

Measure title: **Customised traffic and travel information service for freight operators**

City: **Norwich**

Project: **SMILE**

Measure number: **12.8**

A Introduction

The broad objective of the CIVITAS SMILE project is to improve urban air quality in participating cities and create a sustainable, safe and flexible traffic system. It aims to do this through the promotion of bio fuels, clean vehicles and intelligent travel.

Measure 12.8 of the CIVITAS SMILE project aims to examine whether the provision of user information specifically for freight operators would encourage them to adopt bio fuels or cleaner fuelled vehicles. Some freight operators may already be considering changing their vehicle fleets and the provision of user information may be the added incentive needed for them to commit to the changes.

A1 Objectives

The main objectives were to:

- **Objective 1** - Assess freight operator desire to participate in the project,
- **Objective 2** - Establish freight user needs and priorities with regard to service information,
- **Objective 3** - Get a number of freight operators to adopt clean urban principles in return for user information,
- **Objective 4** - Assess the benefits and disbenefits to the operators of the user information,
- **Objective 5** - Provide an enhanced level of information about traffic management issues, road condition, congestion, availability of parking facilities to freight operators who respect clean urban transport principles,
- **Objective 6** - Work in partnership with goods operators who respect clean urban transport principles in order to facilitate their journeys in the Norwich area and to mitigate the negative effects of urban freight transport on other network users.

A2 Description

A customised traffic and travel information service was to be implemented for freight operators who were prepared to use clean and energy efficient goods vehicles in the urban area. This would act as an incentive to adopt clean vehicle technology. A limited amount of traffic information is already made available to all freight operators and other transport system users, through a variety of media, e.g. on street signage, internet, mobile phone technology, radio and TV broadcasting. The service would draw on information available through Norfolk's integrated Urban Traffic Control Centre.

Task 1

- Assessed freight user need and priorities, through consultation,
- Researched attractiveness to freight users of different services, through working and discussion groups with selected operators,
- Examined freight user willingness to adopt clean urban principles in return for services/priorities, through working and discussion groups with selected operators.

Task 2

- Developed specifications for systems and technology to meet user information priorities,
- Procured systems and technologies, such as real time information, web and mobile phone based information systems,
- Tried to obtain formal agreement to adopt clean urban principles by selected freight operators changing to environmentally friendly fuels.

B Measure implementation

B1 Innovative aspects

Innovative Aspects:

- New organisational arrangements.

The innovative aspects of the measure are:

- **New organisational arrangement, nationally** - A limited amount of traffic information is already made available to all freight operators, and other transport system users, through a variety of media, e.g. on street signage, internet, radio and TV broadcasting. The proposal involves the provision of a higher level of information specifically directed at freight operators and linked to their willingness to work in partnership to meet CIVITAS goals.

B2 Situation before CIVITAS

Norfolk has already established a database, called the Common Data Management Facility (CDMF), for live traffic information. The service is currently supplying real-time information on parking availability in Norwich city centre car parks and park & ride sites. Work is also underway to scope the connection of traffic congestion information from the Urban Traffic Control system into the CDMF. It is anticipated that a number of levels of data will be made available with additional elements of information also available at a later date.

B3 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: Scoping of the work and identifying issues (Aug 2005 – Mar 2006) – Determination of how measure should to be implemented.

