OVERVIEW OF EVIDENCE NEEDS & PLANNED RESEARCH (09/10)

This document summarises the planned strategic evidence needs and key research plans reported by the Department for Transport’s directorates and agencies, and the Commission for Integrated Transport. It does not include every possible planned research project.

Part 1 identifies the research needs and presents them in relation to each of the five goals set out in Delivering a Sustainable Transport System (November 2008), subdivided by the three Networks and a cross-cutting category. This is a presentation based on the goal most likely to be relevant. Some issues, however, are aimed at broader Departmental goals of achieving better value for money (generally included under ‘competitiveness and productivity’). Many are relevant to more than one goal and a few (marked *) support all five.

Part 2 identifies the relevant proposals against three strategic priorities.

While the identification and assessment of possible policy options is one reason that the Department commissions research, the appearance of any particular item of planned work in this list does not in itself bind the Department, or represent any formal position as regards possible new policies or changes in existing policies.

PART 1

Climate Change

<table>
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<tr>
<th>Cities &amp; Regional Networks</th>
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<tbody>
<tr>
<td>Regional and Local Transport Policy / Delivery Directorates</td>
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</table>

Evidence needs

- How to account for carbon in the planning process and ensure regions and local authorities can assess the carbon impact of their proposals
- Clarify the impact on carbon of initiatives on cycling, school travel, sustainable travel towns and ‘smarter’ measures

Planned research

- Development of guidance and tools on assessing carbon impacts
- Establish how to monitor and evaluate the impact of sustainable travel
- Model the potential of demand management measures to contribute to UK carbon reduction targets
- Analyse the carbon footprint of the local highways asset

London and Road Demand Management Directorate

- Assess the potential and implications of using road demand management to contribute to UK carbon reduction targets.
### National Networks

#### Highways Agency

**Mitigation & adaptation**
- Develop an appropriate risk assessment methodology and associated carbon calculation and accounting framework and targets
- Identify specific mitigation and adaptation measures
- Identify measures to help reduce waste at construction schemes

**New technologies**
- Review emerging technologies to assess the opportunities they may offer

#### Rail Directorates

**Evidence needs**
- These are being largely addressed through three topics - energy, sustainable development and rolling stock.

**Research areas**
- Electrification
- Energy storage technologies (e.g. batteries, hydrogen)
- Metrics for environmental performance
- Energy saving by reducing train mass, re-using energy (regenerative braking) and providing energy usage measurement technology
- Making infrastructure resilient to climate change: currently involves quantifying the risks (e.g. of flooding or high winds disabling power cables) and identifying cost-effective adaptation responses to inform future investment decisions

### International Networks and Environment

#### Environment and International Directorate

**Research areas**

**Vehicle Environmental Standards**
- Particle emission measurement techniques for heavy duty diesel engines
- Work as required to inform policy on EU and domestic proposals for vehicle emissions and noise standards

**Reducing carbon emissions**

**New fuels**
- Significant research programme to further improve the scientific understanding of biofuels, starting with scoping study to identify knowledge and evidence gaps on bio-fuels post-Gallagher.
- Work with Carbon Trust to support the development of sustainable ‘advanced’ biofuels. Potential for funding of other projects at ‘demonstration’ stage.
### Improved fuel consumption/CO₂
Gathering data on typical UK light duty vehicle operating patterns to support UN-ECE worldwide harmonised emissions test procedure

### Impact of policy
Scoping study to inform UK position on EU planned review of long term target for new car CO₂ emissions

Procurement of further data and analysis to improve forecasts of the emissions profile of future car stock

Improve capability for modelling effects of policy on bio-fuels market

### Low Carbon Vehicles Innovation Platform
DfT support for the Platform (jointly with BERR, Technology Strategy Board, EPSRC & two Regional Development Agencies)

Competitions announced for 2009-10 for
- enabling technologies for electric and hybrid vehicles
- ultra low carbon vehicle on road demonstration including attitudinal and behavioural aspects
- collaborative R&D on developing broader innovative technologies for large scale carbon reduction in road transport

### Aviation Directorate
Continue work to support international efforts to reduce impact of aviation on climate. This includes better understanding the atmospheric science itself, as well as identifying and assessing possible responses. The latter could involve work on aircraft fuel efficiency standards and metrics; and modelling NOx emissions with a view to International Civil Aviation Organisation consideration of a possible increase in stringency of engine design standards.

