CORRIDOR
NORTH SEA – MEDITERRANEAN

Loading gauge enhancement studies

TAG – 23 September 2015

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

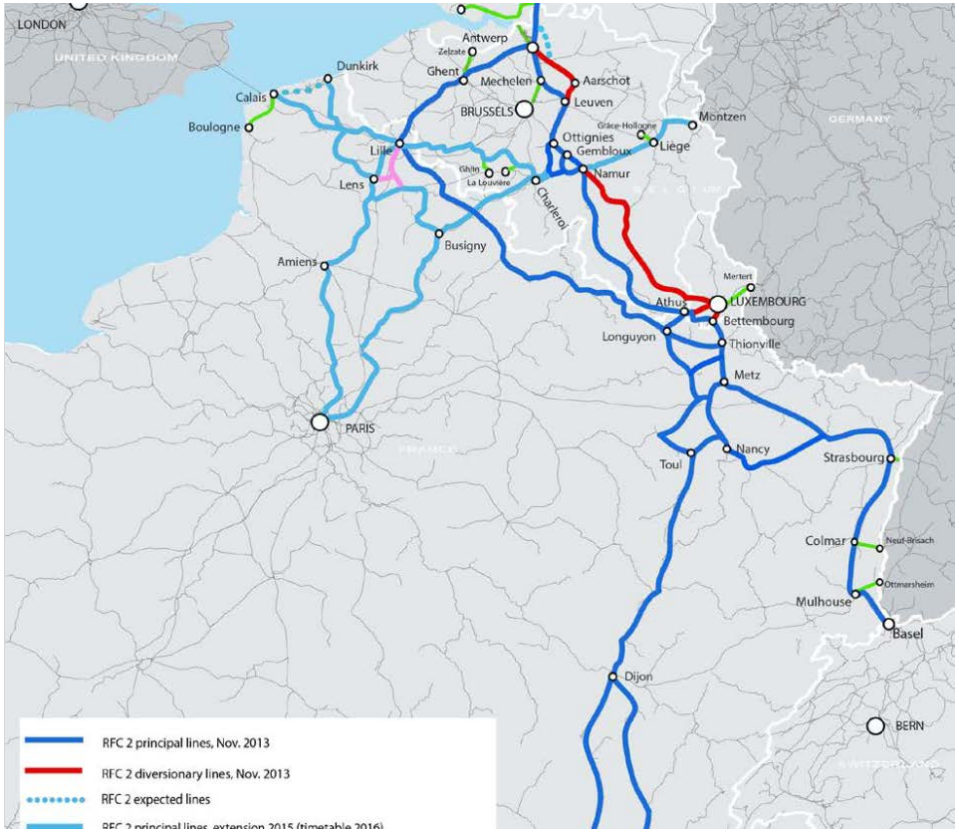
easier, faster, safer

Geographical scope

- This study focuses on the enhancement of loading gauge on the Calais – Longuyon – Luxembourg - Thionville – Metz – Strasbourg – Basel line

- This line belongs to RFC North Sea – Med and is currently run by international trains

- from Antwerp to Basel/Italy
- from the UK to Basel/Italy
- from Le Havre to Basel/Italy



Customer needs

RFC North Sea – Med RAG members: allowing trains to carry 4m semi-trailers => traffic increase

Examples

- Perpignan – Luxembourg
  - 4 returns a day by VIIA + Fret SNCF
- Bettembourg – Lyon
  - 1 return a day by CFLMultimodal
- Freiburg – Novara (RFC Rhine Alpine)
  - 11 returns a day by RAlpin
  - Hupac, BLS, CFF Cargo and Trenitalia
  - Bettembourg Trieste (through Germany)

Photo taken at the FR-LU border on 13/9/2014

(Bettembourg – Lyon service)

Agenda

1. Studies in France
2. Studies in Luxembourg
3. Studies in Switzerland

Customer needs

Wagons are usually owned by combined transport operators, not by the RUs. They all agree to request an infrastructure that allows the transport of 4m semi-trailers