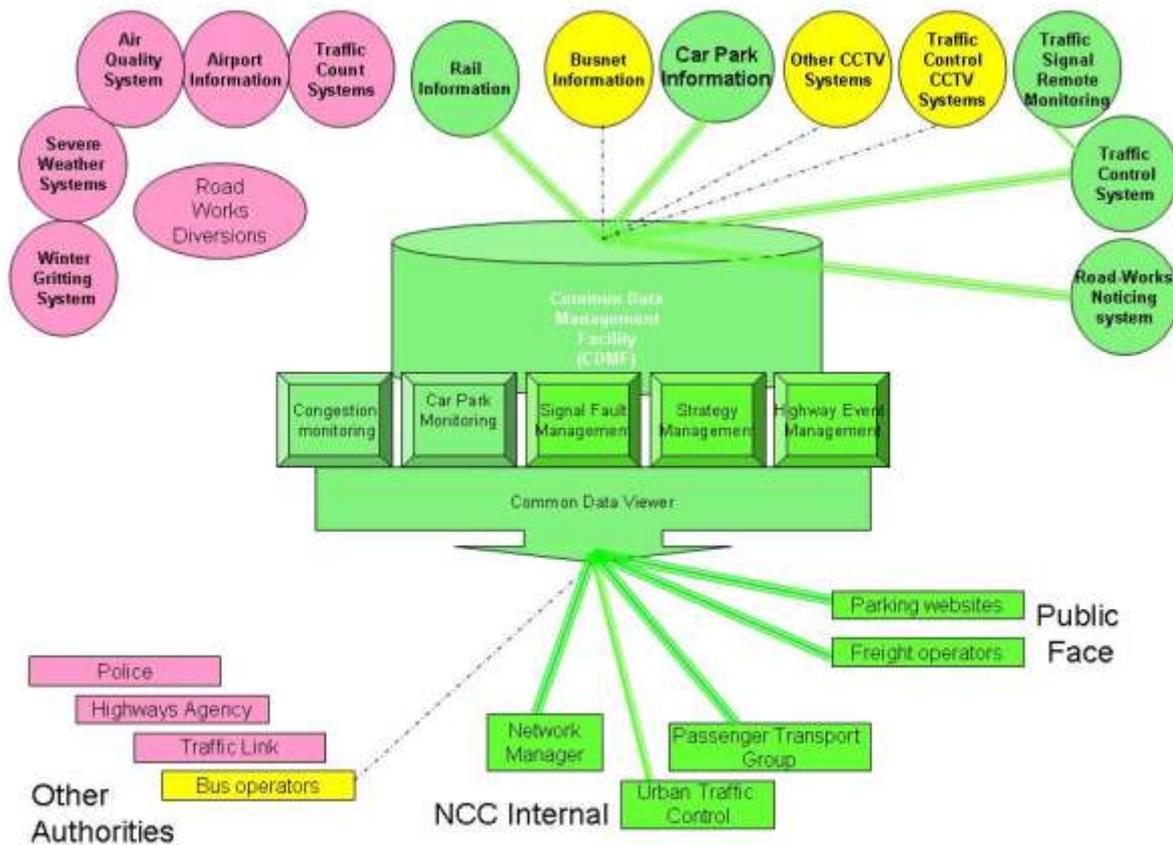
Stage 2: Identifying companies interested in participation (Mar 2006 – October 2006) – A large consultation exercise was undertaken to identify those freight companies that were interested in participating in the measures. This consultation included all the measures involving freight. Consultations included an internet based virtual exhibition, adverts in trade magazines, and letters/e-mails distributed to freight companies. The companies were invited to view the internet exhibition and express an interest in participating with any of the measures 10.3, 10.4, 10.5 or 12.8.

Stage 3: Development of company requirements and technology - Meeting with selected companies to described the service that could be provided and gain agreement from them to participate in measure.

Stage 4: Implement technologies and monitor (Jan 08 to July 08) - Implementation of information viewer with associated training. Development of viewer customised to company needs.

Stage 5: Evaluating information viewer and amending it to meet company needs.

The project involved the development and provision of a customised viewer to allow freight operators to view some of the traffic and travel information currently being collected by Norfolk County Council. This is currently collated together into the CDMF, as shown below.



The diagram above shows the current and future data sources being collected by the Common Data Management facility, together with locations where they are currently being provided.

In the diagram:

Green = information currently being collected

Yellow = work in progress to get information collected

Red = future ideas for information to be collected

The colour coding is similar for the locations that information is currently being disseminated. It can be seen that the majority of information users were within the County Council.

Measure 12.8 was one of the first instances that the information held was provided to an outside organisation (i.e. freight operators). The ability to view this information is provided by a Common Data Viewer (CDV) which is customised towards the user’s individual needs.

The viewer is an application that can be installed onto any computer with broadband internet access. Once installed the application filters the information that the operators can receive and

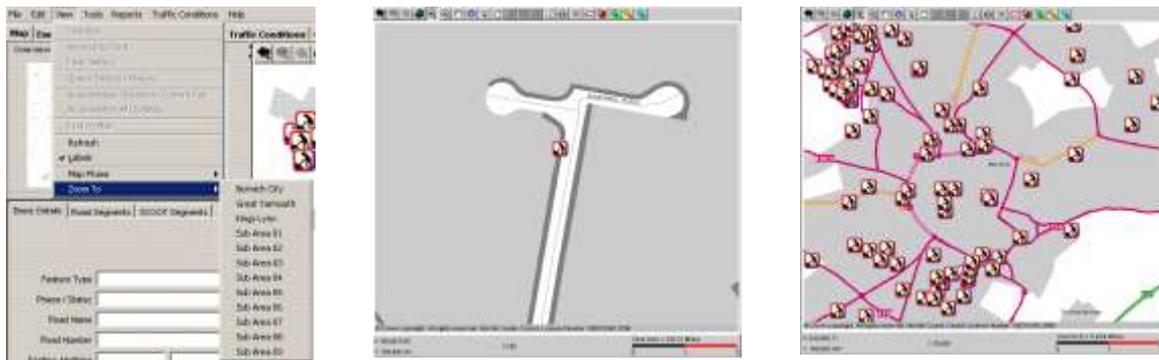
has various functions to identify and obtain information on various events on the highway. The information currently provided includes:

