

TESTIMONY

***Committee on Transportation and Infrastructure
Sub Committee on Railroads, Pipelines and Hazardous Materials
US House of Representatives***

Jean Marie Metzler

Consulting Director TGV Developments
SNCF (French National Railroads)

Washington, DC
April 19, 2007



On Behalf of SNCF...

- I would like to warmly thank the Sub Committee for giving me the immense honor of presenting the French Railway's (SNCF's) views and achievements on High Speed Systems.



- My testimony will be based primarily on TGV™ (Train à Grande Vitesse), which is not only a legal trademark, but one of the 10 most highly valued brands in the mind of French consumers.
- Let me briefly introduce myself: as a young engineer I was project leader for design, delivery and commissioning of the first TGV (Paris-Lyon route), which went into service in 1981. Then I worked on the industry side for a manufacturer of rail rolling stock for 4 years.
- Returning to SNCF I was in charge of SNCF's marketing and sales policies to boost the TGV's growth by setting up a new reservation and ticketing system. We adapted Sabre software under license from American Airlines to the passenger rail industry. Together with this system we implemented the first example of yield management procedures to optimize train capacity and revenues.

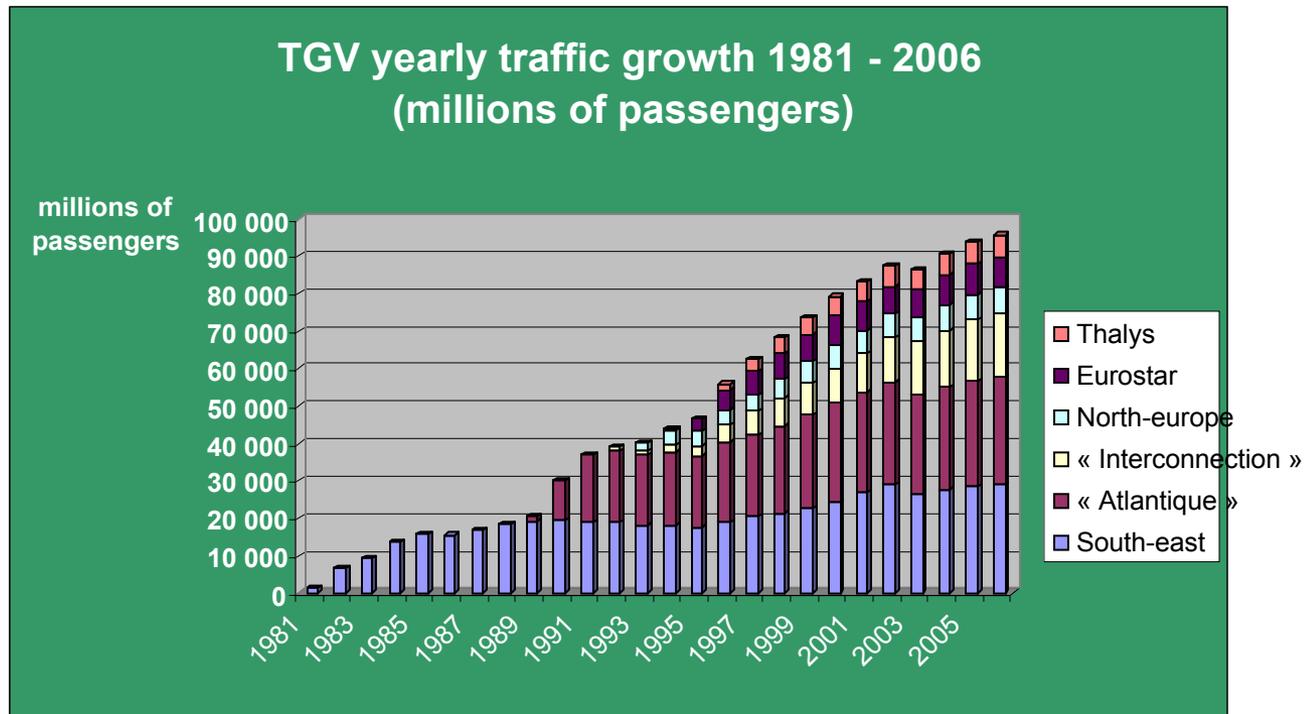
TGV System

The TGV network includes 932 miles of high speed lines operated by more than 500 TGV trainsets in France alone.



Key facts

- 1.4 billion TGV passengers since 1981 without a single casualty
- Continuous growth in passengers
- Currently 100 million passengers a year
- 680 TGV trains circulate daily
- 250 stations served



Reasons for success....

