Vägverket
Swedish National Road Administration

LUND – Results of the ISA trial

BETTER DRIVER WITH ISA

The active accelerator, which helps the driver keep to the speed limit, had the positive effect on speed expected. Average speeds decreased, particularly where they used to be above the speed limit. In addition, the test drivers had become more observant of pedestrians and kept a greater distance to the car ahead. Quite simply, the test drivers had become more considerate and safer drivers!

LARGE-SCALE TRIAL

Between 1999 and 2002, the Swedish National Road Administration (SNRA) worked in partnership with the local authorities in Umeå, Borlänge, Lidköping and Lund on a large-scale trial involving new technology aimed at making it easier for drivers to keep to the speed limit in built-up areas. The technology is called ISA, which stands for Intelligent Speed Adaptation. The trial in Lund was called "LundaISA".

In LundaISA, a supportive ISA system was tested, whereby a driver feels resistance in the accelerator if he/she drives too fast. This resistance can be overcome through a kick-down function. The position of the vehicle is determined using GPS, and the system includes an onboard computer with a digital map of the test area onto which the speed limits are entered.

HIGH SPEEDS KILL

Speed is the most significant factor in the number of road accidents and their degree of seriousness. Previous research has shown that in-vehicle technical support to help the driver keep to the speed limit could be a good way to reduce the number of accidents and serious injuries in traffic.

The aim of the trial was to learn more about how ISA affects driver behaviour, road safety and the environment as well as driver attitudes towards the equipment.

TEST DRIVERS OF ALL KINDS

290 drivers had the active accelerator installed in their vehicles between October 2000 and March 2001. The test period for a driver lasted between six and twelve months.

Although most were private drivers, even official vehicle and commercial drivers took part. There was a wide mixture of both age and gender as well.

While some of the test drivers thought that ISA was a good idea from the very beginning, others were sceptical.

HIGHLY USEFUL AND QUITE ATTRACTIVE

As to usefulness, the test drivers gave the active accelerator a relatively high rating, but attractiveness rated only somewhat over a neutral level.

The oldest test drivers, along with those who never experienced any technical problems, were the groups that assigned the active accelerator the highest level of attractiveness. People who had not thought that ISA was a particularly good idea from the beginning and middle aged test drivers where those who thought that the active accelerator was least attractive.

WANTS ISA FACTORY-INSTALLED

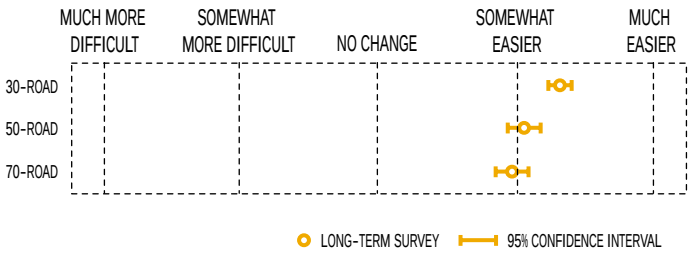
Göte Nilsson is 72 years of age and has taken part in the ISA trial in Lund. Göte thinks ISA is good:

"I think that everyone should have ISA in their cars in the future, at least in urban areas. And ISA should be installed in new vehicles in the factory, so that it works and people will use it."

THE ACCELERATOR GAVE SUPPORT

The test drivers felt that they got support from the active accelerator while driving. They thought it was easier to keep to the speed limit using a speed adaptor and that their own speed of driving had decreased.

Do you think that it has become easier or more difficult for you to keep to the speed limit in the test area when using the speed adaptor?