- Road closures,
- Highway works,
- Traffic signal failures,
- Road being used for other purposes – e.g. processions,
- Other information that the Urban Traffic Control centre operatives are aware of (e.g. known congestion, accidents etc)



The Urban Traffic Control centre in Norwich can use its system of cameras in the city to observe events on the highway. Information that they observe can be provided via the customised CDV.

The measure aim was to trial this customised viewer and obtain feedback, so that a single customised viewer could be developed prior to it being extended out to further freight operators. Eventually these could then be provided to other freight companies. It is envisaged that the provision of a freight viewer would help companies to better plan their delivery routes to avoid unnecessary queuing in traffic congestion. This has the benefit of reduced fuel consumption and vehicle emissions. In return for providing the information, participants would be asked to adopt cleaner vehicle technologies.



Sample screen shots from Customised Freight Viewer

B4 Deviations from the original plan

The deviations from the original plan comprised:

- **Deviation 1 Clean Urban Principles** – Original measure plan was to require the participating freight operators to adopt clean urban principles in return for user information. The clean urban principles were originally assumed to be the retro fitting of pollution reducing equipment to vehicles. However, the cost and maintenance implications of this were prohibitive to companies participating with the measure. The

measure objectives were therefore amended so that the information was provided and in return they were asked to participate in eco-driving training.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure 10.3** - Development of strategic freight stakeholders club
- **Measure 10.4** - Priority access for clean goods vehicles
- **Measure 10.5** - Urban transshipment centre
- **Measure 12.9** - Provision of real-time passenger information.

C Evaluation – methodology and results

C1 Measurement methodology

C1.1 Impacts and Indicators

METEOR / GUARD INPUTS				
NO.	EVALUATION CATEGORY	INDICATOR	DESCRIPTION	DATA /UNITS
ECONOMY				
2		Operating costs	Costs per PT pkm	Euros/pkm, quantitative, derived or measurement Commercially sensitive therefore information may not be quantifiable – rely on operator judgement
ENVIRONMENT				
6		NOx levels	NOx concentration	ppm or g/m3, quantitative, measurement
8		CO ₂ emissions	CO ₂ per vkm	g/vkm, quantitative, derived
10		NOx emissions	NOx per vkm	g/vkm, quantitative, derived
TRANSPORT				
22		Vkm by vehicle type	Total trips length per vehicle per day	vkm per day, quantitative, derived
		Vhrs by vehicle type	Total trip time per vehicle per day	Vkrs per day, quantitative, derived

Detailed description of the indicator methodologies:

The indicators above were originally identified at the start of the project as those that could potentially be evaluated. However, having implemented the information viewer and observed how the companies would use it, the evaluation of the above indicators was identified as an issue.

For example the viewer provides information on where a highway event may cause significant delay on the network. If an event was identified on a delivery route then the company may change one or a number of delivery routes in order to avoid this. These changes may be agreed by personnel at their main depot at the start of the day or may be initiated by a vehicle driver at any time. With this scenario there are a number of variables that are difficult to evaluate, such as:

- How long the vehicle would have been delayed if it had stayed on its original route and queued at the highway event. The time delay and queue length could vary considerably and have a significant effect on emissions and fuel consumption,
- The companies do not have detailed records of the routes being undertaken by drivers, who are able to draw upon their own local knowledge to reach a destination or avoid an event. This makes comparison of the routes being taken before and after the viewer difficult,
- The avoidance of an event could result in more than one delivery schedule being amended. How and when the delivery schedules change would depend on the location and type of event and would often be a decision made on the day of delivery. This makes the assessment of effects difficult to track.

As a result, rather than a numerical evaluation of the measure, a qualitative evaluation was undertaken, via interviews with the users to determine its effects and how it can be improved.

