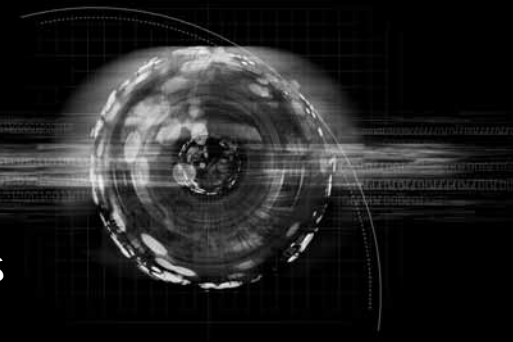


# Innovation Platforms

Intelligent Transport Systems and Services



## Future Intelligent Transport Systems

**A call for Expressions of Interest to participate in academic/industry multidisciplinary research and innovation consortia**

**Closing Date for Expressions of Interest - 12 noon Friday 3rd November 2006**

### Introduction

The Department for Transport (DfT), the Department of Trade and Industry (DTI) and the Engineering and Physical Sciences Research Council (EPSRC) intend to sponsor a small number of new multidisciplinary research and innovation consortia to enable UK industry, local authorities, research and technology organisations (RTOs), and universities to work in collaboration to address key research issues in the longer-term development of the UK transport system.

Expressions of Interest (EoIs) in participating in research and innovation consortia are invited from individuals or research groups in UK Higher Education Institutions, UK-based companies, Local Authorities and independent Research and Technology Organisations. Please note that there is no requirement at this stage to draw together partnerships for a full consortium bid.

Advance notice of the Future Intelligent Transport Systems (FITS) initiative was given in a 'Joint notice of an initiative for academic/ industry multidisciplinary research and innovation consortia' on 29th September 2006 (available on the sponsors' web sites). This document should be consulted when considering submitting an EoI. The FITS initiative is one of a number of initiatives being coordinated by the Intelligent Transport Systems and Services Innovation Platform (ITSS-IP).

The three sponsors will each contribute up to £3M to the FITS initiative. EPSRC's contribution will be used to support universities, the DTI's contribution will be used to support industry, local authorities and RTOs, and the DfT's contribution may be used for any of these depending on the outcome of the commissioning process. It is expected that industrial partners will contribute significant resources of their own to the research consortium.

**dti**

*Department for*  
**Transport**

**EPSRC**

Engineering and Physical Sciences  
Research Council

## Scope of FITS programme

The underpinning theme is studies on problems of **delivering better passenger and freight transport services while at the same time reducing negative environmental impacts** especially the carbon footprint. The five key ITS areas where the sponsors would particularly welcome new ideas, new concepts or new products and services are:

- Improving road network management (excluding road pricing)
- Improving road safety (by reducing collisions, casualties and deaths)
- Better travel and traveller information (matching supply and demand through better information so travellers make informed choices on when / how to travel)
- Better public transport on the roads (supporting more reliable, more accessible, safer and more efficient services)
- Supporting the efficiency of the road freight industry

These challenges and the ways that we might respond to them through technology were explored in detail in the Foresight project on Intelligent Infrastructure Systems ([www.foresight.gov.uk](http://www.foresight.gov.uk)).

Examples of the problems faced in these areas are provided in the Annex to this document. This is not an exhaustive list and ideas should not be limited to these problems.

## Who can apply?

Research and innovation consortia are expected to combine the best UK academic expertise with UK-based companies, local authorities and RTOs, focussing on key longer-term (7-10 years) research issues from the innovation agenda set by the contributing companies. Consortia will vary in size and scope depending on the subject area, the degree of multidisciplinary and the partners involved.

As well as organisations that are currently involved in transport systems and related research, the sponsors wish to encourage contributions from companies and individuals who have not previously worked specifically on transport-related problems. There is huge potential for a range of ideas, concepts and technologies to contribute to the ITS agenda. Many new technologies - for example: distributed networks of sensors, data-mining, agent-based software, modelling & simulation technology, advances in communications technology, speech interface and self-monitoring complex systems - could underpin the development of ITS capabilities. ITS also raises fundamental questions about how drivers and travellers will respond to the provision of improved information and possible intervention strategies.