- Dramatic reductions in journey time:

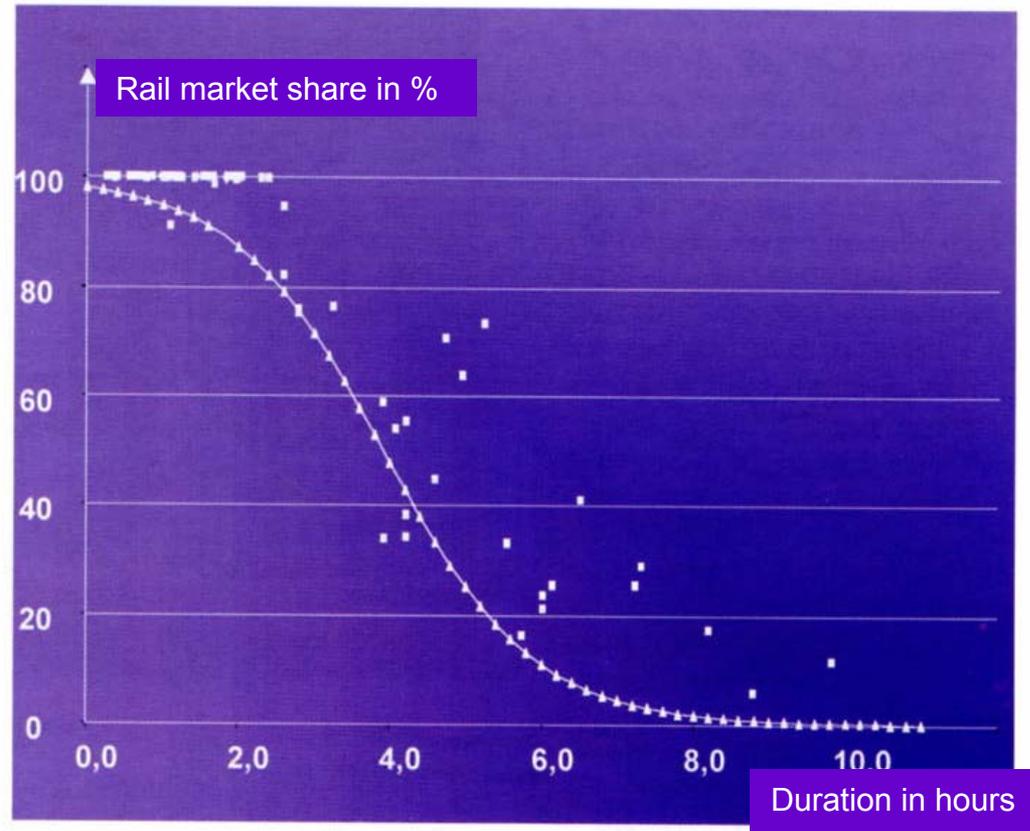
		<i>BEFORE</i>	<i>AFTER</i>
Paris to:	Lyon	4h	1h 55 min
	Bordeaux	4h	3 h
	Marseilles	4 h 40min	3 h
	London	--	2 h 15 min*

*as of 11/14/07



Competition with Air

- The journey time between Paris and Lyon was cut in half (4hr down to 2) opening new markets similar to Paris-London.
- Making rail a fierce competitor to air and enabling rail to win significant market share on routes with journey times of 3 hours or less.

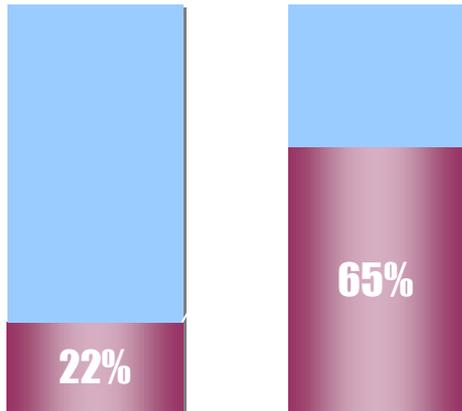


market share versus journey time

Rail vs. Air

Paris – Marseilles*

x3.0

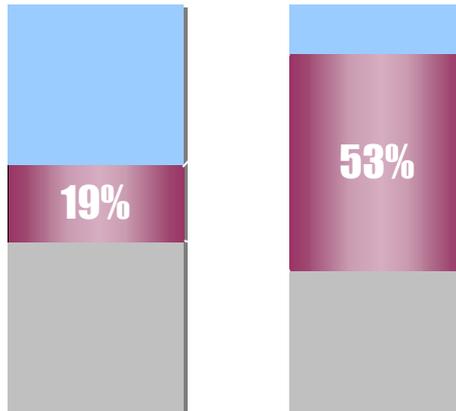


Before TGV
(1999)

After TGV
(2005)