### Transport Analysis and Economics Directorate

**Scope for reducing transport’s impact**

- Improve understanding of the potential for reducing greenhouse gases and the costs of policy options.
- Improve knowledge of the sources of emissions from transport in terms of journey distances, journey purposes etc.
- Review evidence of the social and distributional impacts of DfT climate change policy options.

**Public attitudes to climate change & travel choices**

Develop a segmentation model to identify and quantify the differences in attitudes and motivations relevant to reduced carbon emissions from personal transport use.

**Citizen’s Panel – Listening to the people**

Understanding public attitudes, needs and priorities in developing the sustainable transport strategy. *
### Behaviour change

Learn lessons from existing evidence about what works and why in bringing about behavioural change in a range of policy contexts. *

### Evaluating impacts of transport policy

Continue to develop strategy and methods for robust and consistent impact and process evaluations. *

### Commission for Integrated Transport

Medium length (5-25 mile) journey patterns – focussed on carbon emissions and congestion, this research will consider a) the scope for behaviour change, b) the options for change, and c) how change could be delivered.

### Motoring and Freight Services

#### Transformation, Licensing, Logistics and Sponsorship Directorate

**Evidence needs**

- Improve the potential to reduce the environmental impact of freight, including through both modal shift and more efficient HGVs and vans.
- Measure the carbon impact of freight and the effects of policy interventions aimed at enhancing the network performance, safety and environment e.g. Safe and Fuel Efficient Driving (SAFED), mode shift.

**Planned research**

- Broaden online benchmarking scheme to enable freight operators to compare their efficiency against others, thus identifying areas of potential improvement.
- Advantages / disadvantages of longer semi-trailers and impact on other modes.
- Benefits and scope of establishing a “quieter HGV” recognition scheme.
- Costs and benefits of low carbon technologies for HGVs.
- To develop an approach to understanding our customers’ needs to ensure that services and policies are designed and implemented with a robust understanding of the customer.

### Competitiveness & Productivity

#### Cities & Regional Networks

#### Regional and Local Transport Policy / Delivery Directorates

**Evidence needs**

- Improve understanding of urban congestion, including effect of external factors such as the wider economy, and broader VfM questions.
- Better understand the bus market structure and the effect on it of smartcards and improvements in infrastructure and services.
Better understand the end-to-end journey experience

**Planned research**

Evaluation of the Cycling City & Towns demonstration projects
Identify which interventions to counter congestion have been most effective
Understand how people respond to congestion
What is happening to journey length, trip length and traffic in urban areas
Improving the end-to-end journey experience
Analysis of the shape of the bus industry. Development of a forecasting model
Develop land-use models to help better understand how economic activity responds to transport investment over time
Research on reliability and improvements to demand forecasts and appraisals for projects and policies where reliability will be a major factor
Package of research for UKRLG on various aspects of designing and maintaining local authority highways

**National Networks**

**Highways Agency**

**Operating the highway network**

The evidence need concerns the ways to better monitor & manage the network in line with customer expectations, e.g. making road measurements rapidly to avoid disrupting traffic.

A particular element is how to improve incident detection, management, compliance and enforcement

**Delivering managed motorways**

Identify infrastructure-relevant new technologies
Identify options to reduce infrastructure requirements and increase construction efficiency
Further develop design guidance

**Controlling highway costs**

Identify and develop tools to improve the prediction & management of costs
Identify and develop ‘lean’ construction principles, process and standards

