INTELLIGENT SPEED ADAPTATION IN THE CITY OF STOCKHOLM
IMPLEMENTATION STRATEGY AND STATUS

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ABSTRACT

The City Council of Stockholm has decided that all vehicles belonging to the City of Stockholm will have Intelligent Speed Adaptation (ISA) before 2010. An implementation strategy [1] has been adopted focusing on what steps must be taken in order to: fulfil the implementation goal; to achieve an effect on driving behaviour; and to obtain acceptance among the drivers. These steps include both technical and practical issues: such as the procurement of the ISA-system; technical requirements; speed-limit data; and management and cooperation with other actors.

This paper will present the main issues of the implementation strategy and status of ISA in the City of Stockholm.

KEYWORDS

Intelligent Speed Adaptation, ISA, Implementation strategy, Speed Limit, Stockholm, Sweden

BACKGROUND

ISA is a safety system to help drivers drive at the correct speed. The system is based on a device in the vehicle which informs the driver of the current speed-limit and warns the driver when speeding. The ISA-system also often has logging functionality for evaluation and feedback purposes.

ISA has been tested in several large-scale trials [2] in Sweden and the results were positive with better road safety,a speed reduction of 3-4 km/h and a high acceptance of ISA among the drivers. The recommendation from the trials was to work further with ISA, both in the private and public sector and to launch the system on the market.

Based on these project results the City of Stockholm started a small-scale trial between 2003 and 2005 where around 20 vehicles were equipped with an ISA-system [3]. The purpose of the trial was to help build the support infrastructure for a wider introduction of ISA and to establish whether ISA was usable for the quality-assurance of transport services.

The results were mainly positive, both regarding the effect on speeding and acceptance among the drivers using the ISA-system. The trials also gave a higher level of knowledge of the barriers and opportunities with a wider introduction of ISA. The final result was an implementation strategy that describes how to introduce ISA in the City's vehicle fleet and all procured transport services.

THE IMPLEMENTATION STRATEGY

The implementation strategy for ISA was presented to the City Council in May 2007 and later adopted in November of the same year. The strategy can be described as an action plan focusing on what steps must be taken in order to fulfil the implementation goal and to achieve an effect on driving behaviour and acceptance among the drivers. The strategy contains both technical and practical issues connected to implementation. Some of the main issues in the strategy are:

Type of ISA and procurement of the system

There are a wide range of ISA systems available that offer different levels of support, as well as different kinds of feedback to the driver. The most common types are a visual/auditory warning system or an intervening system with some kind of feedback through the accelerator pedal. The strategy doesn't require a certain type of ISA system. Instead, we have mainly focused on functionality and the overall effect on driver's behaviour. The purpose was to be open to different solutions from the system suppliers in the procurement phase.

The main features required of the ISA system in Stockholm are:

- The system shall inform the driver of the prevailing speed limit and if the driver is speeding.

- The system should be able to reduce speeding substantially.

- The system should be permanently installed in the vehicle and start automatically when the engine is started.

- Speed limit data should be updated remotely, without the need for manual interaction.

- The system shall enable data-logging functionality and follow-up through a web interface.

- The system should work on all roads within the county of Stockholm.

The procurement of the ISA system was finished during the 3rd Quarter of 2008, where the Swedish company Innova AB was contracted to develop and deliver the vehicle units and all other parts of the system, including installation and service. Their solution was a visual and

auditory warning ISA-system based on a GPRS-enabled GPS-navigator that fulfilled the stated requirements.

Figure 1 - The City of Stockholm's ISA system

In addition to the Stockholm ISA will also all other procured transport services for the city include requirements on ISA. For example is waste disposal and transport service within the city using ISA as a quality and traffic safety assurance tool both for the drivers and feedback to the transport purchaser. Further will as well school and elder transport service include with ISA requirements when the transport contracts are renewed.

Speed Limit Data

Provision of speed limit data is an important part in the implementation strategy in order to achieve acceptance of the ISA system among the drivers. The speed limit data must therefore be as good as possible in terms of accuracy, be up-to-date and have good geographic coverage. Speed limit data, in this case, is obtained from both the Swedish national road administration's NVDB (National road database) and the City of Stockholm's LV (local road database). The City of Stockholm maintains the local database and sends updates to the national database. In this way all ISA-suppliers can collect speed limit data from the national database from only one data source. This solution makes it possible for buyers and suppliers of ISA systems in Sweden to co-operate around a defined interface specification for speed limit data, and develop procedures for regular updating and quality assurance of the data content.