Madrid – Sevilla

x2.8

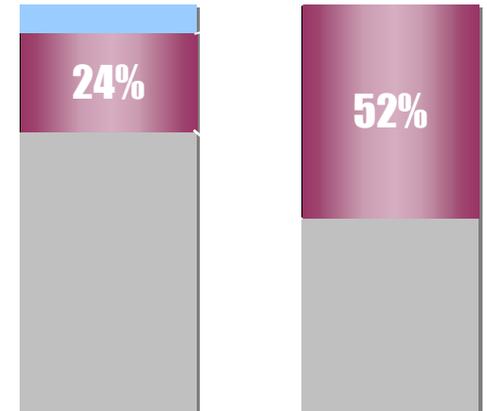


Before AVE
(1991)

After AVE
(1997)

Paris – Brussels

x2.2



Before Thalys
(1994)

After Thalys
(2005)

**regardless of road market share*

 AIR  RAIL  ROAD

Today, we see the most growth on journeys of 4 hours or less – as passengers try to avoid increasing delays and long check-in times at airports.



Key Success Factors

Consumer-oriented product:

- **Safe:** no casualty since 1981 - even in case of derailments - thanks to TGV's articulated design
- **Comfort:** the same smooth ride whether the train is traveling at 100mph or 200mph
- **Convenient stations:** refurbished or new ones, with intermodal connections to other means (ground transportation, airlines)
- A large range of fares, yield managed, that attracts more customers (average load factor 71%)

TGV station/ Lyon Saint Exupéry



TGV Station/Roissy
Charles de Gaulle



A consumer-friendly product

- A consumer-oriented but technologically conservative approach enables SNCF to build trains/rail service to suit the changing demographics and lifestyle of its passengers. For example, seats are now wider with more legroom to accommodate the larger passengers of today. And in response to the needs of an aging population, we are paying more attention to accessibility.

