

Journée BIM 28/09/2017

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Railway Network modernization: a challenge for the future in a new railway organization

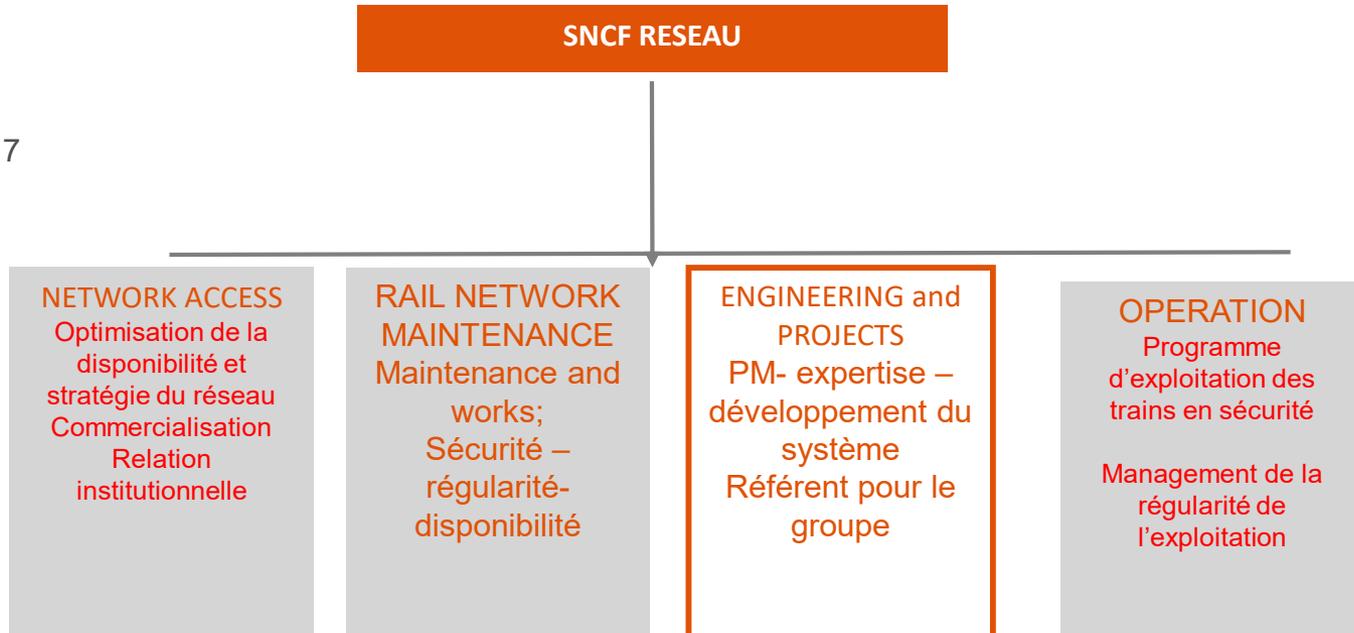
In the last years another target ending in November 2017: test and commissioning + putting in service of 4 HSL

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Engineering and Projects : POSITIONING WITHIN SNCF RESEAU

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Why changing the organization of the project management process

- Ensure that the comprehensive system is managed in the same project team with the same targets.
- Prepare the enhancement of the french railway system : only one and unique Infrastructure Management.
- Developp the interface of the different systems and sub systems part of the project (development or regeneration) to implement the operation in safety and efficiency
- Implement multidisciplinary teams from design to testing and commissioning, hand over to the O&M divisions.
- Develop a sustainable partnership policy

KEY NUMBERS SNCF RESEAU

- 15000 TRAINS per DAY
- 5 MILLIONS OF TRAVELLERS
- 30 000 KM RAILWAY LINES
- TURNOVER: **6,4 G €**
- **4,9 G €** MODERNIZATION OF THE NETWORK
- ENHANCEMENT AND UPGRADING : + **2,5 Mds €**
- MAINTENANCE : + **2,3 Mds €.**
- WITH **1,1 G €** REGION ILE DE FRANCE
- **52 000** EMPLOYEES

The Big Modernization Project of the French Railway Network

- The increase of the investments and upgrading of the network need a relevant project management organization.
- The investments due to an increase of the traffic brings the network and nodes to be full up and their management an everyday challenge
- All the projects developed under maintenance and operation: it is not possible to stop the operation of passenger and freight trains.

