasons for your response?

Communications with drivers to re-arrange workload and jobs. Nestle are currently seeking a system that would provide this functionality.

Timing and road closures, congestion etc.

Seeing where the vehicles are at a glance and seeing historically what they have done. Most systems being offered now fit sat nav's and co-ordinate them with the cambus on the truck and most of them provide you with fuel mpg's etc.

6. For what parts/stages of a driver's journey do you think the NS FRITS system was most useful?

Throughout the operation, especially the ability to change the driver schedules.

7. Is there anything else you would like to add or comment on about the NS FRITS system?

We would be willing to participate further if the points raised are addressed.

Phase 6: "Nordic" system trial

In preparation for the main "Nordic" trial, for three days (Wed-Fri 12-14 Oct 2011) the NS FRITS system was trialed internally in Sweden and Norway by Volvo and Avanti. The system was also demonstrated to stakeholders who were to participate in the Nordic trial event late October/early November.

Unlike the Netherlands/UK trial, where the trial mainly focused on environmental data and driver/dispatcher communication, the main focus of the Nordic Trial would be operational data (Agreements and Driving Info). Although operational data is the main focus, environmental data was also used during to a minor extent.

Two categories of functionalities were tested during the Nordic Trials:

Driving Info

Information that is presented to the driver as he approaches a specified location of interest. The information is divided into two stages: Information presented before the journey in text form, and audible messages displayed as the driver approaches the location of interest. The audible messages are displayed at a certain distances (e.g. 100 meters, 1000 meters, 20 000 meters). The idea behind Driving Info is to present information only when it is useful for the driver, thus not overloading the driver with all information at once.

Agreements

An agreement is a functionality that allows the drivers system to inform a third party of its ETA (Estimated Time of Arrival) by using GPS and route planning information. When an agreement

is initiated, the driver provides a reference number, e.g. vehicle registration number, ticket id or pickup load id. After the agreement is set up, the underlying system will periodically calculate an approximate arrival time from its current GPS position and send it via NS FRITS to the third party, e.g. KGH or Byrknes. An operator at the third party can then observe the arrival time of the driver, and prepare documents and/or cargo for that specific driver.

Data sources used for Nordic Trials

The data used in the Nordic trials was:

- Traffic Information
- Vegvesen (Norway) Newly added for the Nordic Trial
- Trafikverket (Sweden)
- Parking Information
- Rest Areas from Trafikverket (Sweden)
- IRU Parking Locations (Denmark)
- Driving Information
 - Stena Line
 - KGH Customs
 - Byrknes Auto

Nordic trial results

Results are summarised from driver and operator feedback as follows:

- Problems with SIM Cards & Roaming (Eventually solved)
- Good reception from KGH, Stena and Byrknes. Like the concept of Agreements. Advising of Press coverage to take it further.
- Drivers were enthusiastic about the goals of the system
- Many parts of the system that can go wrong:
 - Mobile Coverage & Roaming
 - Server/Application Errors
 - Route Planner Malfunctioning
 - Driver Misuse
 - Quality of Data Sources
- Conclusion: Simplify the user / system interaction

Phase 7: Pilot trial evaluation

There are two main aspects to evaluation of the NS FRITS project. Evaluation of the operation of the project itself is discussed in a separate report by the University of Huddersfield. Here we consider evaluation of the NS FRITS road-based trials in terms of the success of the trial and evaluation of what the results indicate about the usefulness of the NS FRITS concept as well as the prospects for future deployment of a fully functioning (possibly commercial) system.

Work package 5 is not concerned only with running the trials but also with assessing the effectiveness and value for money of the system (WP 5.1) as well as interfacing with other transport-related ITS and relevant projects (WP 5.7 and WP 5.8). The trials were therefore

designed to provide data which could be used to evaluate the success of the project and in particular, the implementation and sustainability of the electronic communications and data capture network as well as measuring improvements in efficiencies in the freight supply chain resulting from the NS FRITS system. Environmental impact and increased competitiveness in the NSR were also considered.