**Over the last
30 years
the average height of a Frenchman
increased by almost 2.5 inches**

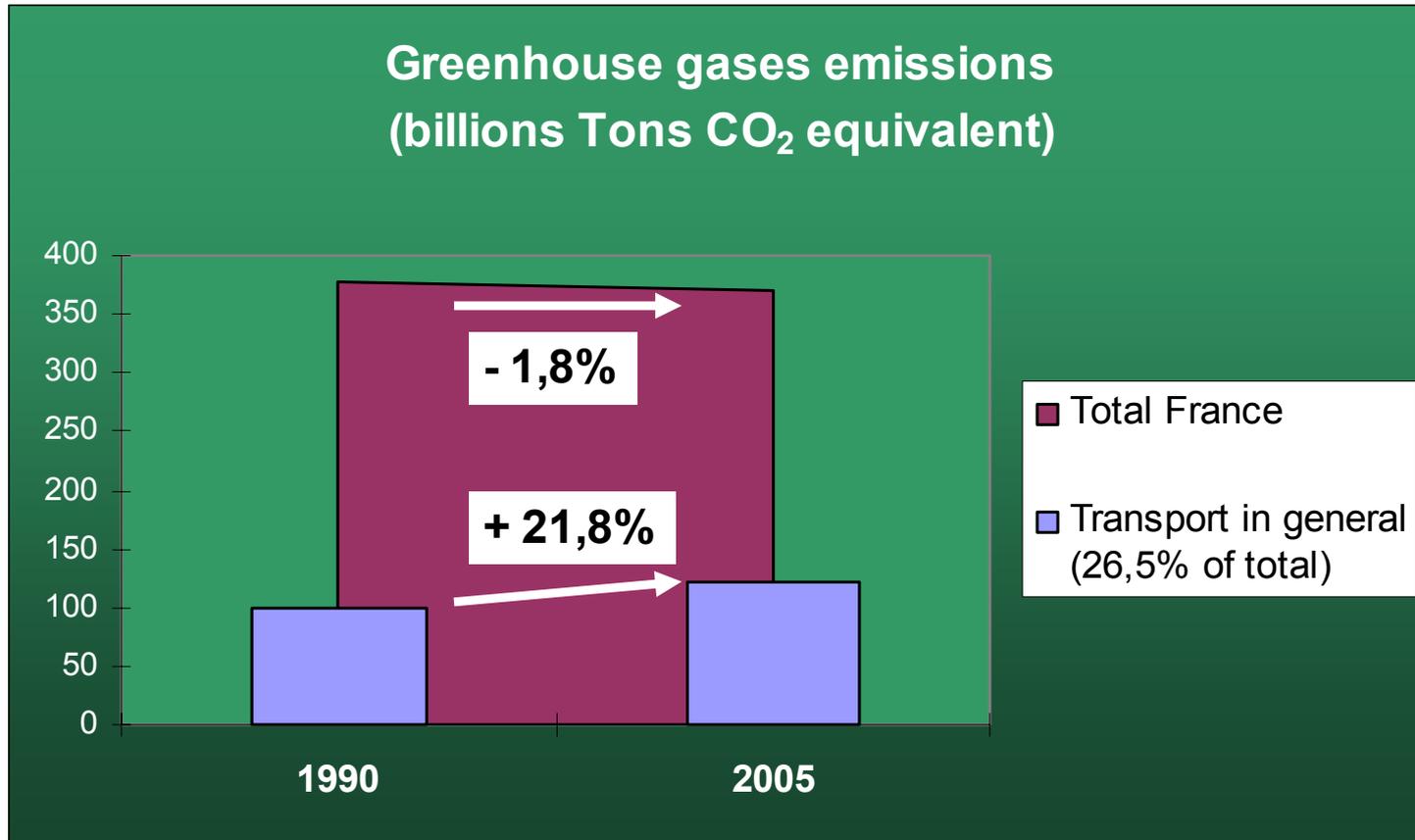
Obesity will increase by 20%

**The average lifespan grows 3 months
each year**

Environmentally Responsible Product

- Precise route alignment design avoids huge earthworks and saves land acquisition costs.
- High speed lines can in fact be coupled with highway right of ways because slopes and ramps used for HS rail design are close to road standards (3.5 to 4 %).
- For instance, the North Europe line in France runs along the Paris Lille highway. This saves on the cost of acquiring land, as well as the amount of land used.

Environmentally responsible



Environmentally responsible

Greenhouse gases emissions: evolution per mode



Higher energy efficiency

Energy efficiency
(pass-km / kg oil equivalent)