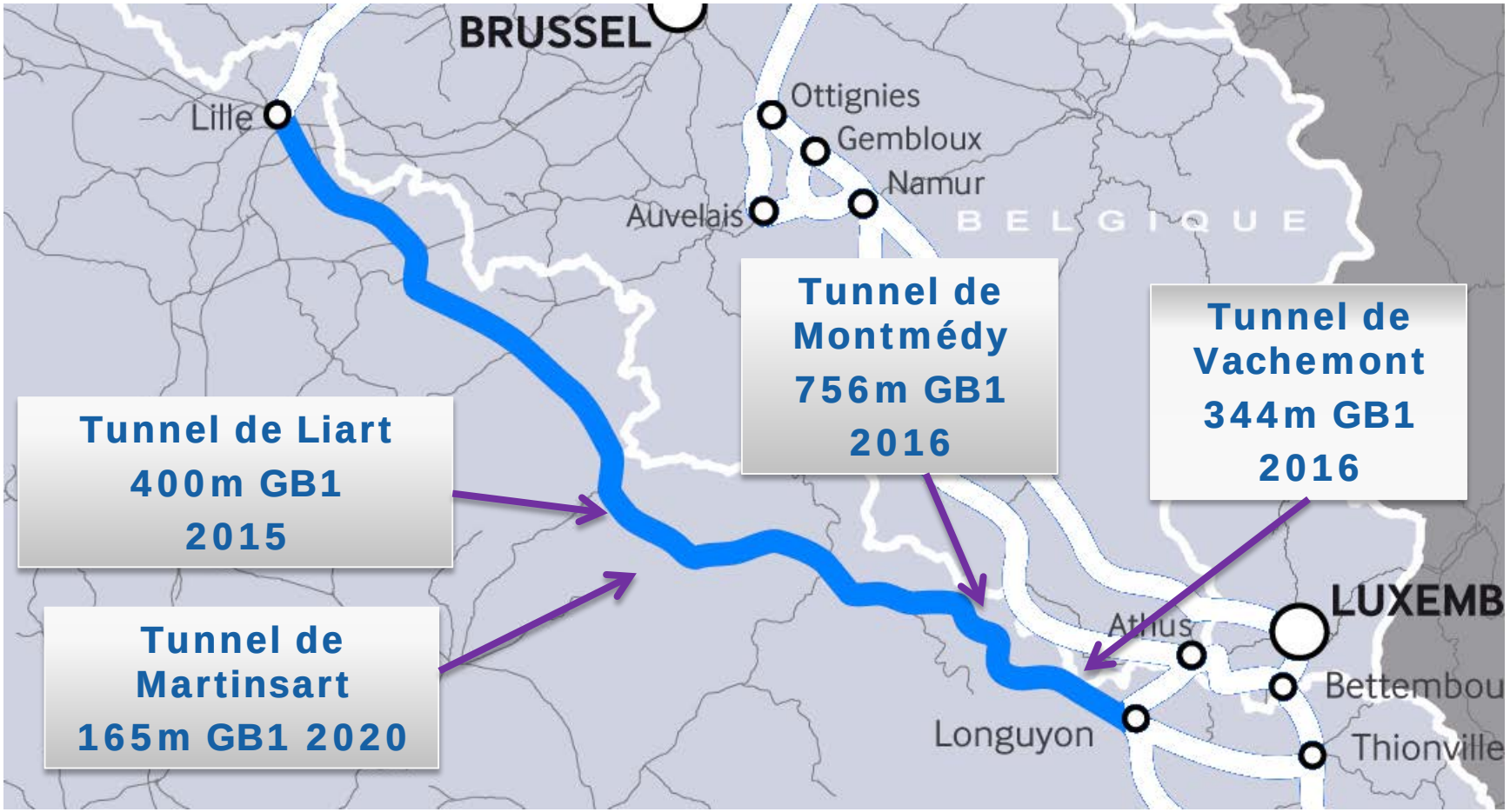
- The issue is: 4m above what ?
  - SNCF Réseau launched a market study to know the opinions of RFC North Sea - Med clients
  - SNCF Réseau interviewed 4 European combined transport operators interested by the transport of semi trailers on the corridor
  - SNCF Réseau may interview another one or two
  - Opinions diverge on this issue (total height of 425cm, 427 cm, 433 cm)
  - 427 cm is the highest existing standard that can be considered on conventional lines in France

2 Dimensions et caractéristiques principales

Longueur hors tampons	34 030 mm
Entraxe pivot	2 x 14 200 mm
Bogie Y25 Lssi diamètre de la roue neuve	920 mm
Empattement du bogie	1 800 mm
Hauteur nominale du plancher de la poche au dessus du rail	1 270 mm
Hauteur plancher pour transport de conteneurs ISO 40',45' ou CM à 7,82 m	1 155 mm
Longueur de la poche	10 650 mm
Largeur de la poche entre longerons mini.	2 700 mm
Position et Longueur de la partie utile de la poche mesuré	
A partir du pivot côté sellette	entre 1 775 et 12 425 mm
Hauteur utile des longerons et traverses de la poche maxi	160 mm
Hauteur des longerons au dessus du plan de chargement de la poche	
Au niveau des prises par pinces de la semi-remorque	625 mm
Hauteur des longerons au dessus du plan de chargement de la poche	
Au niveau des prises par pinces de la semi-remorque	895 mm