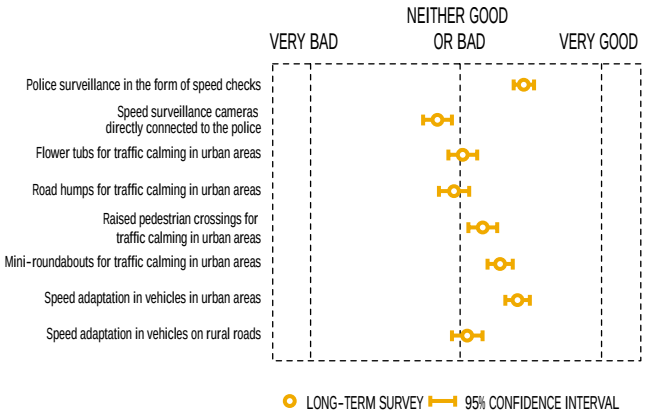


AS GOOD AS POLICE SURVEILLANCE

The test drivers thought that reduced speeds are one of the four best ways to improve road safety.

ISA in urban areas along with police surveillance are considered the best ways to improve adherence to the speed limit. In the opinion of many test drivers, there is no better solution for coming to terms with the problem of speeding than to have ISA in vehicles.

What is your opinion about the following measures to improve adherence to the speed limit?



BETTER DRIVERS…

The test drivers felt that they had become better drivers, that they were more observant of pedestrians and speed limit signs outside the test area, and that their style of driving was smoother. They checked the speedometer less frequently. Moreover, they thought safety had improved, and that feelings of security had tended to do the same thing. They felt that the risk of being caught for speeding had decreased considerably.

…BUT ALSO A CONTROLLED HINDRANCE

The test drivers felt that they were more in the way of others in traffic, were more time-stressed and that driving was less fun when they used the active accelerator. Feelings of being controlled were shown to grow, but not as much as they had feared before the active accelerator had been activated.

SOME TECHNICAL MALFUNCTIONING

One constantly recurring comment was that the system often broke down. Unfortunately, this malfunctioning was annoying for many of the drivers – half of them had to take their car to a workshop for repair – but this was also used as an opportunity to improve the product.

HOW THE TEST DRIVERS DROVE

The reduction in average speed was greatest on those stretches where the speed was highest from the outset, often above the speed limit. The average speed of the test vehicles in the middle of each stretch where the speed was measured decreased by 4.9 km/h on 70 roads and by 2.5–5.0 km/h on 50 roads, depending on the type of road. On 30 roads the average speed decreased by 1.0 km/h.

Apart from the obvious effects of the active accelerator on the average speed on roads with the highest speeds, the results showed a clear reduction in speed on stretches between physical traffic calming measures in the city centre. This implies a lower and smoother traffic rhythm, completely in line with what had been intended by the 30-zone in central Lund.

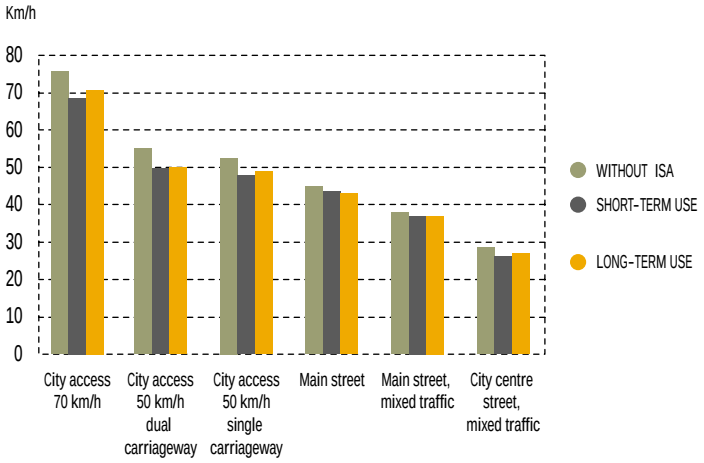
ISA ALSO USED VOLUNTARILY OUTSIDE LUND

The active accelerator worked automatically within Lund, but could also be used by the test drivers outside Lund if they wanted. They then had to install the actual speed limit setting themselves.

