THE TGV

Introduction :

The **TGV** which is mean ‘*Train à Grande Vitesse’*, in (english *high-speed train)* is France's high-speed rail service, currently operated by SNCF, the French national rail operator.

 It was developed during the 1970s by GEC-Alsthom (now ALSTOM) and SNCF. At the beginning, the TGV prototypes are designed to be powered by gas turbines, then, they evolved into electric trains.

In 1981, there is the inaugural TGV service between Paris and Lyon. It’s take 3 hours to join Paris and Lyon.

The TGV network is centered on Paris and has expanded to connect cities across France and in adjacent countries. A TGV test train set the new record for the fastest wheeled train, reaching 574.8 km/h (357.2 mph) on 3 April 2007.

A TGV service previously held the record for the fastest scheduled rail journey with a start to stop average speed of 280 km/h, which was surpassed by the Chinese CRH service Harmony express on the Wuhan–Guangzhou line.

The success of the first line led to an expansion of the network, with new lines built in the south, west, north and east of the country but the center was not harmed because there are a lot of mountains, that implies a high difficulty to build TGV railways.

The success of the TGV and the network high-speed lines developpment , neighbouring countries such as Belgium, Italy, Spain, Switzerland and Germany built their own high-speed lines. T

In 2007, SNCF generated profits of €1.1 billion.

History :

The idea of the TGV was first proposed in the 1960s, after Japan had begun construction of the Shinkansen in 1959. At the same time the French government favoured new technologies, exploring the production of hovercraft and the « Aérotrain ». Simultaneously, SNCF began researching high speed trains. In 1976, the government agreed to fund the first line. In the middle of the 90’s, the trains were so popular that SNCF president Louis Gallois declared TGV "The train that saved French railways.

It was originally planned that the TGV, then standing for « *très grande vitesse » or « turbine grande vitesse »*, would be propelled by gas turbine-electric locomotives. Gas turbines were selected for their small size, good powe/weight ratio and ability to deliver high power over an extended period.

The first prototype, TGV 001, was the only TGV constructed with this technology because there is an increasement of the price of [oil](http://en.wikipedia.org/wiki/Petroleum) during the 1973 : energy crisis, gas turbines were uneconomic and the project turned to the electricity solution. The electricity was generated by France's new nuclear power stations.

TGV 001 was not a wasted prototype : it is gas-turbine powerplant was only one of many technologies for high-speed rail travel. It was articulated, two adjacent carriages shared a bogie, allowing free controlled motion with respect to one another. It reached 318 km/h, which remains the world speed record for a non-electric train. The interior and exterior of the TGV were styled by British-born designer Jack Cooper, whose work formed the basis of early TGV designs.

Changing the TGV to electric traction required a significant design overhaul. The first electric prototype, which is called « Zébulon », was completed in 1974, testing features such as innovative body mounting of motors, [pantographs](http://en.wikipedia.org/wiki/Pantograph_%28rail%29), suspension and [braking](http://en.wikipedia.org/wiki/Brake). The prototype travelled almost 1,000,000 km during testing.

In 1976, the [French government](http://en.wikipedia.org/wiki/Government_of_France) funded the TGV project, and construction of the LGV Sud-Est, the first high-speed line began shortly afterwards. The line was given the designation LN1 for « *Ligne Nouvelle 1 »*.

After two pre-production trainsets had been tested and substantially modified, the first production version was delivered on 25 April 1980

TGV in France :

There are two main types of TGV in France :

 -TGV « Sud-Est » :

The Sud-Est train was built between 1978 and 1988 and operated the first TGV service, from Paris to Lyon in 1981. There are 107 passenger sets operating, of which nine are tri-current (for use in Switzerland) and the rest bi-current. There are also seven bi-current without seats that carry mail for La Poste between Paris, Lyon and Provence, in a distinctive yellow livery.

Each set is made up of two power cars and eight carriages (capacity 345 seats), They are 200 m long and 2.81 m wide. They weigh 385 tonnes.

Originally the sets were built to run at 270 km/h but most were upgraded to 300 km/h during mid-life refurbishment in preparation for the opening of the LGV Méditerranée. The few sets that still have a maximum speed of 270 km/h operate on those routes that include a comparatively short distance on LGV, such as to Switzerland via Dijon.

- TGV « Atlantique » :

The Atlantique train was built between 1988 and 1992. 105 bi-current sets were built for the opening of the LGV Atlantique and entry into service began in 1989. They are 237.5 m long and 2.9 m wide. They weigh 444 tonnes, and are made up of two power cars and ten carriages with a capacity of 485 seats. They were built with a maximum speed of 300 km/h.

The unit 325 of the Atlantique carriage set the world speed record in 1990 on the new LGV before its opening. Various modifications, such as improved [aerodynamics](http://en.wikipedia.org/wiki/Aerodynamics), larger wheels and improved braking, were made to enable speeds of over 500 km/h.

TGV in the world :

The TGV is present in the world :

* Eurostar (UK) : They were built by GEC-Alsthom (now Alstom), entering service in 1993.
* Thalys (BELGIUM) : This train go to Belgium, Netherlands and Germany.
* Japan, Korea : There is the FTX train.
* Africa : In Morocco, there is a TGV which join Casablanca and Tangier.