**Rail Directorates**

Modelling whole life system costs to increase cost effectiveness. A model has been developed and now needs validation
Participating in European research to set future standards for interoperability could reduce costs cf. “UK bespoke” trains
Reducing operating costs associated with incidents by e.g. better driver selection and training and by improving communication between signallers and drivers
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<th>Evaluation of High Speed Rail</th>
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<td><strong>International Networks and Environment</strong></td>
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<td><strong>Commission for Integrated Transport</strong></td>
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<tr>
<td>Continue to examine measures and packages of measures to reduce congestion</td>
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<td>Continue to examine the role and use of commercial vans to assess the causes of the recent exceptional growth in their use</td>
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<tr>
<td>Consider the key transport issues for the next 10 years, identifying a) decisions that will need to be made, b) the choices available and c) a suitable approach</td>
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<td><strong>Transport Analysis &amp; Economics Directorate</strong></td>
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<tr>
<td><strong>Appraisals &amp; evaluation</strong></td>
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<td>Better understand business and public attitudes, including issues affecting the acceptability of specific measures</td>
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<td>Improve understanding of the impact of transport on productivity, through its impact on agglomeration</td>
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<tr>
<td>Support the core programme of the UK Transport Research Centre (TRC) of in-depth innovative research aimed at developing the underlying evidence base relevant to key policy questions, as well as dissemination and capacity building¹.</td>
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<td><strong>Motoring and Freight Services</strong></td>
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<td><strong>Road and Vehicle Safety and Standards Directorate</strong></td>
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<tr>
<td>Continue to provide UK input to the European Co-operative Vehicle Infrastructure Systems (CVIS) project and investigate potential benefits of Co-operative Vehicle Highway Systems (CVHS)</td>
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<tr>
<td>Investigating delays at level crossings with view to recommending better solutions that do not compromise road or rail safety</td>
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<tr>
<td>Investigate and recommend possible options for traffic light controls during low traffic demand periods, and other developments to improve traffic signal control</td>
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<td><strong>Vehicle Certification Agency</strong></td>
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<tr>
<td>Continue to explore the implications of Virtual Testing</td>
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<tr>
<td>Monitor and assess emerging technologies, alternative fuels, powertrains and on-board electricity generation and storage, to develop a measured response</td>
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<tr>
<td><strong>Transformation, Licensing, Logistics and Sponsorship Directorate</strong></td>
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<tr>
<td><strong>Evidence needs</strong></td>
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<tr>
<td>Understanding and improving freight performance (including impacts of distribution patterns, products carried and main origins and destinations, journey times by mode, freight use on the defined national corridors, and international</td>
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</table>

¹ This work will take a longer term view of key transport challenges, address these from a socio-economic perspective and draw in new expertise on issues such as competitiveness and productivity, climate change etc.
Measuring effects of interventions aimed at enhancing the network performance, safety and environment e.g. Safe & Fuel Efficient Driving, mode shift

To understand the customer needs and to test the customer experience for web-based information and services; and to understand how to increase take-up of online services to support the moving of information and services onto web.

**Planned research**

Understanding mode shift barriers & attitudes, including possible demonstration

Analyse freight movements, including journey times, by mode and commodity, on the strategic national corridors and into the main cities and regions to support Freight Strategy and DaSTS option generation

Improve van efficiencies across a diverse range of operations and industries

Provide evidence of customer needs to support transformation and develop Departmental online services

Customer usability testing to support the moving of information and services from DfT(c) and Agencies onto web.

To develop an approach to understanding our customers’ needs to ensure that services and policies are designed and implemented with a robust understanding of the customer across the Department.

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**Equality of Opportunity**

**Cities & Regional Networks**

**Regional and Local Transport Policy / Delivery Directorates**

Research how best to improve modelling and appraisal capability sub-nationally

Identify the most effective programme management arrangements to deliver local transport policy

Identify needs and tools for decisions on transport priorities for small investments and to help local authorities’ capacity to deliver their transport plans

Understand how and where the benefits of transport schemes are distributed

Improve understanding of the requirements for accessing the information on policy development and best practice that LAs need to develop their capability

**Disability**

Contribution to DWP-led longitudinal study to investigate disabled people’s experiences. Covers transport behaviour and role of transport in providing access outside of the home