The ISA-system supplier should also offer as far as possible an automatic internal speed data handling and delivery process in order to minimize the update lead time to the vehicle ISA-unit. This is preferably done with wireless interface to the vehicle unit. Temporary speed limits such as road works etc. which are not included in the speed data base shall also be handled to obtain a reliable and an acceptable ISA-system. Therefore the procured system included a web and map based administrator module for temporary speed limit updating direct to the vehicle unit.
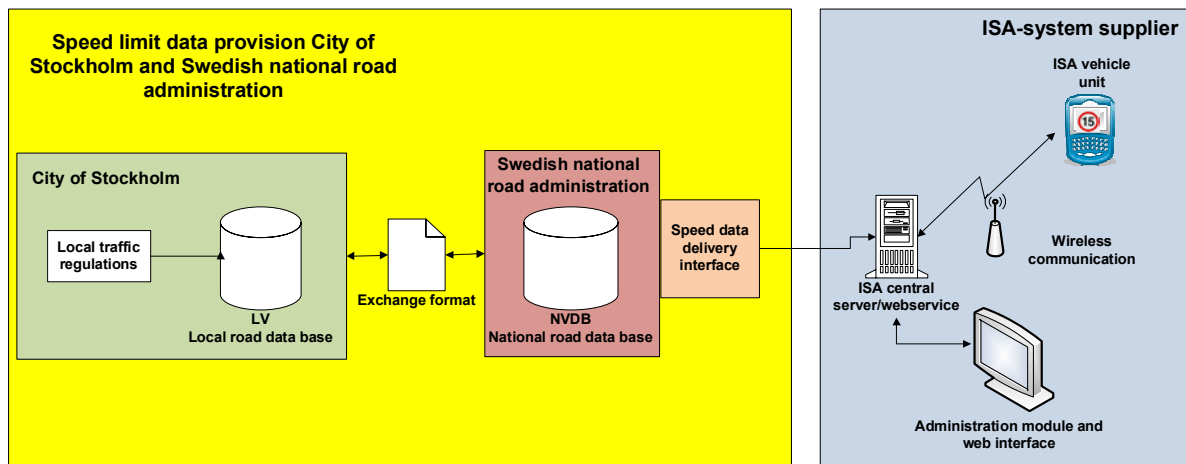
Figure 2 – Speed limit data provision and maintenance to the vehicle unit

Information strategy

One of the major tasks in the Stockholm implementation strategy is to have a well-established communication and information plan. In this case the strategy describes important internal introductory activities for the employees of the City of Stockholm who will use the ISA-system, directly or indirectly. Also other information activities are essential in order to spread the knowledge about the ISA system and to find possible co-operation partners.

Some of the ongoing activities are:

- Information and demonstrations activities, both for fleet managers and drivers within the city.

- Posting information on intranet, papers etc. about ISA, the implementation decision and the progress of the activities.

- Internal Questions & Answers document listing the most frequently asked questions and suitable answers

- Information and cooperation with other transport activities in the City of Stockholm such as alco-locks, "green car" project and car pools.

- Press releases, newsletters and general brochures.

- Demonstrations for external partners and journalists.

- Information on ISA-equipped vehicles.

- The World Congress for ITS in Stockholm 2009, should be used as a driving force for implementing and demonstrating ISA in Stockholm.

Cooperation activities

All types of cooperation activities connected to ISA are encouraged and are essential within the ISA implementation work. Experience exchange between municipalities regarding the whole ISA implementation work minimizes the risk of failure and speed up the in many cases long and time consuming process from the political decision to status "in operation". One example is to cooperate with other ISA buyers in the procurement phase to enable larger

volumes and bigger interest from the ISA supplier side and hopefully get reasonable prices for the systems.

The Swedish road administration has an important role in terms of its sectorial responsibility to create conditions for and support and cooperation activities about ISA in Sweden. The Road Administration is also working actively to promote a broader-based introduction of ISA in the country.

Stockholm also promotes activities such as external cooperation with other countries within ISA and other adjacent areas. Stockholm participates in the EU-funded project TeleFOT by using the existing ISA vehicle fleet for evaluation purpose and research work.

SAVING FUEL AND PROTECTING THE ENVIRONMENT WITH ISA

The implementation of ISA in Stockholm will also improve fuel efficiency, and thus contribute to protecting the environment. Fuel-saving and economical driving components will be added to the existing ISA-system. Economical driving will be achieved by combining support *before* driving (education, incentives), *during* driving (from the vehicle computer) and *after* driving (statistics, feedback). The goal is a 10 percent saving in fuel use with this combined system. Status and results from this project will be presented in a separate technical paper at the ITS world congress 2009 in Stockholm.

Figure 3 ISA with fuel saving and economical driving functionality

CONCLUSIONS

Often the introduction ISA is handled only as matter of technology that will be solved. Usually this part it simplest in relation to other more complicated questions when a new system will be introduced that influences and involves many persons. Therefore, this strategy has tried to take an exhaustive grip around the whole ISA introduction process.

During 2009, the City of Stockholm is in an intensive, implementation phase of the ISA system. By using a politically-approved and well-reviewed strategy during the implementation phase, the chances of success will be, hopefully, increased significantly.

This paper has outlined the most important issues in the implementation strategy of the ISA system in the City of Stockholm. Hopefully, these issues will be useful to other cities that are planning to introduce ISA.

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