An initial consultation process was undertaken with approximately 700 companies to identify those that were willing to participate with this measure. 6 companies (4 within Norfolk) expressed an interest in participating and from these two companies were invited to trial the information viewer. They were:

- D and F McCarthy Ltd, a UK fresh produce distribution company whose warehouse site is located in Norwich,
- Foulgers Transport Ltd, a road haulage company whose warehouse is located at Snetterton, about 20 miles south west of Norwich.

Of the other 4 operators, 2 were freight delivery and storage companies based in Norfolk. One was a scaffolding and house refurbishment company located in Suffolk. The other operator was an international parcel deliverer and courier with depots located throughout the country.

Measure 12.8 was one of the first experiences that the traffic and travel information was issued to private operators. Previously it had only been used internally within the local authority to help management of the highway network. Therefore, to reduce the initial risk, only 2 companies (those showing most interest) were chosen to trial the viewer.

Some companies were interested in the results of the viewer development, and once developed would consider its use. As a result there is potential to easily expand the viewer use at a later date.

C1.2 Establishing a baseline

There are a number of freight and delivery companies in Norfolk. In 2006 an interrogation of the licensed operator sites identified approximately 700 operators in Norfolk that had more than 10 vehicles. In addition to this, there are locations that are significant HGV generators but may not necessarily be licensed as an operating centre (e.g. industrial estates, shopping centres, supermarkets). The extent to which these companies use technology to provide traffic and travel information varies with the use of GPS locating systems being the most frequently used technology.

C1.3 Building the business-as-usual scenario

The initial questions put to the operators asked whether they had previously considered the benefits of traffic and travel information.

Did you previously provide traffic and travel information to your drivers?

No formal systems for providing traffic and travel information were in place at the companies. Most information on traffic conditions was fed through the office from sources such as the radio, newspaper and the drivers themselves.

Did you previously use any systems to obtain traffic and travel information?

Both companies only adopted a limited use of recent technology to obtain traffic and travel information. McCarthy's have a satellite tracking system for their vehicles although this does not provide any information on traffic conditions.

Foulgers have no vehicle tracking system in place.

Have you had problems providing traffic and travel information to your drivers on route to deliveries?

The most frequent method for providing information to drivers whilst on deliveries was via mobile phones. Most drivers had mobile phones but problems occurred when they could not be contacted or did not answer the phones.

C2 Measure results

For the purpose of the evaluation of the project the two companies were invited to provide comments on the information viewer at two key stages:

1. To gain initial thoughts when the viewer is first provided,
2. To gain thoughts towards the end of the project once the viewer had been used for a period of time (about 6-8 months).

The results are presented under sub headings corresponding to the areas used for indicators - economy, environment and transport, as well as a section on general questions.

It should be noted that after installing the first viewer a number of issues were identified, which resulted in a second (and more simpler version) to be developed. This new version has only recently been installed.

C2.1 General Questions

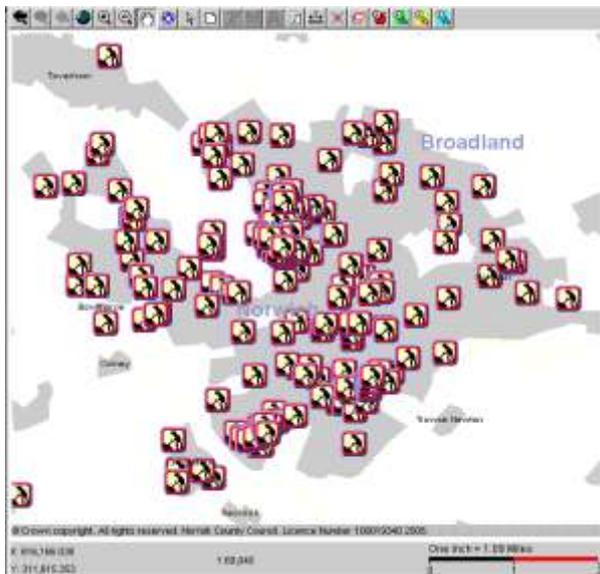
A number of comments regarding the general operation of the freight viewer and its potential benefits were provided by the participating companies. These were as follows:

What were your first impressions of the viewer?

Both thought that too much information was presented on the screen. It was an advantage to be able to have a view of the whole county road network but in this view the number of events on the highway were numerous. This made identifying significant events difficult and reduced its usefulness.

The data viewer shows all events on the highway and the user is required to ‘drill down’ on an event to determine its exact location and effects. For a company with various long distance delivery routes this could be time consuming.

