



**SPEED LIMIT ADHERENCE AND ITS EFFECT ON ROAD SAFETY AND CLIMATE CHANGE -**

**A JOINT REPORT BY THE COMMISSION FOR INTEGRATED TRANSPORT AND THE MOTORISTS' FORUM**

*Introduction*

1. The Commission for Integrated Transport (CfIT) and the Motorists' Forum (MF) decided jointly in 2007 to consider what impact the voluntary introduction of an Intelligent Speed Adaptation (ISA) system across the entire road network would have in reducing deaths and injuries on the UK roads and in reducing carbon emissions, other pollutants and fuel consumption. The Institute for Transport Studies, University of Leeds were commissioned to report on this matter.
2. A Working Group (WG) under the Chairmanship of John Lewis, Director General, British Vehicle Rental and Leasing Association, was appointed by CfIT and the MF to oversee the work of the consultants. WG members, strategic advisers, advisers from the Department for Transport (DfT) and our secretariat are listed at **Annex A**. The WG discussed draft reports with the advisers and the consultants and are happy to endorse the report's findings.
3. Reducing the number of people killed or seriously injured on our roads and cutting carbon emissions are two of the most important challenges faced by Government. We believe that this report is an important one, deserving of serious consideration if the objectives of the Government in these fields are to be realised. It is also timely as DfT has now started preparing a new road safety strategy, looking ahead to the targets it should aim for beyond 2010 and given that the UK Climate Change Act 2008 and the EU Climate and Energy Package will both set ambitious and legally binding targets for greenhouse gas emission reductions.
4. We have summarised some of the report's main recommendations, making our own observations on some of them. (See paragraphs 15 - 19).

## Objectives

5. The objectives the WG gave the consultants were:-
- To estimate the impact on the number of people killed or injured (both seriously and slightly) in road accidents that would arise through raising the levels of adherence to speed limits through the voluntary introduction of an ISA system;
  - To estimate the impact on carbon emissions, other pollutants (including noise) and fuel consumption that would also arise through the voluntary introduction of an ISA system;
  - To identify and estimate other benefits and disbenefits eg journey time reliability that would also arise through the voluntary introduction of an ISA system;
  - To perform cost-benefit analyses comparing the cost of introducing and operating an ISA system with the value of accident savings and the value of reductions in carbon emissions, other pollutants and fuel consumption;
  - To estimate the critical mass at which benefits increase rapidly as compared to the numbers of vehicles fitted with a system that is in use;
  - To advise how a greater take-up and usage of ISA on a voluntary basis can be encouraged; and
  - To identify any disbenefits of ISA and to advise how these can be overcome.

## Intelligent Speed Adaptation

6. ISA is a system that compares the local speed limit to the vehicle speed. The system can then (i) advise the driver when the vehicle is found to be exceeding the speed limit with an audible and/or visual warning (advisory ISA); (ii) control maximum speed through an overridable system where the driver can choose to override the speed limiting function and regain full manual control until a new speed limit is encountered and/or the road speed drops beneath the current speed limit at which time ISA regains control (overridable ISA) and; (iii) control maximum speed through a mandatory speed limiting function that the driver cannot override (mandatory ISA).

## The ISA-UK project

7. Research on ISA has been going on for more than 10 years, including the major ISA-UK project funded by DfT between 2001 and 2006. The present work builds on and extends this previous work, including the

final report on the ISA-UK project published by DfT in September 2008.

### Background to road safety in the UK

8. The number of deaths on our roads fell to 2946 in 2007, the lowest since records began in 1926. However, whilst Great Britain continues to have an enviable record on road safety, Malta, Netherlands, Sweden, Switzerland and Norway all now have fewer road deaths per 100,000 population.
9. Great Britain was also one of the first countries in Europe to employ casualty reduction targets which has helped to focus action and so lower casualty figures. The Government is on course to meet its 2010 road safety targets across Great Britain. This will see significant reductions in the number of deaths and serious injuries on our roads, particularly among children – despite rising traffic. The number of people killed or seriously injured in 2007 was under 31000, a 36% reduction from the 1994 - 98 baseline against the target 40% reduction target set for 2010.
10. Progress has been made through legislation and its enforcement, road safety engineering, improved vehicle design, education and training, awareness campaigns aimed at changing attitudes and responsible driving and compliance by road users with traffic rules and regulations. These measures have helped reduce the number of people killed or seriously injured on our roads in recent years. But there is still much more to do. On average, around eight people still die every day on our roads. It may be difficult to make further significant progress on reducing deaths on our roads without the introduction of additional measures.