Cost effectiveness should be proven by balancing the cost of NS FRITS (including the cost of the initial project as well as per-company infrastructure) against the value to the company of likely gains mentioned above. More general efficiency improvements which benefit road users in general (such as reduced congestion or reduced carbon footprint) should also be enumerated.

However, it is very difficult to assess the likely monetary value of benefit to the road freight industry as a whole of the widespread use of systems like NS FRITS. In the NS FRITS trials most of the driver feedback obtained during the trials was related to the drivers' experience of the prototype system and to a large extent, difficulties encountered masked the potential benefits in terms of time saved per journey, avoidance of delays and improved driver and load security.

Summary and conclusions

Most of the drivers and operators who participated in the NS FRITS system trials agreed that the NS FRITS concept is valid and useful, and that the system has the potential to provide significant benefit to the road freight industry.

However, most of the feedback received from trials participants both during and after the trials was concerned with day-to-day experience of the system and tended to concentrate on suggestions for improvements to the system rather than operational usefulness.

In hindsight the questioning should have tried to answer questions such as:

- How much time per day does NS FRITS save you?
- What reduction in crime against your vehicles has occurred whilst using NS FRITS?
- What driver benefits have resulted from use of NS FRITS?

In reality the drivers and operators spent considerable time becoming familiar with the system and sorting out implementation issues. This time, often viewed by the participants as unproductive, masked any efficiency gains that might occur with a fully developed system.

Most operators and drivers agreed on additional functionalities which should be in a fully developed system. The following lists are typical of the majority of post-trial comments:

“Wants” from Humber trials:

- Turn by Turn Sat Nav - expressed by all of the drivers
- A Favourite Locations button rather than favourite routes
- Improved signal (3G reception) - again fairly unanimous by the participants
- Re-Routing when off route - possibly will be addressed with turn by turn sat nav functionality

- Time taken to load maps
- Easy of route planning - deemed to be very slow
- Icon display is pertinent to your route/destination
- map orientation when in driving mode
- Bridge height and weight restriction programmability
- Accurate and consistent time to destination

“Wants” from Rotterdam trials:

- Un and Secure parking (NS FRITS has this)
- Crime hotspots (already in NS FRITS)
- Traffic information all kind (some data already in NS FRITS)
- Pictures from a police car are not “geocoded”
- Information not always on the right moment
- Geofencing to alert when off-route
- Driver can not add parking information like “good hamburger” or “expensive”
- Android is easy to fake, now not suitable for security

It can be seen that many of these requirements would be relatively easy to implement in a further developed system.

Feedback from the drivers and operators in the Nordic trial (which was mainly to test the feasibility of using operational data in NS FRITS) was that the concept does work but that the driver / system interface needs to be kept very simple and easy to use.

What is not recorded in the documentary feedback are the overall comments from the trials facilitators to the effect that most, if not all, trials participants felt that there is definitely a need for a system such as NS FRITS and that current systems do not provide all of the required facilities. In spite of detailed criticism of the implemented system, many of the trials participants were reluctant to relinquish the handsets at the end of the trials period as they had gained familiarity with, and started to use various features of the system to advantage.

During the system trials good working relationships were established with a number of road freight operators across the North Sea Region and many of these have expressed a willingness to be involved in any further trials of an improved system.

Overall, the NS FRITS project should be regarded as a success, having demonstrated beyond doubt that there is a need within the road freight industry for a system of this type and having produced a working prototype which has proved the validity of the concept in real-world situations. As with any prototype, system trials have highlighted areas for further development but none of the suggested improvements call into question the basic concept which should therefore be regarded as proven.

Section B - Comparing the NS FRITS solution against other ITS systems for compatibility and data sharing for future EU rollout

Background

Current vehicle information and communication technology (ICT) systems and other data systems which have application to the road freight transport industry, offer a very wide range of facilities and services but mostly fall into two categories:

- General information platforms;
- Specific task-oriented applications.