The Big Modernization Project of the French Railway Network: axle management

- About 30 main lines identified. During 2015/2016 the national project team with the local teams prepared the General Modernization Management Scheme.: development and asset management
 - ❑ Description of the line (example Strasbourg Bâle Dijon, Paris Orléans Limoges Toulouse...): length, type of power supply, type of signalling, GSMR, type of trafic, UIC classification etc...
 - ❑ State of the infrastructure track, power supply, signalling, bridges, safety equipments, crossings in regards of the reliability of the line: Is the infrastructure the main origin of train delays.
 - ❑ Analysis of the projects on going: previsted and implemented (maintenance and development
 - ❑ What are the main points to be implemented to increase the reliability of the line versus the future development of the trafic previsted by the TOCs. (passengers and freight)
 - ❑ Action plan
 - ❑ Financial items: capex and opex of on going projects and on the future projects
- The Mangement Schemes have been presented to gouvernement. They were all delivered till now. Discussions and décision followed during 2016. Project launched.

Industrial Network Rail Strategy: Integration in the core ASSET MANAGEMENT



Design a Network Strategy

Based on RAMS conditions
(performance regime, reliability, availability,
Maintenance and Safety)
Including the economic approach

How to implement the strategy in the Network

Maintenance & Renewal policy of Network

- Renewal plan & schedule
- Maintenance plan & schedule
- Combination of both approaches:
 - sub network
 - route
 - line
 - track

Degradation /evolution of performance analysis of sub-systems & components

Others aspects

- Economical
- Track outages

Ressources plan & schedule

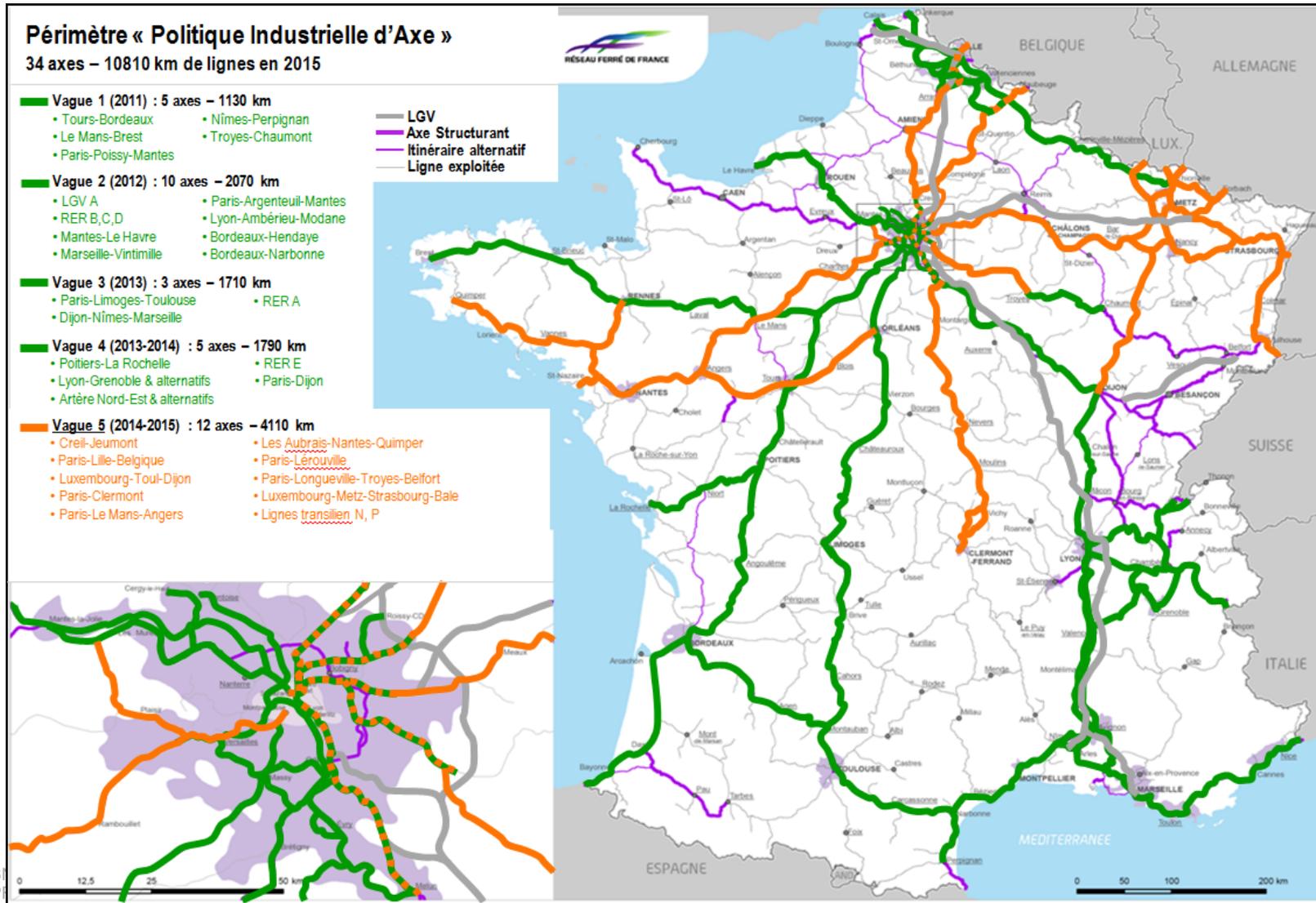
- Availability & adaptation of Network
trace reservation for commercial trains
- Logistics, HR

