



ERTMS DEPLOYMENT IN ITALY

ERTMS LEVEL 2 IN OPERATION



Italy, as an early investor in ERTMS, distinguishes itself by the use of ERTMS Level 2 on the main national axis, from Turin to Salerno, allowing for mixed traffic (passengers and freight) on what is nationally called a “High Speed, High Capacity” network. In most sections of it, ERTMS level 2 is used as the only signalling equipment (without any fall-back system and without trackside signals), which allows for considerable savings in infrastructure and maintenance costs. ERTMS has helped gain significant market share for rail transport in Italy and the completion of the High Speed network (new sections linking Milan to Venice and Genoa have been already scheduled and civil works are already underway in a few sections) is expected to bring considerable further economic and social benefits.

What is the status of ERTMS deployment in Italy?

Italy has been heavily investing in High Speed lines since the early 2000's. The construction of the first ERTMS-equipped lines commenced in 2004. RFI, the Italian Rail Infrastructure Manager, has opted for the use of ERTMS Level 2, which is currently installed and in revenue service on the following lines:

- Rome-Naples route (203 km) since December 2005
- Turin-Novara route (85 km) since February 2006
- Padova-Mestre (25 km) since March 2007
- Napoli-Salerno (29 km) since 2008
- Milan-Bologna route (198 km, including “passante”) since December 2008
- Bologna-Florence (80 km) since December 2009
- Novara-Milan (40 km) since December 2009
- Treviglio – Brescia (40 km) since December 2016

At 31st December 2019 709 km have been implemented with ERTMS for HSL without overlapping the national signalling. ERTMS will be implemented along the conventional lines that form part of the EU corridors. The traditional national Signalling (SCMT) and reusing some components like balises and encoders will be maintained. The plan is transforming the whole railway in ERTMS. Italian railways have a plan of installing ERTMS over 6000 km of conventional lines by 2030 and expects to have 1250 km implemented by 2020 and 4000 km implemented by 2026. 10236 km of the Italian network is characterized by being part of the TEN-T network.

There are 4 core European corridors across Italy:

- the Mediterranean Corridor
- the Rhine-Alpine Corridor
- the Scandinavian-Mediterranean Corridor
- the Balti-Adriatic Corridor

The completion of the above-mentioned axes in December 2009, together with the upcoming upgrade of the old Rome - Florence “Direttissima” High Speed line (expected to be in operation by 2021), enables High Speed travel between Milan and Rome in less than three hours. This travel time is expected to be reduced even further once new stations are built and put into service namely in Florence (Belfiore HS station).

Five brand new High Speed stations have already been inaugurated and are in commercial service in major cities along the axes: the new intermodal Tiburtina HS station in Rome (inaugurated on 29 November 2011), the new Porta Susa HS station in Turin (inaugurated on 14 January 2013) and the upgrade of the Bologna Central Underground HS station (opened on 9 June 2013), the Reggio Emilia AV Mediopadana (inaugurated on June 2013), and Napoli Afragola (inaugurated on 6 June 2017).

Additionally, there are further plans approved to build High Speed ERTMS links connecting Milan towards the East (Verona & Venice) and towards the West (Genoa). Work is already underway in certain segments of both lines. Finally, two lines Naples-Bari and Palermo-Catania-Messina, both part of the Scandinavian-Mediterranean Corridor, will be built in the South of Italy.



The Lyons-Turin international High Speed connection underneath the Alps is another major international project also being constructed. This is point of massive European interest that will bring benefits not only in France and Italy but to European passenger and freight transport as a whole. For the creation of the Brenner section of the Scandinavian-Mediterranean Corridor, fundamental for the freight transport, two projects are of utmost importance: the upgrading of the Fortezza-Verona line (between Italy and Austria) and the creation of the new tunnel underneath the Brenner.

The new High Speed line Venice-Trieste is planned to increase the commercial exchange between East and West Europe. The Trieste – Divača line, between Italy and Slovenia, is, also with the Turin-Lyon line, part of the Mediterranean Corridor.

How was ERTMS implemented in Italy?

Italy made the very important decision of installing ERTMS Level 2 as the only signalling system applied to its new High Speed lines without installing any fallback system. This has allowed considerable cost savings since trackside equipment needs to be carefully designed fit for purpose. Therefore, any ongoing or associated trackside maintenance costs are avoided.



What are the benefits brought by ERTMS in Italy?

In addition to the example of the Rome-Milan line (see below), ERTMS has brought considerable advantages to the Italian railways and society as a whole. As far as the first ERTMS line that came into service (Rome-Naples) in Italy, it has doubled its patronage in less than a year.

Despite a naturally difficult environment ERTMS has also proved advantageous to facilitate very high speed travel in Italy, and this, where many railway lines go through the Alps or Apennines. For instance, 73 km out of the 80 km route between Bologna and Florence consists of tunnels. In test trips, a new world speed record in tunnel was achieved at 362 km/h!

RFI made a technical-economic analysis in 2015 in order to understand if there were benefits implementing ERTMS over conventional lines. The outcome was positive showing savings over maintenance. The strategy derived now is to dismantle the local signaling system and implement ERTMS in the future in order to have a fully operational ERTMS network over all conventional lines by 2030.

Modal shift in action: From “Sorpasso” to preferred transport choice

In the first 50 days of commercial service of the Rome - Milan High Speed line, the airlines connecting Milan Linate Airport with Rome lost a total of 91,000 passengers (almost 2,000 per day, representing 30% of the market). Conversely, the High Speed service has gained 1,600 new passengers per day.

According to a Legambiente report, in 2019 the Italian High Speed line served 170,000 passengers per day. The modal shift “sorpasso” actually happened in 2010, when corridor traffic was dominated by rail transport services (55% share), followed by air (35%) and road 9%. By the end of June 2015, the modal shift kept favouring rail traffic with a 65% share, 24% for air connections and 11% by car. That means, 2 out of 3 trips are made by rail. The chapter now being written in this “modal war” is the steep reduction in airline seats capacity in the corridor with several airlines cancelling Rome-Milan connections.

Such modal shift translates into considerable CO2 savings. In this respect, RFI estimates that rail transport produces 44g of CO2 emissions per km while cars are at 118g per km, airplanes at 140g per km and trucks are at 158g per km.

Opening the High Speed passenger services to competition

28 April 2012 saw a new milestone in the European High Speed rail market. NTV (Nuovo Trasporto Viaggiatori) commenced commercial services on the Italian High Speed network becoming the very first private company offering High Speed rail passenger services in Europe. Italy has therefore become the first European country with High Speed rail services open to competition, a success story that others will certainly follow as example.

Since that date NTV, renamed Italo – Nuovo Trasporto Viaggiatori S.p.A. since 2018, runs services connecting the most populated Italian cities and has heavily invested in a modern Very High Speed fleet. ERTMS is an essential part of this achievement for the new NTV services will profit from state of the art interoperable infrastructure and from ERTMS equipment available from no less than 7 independent suppliers.

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