**Special needs**

Research to support the “blue badge” strategy
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<th><strong>Automobility</strong></th>
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<tr>
<td>To develop future policy, continue to gather evidence into travel needs, demands, expectations and requirements of disabled people</td>
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<th><strong>National Networks</strong></th>
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<th><strong>Rail Directorates</strong></th>
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<tr>
<td>Identify the most cost-effective approach to matching station platform heights with train floor heights so as optimise the interface for users with reduced mobility</td>
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<tr>
<th><strong>Social distributional impacts (SDI)</strong></th>
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<tr>
<td>Continue work to explore in detail how to better reflect SDI issues in appraisal. Work to inform New Approach to Transport Appraisal (NATA) refresh including appraisal summary table and enhancement of current webTAG guidance</td>
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<th><strong>Accessibility</strong></th>
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<tr>
<td>Systematic review the processes and impacts of accessibility planning and evaluate how well it is working and why</td>
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<th><strong>Commission for Integrated Transport</strong></th>
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<tbody>
<tr>
<td>Implications of an ageing population and willingness to retain personal mobility on transport policy</td>
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<th><strong>Smart ticketing</strong></th>
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<tr>
<td>Support the Integrated Transport Smartcard Organisation specification, completing work on near field communications</td>
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<th><strong>Future technology</strong></th>
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<tr>
<td>Continue work on co-operative vehicle highway systems, a number of Intelligent Transport System projects including Future ITS systems (FITS) and a web-based ITS toolkit. Also develop ways to help local authorities capture speed limit data consistently</td>
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<th><strong>Cross-Cutting Directorates</strong></th>
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<th><strong>Teleworking</strong></th>
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<tr>
<td>Further understanding of the implications by exploring business attitudes to the potential for take-up and the barriers to its exploitation</td>
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# Health, Safety & Security

## National Networks

### Highways Agency

**Highway workforce safety**

- Improve contractor performance and worker protection adjacent to ‘live’ carriageway

**Highway user safety**

- Identify new measures to improve safety

### Rail Directorates

**Health**

- Collect health data (workforce, passengers & public)
- Research sleep disorders (related to drivers), occupational stress, deep vein thrombosis, and the ageing workforce

**Safety**

- Measure values people attribute to safety, modelling risk and estimate costs of accidents and safety measures
- Analyse safety culture and training
- A particular concern is safety at level crossings

**Security**

- Knowledge gaps include the role of alcohol in assaults, benefits of new-CCTV technology and analysis of causes of anti-social behaviour on trains.

## International Networks and Environment

### Maritime and Coastguard Agency

**Survivability standards of domestic passenger ships**

- Assess likely damage scenarios and probable vessel survival

**Radar**

- Projects to improve the cost-effectiveness, reduce interference and re-plan frequency of radar for navigation and search & rescue

**Lifejacket wear**

- Identify those potential wearers most reluctant to use lifejackets, the reasons and the best ways of encouraging behavioural change

**Maritime leisure participation**

- Collect data on the number and type of participants to assist risk assessment and resource allocation and search & rescue decision making
### Human factors issues in the maritime industry

80% of marine accidents involve human factors. Need to research, evaluate and develop understanding and consolidated guidance for the industry.

Examine the safety implications of behavioural issues, capability and aptitudes of operational staff in the Merchant Navy (part of the response to the present shortage of suitable crew).

### Lookout practices on ships bridges

Identify knowledge gaps on adaptation to darkness (a possible factor in the loss of the *Ouzo*).

### Alternatives to statutory provisions for marine safety

Identify ways of safely establishing equivalent standards. A response to increasing innovation in ship design. Supports IMO initiative on goal-based standards and formal safety assessments. Funded by the European FP7 GOAL Based Damage Stability (GOALDS) project of which MCA is a partner.

### Transec

Further improvement and enhancement of screening capabilities for hand baggage, hold baggage and cargo in the aviation industry.

Research into better protecting vessels from seaborne attack.

Methods for detecting a wider range of explosives on transport networks.

Improve understanding of the effects of the release of chemical, biological or radiological agents on the rail and underground networks.

### Commission for Integrated Transport

#### Health

Understand implications for travel demand from changes in provision of health facilities.

### Local road safety schemes

Understand the treatment and impact of such schemes in the LTP process.

### Motoring and Freight Services

#### Road and Vehicle Safety and Standards Directorate

**Safety as a cross cutting issue for all modes**

Follow up initial research from a cross-modal perspective.