In the former category the vehicle ICT system tends to be a small part of a larger information gathering and handling system.

Overview of a selection of existing systems

A survey of existing systems and their capabilities was carried out prior to commencement of NS FRITS detailed system design in the last quarter of 2009 (see Appendix A).

Significant developments have occurred since 2009 with a widening awareness of the value of data to human welfare in general and commerce in particular. Two specific examples illustrate the value that large companies place on accurate and timely data retrieval and handling and on the expanding business opportunities in this field:

Hewlett Packard (HP) is introducing their “Next Generation Information Platform” to address the potential for improvements in data handling:

- It is estimated that only 15% of information potential value is currently exploited;
- Only 2% of businesses deliver information 100% of the time;
- 85% of information is “unstructured” and therefore difficult or impossible to deal with in a coherent manner.

Fujitsu have introduced the SPATIOWL system: This is again an information platform in the same vein as hp. They say:

“Fujitsu aims to utilise information and communication technology (ICT) to bring about a human-centric intelligent society in which people can live more prosperous and secure lives.”

The SPATIOWL system uses a Dynamic management system by Transtron Inc. of Japan which “..... provides more sophisticated linkage between "Shipper - Carrier - Vehicles". Text transmission and MP3 voice transmission function now replaces conventional radio transmission.”

GPS/GPRS and CAN Bus systems

The following are a selection of systems that use a common set of technologies including:

- Vehicle location using GPS
- Location reporting and messaging using GPRS
- Access to vehicle CAN Bus to provide vehicle condition / status information and driver performance statistics.

Once this data is available, there are almost limitless applications that can be built, the most obvious being driver and vehicle fuel efficiency, route planning, geofencing and related security applications.

Fleetmatics

Fleetmatics is a GPS-based fleet tracking tool. Its advertised benefits are:

- Lower Fuel Costs
- Reduced Labour Costs
- Improved Customer Service
- Increased Productivity

The system can be used with any computer or mobile device that has Internet access ie no special terminal are required. FleetMatics is currently used by over 14,000 customers, tracking over 200,000 fleet vehicles.

Business Vehicle Tracking

This is another similar system, using a combination of GPS and GPRS. It costs around 33p per vehicle per day and offers

- Fonix VT
- Geofencing
- Pre-assigned onsite times

Other features offered include security using remote vehicle disabling and access to the vehicle's CAN bus which opens up many possibilities for vehicle condition and driver performance monitoring.

Satmo.co.uk

Voted the best telematics system 2011

Tom Tom

Worksmart-track or WEBFLEET

Tracker

Tracker Fleet

- Reports
- Geofencing
- traffic conditions

Tracker Traffic

- Traffic
- Camera locations
- Roadworks
- Accidents

Daimler FleetBoard

Operates in three business areas:

- Logistics Management
- Fleet Management
- Time Management

Uses two special hardware devices: **TiiRec** (basically an in-cab computer). Has a card slot for driver ID, used to download data. **DispoPilot** is the end-user device, which comes in two types: handheld (smartphone), and 7" table display.

ITIS

Two systems seem to exist, a traffic management system in KL, Malaysia (largely irrelevant); A traffic data company which was recently acquired by INRIX (see below).

INRIX

A very comprehensive system, which, if it had AVCIS crime data, would do everything that NS FRITS does. Again the emphasis is on an overall information management system or platform (similar in concept to those of HP and Fujitsu) which may be tailored to individual customer requirements.

Google Latitude

Licensed use of *Navtec* which is owned by Nokia, which allows location-based services to be implemented on smartphones. Powered by maps made by Navteq.