Produce Maintenance and Renewal files

Take advantage of experience and realization:

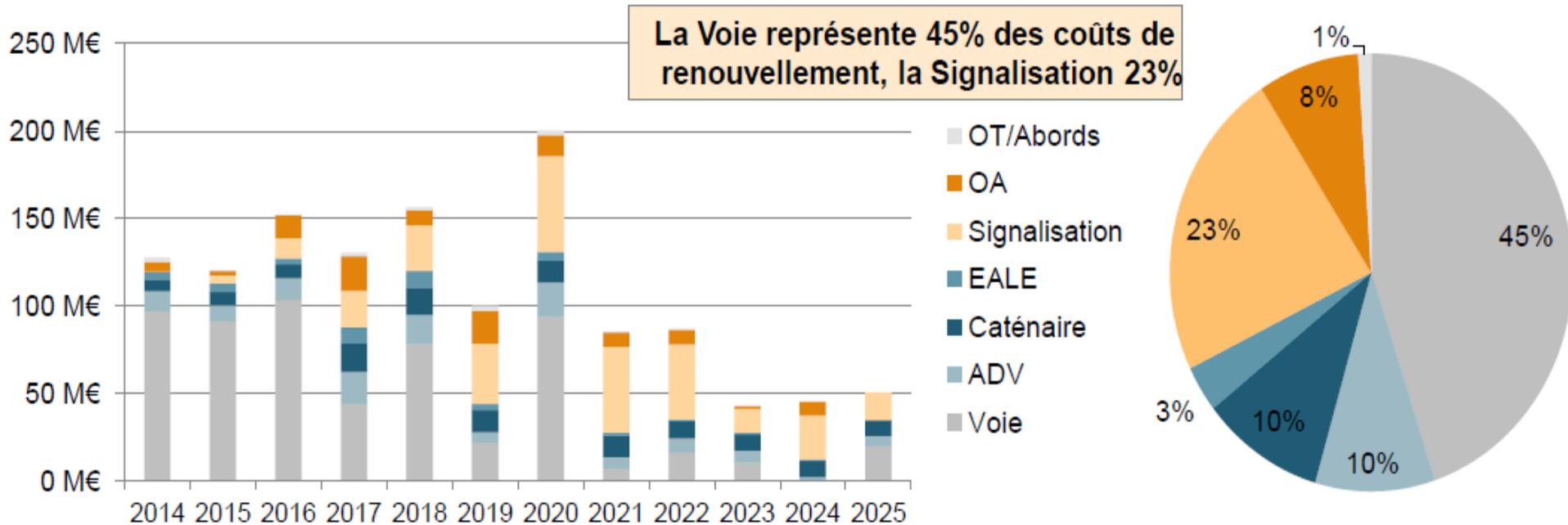
- Component base registration
- capital holding
- Performance Management of
component (Reliability & optimization)