**Drivers, riders & passengers**

Evaluation of remedial measures such as educational and enforcement interventions aimed at non compliant road users e.g. speed awareness courses.

Continue work to improve safety of motorcyclists.
Evaluate the effectiveness and impact of work related to road safety measures

Improve understanding of driver and rider behaviours (linked to work in the EU Framework R&D programme and work on driver distraction and the impact of new technologies)

**Vulnerable road users (non motorised)**

In support of the Government-wide Public Service Agreement target on improving child safety explore how road safety can fit in with wider child safety issues

Better understand road risk of young people (age, gender, location, behavioural and attitudinal factors etc)

Investigate road safety implications of an ageing population

Review the evidence on the safety of bicycling.

**Health & impairment**

Gather further evidence on the contribution of alcohol consumption to accidents, update knowledge of who is drinking and driving, and develop methods to deal with offenders and encourage prevention

Review and address the evidence gaps on drug driving

Study safety impact and countermeasures for excessive tiredness and other safety-relevant medical conditions

Develop health impact assessments to ascertain the wider health impacts of transport policy

**Accident causation and data**

Review the Department’s in-depth road traffic data collection studies (Co-operative Crash Injury Study, On-the-Spot Crash Study and Heavy Vehicle Crash Injury Study) to identify efficiencies and VfM options

Continue collection / analysis of data, e.g. on crashes from various sources and evidence to identify high risk groups and understand key risks, and prepare forecasts and targets for post-2010 and enable policy monitoring of e.g. seatbelt and cycle helmet wearing rates, mobile phone use etc.

Continue funding National Police Improvement Agency to improve the accuracy and timeliness of STATS 19, the foundation for monitoring and analysis of injury accidents (CRASH)

Analyse trends in the matched police and hospital data on casualties to improve understanding of the costs and clinical consequences of crashes

Build on these outputs to better understand the impact on accident and casualty rates.

Enhance our understanding of the mechanisms involved in road crashes through in-depth analysis, including of fatal crashes and trends over time

**Support local delivery**

Improve delivery by identifying good practice by local delivery agents e.g. evaluation of rural demonstration towns and other local interventions
Improve understanding of road safety in disadvantaged areas and identify effective measures to reduce inequalities
Continue to monitor public attitudes to road safety

**Infrastructure**
Investigate the impact of streets designed on principles of shared spaces, and possible responses, for people with disabilities.
Investigate advantages and disadvantages of allowing motorcycles to use advance cycle stop lines at junctions, including assessing the concerns of cyclists and pedestrians

**Primary vehicle safety**
Monitor and evaluate the benefits of new vehicle technologies, work with European partners to develop performance requirements for advanced braking and lane departure systems. Investigate HGV wheel detachment, continue work to support the motorcycle strategy, review of electric cycles and work on in-vehicle information systems and the human-machine interface. Study of vision from all vehicle types, in particular blind spots.

**Secondary vehicle safety**
Work with international partners, exploring the options for new approaches to improve passenger car occupant protection during side impact and front impact, and to provide whiplash mitigation during rear impact. Support European level projects on car-to-car crash compatibility. Review the effectiveness of regulations concerning vehicle design for pedestrian protection, establishing the evidence base for future policy. Review and understand the risks of specific injury types with particular attention to age and gender specific injury patterns.

**Commercial vehicles**
Assimilate of UK data and research findings into international activities, assessment of proposals and development of alternatives, analysis of benefits and costs of possible changes to commercial vehicle safety structures and systems, and development of technical requirements.

**Consumer information**
Support EuroNCAP tests and contribute to the development of the EuroNCAP methodology; continue to develop the Safety Helmet Assessment and Rating Programme (SHARP); populate ratings database; explore options for providing consumer information on child seats.

**Driving Standards Agency**

**New Approach to Learning to Drive**
Following consultation, research is now focussing on trialling and evaluating proposed measures:
- extend the competence framework for car drivers to instructors and drivers of other vehicles;
- evaluate the new qualification in safe road use;
- evaluate the new syllabus; and,
investigate and trial possible improvements to both theory and practical tests and improve feedback arrangements.

A benefits evaluation of the whole programme is also envisaged.