## Selection process for research and innovation consortia

Selection of the consortia to be supported will follow a three-stage process.

## Expression of Interest submission

This first stage is to invite potential participants to express an interest in taking part in the FITS initiative. Eols submitted will be sifted at a Panel meeting, consisting of experts from relevant institutions and organisations. Eols will be assessed against the criteria contained in this document. Applicants will be informed of their selection/non-selection for the workshop event on the **10th November 2006**.

## Consortia building workshop

The second stage of the process is focused around the consortia building workshop that will be held on **22-24th November 2006** at the Sheraton Skyline Hotel, Heathrow, to which only successful Eol applicants will be invited. The workshop will be organised and facilitated by EPSRC, based on the successful 'sand-pit' style of workshop. Participants will be expected to engage constructively in dialogue with each other, the facilitators and the external assessors that will be present to participate in the prioritisation process. EPSRC has used this style of workshop for a number of high profile strategic partnerships with industry and the participants involved rated the experience highly. Further details on the workshop are contained in the 'Joint Notice' document.

The purpose of the workshop will be to:

- Refine the priority research challenges that the initiative should address;
- Bring together potential research partners for science base, science to business or business to business collaborations;
- Develop potential research/development work packages to address the agreed research priorities;
- Bring together potential work packages within a series of potential integrated research/development projects with identified research leaders, research team and management arrangements.

## Final panel review of consortia proposals

Following the consortia building workshop, each team will be tasked with writing a Consortium Proposal covering their intended activities as identified at the workshop. Further guidance on this part of the process will be available at the workshop. The deadline for submission of proposals will be the **31st January 2007**.

The proposals will be subject to a rigorous peer review and assessment panel reviews, before funding is awarded. The Panel will include a mixture of mentors from the workshop event for continuity and independent assessors, who will not have seen the proposals before. The panel meeting is scheduled to be in early March.

## Expressions of Interest Requirements

The format for the Eol is at the end of this document.

The first section of the Eol is **contact and biography details** for the person offered to attend the consortia building workshop. The second section of the Eol is for the **case supporting the application**. Here applicants have up to five pages to describe their ability and interests relevant to the scope of the FITS initiative stated above. It should also show an appreciation of the issues, technology, objectives and challenges of research and innovation in the area. It is up to the applicants how they provide this information, but this must be contained within five A4 pages and clearly address the selection criteria below. **Please ensure you fully complete the Eol form, as this is the only information on which potential workshop attendees will be selected.**

Eol submissions should comprise an electronic copy of this document with the proforma section at the end of the document completed. No further documentation will be accepted.

Expression of interest application forms can be downloaded from <http://www.epsrc.ac.uk/CallsForProposals/FITS.htm>

Eols must be submitted to EPSRC at [its@epsrc.ac.uk](mailto:its@epsrc.ac.uk), no later than **12:00 noon, Friday 3rd November 2006**.

## Selection criteria for all Eols:

- A brief description of your outline ideas in ITS which will impact on the areas shown in the annex and the timeliness of these
- Statement of commitment to contribute actively to the workshop
- Availability of individuals on workshop dates offered for the November workshop & any back-up team

## Selection criteria specific to Industry/ Local Authorities/ Non-academics:

- Organisations' track record in ITSS and related areas
- Specialist experience and qualifications of individuals seeking to participate in the November workshop
- Evidence of previous experience in multidisciplinary collaborative research and development and innovation
- Statement of organisations' potential financial or other resource commitment to this initiative (including provision of specialised facilities)

DTI's aim is to stimulate and accelerate industry's own investment in innovation. The assessment criteria for industry have been structured to both encourage innovation within the existing market-place and to encourage new entrants.

## Selection criteria specific to Academia:

- Scientific excellence and novelty in the outline ideas put forward
- Track record in gaining research funding (not limited to EPSRC-funded research).
- Experience in conducting research in multidisciplinary areas, especially with end-user focus (not limited to EPSRC-funded research).