Roads forming the main road network are those that would be most frequently used by longer distance delivery vehicles. Therefore the suggestion was made that a filter option be provided to only show those events on the A and B road.



Freight viewer showing all events on the highway in Norwich. In this view and also the overall view of Norfolk it is difficult to identify these located on the main road network. The ability to filter events and show only those that were on the main road network was considered beneficial.

The companies thought that the ability to quickly zoom to town centres was of benefit. The viewer had short cut buttons to automatically zoom onto Norwich, Great Yarmouth or King’s Lynn. The suggestion was made that they would like to easily/quickly zoom to other urban areas.



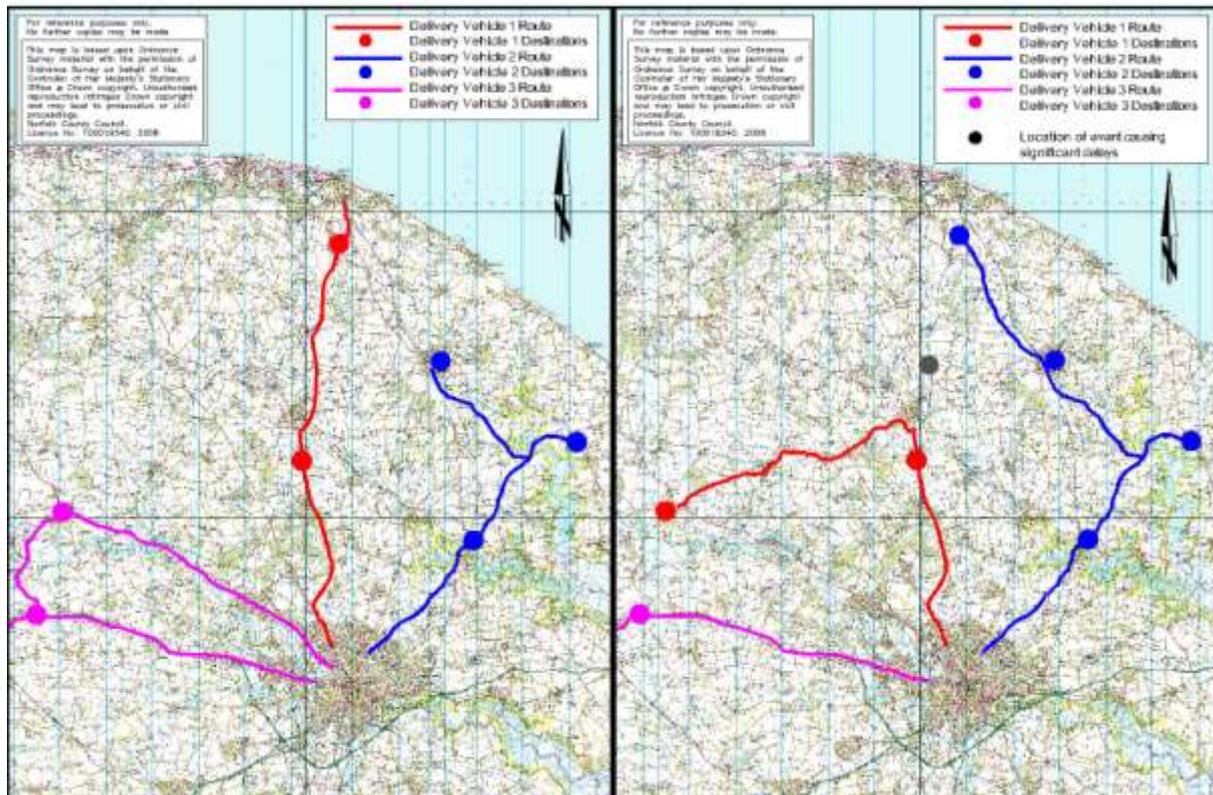
A useful tool on the viewer was considered to be the ability to quickly view town centres such as King’s Lynn. Views of additional town centres were suggested.

Following the introduction of a second viewer with the ability to only show main road events, the feedback from Foulgers was that the viewer was much simpler to use.

Has the viewer been used for your operations?

Initial thoughts were that the freight viewer would be of benefit during the planning of deliveries rather than by drivers whilst in their vehicles. The companies would not want to commit the staff time to continually tracking their vehicles to see whether any of them was near a highway event.

It was envisaged that the viewer would be a useful tool, to be used at the start of each working day, allowing the potential delays on each delivery route to be assessed and changes made where necessary.