**Transformation, Licensing, Logistics and Sponsorship Directorate**

**Evidence need**

Improve compliance levels of HGV operators, drivers and vehicles, including a review of where best to focus effort and resources

**Planned research**

- Identify reasons for non-compliance through customer research
- Model and analyse causes and effects of non-compliance
- Costs and benefits of compliance
- Better understand the impact of education on compliance levels

**Cross-Cutting Directorates**

**Chief Scientific Adviser’s Unit**

- With Highways Agency to explore how Systems Integration and Synthetic Environments might be developed to inform decision-making in transport
- With Transec and Transport Analysis and Economics Directorate, provide a clear set of recommendations on how to construct a framework for analysis of transport security policies, and to identify the evidence that should be used to do so.

### Quality of Life & Natural Environment

**Cities & Regional Networks**

**Regional & Local Transport Policy / Delivery Directorates**

- Identify improvements to guidance on Park & Ride

**National Networks**

**Highways Agency**

- Better understand the factors, including but not only spatial planning issues, influencing travel and journey planning and the factors underlying driver behaviour. This will help to inform decisions on, for example, what traffic information can and should the Agency provide post-2011

**Environmental impacts**

- There is a need to look at the role of compliance with legislation in managing these impacts
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<th>Rail Directorates</th>
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<tr>
<td>Trespass, vandalism and suicide are significant problems on the railways related to quality of life. Research priorities include identifying suicide hotspots, optimal communication strategies and working with non-rail bodies to counter trespass.</td>
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<tr>
<td>Research related to other emissions besides CO₂</td>
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<th>International Networks and Environment</th>
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<tr>
<td>Establish if any further research is needed to achieve the environmental conditions and controls agreed as part of the decision to authorise additional capacity at Heathrow. In particular to relate projected aviation activity levels to environmental targets for noise and local air quality.</td>
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<tr>
<th>Maritime and Coastguard Agency</th>
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<tr>
<td><strong>Countering marine oil spillages</strong></td>
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<tr>
<td>Develop a protocol to design, build and operate a waste oil processing plant.</td>
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<tr>
<td><strong>Effects of hazardous &amp; noxious substances (HNS) in marine transport</strong></td>
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<tr>
<td>Increase confidence in chemical spill modelling, review current models and monitoring techniques.</td>
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<tr>
<td>Develop model for loss of HNS from tankers &amp; containers afloat and sunk to assess their fate and behaviour in the sea and in the atmosphere.</td>
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<tr>
<td>Develop tool to determine best methods for dispersion and diffusion of commonly carried HNS.</td>
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<tr>
<td><strong>Risk of non-native species introduced via bio-fouling</strong></td>
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<tr>
<td>Obtain data on distribution of bio-fouling in ships in UK waters and potential management methods. Results will feed into International Maritime Organisation work and implement part of the Convention on Biological Diversity.</td>
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<td><strong>Land –Use Planning and Transport</strong></td>
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<tr>
<td>Following completion of analysis into the inter-relationship between land-use and transport planning, develop best practice guidance for decision-makers.</td>
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<tbody>
<tr>
<td>Support the development of parking and traffic management, the reshaping of the traffic and public spaces agenda, and the traffic signs review.</td>
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PART 2

Climate Change

1. The Environment & International Directorate is leading on biofuels research in response to the Gallagher Review. This initially comprises a scoping study on biofuels research, and will then be followed by a significant programme of research into the areas identified as ‘research gaps’. This is expected to identify a need for further research in areas such as: indirect and direct land use change, social and economic impacts of biofuels including on food, the biofuels market and supply chains, advanced biofuels and upstream and downstream infrastructure. We are also contributing (£6m over two years) to the Carbon Trust’s Advanced Bioenergy Directed Research Initiative, with a potential extra £2m for other demonstration projects.

2. The Environment and International Directorate is continuing to improve the capacity for modelling the effects of policy on the vehicle fleet – including analysis to forecast the emissions profile of future car stock. Further work will be necessary to inform the UK position on new CO2 emissions targets.

3. The Technology Strategy Board’s Low Carbon Vehicle Innovation Platform is the Government’s key delivery agent for research and development on low carbon vehicles with funding of c£100m. Given the international effort now focussed on the challenge, there could be scope for an effective technology watch on wider progress.

