

ERTMS DEPLOYMENT IN SWEDEN



The Swedish Transport Administration has taken a cautious but measured approach to the introduction of ERTMS into the national rail network. The well operating existing/legacy train protection system was introduced in the 1980s and is expected to last both technically and economically until around 2020. However, ambitious plans foresee the gradual installation of ERTMS on the Swedish rail network.

*What are the main characteristics of the Swedish rail network?
How many vehicles will have to be equipped with ERTMS?*

The rail network itself consists of 11,900 track-kilometres of which 3,700 km are either double track or multiple track and 9,800km are electrified. The Swedish vehicle fleet impacted by ERTMS introduction consists of between 800 and 1200 vehicles with approximately 50 different vehicle types.

What is the Swedish ERTMS implementation program?

The Swedish ERTMS Implementation Plan drawn up in September 2007 clearly identified the Swedish order of priority for the introduction of ERTMS as follows:

- 1 New and/or essentially upgraded routes or lines
- 2 Routes or lines without signal plant, centralised traffic control or ATP systems
- 3 Routes or lines with major re-investment needs for existing signal plants
- 4 Routes or lines included in the corridors identified by the EU
- 5 The remaining parts of the routes in the Trans-European Network (TEN) and after that other parts of the railway network

Level 2 technology has been chosen for the whole of Sweden, with possible exceptions of a Level 1 solution being deployed at larger stations and railway yards with extensive shunting movements. A specific ERTMS "Regional" solution will be implemented on very low traffic lines, which are currently supervised by manual operation. Most Swedish lines are expected to be equipped for full introduction of ERTMS by 2030.

What is the status of ERTMS deployment in Sweden?

ERTMS Level 2 is to be implemented first on the Bothnia Line, Ådal Line, City Tunnel and Haparanda Line. These are in the process of being equipped with ERTMS Level 2 and will provide key experience for the next phases of ERTMS introduction in Sweden:

- The Bothnia Line running between Umeå and Ångerman River north of Kramfors is 190 km long and comprises 25 km of tunnels and no less than 140 bridges. ERTMS Level 2 was chosen for the Bothnia Line, and the entire line has been open for traffic since August 2010.
- The Ådal Line carries both passenger and cargo traffic. It includes over 100 level crossings and runs between Sundsvall and Västeråsby. The line is 180 km long, of which 50 km are new (Härnösand – Mörtstal). ERTMS Level 2 has been chosen for the implementation and when the line is completed, capacity will increase from 8 - 10 trains per day to 50 - 60 trains per day. The completed line is expected to be open for traffic in 2012.
- The Haparanda Line running between Boden and Haparanda is expected to start carrying traffic in 2012. ERTMS Level 2 has been chosen for the line, which is 156 km long (42 km of which is new track between Kalix and Haparanda), comprises 17 railway bridges, 40 level crossings and is intended mainly for cargo traffic.
- The City Tunnel is a 17 km long electrified rail connection running through and under the city of Malmö. ERTMS Level 2 has been chosen for this section and the work will also involve rebuilding Malmö Central Station and building new stations at Triangeln and Hyllie. The section was ready for traffic in December 2010 and the ERTMS system will be commissioned in 2014.

Please see map for a detailed overview of the Swedish implementation plan.



What is ERTMS Regional?

ERTMS Regional, based on the new UIC rail control specification for less intensely used routes, is now being introduced in Sweden on the so-called "TAM" lines – lines that do not have an Automatic Train Control (ATC) system – on which traffic control takes place manually using telephone communication between local train dispatchers. Safety will improve substantially when ERTMS Regional is introduced on these lines. Another benefit of the new system, which will see the lines upgraded from manual to automatic control, is the creation of a cost-effective alternative for lines which otherwise might face closure due to the cost of maintaining manual operation or upgrading to traditional remote-controlled signalling. The Västerdal Line (134 km long, 16 trains per day) is the first ERTMS Regional line and was selected mainly because it is typical of its type and has no through traffic. This means that a limited number of vehicles are affected and only one traffic control centre is involved.

What is the onboard procurement strategy?

ERTMS will be introduced in accordance with the vehicle strategy, which indicates that the majority of the train fleet will be equipped initially, followed by a deployment trackside. Since the transition to ERTMS cannot take place overnight, trains must be able to operate on ERTMS-equipped infrastructure as well as on existing/legacy system lines. A Specific Transmission Module (STM) is needed to achieve this. The STM unit can read data from the existing trackside equipment and can convert it into a format that is transmittable to the new onboard system. This makes it possible for a train equipped with ERTMS to run on both legacy system lines and ERTMS lines, and the system can be introduced into the infrastructure gradually.

What are the benefits of ERTMS Deployment for Sweden?

The adoption of ERTMS marks a significant technology shift for Swedish railway operators. It means that Sweden is now well positioned to gain from increased competitiveness and is taking a major step towards improved cross-border operations and interoperability, reduced journey times, as well as cutting Sweden's carbon footprint. Sweden also constitutes a key section of Corridor B. This section of line is expected to be appropriately fitted before 2020.

The transport sector as a whole contributes 40% of Sweden's greenhouse gases. Sweden is justly proud of its efforts to maintain and improve the environment. ERTMS not only contributes to this, but brings with it the highly important benefits of rail safety and reduced costs.



SUPPLIERS

ALSTOM



BOMBARDIER

CAF

invenSYS
Rail



SIEMENS

THALES