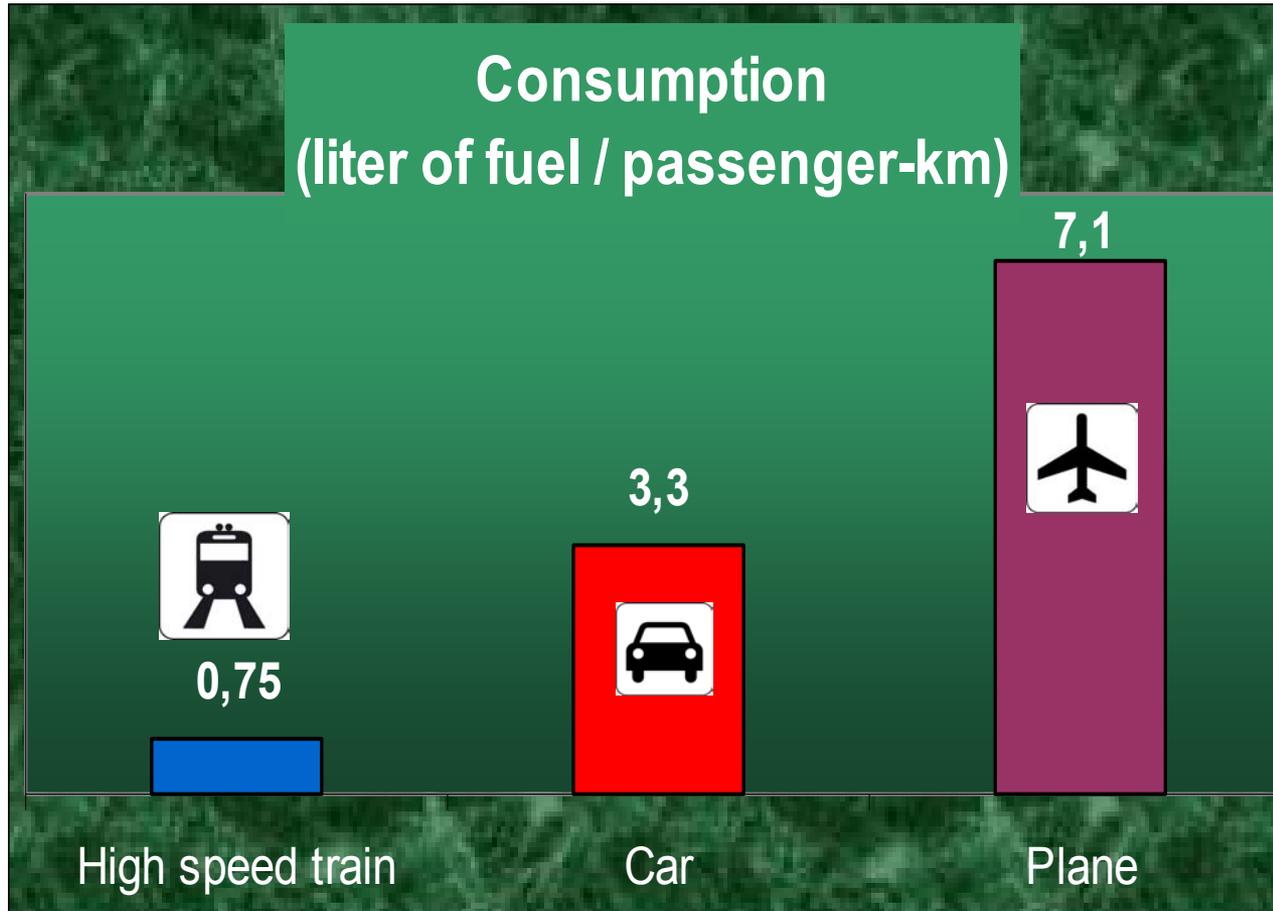
Plane 18,2

Car 38,8

Bus 91,2

High speed train 172,2

Less fuel consumption



Alignment features

**This design (ramps up to 3.5%)
saves earthwork
and minimizes (or avoids) tunnels**

High speed line Paris Lyon



Old line Paris (Dijon) Lyon



**This design (ramps < 0.8%) requires
long tunnels**

TGV platform is only 56 feet wide vs. 115 ft required by a 2 x 3 lane highway

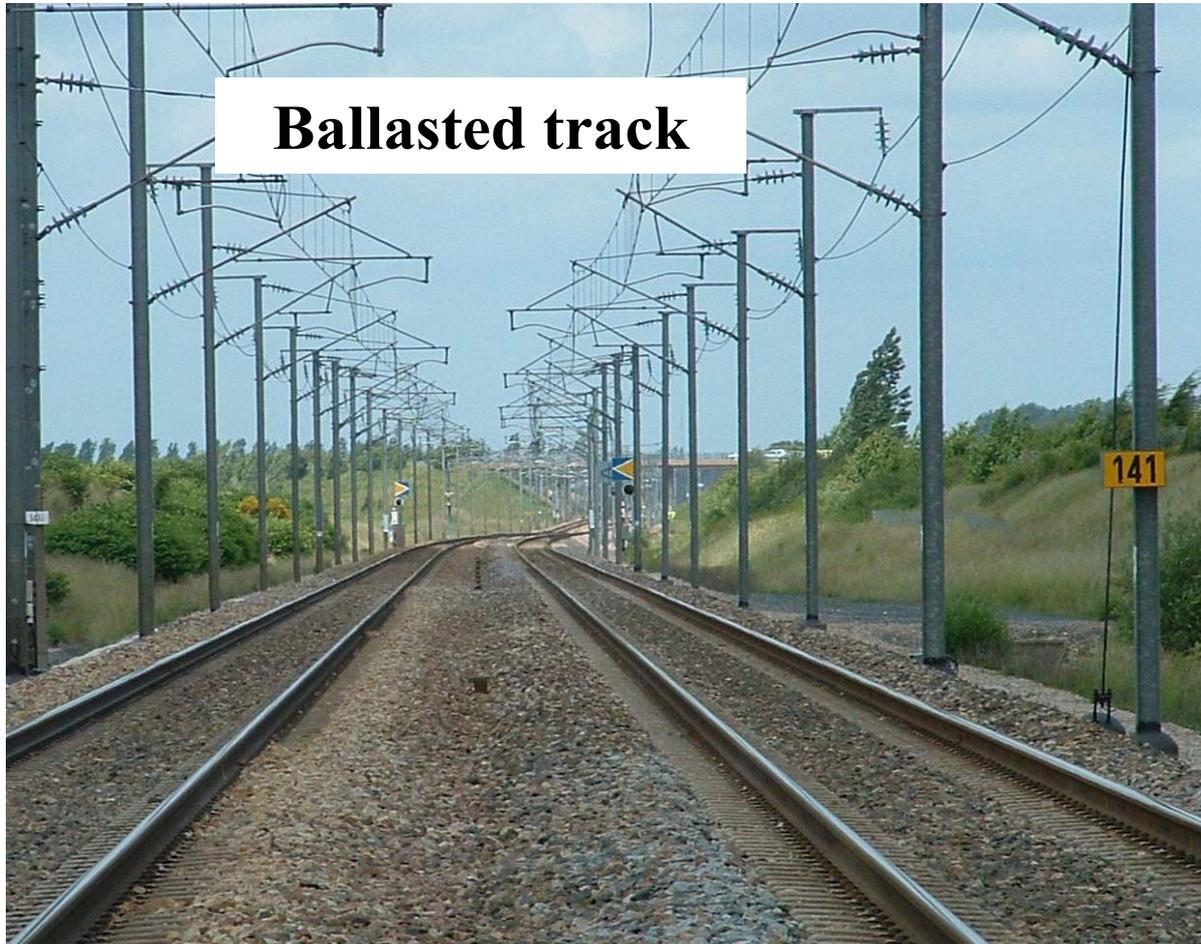


114,83 ft



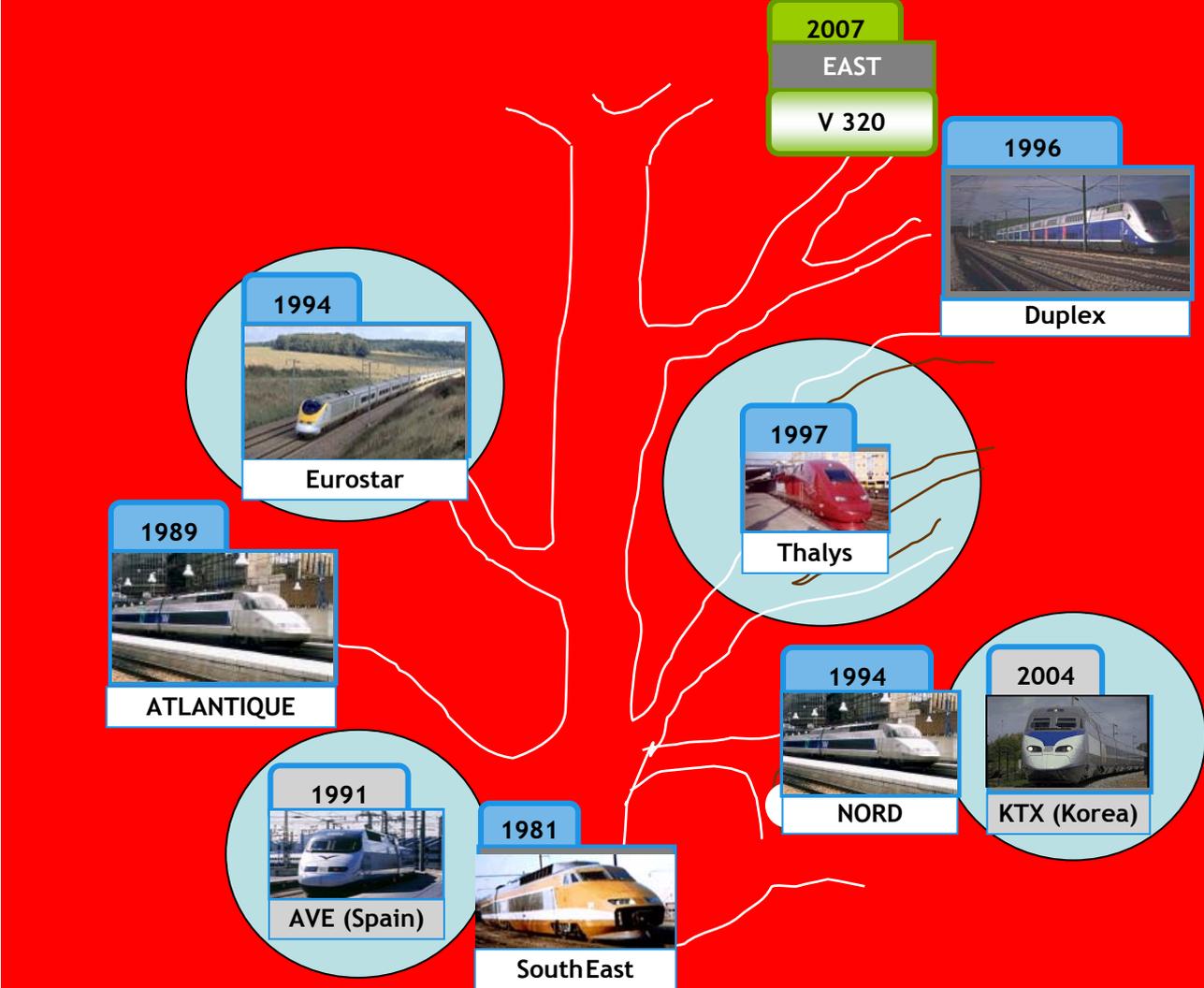