Summary

A summary of the key features of indicative potential competitors is as follows:

	Products/Services	Secure Parking	Crime Hotspots	Police ID Images	Traffic Alerts	Weather & Local Driving Conditions	Advanced Booking System	Customs Info	HGV Optimised Routes	Real-Time Information	Translation of data into own language	Expected Arrival Times	Direct Driver Communication	Mobile Applications	Vehicle Tracking	Voice Controlled Navigation	Turn by Turn	Driver Hours
TOM TOM	N,F,A				x	x			x	x		x	x	x	x		x	x
GARMIN	N,F,A	x			x	x						x		x	x		x	
MIREO	N,F,A				x					x		x	x		x		x	
ALK	N,F,A				x				x	x		x			x		x	
TRAFFIC MASTER	N,I		x	x	x									x			x	
INRIX	I				x					x				x				

Products/Services: N = Navigation System, F = Fleet Management, A = Asset Management, I = Information System

The yellow columns illustrate comparisons to current features of NS FRITS and the orange columns are features that have been requested in feedback to the prototype or which could be added prior to a commercial launch of the system.

Key facts which summarise these six providers are as follows:

- TomTom provides in-car location and navigation products and services. Headquartered in Amsterdam, TomTom has over 3,500 employees and sells its products in over 40 countries. Products include portable navigation devices, in-dash infotainment systems, fleet management solutions, maps and real-time services, including the award winning HD Traffic.
- Garmin provides navigation, communication and information devices and applications, most of which are enabled by GPS technology. Garmin designs, develops, manufactures and markets a diverse line of user-friendly handheld portable and fixed-mount products for the auto, mobile, outdoor, fitness, marine and general aviation markets.
- Trafficmaster is a provider of real-time traffic information in the UK, from a range of unique data sources.
- Mireo is a provider of navigation and GPS tracking solutions, including applications for mobile devices.
- ALK Technologies is a developer of mobile navigation and transportation technology solutions. ALK has a number of brands which include CoPilot, a GPS navigation service platform for fleets, mobile operators, hardware OEMs, systems integrators and professional drivers globally, and PC*MILE, a routing, mileage and mapping solutions (primarily US based mapping).
- INRIX, a provider of traffic information, directions and driver services, as well as apps and tools for developing traffic-powered solutions to market. They operate a worldwide traffic information network (the largest in the world), and are partnered with auto manufacturers (including Ford), mobile developers, transportation agencies, fleet and Internet companies.

It can be seen from the table that several of the competitor's service ranges cover the general areas provided by NS FRITS and that navigation services are, more often than not, combined with asset and fleet management services.

Overall conclusions

Across the road freight sector there is almost unanimous agreement that vehicle ITS, used appropriately, can lead to very significant savings for logistics operators. Several large and influential companies (HP, Fujitsu and INRIX, as examples) are incorporating fleet management data into a wider awareness of the importance of fast and accurate data handling for the benefit of business, often with a human-centric societal (eg Fujitsu) message attached.

When applied to the road freight sector, products tend to offer comprehensive fleet management solutions which require significant commitment from the customer, both financially and in terms of investment of expertise. These systems are therefore biased towards larger companies who can spread the cost of implementation across a large number of vehicles and drivers.

Bearing in mind that around half of freight vehicles are operated by small companies, there is definitely a need for a system which proves the benefits of these larger systems without the

corresponding level of financial investment. In this context it may be seen that NS FRITS has the capability to offer two main advantages, particularly to small logistics companies:

- NS FRITS offers a low-cost entry to the field of in-cab data. No special terminal is required and there is no break-even level of usage to be considered. CAN bus access facilities could be added to NS FRITS in a further phase of development
- NS FRITS offers types of driver and load security data which is not currently available in other systems summarised above

The operational concept of NS FRITS has been proved, by real-world testing, to be valid and useful to the road freight community. The summary of rival systems given above also shows that it has the right capabilities to be a commercial success, provided that an appropriate system development plan can be defined. A business plan to explore these possible development routes has been prepared and is available to interested readers and potential investors.