Example: characteristics of a TWIN pocket wagon

Calais – Longuyon: date of works



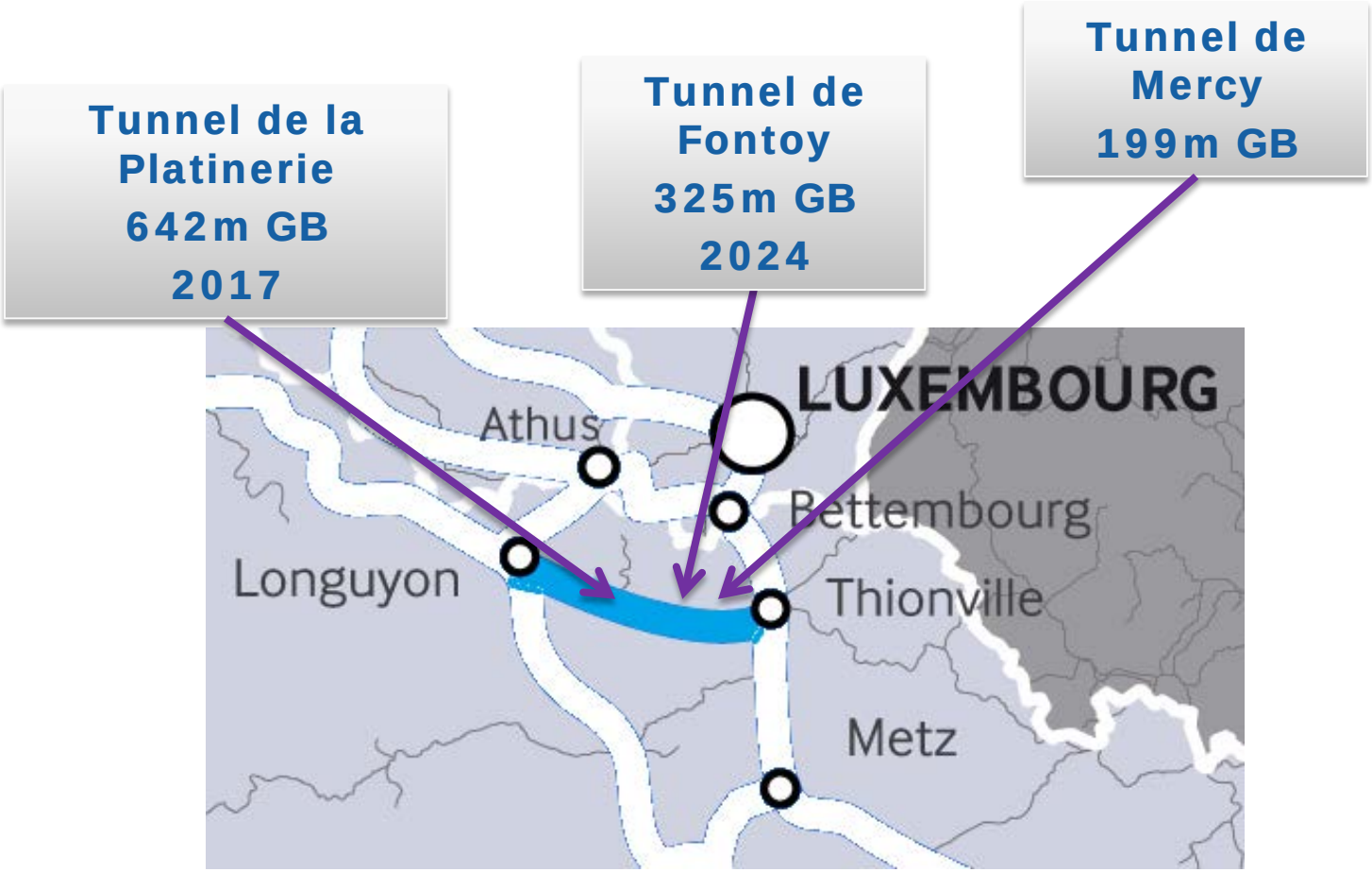
Calais-Longuyon tunnels

	Liart	Martinsart	Montmédy	Vachemont
length (m)	400	165	756	344
date of studies		2015-2017	2012-2014	
cost of studies	TBD	TBD	≈ 850k€2014	
date of works	2020	2020	4/2016 to 10/2016	
cost of works+studies	TBD	≈ 4,2M€2010	≈ 10M€2014	
nature of the works		foundation raft	vault renewal	
total closure assumed		Yes	No	