55,77 ft

Conventional design for both track and rolling stock



Ballasted track

TGV Family



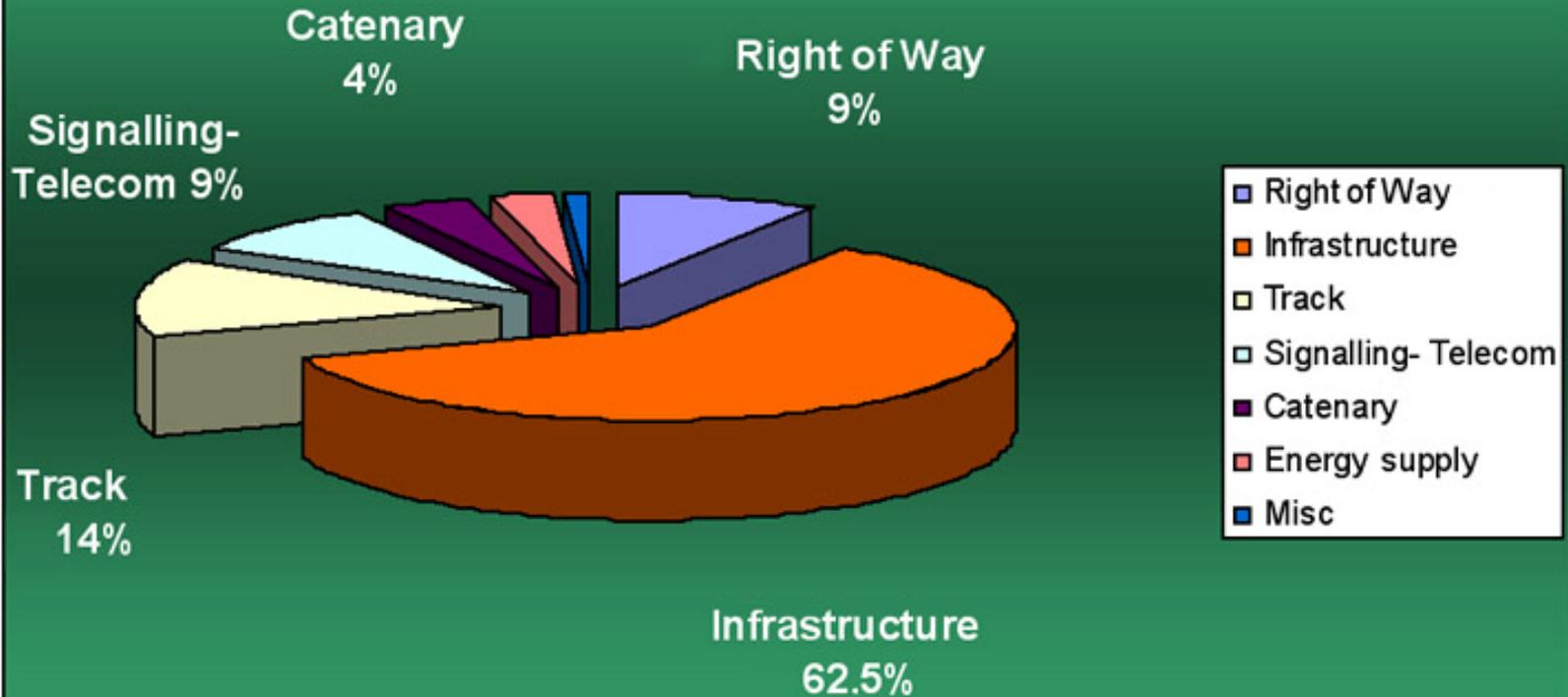
TGV Family...

- For each new generation of TGV's family proven we have built on proven or tested equipment/technology.
- The common rule is: "You will have a disaster if your project contains more than 20% of innovation" [Rand Corporation, 1980's].
- Very dramatic improvements over time: the V150 trainset, which set the world record for steel-wheels-on-steel-track on April 5, 2007 incorporates much more than 20% of new technology compared to the first TGV sets of 1981.

Investment needed to achieve success

- The cost of building a new TGV line today is approximately \$20 million per mile. This is significantly more than the first Paris-Lyon line that I helped to build, since it was easier to build without densely populated areas to pass through.
- In addition, increases in cost are due to the need to comply with environmental protection regulations (noise, access, hydrologic precautions, etc.).