The above diagram gives hypothetical example of how delivery routes could be adjusted to avoid a particular event on the highway that is causing significant delay.

One company envisaged that the viewer screen could be projected onto a wall allowing it to be viewed by all staff working on the warehouse floor, including the drivers as they left the warehouse to start their deliveries.

There has only been limited use of the viewer because of the difficulty in using the first version. Now a second version has been provided there was comment that it would be of use to the traffic operations office. The information of use would be major events (such as road works/closures) and information on the main routes sand in town centres. Information on minor roads was considered least helpful.

C2.2 Economy

Do you think that having the information will save you money/fuel?

There was concern that whilst each event is given a category of severity (low, medium or high) this would still require their judgement to determine whether changing delivery routes was more cost/time effective than remaining on the same route and joining the queues. This was particularly relevant to events such as road works.

Other information to help this decision making process was considered to be beneficial. Examples would be:

- Information on the locations of weight restrictions
- Bridge height restrictions
- Roads unsuitable for HGVs
- Route Hierarchy information

The County Council has a Route Hierarchy that identifies roads according to their function and level of use. This Route Hierarchy identifies the main road network as A and B roads that are called Principal Routes and Main Distributor Routes respectively. Previous reviews have been undertaken to identify the most suitable route to access local communities, HGV generators and tourist attractions from this main road network. The routes are called Local Access Routes, HGV Access Routes and Tourist Access Routes respectively. Together these identified routes form the Route Hierarchy and are where the county council seeks to encourage the majority of traffic. Accordingly it is these routes that receive a greater improvement and maintenance priority, together with a better standard of traffic signing. They are also the routes that tend not to have any form of access restrictions.

Providing details of the Route Hierarchy Routes as an information layer on the viewer would have two benefits:

1. If a certain route to a community was restricted by an event, then the companies could use the Route Hierarchy information to identify the alternatives routes that would be of a better standard and free from access restrictions,
2. The viewer would provide the County Council with another way of promoting the Route Hierarchy and encouraging vehicles onto the most appropriate routes.

There was a belief that the system would be able to save fuel but comment was made that the saving was difficult to quantify.

Were there any circumstances when the information provided was inaccurate?

There were no reported instances when the information provided was incorrect.

Were there any circumstances when the viewer has not worked and cost you money? (Was the support service used when this has happened?)

There were no reported instances when the viewer had not worked and had cost the company money. However, concern was still expressed that there was not sufficient information to allow an effective decision to be made on whether to avoid an event. Companies may incur an additional cost caused by the longer distance travelled to avoid an event (because the congestion caused was only minor) and would not realise this.

C2.3 Environment

Similar to Economy.

C2.4 Transport

Similar to Economy.

C3 Achievement of quantifiable targets

No.	Target	Rating
1	Establish freight user needs and priorities with regard to service information?	**
2	Provide traffic and travel information service to selected freight operators?	**
3	Get freight operators to adopt clean urban principles in return for service information (see comment below)?	0
NA = Not Assessed 0 = Not achieved * = Substantially achieved (alt least 50%) *** = Achieved in full **** = Exceeded		

Under the original aims of the measure, the adoption of clean urban principles was envisaged to be the retro fitting of pollution reducing equipment or the conversion to more environmentally friendly fuels. However, during the scoping and consultation phase of the project it became apparent that the benefits of improved traffic and travel information was not sufficient enough to offset the cost implications to freight companies that would result from introducing and maintaining retro fit equipment. Therefore the measure aims were amended so that eco-driving training was adopted as a clean urban principle.

Only limited eco-driving (five drivers trained in conjunction with the training associated with Measure 10.4) was undertaken during the lifetime of the measure although more is proposed, providing that the companies are willing to pay for it. This is because:

- The first information viewer was not suitable for the company use and a second viewer has had to be developed before asking the companies to undertake the training,
- The companies employ their own in-housing trainers who were wary of training being undertaken by an outside organisation.

C4 Up-scaling of results

Up-scaling of the information element could be undertaken in 2 forms:

1. Supplying the information to new companies,
2. Providing new types of traffic and travel information.

The measure objectives were to use the provision of traffic and travel information as a means to encourage freight operators to adopt cleaner vehicles. To do this the information had to be provided in a form that could only be seen by the operators agreeing to adopt cleaner vehicles and not other operators. As a result the method of installing viewers into the company depots was used.