Lines which are finalized onto the process (CORE NETWORK)



Renewal costs. period 2014-2025

North-East route (Dunkerque / Calais – Thionville)



RAILWAY UNDERTAKINGS ARE WAITING FOR SUCH INFORMATIONS !

The Big Modernization Project of the French Railway Network: don't miss another target : test and commissioning and putting in service of 4 HSL till end of 2017

- A HSL in the east part of France: on operation since July 2016
- 3 PPPs in the same time more or less: SEA and BPL in July 2017. CNM in November 2017

BPL

- **Le projet s'inscrit dans le prolongement de la LGV Atlantique Paris - Le Mans, mise en service en 1989 (aujourd'hui 16 millions de voyageurs/an, 15 % du trafic TGV national) et ce jusqu'à Rennes**
- **Ligne à double voie, réservée au trafic voyageurs (TAGV et TERGV) à l'exception de la section nord du Mans qui est mixte (voyageurs + fret), sur 25 km**
- **Pas de création de gare nouvelle**
- **182 km de ligne nouvelle entre Connerré (Est du Mans) et Rennes, 57 communes - 3 départements (Ille-et-Vilaine, Mayenne, Sarthe), 2 Régions**
- **32 km de raccordements aux lignes existantes (Connerré, La Milesse, Laval, Rennes) dont le barreau de Sablé-sur-Sarthe**
- **Vitesse commerciale : 320 km/h (tracé apte à une vitesse de 350 km/h) TVM300-ERTMSN2 et N1**

CNM Project: 1 mixed traffic line and 2 stations

■ 80 km line between Nîmes and Montpellier

➤ Freight traffic : V120 km/h

➤ Mixed Traffic :

➤ Route line : V350 kph

➤ Speed :

- V120 kph freight traffic

- V220 kph passenger traffic

➤ Signaling ETCS1/BAL-KVB

Other issues

- Innovation process (shiftrail, digitalisation etc...) with new issues like Cybersecurity, big data and Bim
- International : the french know how : a global approach to enhance
- Partnership in house and abroad

conclusion

- We have achieved the management system of both the modernization of the network and the HSL
- The future will bring more developments with the implementation of « SNCF Network » merging between the infrastructure manager RFF and SNCF Infra. Since the 01/01/2015 we are all on board
- Enhancement and development of the overall french railway network from suburban trafic to HSR in an sustainable development approach and included in the european network.
- Many things to enhance: for example the safety management, the system technical excellency and the development of the HR. .
- Achieve the putting in service of the 3 HSL in less than 1 year now

ISSUES

- change in the production process to be managed on each stage of the project
- The work packages are different – the tools also
- Need of investment coming from the owner. He is the winner;
- Attention : BIM was developed for buildings and localized items (bridge). So in need of developing tools for linear infrastructure: for example the signaling technical plans are not the same than un bridge design or catenary or track.
- Also the maintenance process had to be updated with new tools and project management.
- The engineers and technicians have to be trained and the biggest gap between the processes is in the maintenance area.

Why BIM?

- Integration of the maintenance aims in the early stages of the design
- Asset management based on an uptodated projects
- Predictive maintenance facilitated
- Cost saving in the maintenance stages
- Hand over faciltaded between the design team – construction team – maintenance team and owner
- Everybody works on the same plateforme.
- Compatibility with big data and EDM (GED)

THANK YOU FOR YOUR
ATTENTION