Photo : Martinsart tunnel

Photo : Montmédy tunnel

Longuyon-Thionville: date of works

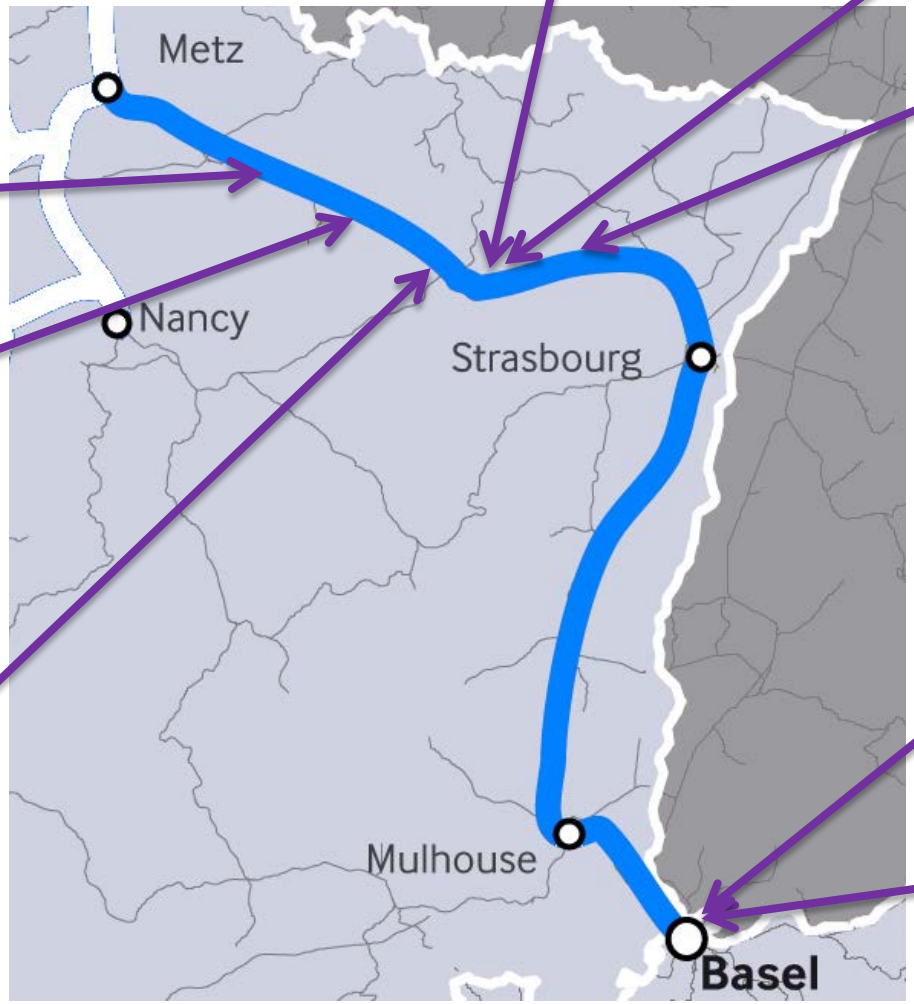


Longuyon - Thionville

	La Platinerie	Fontoy	Mercy
length (m)	642	325	199
date of studies	2014-2015	2015-TBD	2015-TBD
cost of studies	≈ 1,24M€	TBD	TBD
date of works	4/2017 to 9/2017	maybe 2024	TBD
cost of works+studies	≈ 10M€2013	TBD	TBD
nature of the works	foundation raft	TBD	TBD
total closure assumed	Yes	TBD	TBD

Photo : La Platinerie tunnel

Metz-Basel



Tunnel de Niederrheinberg

Tunnel de Niederrheinthal

Tunnel du Haut Barr

Tunnel d'Arzviller

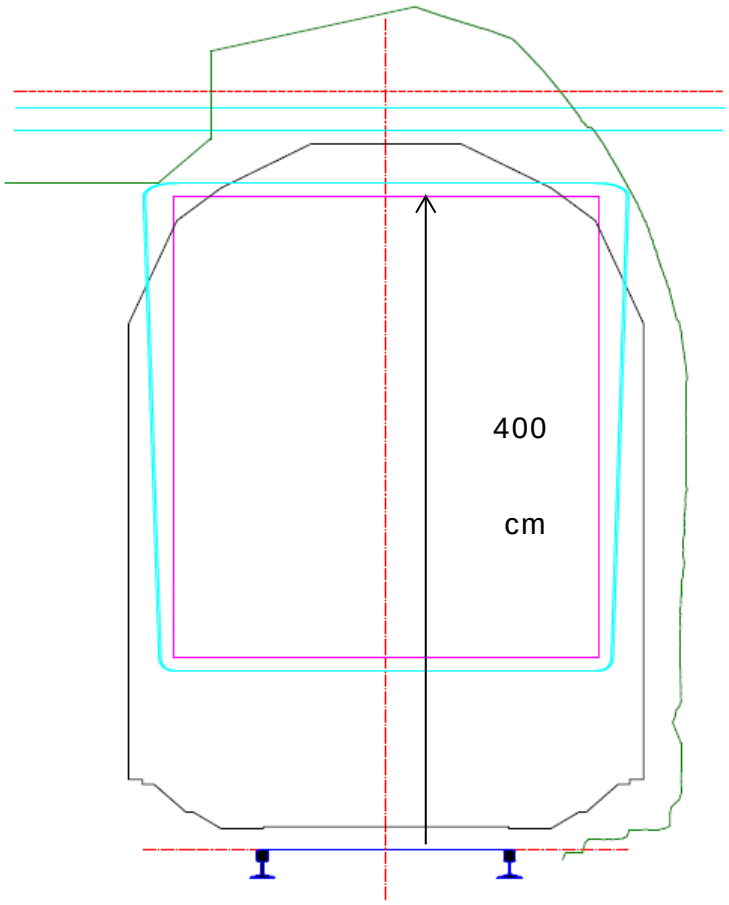
Tunnel de Hofmuhl

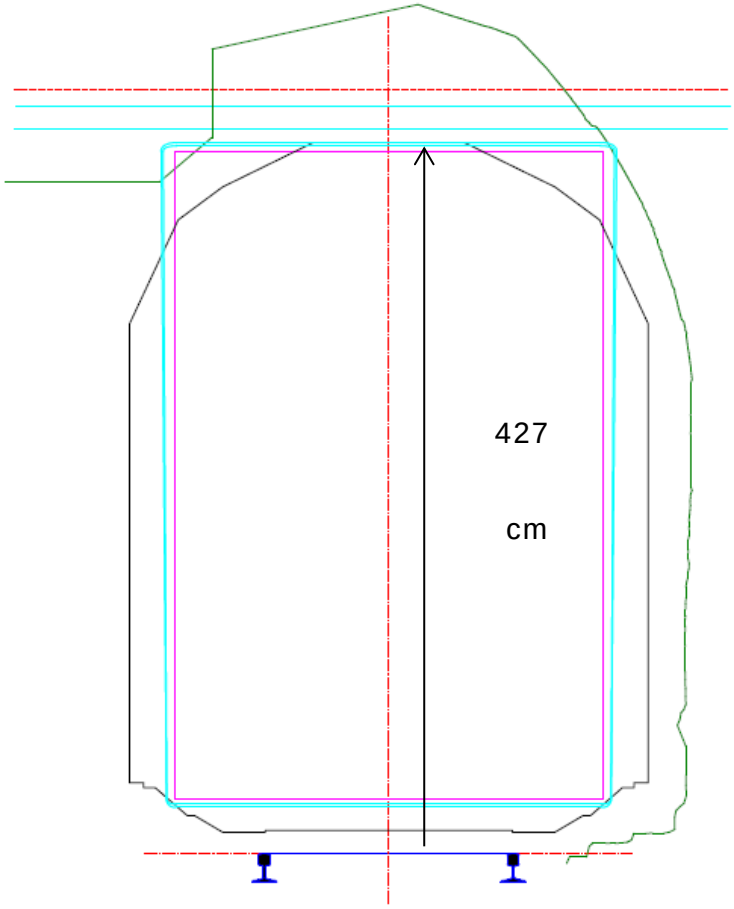
Tunnel de Lutzelbourg

Kannenfeld Tunnel

Schützenmatte Tunnel

Arzviller (2678m)