By working with the chosen companies a greater appreciation of freight operator needs and requirements has been established and the viewer revised so that a common viewer established for freight companies. As a result of this up-scaling of the measure could be achieved by installing the customised viewer into the depots of other companies.

The main issue identified with providing additional viewers is the financial implications associated with providing a maintenance and support service for this. The companies participating with this measure were given training on operating the customised viewer and were also provided with contact details should technical issues arise. Such technical issues could include:

- Requiring the customised viewer software reinstalled on a PC,
- Failure of the viewer to work,
- Additional training,
- Other PC operational issues.

As the number of companies with the viewer increases, then the commitment to provide a technical support service increases and this has on-going revenue implications. One idea being considered is whether the companies could be charged for the viewer. This could be either by an initial single payment or an annual fee. Alternatively, providing information directly via the internet, as previously described, would allow all operators to view the information with less maintenance/support implications.

There is concern that the provision of traffic and travel information alone has insufficient incentive to encourage the adoption of cleaner vehicles. However, providing the information alone does have some benefits. Therefore such information could be provided without the added provision that cleaner vehicles needed to be adopted, it being envisaged that there would be greater interest in using the information. If this were the case then the provision of viewers may be the most appropriate form of information dissemination. This is because they have associated installation and maintenance implications (e.g. visits to the depots to reinstall and repair an existing viewer). To provide information from the CDMF directly out via an internet site would allow all operators to view the information for free, whilst also reducing the system maintenance/support costs.

In terms of supplying additional information the most important information that could be provided were considered as:

Is there any other specific information that would be useful to your operation?

There was a request for greater ability to filter information, as even with just the main route events shown the viewer screen was still too cluttered. This could be achieved by providing an additional option to filter events by their level of severity. The severity of effects of an event are currently categorised as 'low', 'medium' or 'high'.

Suggested additional information that would be useful was:

- Road traffic accidents
- Weight/height restrictions
- Congestion in built up areas
- Cross boundary information e.g. having the information currently available for Norfolk also available for Suffolk, Essex, and Cambridgeshire via the same viewer
- Greater truck road information.

With the establishment of the Common Data Management Facility various traffic and travel information is being and will continue to be collected. There is an aspiration that new information could be provided in the future.

Q10. How can the viewer be improved to make it easier to use?

One idea suggested the colour coding of the event icon according to their severity. Generally freight operators would only be interested in events that closed the road or caused severe hold-ups (i.e. those currently defined as having high severity) to vehicles. Colour coding the event icons would help this identification process.

The ability to print maps for drivers was also identified as a factor that would make the viewer easier to use.

Q11. – How would you envisage the future use of the information, if it could be expanded for your operation?

One company thought the benefits of the traffic and travel information would increase considerably if it could be linked with vehicle satellite tracking systems. This would allow a warning to be automatically sent to the drivers if they are within a certain distance of an event (e.g. a warning sent to their mobile phones or to the existing satellite system if they were within a 10 mile radius of an event). This would avoid the need for the system to be continually monitored from the warehouse location.

The initial aim was to provide this requirement by sending the satellite tracking information to the Common Information Database. It could then be disseminated to the company along with the other traffic information via the customised freight viewer. However there is a sustainability issue associated with this method. If the viewer is to be up-scaled and provided to other companies then the Common Information Database could be filled with information on company vehicle movements that would only be useful to each individual company. Other methods for achieving this requirement will therefore need to be examined.

An alternative method being considered would be to allow the freight operators using the viewer to register a number of telephone numbers and routes. When an event occurred on the registered routes then an appropriate message could be automatically sent to the registered phone numbers.

Would you recommend to other companies that they use the viewer?

Yes, the operator would recommend the viewer.

Would you continue to use the viewer after the trial?

The viewer would be used by companies provided that it was free of charge.

If there was an opportunity would you be willing to report events as your drivers come across them so that they can be seen on the viewer by others?

Potentially, the drivers would be willing to report events and contribute to the viewer information.

What other technical innovations would you like to see?

None identified by the companies other than the linking of the information with vehicle tracking systems.

C5 Appraisal of evaluation approach

Evaluation of the measure is difficult for the following reasons:

- Private company difficulty attributing any overall fuel/emission saving directly to the measure when delivery routes and destinations can vary
- Private company willingness to provide its operational information that may then be available to potential competitors
- The problems of comparing the fuel/emission savings by diverting away from an event on the highway against the original situation of staying on the original route.

As a result a qualitative method of evaluation was adopted to identify approximate savings as a result of the measure.