4. The Highways Agency is looking to develop a climate change risk assessment methodology and a carbon accounting framework.

5. The Rail Directorate is looking to develop an effective environmental target (with robust metrics with widespread industry buy-in) for the next control period to help deliver a sustainable railway. This includes work to improve methods of estimating total rail emissions used to inform the Committee on Climate Change. Through the Rail Safety and Standards Board (RSSB), research on electrification and the potential of energy storage technologies will be taken forward. Energy saving, for example through reducing train mass or regenerative braking, are further important themes.

6. The Regional and Local Transport Policy & Delivery Directorates are seeking to improve assessment of the carbon impacts of proposed schemes and how these are taken into account in the planning process. Related to this are issues of the impact of cycling (through the Cycling Cities and Towns), school based interventions, the sustainable travel towns, smarter measures and transport guidance for Eco-Towns.

7. The Freight & Logistics Directorate seeks to measure the effects of interventions on our climate change commitments and will, in particular, be commissioning research to determine the potential benefits for modal shift and other freight efficiency programmes to reduce freight and logistics contribution to CO2.

8. Though not specified at this stage, Transport Analysis & Review Division expects that some research will be directed at improving our understanding of the greenhouse gas reduction potential and costs of policy options to tackle the commitment to an 80% reduction in greenhouse gas emissions on 1990 levels by 2050.
9. The Commission for Integrated Transport is considering the need for further work, building on their earlier work on the transport contribution to meeting stringent carbon reduction targets in the light of Eddington\(^2\), Stern\(^3\), DaSTS\(^4\) and the recent Committee on Climate Change report, ‘Building a low carbon economy’.

10. Attitudinal and behavioural issues related to climate change are included below.

**Behavioural Change**

11. Encouraging behavioural change lies at the heart of many of the Department's policies and goals. ‘Smarter Choice’ measures seek to influence people's transport behaviour in order to ease congestion and reduce the impact of transport on the environment; the Department seeks to reduce road casualties through interventions that are aimed at encouraging and reinforcing attitudes that lead to safer and more considerate behaviour by all road users; and the Freight Best Practice Programme seeks to change driving behaviours to promote operational efficiency within freight operations.

12. There are many other examples and a programme of work, managed by Social Research and Evaluation, will commence on learning the lessons from existing evidence on Behaviour Change. The broad objective will be to identify what works (as well as what doesn't) in bringing about behavioural change in transport, looking for relevant experience across other policy areas (i.e. non-transport) and building on work by the Government social research service centrally.

13. In 2008-09 a number of initiatives also generated better evidence on public attitudes to transport. These included a knowledge review to make best use of the existing evidence on attitudes relating to the five strategic departmental goals set out in DaSTS; and a Citizen’s Panel. A major study on ‘Public Attitudes to Climate Change and the Barriers to Behavioural Change: a Deliberative Study’ is contributing to the Department’s policies and communications strategies on climate change issues including the Act on CO\(_2\) campaign.

14. This year, the Department will take forward a segmentation study of public attitudes to climate change and travel choices. The planned project will develop a segmentation model that identifies and quantifies groups within the population that differ in terms of their attitudes, motivations and wider psychographic factors relevant to reduced CO\(_2\) emissions from personal transport use. This research will enable the Department to identify the levers to incorporate and the barriers to overcome when developing policy and communications.

15. We will also be developing a better understanding of business attitudes and priorities in conjunction with the Department for Business, Enterprise & Regulatory Reform (BERR) in order to complement other evidence, including evidence provided by bodies representing the business community.

\(^2\) Sir Rod Eddington was jointly commissioned by the Chancellor and the Secretary of State for Transport to examine the long-term links between transport and the UK’s economic productivity, growth and stability, within the context of the Government's broader commitment to sustainable development. The study was published on 1 December 2006

\(^3\) Sir Nicholas Stern, Head of the Government Economics Service, published his review on the Economics of Climate Change in October 2006

\(^4\) Delivering a Sustainable Transport Network, DfT 2008
16. In addressing road safety, improved understanding of the behaviour of drivers and other road users continues to be crucial to developing effective policy responses. Priorities include young and novice drivers, child pedestrians, the prevalence of alcohol and drugs, as well as issues around driver distraction. Road User Safety Division is also undertaking work to improve understanding of public attitudes and behaviour in relation to risk and road safety – to inform, for example, consideration of the acceptability of technology for improving safety and the behavioural changes this might encourage.