On a floor that is 27cm above the rail head, semi-trailers of more than 373 cm cannot run through the tunnel

Metz-Basel

	ARZVILLER	HAUT BARR	HOFFMUHL V1	HOFFMUHL V2	LUTZELBOURG	NIEDERRHEINBERG	NIEDERRHEINTHAL
length (m)	2678	304	248	328	439	300	493
date of studies	2015-TBD	2015-TBD	2015-TBD	2015-TBD	2015-TBD	2015-TBD	2015-TBD
cost of studies	little	little	little	little	little	little	little
duration of works	7m - 14m	TBD	TBD	TBD	TBD	TBD	TBD
cost of works+studies	29 to 50M€	11 to 18M€	TBD	TBD	TBD	TBD	TBD
nature of the works	vault	vault	TBD	TBD	TBD	TBD	TBD
total closure assumed	Yes-No	Yes-No	TBD	TBD	TBD	TBD	TBD

Photo : Arzwiller tunnel

Photo : Hoffmuhl tunnels

Preliminary studies

- SNCF Réseau is currently performing preliminary studies for
- 6 tunnels between Metz and the Swiss Border and
- 3 tunnels between Calais and Thionville (Liart, Mercy and Fontoy)

The preliminary studies include for each tunnel

- Data collection (geometric measurements)
- Review of the tunnel archives (data, historical works, condition of the structure…)
- Comparative Study of loading gauge enhancements: GB1, GB1 + AFM427, AFG
- Definition of technical solutions
- Compatibility with the condition of the tunnel and renewal works possibly foreseen
- Explanatory note of the technical choices with work conditions, risks and constraints
- Estimated costs and completion dates of work for each loading gauge standard
- Estimated total amount of each transaction on the basis of ratios derived from similar operation
- Summary table of solutions, costs and timing

Conclusion about studies in France

- Between Calais and the Swiss border, 13 tunnels do not comply with the 427cm standard

- For 4 tunnels, SNCF Réseau was able to combine loading gauge studies with renewal studies
  - ➢ Works will be done in the next five years

- For the remaining 9 tunnels, preliminary studies are either finished or currently underway and will be finished before end of 2015
  - ➢ Decision to do the works will depend on the results of the studies and the possibility to combine these works with renewal works

Combining renewals and loading gauge enhancement

- There is a real interest in mutualising civil works to be done for gauge enhancement and for tunnel maintenance (renewals)

- Works duration is marginally increased
- Total impact on railway traffic is minimised
- Total costs are minimised

- This is also true for studies as they are similar in terms of soundings, plans, structure analysis, diagnostic visits. BUT :

- Because gauge enhancement involves the whole of the tunnel structure instead of specific areas to be renewed. Then the combined studies costs are higher than those involved for maintenance only
    - => Costs (GE+M) ≈ Costs (GE) > Costs (M)

Agenda

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2. Studies in Luxembourg
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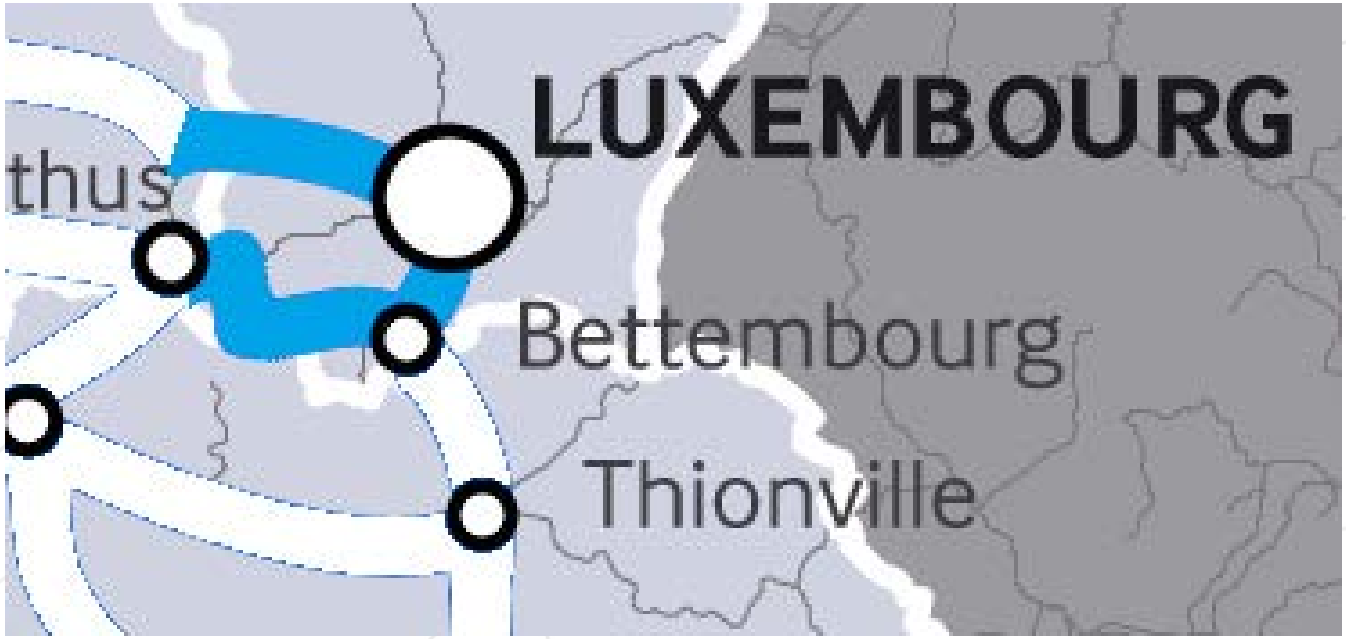
Studies launched in Luxembourg