### Background to effects on the environment

11. Climate change is now one of the biggest issues facing the human race. Three reports in 2007 from the Intergovernmental Panel on Climate Change point to a strengthening international scientific consensus about the causes, impacts of and responses to climate change.
12. Road transport is the most significant producer of greenhouse gases in the transport sector, accounting for 93% of domestic transport emissions by source. In moving towards a low-carbon transport system, substantial progress towards reducing emissions from road transport will be vital.
13. However, although much of the environmental focus is currently on tackling climate change, the importance on tackling air quality issues should not be overlooked. Poor air quality reduces life expectancy in

the UK by an average of 7 – 8 months, with accompanying health costs estimated to be up to £20 billion a year.

*The consultant's report*

14. The research has used an evidence base that is, wherever feasible, grounded in empirical findings. Thus the UK trials, which covered a total of 355,000 miles of driving on roads whose speed limit was known, supplied information on the impact of ISA on driver speed choice. The data have been used for estimating both the safety effects of driving with ISA and for examining environmental impacts. The accident analysis combined the information on behavioural changes with ISA and consequent changes in risk with an analysis of the national road traffic accident database. Such empirical data has been supplemented where required with simulation modelling on a variety of roads networks to examine “what if” scenarios, such as what happens to emissions and network performance when ISA penetration increases.
15. In our judgement the consultants' report reaches interesting and important conclusions on a number of matters:-

***Emissions, Fuel Consumption and Noise***

- Overall, for CO<sub>2</sub> emissions, changes are not very significant on roads with a speed limit of 60mph or lower. But on 70mph roads, there is potential for a substantial reduction in CO<sub>2</sub> emissions of 5.8% (with an uncertainty range of +/- 0.7%) with a mandatory ISA system
- On the modelled rural network, neither overridable nor mandatory ISA make a major impact on overall CO<sub>2</sub> emissions or fuel consumption rates at any level of penetration
- In the two modelled urban networks, increasing ISA penetration had a small detrimental effect on both CO<sub>2</sub> emissions and fuel consumption, increasing both by up to 3%. The detrimental effect is stronger at levels of ISA penetration above 20%. This is because cars tend to operate most efficiently at speeds above 30 mph. On the other hand, the more elaborate emissions modelling of the speed profiles from the UK trials indicated small savings in CO<sub>2</sub> emissions and fuel consumption on both 30 and 40 mph roads, most likely because of reduced acceleration.
- Regarding other pollutants, no substantial effects have been found
- Regarding noise, the implementation of ISA systems is likely to make a negligible contribution to reducing overall broadband noise levels.

### ***Accidents***

- ISA can have a large impact on future accident numbers, particularly on the more severe crashes – a 100% usage of mandatory ISA could save nearly 29% of injury accidents
- Potential is greatest on 30mph roads where there is considerable propensity to exceed the speed limit and crashes involve collisions with pedestrians and cyclists
- Advisory ISA is predicted to be substantially less effective than the intervention based (overridable and mandatory) forms of ISA
- The impact of ISA is increased by strategies that lead to a higher level of penetration into the vehicle fleet and also by more rapid introduction of intervening ISA in the form of the overridable system

### ***Cost Benefit Analyses***

- In less than 15 years, under virtually every scenario, ISA recovers its implementation costs
- Over the period 2010 – 2070, the benefit to cost ratios are very large, apart from the Advisory only ISA scenario, which is not considered a realistic option because it can be assumed that some parts of the market will choose to adopt overridable ISA

### ***Critical Mass***

- The micro-simulation showed that there was no “critical mass” effect of ISA. It was broadly concluded that the impact of penetration was linear, so that the effect at 80% is double that at 40% and so on.

### ***Journey Time Reliability***

- The measurements relating to the variability in journey times in the modelled networks were generally inconsistent; there were some indications of small improvements in reliability, particularly with mandatory ISA, but these were counterbalanced by contrary results from other networks. However, experience on the M42 pilot scheme has shown that reduced variability in journey times can result from smoother, more consistent traffic conditions and the consequent reductions in crashes under these conditions.

