

BORLÄNGE – Results of the ISA trial



TEST DRIVERS LEAD THE RIGHT WAY

The "Right Speed" equipment clearly affected the speed at which private motorists chose to drive. The "Right Speed" trial conducted in Borlänge showed that the test drivers slowed down and kept to the speed limit much better than normal drivers. The greatest effect could be noted on stretches where speeds prior to activating the equipment had exceeded the limit.

The test drivers already had a positive attitude towards the equipment they were going to test before

the trial even started. This attitude remained unchanged throughout the trial.

The trial showed good correlation between driver attitudes and their actual way of driving.

The "Right Speed" equipment had the greatest effect on roads with a 50 km/h speed limit. This is also where there is the greatest accident risk in built-up areas.

Despite the reduction in speed, it was found that travel time was not appreciably affected.

HOW IT ALL BEGAN

Four years ago, Borlänge Municipality applied to the Swedish National Road Administration (SNRA) to take part in a nationwide road safety experiment. Borlänge became one of four municipalities in the country given the opportunity to test Intelligent Speed Adaptation – ISA. The aim was to test whether an in-vehicle warning system could be an effective alternative to road humps and other traffic calming installations. New technology was to be used and the SNRA wanted to study its impact on road safety, driver attitudes and whether people would be willing to pay for ISA in the future.

The four municipalities would all be using different techniques to be able to compare what gave the best results. In Borlänge an informative system was used. A display on the dashboard showed the local speed limit. The position of the vehicle was determined using GPS, and there was an on-board computer with a digital map of the test area onto which the speed limits had been entered. If a driver exceeded the speed limit, he/she received both a light and sound warning signal. In Borlänge the trial was called "Right Speed".

400 TEST VEHICLES

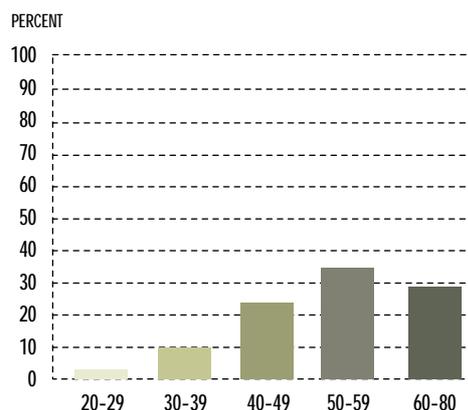
In Borlänge the group of test drivers comprised both private and commercial drivers. All in all, almost 400 vehicles took part, some 250 private cars and 150 commercial vehicles.

Most of the test drivers were men between the age of 40 and 69. Only 30 percent were women. Three percent were between 20 and 29 years of age and ten percent between 30 and 39. A random selection was made from the national vehicle register through sending out three thousand questionnaires to private vehicle owners.

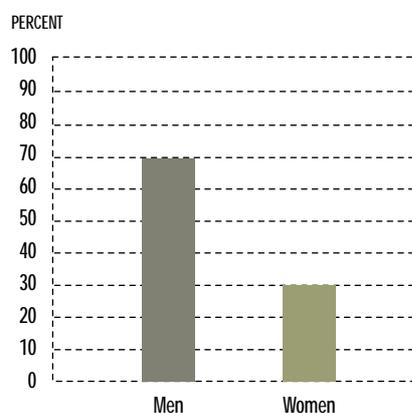
Commercial drivers were engaged in the project through contact with their companies.



Age distribution amongst the ISA test drivers



Gender distribution amongst the ISA test drivers



During the test period, which started in the autumn of 2000 and ended in 2002, all the test drivers had to fill in written questionnaires and answer scores of questions. Towards the end of the trial, groups of drivers were assembled to discuss their opinion of the system.

During the trial, the on-board computer was on-line with a server via a mobile telephone and logs were kept of the movement of the vehicle and stored in a database.

For reasons of personal integrity, all the data was obviously made untraceable before conducting the analyses and drawing conclusions.



Private car test drivers think that ISA makes it easier to keep the right speed.

SPEEDS NOTICEABLY REDUCED

ISA had the greatest effect on 50 roads with high average speeds, where the accident risk is highest in urban areas.