Studies launched in Luxembourg

- In 2013 and 1st half of 2014, three measuring campaigns have been done
- The measurement data have been processed and the report sent by the contractor
- The measurement data are being analysed in order to evaluate the works to be done
- The study including the cost evaluation of the works will be finished by the end of 2015

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Switzerland: 4-metre corridor

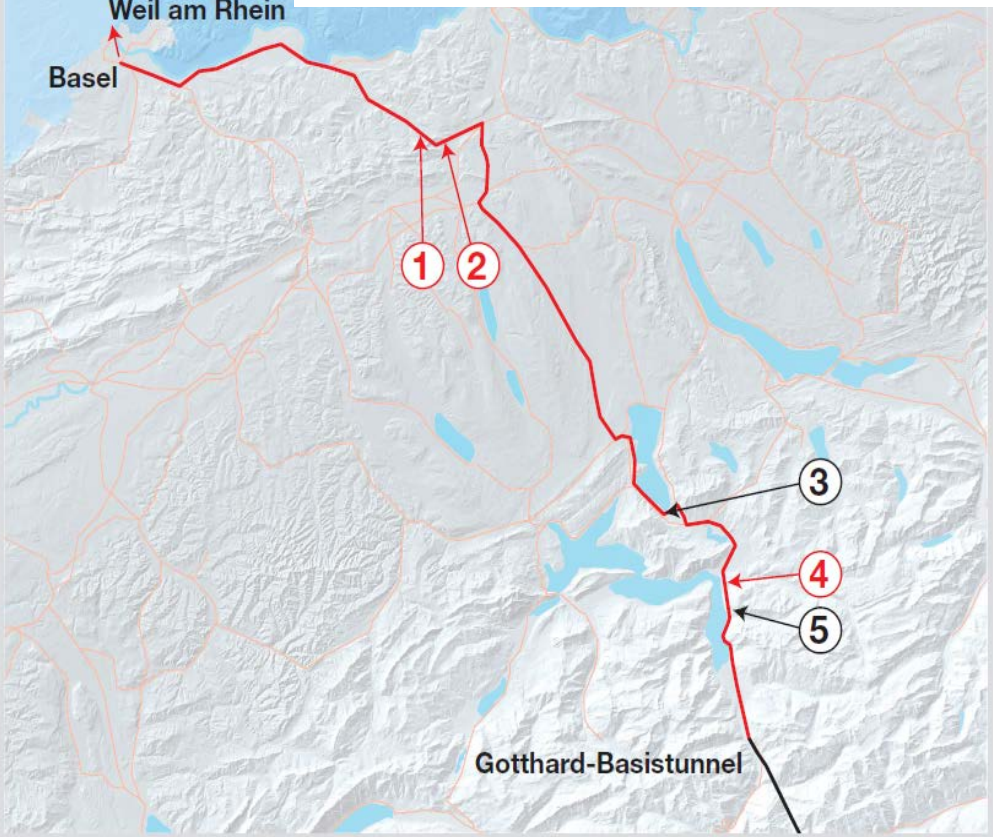
In order to increase the volume of transalpine freight carried by rail rather than road, SBB will (on behalf of the federal government) upgrade the Gotthard route to a 4-metre corridor by 2020. This allows semitrailers with a 4-metre headroom to be carried.