### ***Encouraging the adoption of ISA***

- The attitudinal work revealed that the public is segmented into three major groups of approximately equal size. These are:-

- Those who are extremely hostile to ISA and who declare that no amount of incentive would sway them to purchase or use ISA
  - Those who are non-committed and who indicate that they would be persuaded by the right kind of incentives, particularly on purchase price and fuel cost
  - Those who appreciate the safety potential of ISA and who do not require any incentives to adopt it
- If incentives are required, in general the public favoured transparent and simple incentive schemes designed to address basic costs associated with motoring such as rebates on insurance, road tax and fuel
  - There was also some support for legislation making fitment compulsory rather than encouraging usage through fiscal incentives

Conclusion on these recommendations

16. The consultants have produced a report that confirms the prediction of substantial benefits from the introduction of ISA. These benefits consist principally of the savings in accidents, mainly on urban and rural roads, and in particular in more severe accidents. Some emissions reductions are also delivered, although these are not significant on roads with a speed limit of 60mph or lower. The report also shows that the costs of ISA - both to drivers and to the public purse - are substantially less than the benefits in the form of accident savings, fuel savings and CO<sub>2</sub> reductions.
17. The task we set the consultants was to examine the impact on casualty reductions and carbon emissions that would arise through the voluntary fitment of an ISA system. Although the consultants have also examined the results that would arise through the introduction of an ISA system under an authority driven scenario, **we wish to make it clear that we are not recommending the compulsory fitment or usage of ISA.** And we note the Department for Transport's position that any future use of ISA should be taken forward by the motoring industry in response to customer demand, just as with other technologies available for customers to purchase if they so choose.
18. However, we believe that the potential reductions in injury accidents that could be saved through the usage of ISA (at 100% penetration, overridable ISA would reduce the number of injury accidents by 12% and mandatory ISA by 29%) means that serious consideration should be given to the voluntary introduction of this technology. For this reason, we have set out below a number of steps we consider Government should take to help take this matter forward.

19. Finally, one important aspect of this report that has not been considered before is the incentives that could potentially be used to encourage take-up of ISA. We believe that the findings reported by the consultants in their report are interesting but consider that this is an area that would benefit from further research. We recommend that the Department for Transport might wish to explore the best way to build on this existing research and to take it forward, particularly with regard to the business car sector.

### Next steps

20. We recommend:-

- Immediate submission of this report and cover paper to the Secretary of State for Transport
- The Department for Transport should work with the relevant European authorities, vehicle manufacturers, local authorities, insurance companies, representative bodies and others to consider what steps should be taken to support the future availability of the technology and to promote its take up
- A public debate on the future of ISA. The potential benefits and opportunities of ISA should be widely disseminated to companies that can provide effective incentives for its adoption to encourage the establishment of market driven solutions
- Government should engage with employers to ensure they are aware of the overall benefits of ISA and consider the fitment and use of this technology within their duty of care and work related road safety policies, when it is available
- The Department for Transport should move immediately to put in place the infrastructure necessary to provide the digital maps required to operate an ISA system
- The Department for Transport should look at opportunities to equip its own fleet with ISA and act as a champion with other Government Departments and public bodies. Its role as a champion should focus on engaging Government Departmental support for the concept and encouraging Departments and Agencies with large workplace driving activity to implement ISA in their vehicle fleets
- Fleet operators and vehicle rental companies should be appraised of the benefits of ISA and encouraged to introduce ISA into their own fleets
- Government should examine whether ISA in any form has a role to play in supporting drivers convicted of dangerous driving where speed

is a factor or as a benefit to supporting vehicle access for younger drivers

*Code of Practice for Scientific Committees*

21. The WG was selected to reflect opinion as widely as possible. However, no guarantee can be made that all instances or opinions have been taken into account in the Panel's work, nor that conclusions reached and published are incontrovertible.

***December 2008***

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**JOINT CfIT/MOTORISTS' FORUM WORKING GROUP**

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<i>David Prescott - Joe Carey - Matt Coleman/ Chris Watts</i>	<i>Motorists' Forum Secretary Motorists' Forum Secretariat  CfIT Secretary</i>