17. Related to understanding behaviours, Transport Security Directorate (Transec) are planning to undertake a programme of research to explore the attitudes and experiences of the travelling public on transport security generally and with regard to particular initiatives. Building on the existing evidence base, the research will provide understanding of participant experience and acceptability of specific measures and assess the level of public confidence in transport security and resilience nationally. Outputs will be used to inform development of Transec’s strategy for maintaining security and resilience as well as general policy development.

18. The Maritime and Coastguard Agency’s research interest regularly extends to behavioural issues. Issues to be tackled include: an improved understanding of the human factors acting in the maritime industry (80% of accidents are estimated to be related to human factors); skills and experience of merchant navy crew; and work to identify customer populations most reluctant to wear lifejackets and to develop ways of encouraging behavioural change in this audience.

**Journey Generation**

19. Improved understanding of the purpose, pattern and experience of end-to-end journeys (of travellers and freight) is needed to underpin policy development as set out in DaSTS. Significant work, both quantitative and qualitative, has developed understanding of the freight/logistics ‘journeys’ and of travellers’ journeys through several UK airports. But our longer term aim is to have a more systematic evaluation of end-to-end journeys across and between all modes and journey types.

20. Appraisal tools, including the TEMPRO model which provides projections of growth over time for use in local and regional transport models, and National Transport Model, are informed by extensive research and evidence underpinning trip generation, much of it linked to the Department’s support for modelling. Integrated Transport Economics and Appraisal may consider reviewing some of the drivers in the light of emerging evidence indicating changes (for example relating to local freight trips?) Work will also be undertaken on the National Transport Model to allow multi-modal forecasts of demand, congestion and emissions to advise and inform decision makers.

21. A number of new evidence needs are identified within Freight & Logistics Division’s programme including studies to understand attitudes and barriers to mode shift and improved understanding of the industry’s actual and perceived performance of corridor / journey times.

22. Elsewhere there is little research identified to address the topic (in our survey of research plans). This may be due to the relevant analysis being considered in-house and/or through the dependence on established statistical sources of travel and transport information.
Enabling Capabilities of strategic importance

23. These include System of Systems thinking, Systems Engineering, Intelligent Transport Systems (ITS) and Information Services. The Chief Scientific Adviser is tasked with assisting the Department to take advantage of relevant development in areas such as these and is reviewing the current state of knowledge and implementation.

24. A number of recent initiatives have addressed the development of information and use of data in the transport context. These included pump-priming funding for a National Transport Information Incubator (NaTII) and short think-pieces on Synthetic Environments, Improving Land Use to reduce Transport Demand and Systems Integration. Building on these developments, Highways Agency and Transec (with support from the Chief Scientific Adviser’s Unit) are moving to the next phases to investigate and facilitate how a number of these ideas might be developed further to support decision-making in the transport domain. Other related work includes that on Intelligent Speed Adaptation (including accurate information on speed limits) and with Transport Technology and Standards development of a National ITS Technical Framework to facilitate interoperability between ITS systems and applications. Work will continue to support the Cabinet Office and cross-Government response to the Power of Information report, and the Power of Information Taskforce.

25. Upcoming work includes exploring how best to take forward the ITS agenda across the broad range of transport applications, and how the Department might contribute to this. Work also continues to ensure relevant engagement in Government initiatives addressing location referencing strategies (through membership of the Location Council) and possible data frameworks to facilitate data sharing.

26. Finally, there is a range of research associated with improving the Department’s modelling and analytical capabilities, mostly aimed at improving forecasts and/or value for money in its eventual decisions. Examples include: assessing the value for money of different types of spending; re-estimating elasticities, generalised costs and generalised time, and initiating the development of a framework for analysing smarter choices.

Chief Scientific Advisers Unit
Department for Transport
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