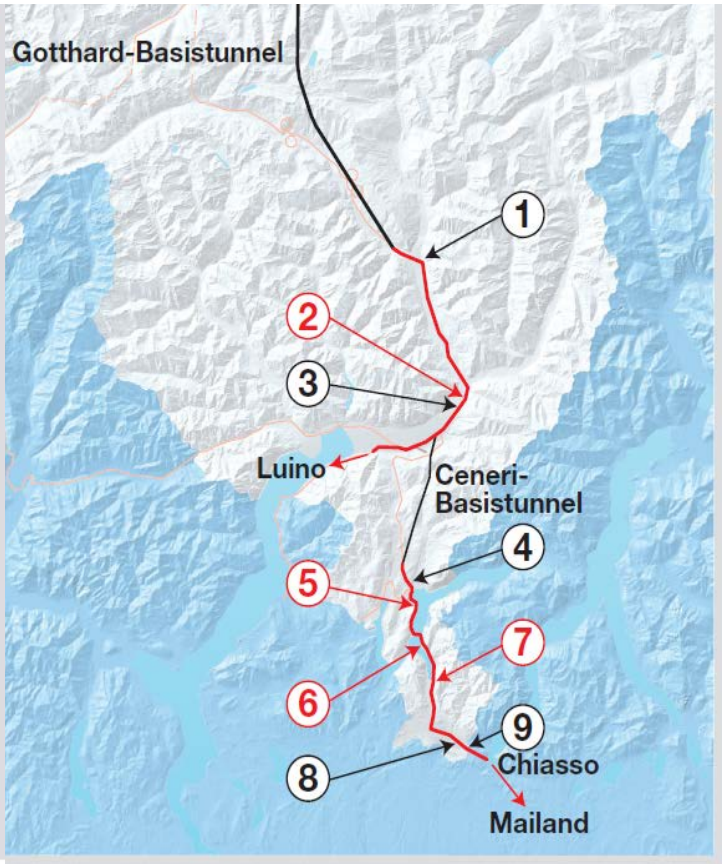
The project, estimated to cost CHF 940M, is an important component of Switzerland's transport policy. In order to create a 4-metre corridor along the entire length of the Gotthard route, some 20 tunnels need to be enlarged and 150 alterations made to platforms, traction current systems, signalling installations and overpasses. In order for the 4-metre corridor to achieve its full potential, sections of lines in Italy will also be upgraded to a 4-metre target. To upgrade the feeder routes in Italy, the Swiss parliament also approved a loan of CHF 230M.

4-Meter-Korridor B

Übersicht Nord.

Tunnel Nord-Süd Korridor Aufweitung auf 4,0 m Eckhöhe - zur Zeit in Studie										
Axenberg	Brunnen - Flüelen	600	1.128	1	1880	Malmkalke	geschlossen (bergmännisch)	x?	bis ca. 2020	Aufweitung auf EBV3-Profil
Morschachtunnel	Brunnen - Flüelen	600	1.003	2 (1+1)	1880/1947	Kalke	geschlossen (bergmännisch)	x	bis ca. 2020	Aufweitung auf EBV3-Profil
Stutzeck	Brunnen - Flüelen	600	988	1	1880	Kalke	geschlossen (bergmännisch)	x?	bis ca. 2020	Aufweitung auf EBV3-Profil
Stutzeck	Brunnen - Flüelen	600	128	1	1880	Kalke	geschlossen (bergmännisch)	x?	bis ca. 2020	Aufweitung auf EBV3-Profil
Tellsplatte	Brunnen - Flüelen	600	171	1	1880	Kalke	geschlossen (bergmännisch)	x?	bis ca. 2020	Aufweitung auf EBV3-Profil
Bözberg	Basel - Baden	700	2.400	2	1875	Kalke/Mergel	geschlossen (bergmännisch)	x?	offen	Evtl. Paralleltunnel und/oder umfassende Gewölbeinstandsetzung, Entwässerung





Switzerland

- The Swiss loading gauge enhancement program for the North – South route is very ambitious (see chart)

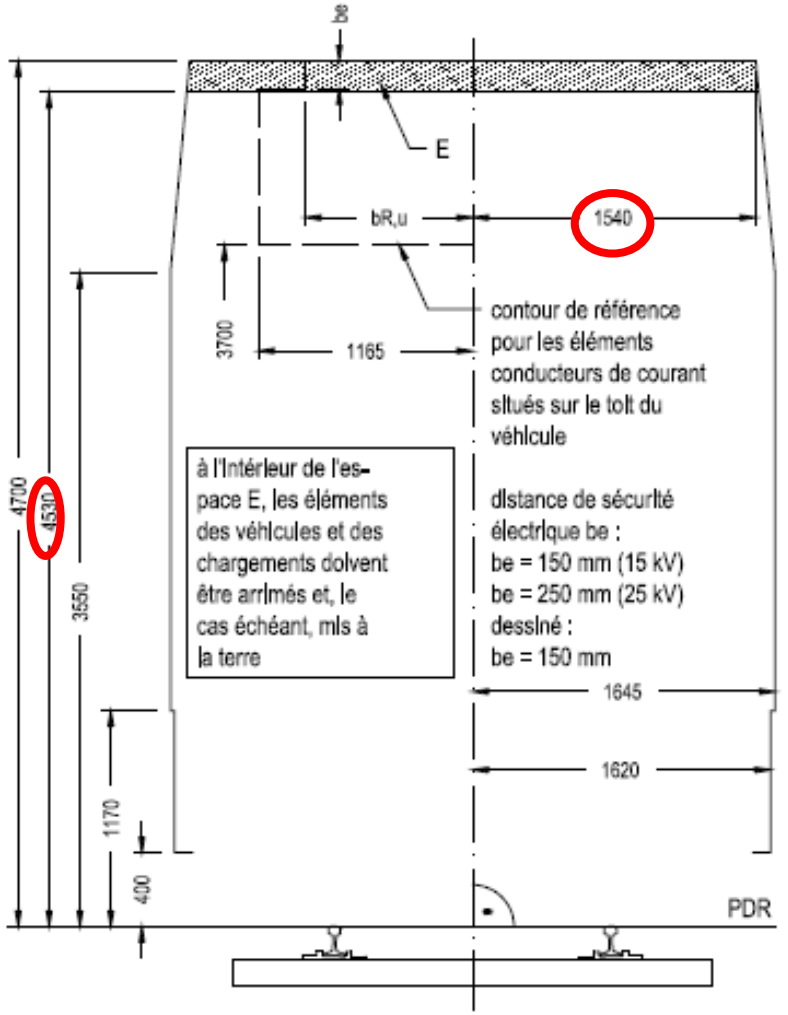
CONTOUR DE REFERENCE OCF 04, PARTIES HAUTES