C6 Summary of evaluation results

The key results are as follows:

- **Key result 1** – There is an awareness that as traffic increases on roads then the importance of good traffic and travel information increases.
- **Key result 2** – Whilst the traffic and travel information can help with the planning of delivery routes prior to setting off, it can also be beneficial during deliveries. For example during a delivery on a main route, information is relayed to the driver that there are road works ahead. The driver then has the option of continuing on the same route and risk being delayed by the works, or taking a longer and potentially unknown route on more minor roads where traffic signing would be of a reduced standard. The decision on the most appropriate choice can be difficult and insufficient information on the amount of delay could lead to the driver automatically remaining on the main route.
- **Key result 3** – An increased benefit could be achieved if the provision of traffic and travel information could be backed by other information such as the most appropriate routes for HGVs and the locations of weight/width/height restrictions on the highway network. This could be in the form of a Freight Map for Norfolk.
- **Key result 4** – Accuracy of the information provided is not dependent on the operating system, but rather the accuracy of the original source of information. For example, the accuracy of information on road works (start, finish, potential delays) is initially dependant on information provide by the designer prior to construction and then the contractor during construction.
- **Key result 5** – Currently the provision of traffic and travel information does not provide sufficient incentive to charge operators for the viewer or encourage them to adopt cleaner vehicles.

D Lessons learned

D1 Barriers and drivers

D1.1 Barriers

- **Barrier 1** – Technology – in some instances the technology of the system provided could not be met the demands from companies. The previous description of linking with satellite tracking systems is given as an example of this.
- **Barrier 2** – Base line information and Validation – the viewer is a means of providing up to date traffic and travel information to freight companies. However, this is only as accurate as the initial information provided. The information sources vary, and include design engineers, contractors, street works officers, Urban Traffic Control camera operatives.
- **Barrier 3** – Maintenance and backup – by extending the provision of the viewer to other companies, there is also an added resource required to provide support for the product. This includes training on how to use the viewer and maintenance support in the event of a technical failure. Currently the resource implications associated with this are being examined.
- **Barrier 4** – Apathy – the results of the initial project consultation showed that many freight operators were not interested in trying the viewer. Lack of interest may be a result of companies being unaware of the type of information that can now be collected/disseminated. They may be unaware of the potential benefits of receiving such information.
- **Barrier 5** – Economic conditions – Current economic conditions result in companies being less willing to take risk but concentrate on their existing operations. This may have been a factor in the lack of initial interest in participating with the measure.
- **Barrier 6** – Norfolk information only - deliveries can be longer distance and to provide a more comprehensive information system it would be beneficial to provide information on events outside Norfolk.
- **Barrier 7** – Lack of incentive - the cost of clean vehicle technology (such as retro-fitting vehicles) is high and is difficult to offset by the benefits gained from traffic and travel information.

D1.2 Drivers

- **Driver 1** – Current congestion levels and increasing fuel costs mean that some companies are looking at potential avenues to reduce their overall fuel bill.
- **Driver 2** – The Traffic Management Act which requires local authorities to keep traffic moving and avoid congestion. The provision of good quality information could help towards achieving this.

D2 Participation of stakeholders

- **Stakeholder 1** – The main stakeholder participation was with freight companies and interest from them, in participating with the measure, was low. However, the interest was sufficient to identify to companies that could help develop a customised freight viewer. The envisaged reasons for this lack of interest are described in Section D1.1 ‘Barriers’ of this report.

D3 Recommendations

- **Recommendation 1** – When obtaining interested companies there is a need to promote the positive aspects of such information and the benefits to companies receiving the information.
- **Recommendation 2** – Freight companies would like information in a simpler form that does not require significant resource to operate.
- **Recommendation 3** – The cost of clean vehicle technology (such as retro-fitting vehicles) is high and is difficult to offset by the benefits gained from traffic and travel information.
- **Recommendation 4** – The provision of traffic and travel information alone has its benefits without the provision that companies need to adopt cleaner vehicles to receive it. Therefore a dissemination format that can be viewed by all could be considered.

D4 Future activities relating to the measure

- Investigate maintenance and support implications associated with a roll out of the customised freight viewer to other companies (including potential revenue sources to provide this),
- Undertake publicity and promotion amongst freight operators to disseminate results of trial and see whether there is renewed interest in using the viewer,
- Continue to consider how additional information could be collected, validated and disseminated via the viewer (such information could include city centre congestion measured by detector loops, and road traffic accident information),
- Expand viewer application to allow users of the freight viewer to contribute to the traffic and travel information.