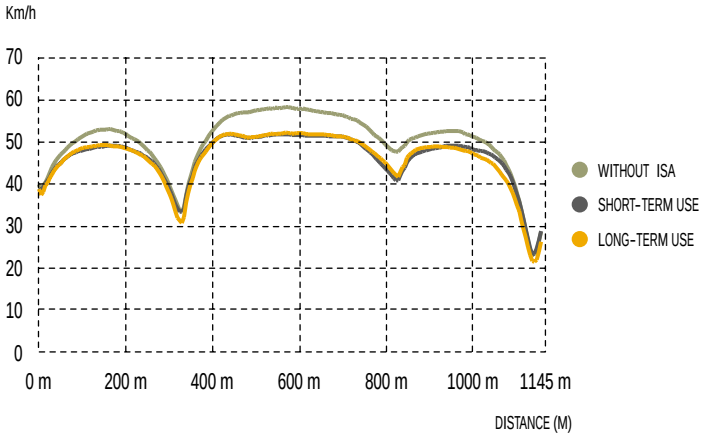
The voluntary use of the active accelerator varied between the different drivers from 0 to 88 percent, with an average of eleven percent. Women and the upper age groups used it voluntarily to a greater extent than men and the younger drivers. Those who do a lot of driving used the active accelerator voluntarily to a much lesser extent than those who drive less.

IT WAS FASTER TO DRIVE MORE SLOWLY!

Remarkably enough, travel times became shorter. They decreased most on streets with a speed limit of 30 km/h and increased somewhat on streets where the speed limit was 50 and 70 km/h.



The speed limit was clearly exceeded without ISA on city access roads, both where the speed was 70 and 50 km/h. Where there is mixed traffic, speeds were already low without ISA, and there was less change.



Without the active accelerator, the test drivers often drove too fast on the ring road where the speed limit is 50 km/h. Speeds clearly decreased with the active accelerator.

Theoretical calculations have shown that smoother driving has a positive effect on traffic flow. This was confirmed by the results from LundaISA, and can be explained by the fact that not only was the driving calmer, but more efficient, with shorter stops, meaning that the trips did not take a longer time, even if driving speeds were slower.

LESS EMISSIONS WITH ISA

Vehicle emissions decreased by eleven percent for carbon monoxide, seven percent for nitric oxides and eight percent for hydrocarbons. Fuel consumption, and thereby carbon dioxide emissions decreased by one percent.

HOW MUCH SAFER IS IT?

Calculations can be based on the speed reductions resulting from the active accelerator. On city access roads, the estimated decrease in the number of serious injuries would be between 18 and 25 percent, between 8 and 20 percent on main streets, and 17 percent on streets in city centres if everyone drove like our test drivers. The expected impact on road safety resulting from lower speeds can be amplified by the greater headway and the fact that drivers became more observant.

A certain negative effect could be seen outside Lund where the active accelerator did not function automatically. A few test drivers forgot to reduce or increase their speed when passing a sign with a new speed limit. This effect can occur when the ISA system is not active everywhere.

GOOD TO HAVE

The test drivers' overall opinion about the active accelerator is: useful and effective support that is needed, even if not the coolest thing in the world.

THE FUTURE

We will be seeing developments in technology for in-vehicle equipment and systems that provide current information about the prevailing speed limit.

The Lund municipal authorities want to keep on working to improve road safety. ISA is one way to do this, for instance through:

- continuing the ISA trial in city buses
- safe transport requirements in the public procurement of transport services
- installing ISA in municipal vehicles to hasten the development of a safer traffic environment in Lund.

Further research in the field will be conducted by the Lund Institute of Technology (LTH) and the people of Lund can increase public demand for speed adaptation aids and give further impetus to the positive trend found within the automotive industry.

On Church Street in Lund, cars and vulnerable road users share the same space and low speeds are a must.

Lund is one of four places in Sweden that has been included in a national trial involving ISA. The Swedish National Road Administration (SNRA) is the principal and project funder. The other municipalities that took part were Lidköping, Borlänge and Umeå. Different techniques and methods were tested. A summary report can be ordered from the SNRA.

If you would like to know more about the trial in Lund or order the final report published by the municipal authorities or the evaluation report published by LTH, please call the Public Works Department at Lund Municipality, + 46 46 35 50 00 or the Traffic Engineering Department at LTH, +46 46 222 91 25.

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