Il en résulte :

– gabarit limite des obstacles et profil d'espace libre OCF 4 (art. 18, feuilles n° 9 N et 14 N)

Valable pour :

– installations fixes pour lignes de la transversale nord-sud Bâle – Chiasso
– lignes pour V > 160 km/h



valeur bR, u : voir feuille n° 11 N
parties basses : voir feuilles n° 4 N à 6 N

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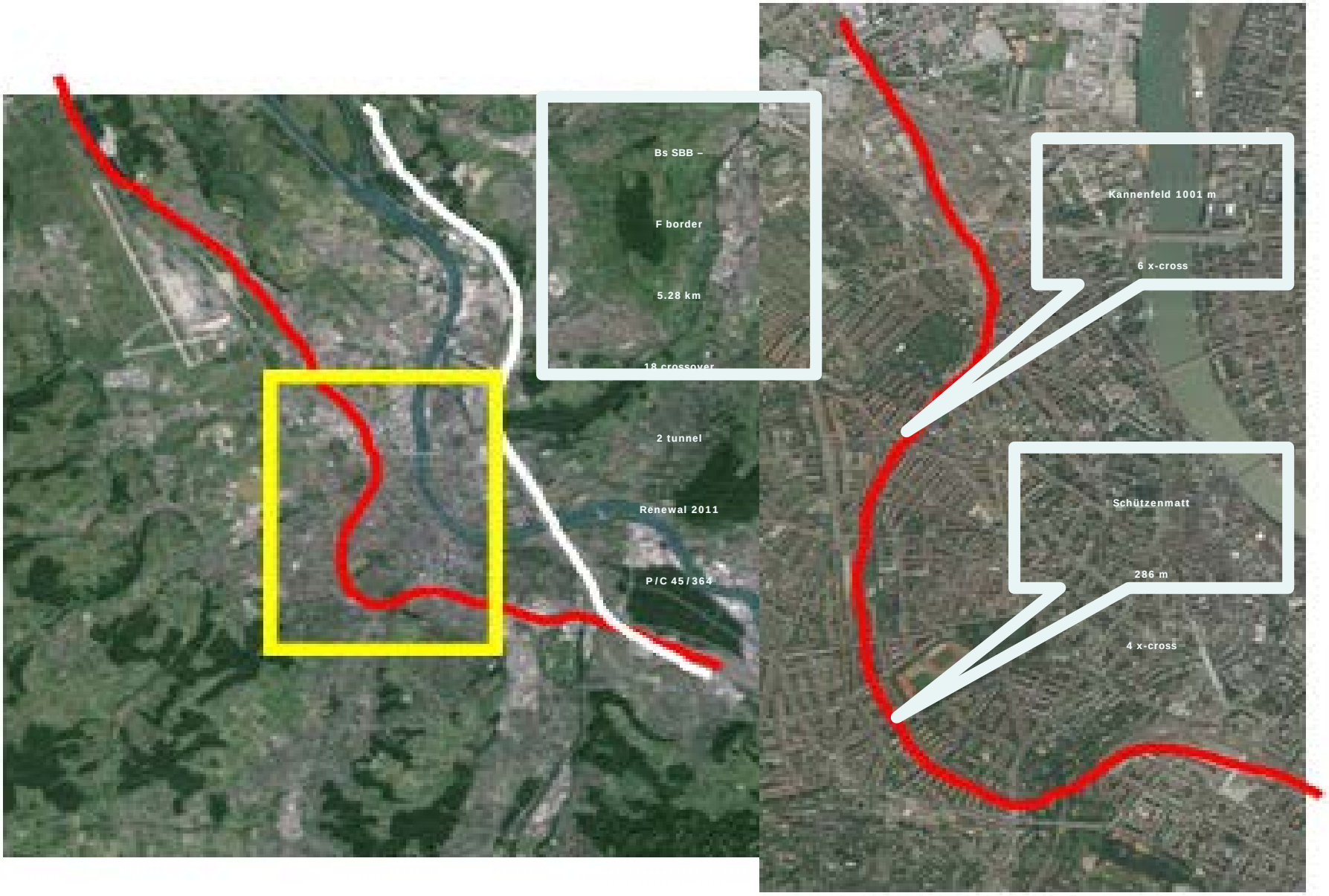
Basel area


Bs SBB –
F border
5.28 km
18 crossover
2 tunnel
Renewal 2011
P/C 45/364
Kannenfeld 1001 m
6 x-cross
Schützenmatt
286 m
4 x-cross

Switzerland

- In Switzerland, the upgrade of the Kannenfeld and Schützenmatt tunnels between Basel SBB and the French border could cost as much as 400 M€
- A “short life cycle renewal” was performed in 2011
- It might be possible to consider loading gauge enhancement when the next renewal is performed (around 2026)
- It is worth coordinating the Swiss and French projects at the ministry level

Contact

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ProRail

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NetworkRail

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