The trial meant a general reduction in average speed that proved to last, even if speeds decreased most at the beginning of the trial. A striking example is Highway 70 outside the "Kupolen" shopping centre, where traffic moves at about 59 km/h, despite a 50 km/h limit. The test drivers had driven at an average speed of 54 km/h during the pre-trial survey. Once the equipment had been activated, their speed dropped immediately to 50 km/h and subsequently stabilised at 52 km/h, which is when the warnings are emitted. After the system was deactivated, speeds began to increase again. On more local roads, the reduction in speed continued even after the system had been deactivated.

EASIER TO KEEP THE RIGHT SPEED

The private test drivers liked to get information via the display and thought that the equipment made it easier

to keep the right speed. When using the ISA system, the drivers' style of driving was smoother and their speed when approaching intersections was somewhat lower. The total travel time was barely affected due to the more even speed distribution.

COMMERCIAL DRIVERS LESS POSITIVE

It is not as easy to draw conclusions about the effects when it comes to the commercial drivers. Not all the commercial drivers were as positive as the private drivers, and some even felt that the warning signals sometimes disturbed their passengers.

Since some drivers found the sound emitted by the ISA equipment annoying, an apparatus that produced vibrations in the accelerator instead of the beeps was tested on a small scale instead. Those who tried this solution were very satisfied.

QUALITY INDEX

One result of the project is that a quality index can be compiled for every driver. A record is kept of each time a driver drives too fast, and this can be used to calculate the increased risk of an accident. The values calculated are added together for all the driving done during a particular period of time and an index is calculated that shows how much more dangerously the driver drove compared to if he or she had kept to the speed limit. This kind of index

BORLÄNGE AT THE FOREFRONT WITHIN ROAD SAFETY

"We're today very pleased that the results of the ISA project, which we refer to in Borlänge as "Right Speed", have shown clear improvements in road safety. We also believe that the trial has resulted in a method to calculate the potential risk of human injury related to different driving patterns. This is a method we would like to use in the future when contracting transport services for the elderly or disabled, school transports, etc."

Municipal Commissioner Peter Hultqvist (Social Democrat)



could ultimately be used by principals to provide safer transports and by insurance companies to calculate bonuses.

CONTINUING ALONG THE PATH STAKED OUT

As a direct continuation of the "Right Speed" trial, a number of new projects are in progress gathered under a common name – VITSA, a Swedish acronym for Further Development of ITS Applications.

"Borlänge wants to continue to be a test arena for sophisticated road safety systems. We can see a number of interesting technical developments as an outcome of the ISA project," says Håkan Bergeå, project manager.

The ISA project and "Right Speed" has contributed to the creation of a competence cluster consisting primarily of the SNRA, Dalarna University, the Transport Research Institute (TFK), Swedish Road and Transport Research Institute (VTI) and several consultancy firms within the new "Framtidsdalen" complex now under construction in Borlänge.

INTELLIGENT TRAFFIC RULES

A trial involving Intelligent Traffic Rules (ITR) is being run through VITSA. In this test, the map in the test vehicles will contain a greater amount of information on traffic rules; e.g., if the street is one-way, whether stopping or parking is prohibited, etc. This trial will be launched at the beginning of 2003.

"NATIONWIDE ISA"

Another trial has been called "RiksISA" and is based on the SNRA's new national road database. RiksISA will start with a few vehicles in 2002.

DYNAMIC ISA

Dynamic ISA is the most advanced of the development projects and involves an in-vehicle system that provides information about the risk of slippery roads, road works in progress or accidents. This trial will be initiated on a small scale in 2003.

ECONOMIC INCENTIVES

A joint trial is being run by VTI and Dalarna University to study how economic incentives can influence drivers' inclination to keep to the speed limit.

REPORTS FROM THE TRIAL CAN BE ORDERED FROM TEKNIKDALEN FOUNDATION IN BORLÄNGE

1. "Right Speed" – Summary of the ISA project in Borlänge
2. "Right Speed" – Implementation
3. "Right Speed" – Technology
4. "Right Speed" – Recruitment of private test drivers
5. "Right Speed" – Public opinion regarding road safety: before and after
6. "Right Speed" – Impact on traffic
7. "Right Speed" – Private car test drivers: before, during and after
8. "Right Speed" – Speed violations and self-reported speeding
9. "Right Speed" – User views on the equipment
10. "Right Speed" – Commercial drivers
11. "Right Speed" – Quality assurance of speeds
12. "Right Speed" – Vibration or sound signals
13. "Right Speed" – Effect of physical measures
14. "Right Speed" – Log database and analysis tool
15. "Right Speed" – Questionnaire database

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