The final criteria for selection of the Consortium Proposals for financial support under this initiative for organisations and/or academic institutions funded by Government Departments will include the Technology Strategy Board's criteria

(<http://www.dti.gov.uk/innovation/>): -

- The UK's capacity to develop and exploit the technology;
- The size of the market opportunity;
- Potential for impact and timescale;
- A clear rationale for Government support.

## Closing date for expressions of interest

Expression of Interest application forms to take part in a Research Consortium workshop on 22-24 November at the Sheraton Skyline Hotel, Heathrow can be downloaded from <http://www.epsrc.ac.uk/CallsForProposals/FITS.htm>

Completed Expression of Interest application forms should be submitted electronically to [its@epsrc.ac.uk](mailto:its@epsrc.ac.uk) by **12 noon on 3rd November 2006**. Late submissions will not be considered further.

## Contacts for further information

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# Annex – Key ITS areas

The table below shows examples of topics within the five key ITS areas where DfT would particularly welcome Expressions of Interest describing new ideas, new concepts or new products and services. The underpinning theme is studies on problems of delivering better passenger and freight

transport services while at the same time reducing negative environmental impacts especially the carbon footprint. When EoIs are put forward for any topic the associated environmental impact agenda should be clearly spelled out.

TOPICS TO BE STUDIED	EXAMPLE PROBLEMS
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IMPROVING ROAD NETWORK MANAGEMENT (includes ways to improve journey time reliability, and relates to benefits for all road users including bus passengers and cyclists/ motorcyclists)

What in-vehicle technologies (e.g. advanced cruise control, lane keeping) and Infrastructure changes (e.g. slip road design, new pavements) are likely to be required for successful demonstration of a Cooperative Vehicle-Highway System?

There have been a number of advances with the use of intelligent systems for wide-area network management and in particular interactive tools for supporting Traffic Control Centre staff when devising mitigation strategies. To what extent can ITS be used to manage the consequences of a road traffic incident? e.g. consistently and reliably assessing the scale of the incident; notifying emergency services; accurately locating the core of the incident; providing early warning information to approaching drivers, advising of alternative routes and amending them to avoid secondary congestion.

Can we devise accurate and consistent models of drivers' behaviour and reactions to changes in traffic management systems that are faster and cheaper than simulators and so would allow us to determine the response of the driving population to innovative schemes more accurately than at present, and therefore install an "optimised" solution from the start of a project?

Are there cost effective means of detecting vehicles and their speeds, perhaps their class, identity and occupancy? That are more reliable and easier to install / maintain than in-road loops? While these are a very effective form of vehicle detection especially for high speed roads costs, especially for installation and maintenance, are rising rapidly. Research projects have looked at a number of alternatives (fibre-optic cable, CCTV image analysis, radar, magnetic anomaly, acoustics, mobile phone signal reflections, etc) but all have limitations, particularly in adverse weather and incident conditions.

Secondary vehicle safety is now very well developed and making improvements tends to require increasing cost for decreasing gains. The automotive industry has started to research and test primary

safety measures - e.g. techniques for alerting the driver to a latitudinal or longitudinal collision or to a drift from within a marked lane, or even over-riding the driver and automatically steering or braking the vehicle. There is a pressing need for primary safety measurement techniques e.g. how can ITS be used to provide accurate and reliable accident sensing information? How can ITS be used to identify and assess the effectiveness of primary safety measures (identifying and understanding why the accident that never happened didn't happen)?

IMPROVING ROAD SAFETY (by reducing collisions, casualties and deaths)

What methods can predict the effect of new vehicle-based primary and e-safety technologies on casualty numbers? What methods are available to quantify changes in casualty numbers once a system is deployed? How might any HMI problems eg driver overload be identified at an early stage? How might changes in driver behaviour be predicted before implementation or measured once implemented?

Will it possible to incorporate safety tools into other ITS services rather than have a focus on a dedicated safety system or service? if so how might this be done?

What is the scope for deriving safety benefits from technologies which identify the location and speed of vehicle? How soon might motorists be willing to "opt-in" to cooperative vehicle-highway systems, which would take over many driving functions to keep vehicles a safe distance apart on the most heavily trafficked parts of the network? Are we ready to design and trial such a system?