High speed lines costs breakdown

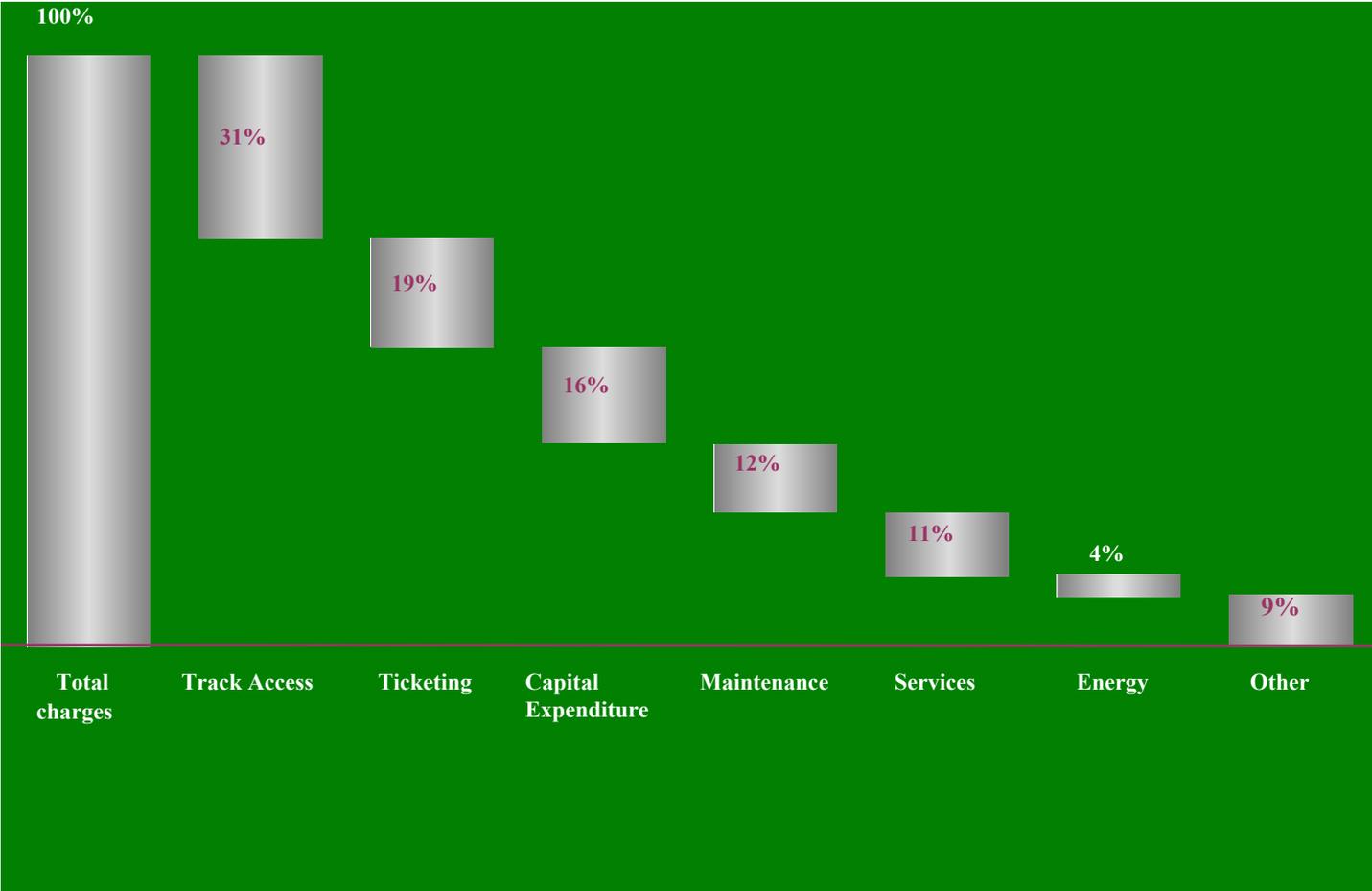


Funding New TGV Lines

In all cases, rolling stock is financed by SNCF. As far as the infrastructure itself is concerned:

1. The first TGV line, Paris Lyon (TGV Southeast) was entirely financed by SNCF itself.
2. TGV Atlantique line (Paris-Tours) benefited from a State subsidy of 30% for "superstructure" (track, catenaries, signaling...),
3. TGV North line (Paris-Lille) was built entirely without any public subsidy, (except for Lille's second station).
4. TGV Mediterranean (extension of Southeast) received a subsidy of 10% of total costs.
5. The most most important example of subsidy is the new TGV East line (Paris-Strasbourg), which was largely paid for – up to 76% - with public funds (National government, EU, and regional cities served).

Operation Costs Breakdown

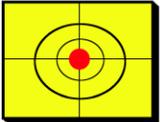
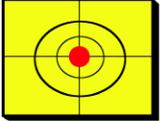


Marketing & Sales

To maximize return on this large investment, Railway Companies must not only master technical key factors of success described above but also:

- comprehensive forecasting methods
- marketing and sales strategy, e.g. market knowledge, pricing policy
- and, as mentioned earlier, efficient and user-friendly sales and reservation systems

As example: forecasts and results for TGV South East

Long-Term Forecast Made in 1969			
YEARS	FORECAST	ACTUAL	ACCURACY
1985 <i>(YEAR +16)</i>	15.0 MILLION	15.0 MILLION	
1995 <i>(YEAR +26)</i>	19.8 MILLION	20.0 MILLION	

The main focus must be on constantly analyzing load factor and revenue per seat in order to optimize volume and revenue.