BETTER TRAVEL AND TRAVELLER INFORMATION

Current research indicates that a high proportion of transport information recipients will amend their originally intended modal preferences as the result of information received. How can stakeholders from the private and public sectors derive the maximum benefit from this with the most efficient level of effort and expenditure? What arrangements need to be in place to gather, reference and access information, including standards, descriptions, interfaces and access & use permissions?

Current information provision tends to be by "User Pull". Bearing in mind that most travellers rarely use journey planning services, would there be wider take-up of advice and travel warnings if more information were made available by "Infrastructure Push"?

Are new information architectures needed for better travel and traveller information - and if so how should they be integrated with other ITS services such as traffic management, road pricing? How might users be able to access the best predicted journey plan for their chosen itinerary and how might it be updated in real time? What are the roles of Government, the wider public sector, the transport industry and the IT and information provision communities?

Can ITS techniques be used to better manage vehicle loading of passenger vehicles (weights and carrying capacity)? How can ITS be used to dynamically monitor progress on a single trip which crosses transport modes (e.g. an on-board "Transport Direct" service provided either from the vehicle or directly to the traveller through a personal device (mobile phone?) with real-time data on location?

#### BETTER PUBLIC TRANSPORT ON ROADS

How can we get a better match between public transport capacity and demand? Might a smartcard scheme reveal demand variation by origin or destination, weather, time of travel, information availability?

Could a Freight ITS Infrastructure support partnering to share fixed and mobile assets, open night time capacity by using ITS to minimise noise intrusion and facilitate increased utilisation to reduce wasted miles? To what extent might the technologies deployed for freight be applied to other modes such as easing access for equipped passenger cars into Park-and-Ride centres or giving high priority network paths to PSVs?

What scope is there for using ITS to reduce the burden on freight operators through reduced cost of compliance e.g. remote vehicle or driver condition monitoring?

#### IMPROVING THE EFFICIENCY OF THE ROAD FREIGHT INDUSTRY

Would an HGV-specific Satellite Navigation device be cost-effective? The majority of SatNav products are designed primarily for cars and hence have shortcomings when used in trucks. Most system maps do not alert to routes not suitable for HGVs; there are some services available that alert the driver to low bridges and other infrastructure constraints. Could this lead to ITS systems or services that support an integrated freight transport system incorporating road, rail, air, sea and inland waterway modes allowing freight to be routed optimally for price, time and/or sustainability?

A typical modern HGV will be fitted with a number of separate ITS products - fleet management, remote diagnosis or automatic fault reporting, payment for continental roads, e-Business invoicing, for example - that are built up from common components such as GSM telephony, GPS position fix, access to the vehicle's databus, an open software platform and secure memory. There is scope for considerable cost saving, and lowered barriers to new functionality [eg better security systems or allowing better partnering of smaller operators to compete with larger ones] if there were agreement on a standard framework for the in-vehicle hardware and a standard set of "add-on" modules for services such as the digital tachograph. Is it possible to build such devices so that in addition to supporting interoperability of services they would be interchangeable between vehicles in a fleet?

Are the necessary System Architectures and Standards available to support joining up the topics listed here? Are the relationships between throughput, safety and environmental impact sufficiently well understood? How might integration be demonstrated for both supplier and end-user benefit?

What processes need to be in place for payment especially mobile payment?

## CROSS-CUTTING WORK

The telecoms industry is predicting widespread changes to the way we work as a consequence of new WiFi services giving enhanced capacity for vehicle-vehicle and vehicle-vehicle links. How might the typical traveller benefit from these developments?

Is it possible to achieve better coordination of enforcement technologies and the associated institutional, legal and public acceptability issues? Systems that could be integrated include: remotely identifying a vehicle and its keeper information when an offence is committed; reliably recognising when a car's electronics have been tampered with to avoid detection; identifying foreign vehicles and sending language-specific information on UK laws and traffic regulations; informing drivers of imminent offences eg sending information on speed limits, illegal parking, speeding; "intelligent cars" that indicate to a driver when the car is being parked illegally, or places where the car should not be stopped, giving warnings about seat-belt wearing, alcolocks?