ATLAS of ERTMS

ATLAS of ERTMS

Worldwide Implementation 2009

Prepared in connection with
UIC ERTMS World Conference
Málaga, 31st March - 2nd April 2009

ertms
uic ertms platform

ATLAS of ERTMS

ATLAS of ERTMS

Worldwide Implementation 2009

Prepared in connection with
UIC ERTMS World Conference
Málaga, 31st March - 2nd April 2009

ertms
uic ertms platform

ISBN 978-2-7461-1630-6 (English version)

Table of contents

Introduction	5
Algeria	8
Australia	10
Austria	12
Belgium	14
Bulgaria	16
China	18
Croatia	20
Czech Republic	22
Denmark	24
Finland	26
France	28
Germany	30
Greece	32
Hungary	34
India	36
Italy	38
Lithuania	40
Luxembourg	42
Mexico	44
Norway	46
Poland	48

Portugal 50

Romania 52

Saudi Arabia 54

Slovakia 56

Slovenia 58

Spain 60

South Korea 62

Sweden 64

Switzerland 66

Taiwan (China) 68

The Netherlands 70

Turkey 72

United Kingdom 74

Some statistics on ETCS 77

Some statistics on GSM-R 83

List of abbreviations 87

Annex: Detailed GSM-R Maps 89

Introduction

UIC Atlas
of
ERTMS worldwide implementation

2009 release

The International Union of Railways conducted a survey on the situation of ERTMS, with the objective of delivering this Atlas during the UIC ERTMS World Conference 2009 held between March 31st and April 2nd in Málaga – Spain. Information reported in the ATLAS is extracted from the database on ERTMS implementation managed by UIC. This database is built on official information given by Platform members with the objective of offering them an ongoing added-value service and to maintain Platform strategic position and understanding of the rail business. The ATLAS 2009 is the most comprehensive assembly of concise information available on ERTMS implementation at this point in time. The survey presents a picture of the situation, as of December 2008, of the installed ERTMS components: ETCS, (the European standardised control command system) and GSM-R, (the standardised railway radio digital communication system) in respect of the implementation programmes in many countries.

Each ETCS project has been classified within one of the four following categories (status):

- Pilot/test means the infrastructure and/or rolling-stock is being tested, but not yet in commercial service;
- Contracted status means that a contract has been awarded to a supplier to equip the infrastructure and/or rolling-stock;
- Commercial operation means the line is in revenue service with ETCS;
- Planned is a status used for potential projects for which no contract has been awarded yet; for instance, that would typically be the case for lines that are part of important corridors.

A specific colour was assigned to each ETCS level, whereas continuous lines were used to represent commercially operated lines (dotted lines for contracted or planned lines).

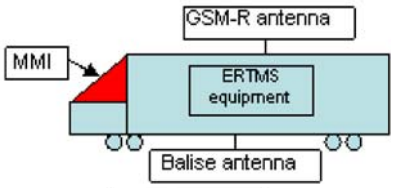
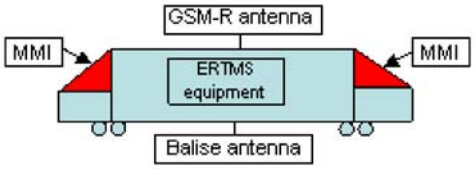
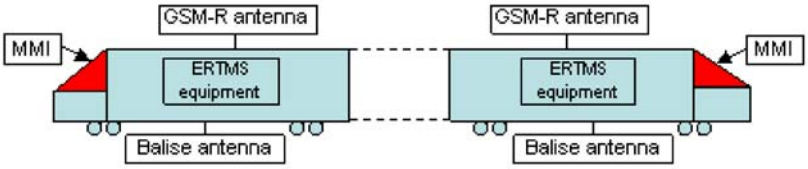
The above-mentioned statuses were assigned according to the national infrastructure manger or railway undertaking view point. When a country contracted both ERTMS Level 1 and Level 2 for the same section, we counted it as Level 2 in the statistics.

Similarly to the last edition, the set of concise information that is given in the form of a table is also displayed on a map for a convenient visualization. The term “section” or “route length” refers to the distance in km between the two cities connected by the project, and therefore can be single, double track or even triple track depending on the projects.

A similar approach has been adopted for rolling-stock to identify its status with regards to ERTMS. Usually, rolling-stock is classified using power supply source (Diesel, DC, AC, etc.). But given the impact of ETCS on the various types of engines, the classification below seemed more suitable.

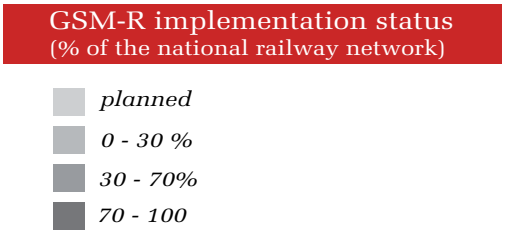
The various acronyms stand for:

EMU: Electric Multiple Unit;
DMU: Diesel Multiple Unit;
HST: High Speed Train;
MMI: Man Machine Interface.

Type	Architecture	Comments	Example
Single Cab Unit		One MMI One such engine per train	if self-propelled: switching/shunting/ plant loco; if not self-propelled: propelling control vehicle, driving van trailer…
2-cab loco		Two MMIs One such engine per train	General purpose self-propelled locos: suited both for freight and passenger cars trailing, track inspection locos…
EMU DMU HST		Two MMIs Two such engines per train	Conventional or high speed multiple units

"New" refers to newly-bought engines with ETCS on-board equipment included, whereas "retrofitted" refers to engines initially bought without ETCS on-board, and upgraded afterwards.

Contrary to ETCS which has been deployed on specific routes, GSM-R has been deployed on a national basis. As a consequence, the status of GSM-R is given by the colour of the map, showing its different implementation phases:



All this information was kindly provided by our members and UNIFE. The data collection process was frozen on 5th December 2008. However, very late contributions have been integrated when possible.

The following pages give country-specific information, whereas the reader can refer to statistics pages for global trends overview. "Europe" should be interpreted as the European continent, not the European Union (for instance, the Swiss data in encompassed in the European one).

ATLAS of ERTMS

ATLAS of ERTMS

Worldwide Implementation 2009

ALGERIA

Line	Section Length (km)	ETCS Level	Status	Year	Status	Railcar Type	Model name	Quantity	Origin	Year
Annaba - Ramdane Djamel	96	1 and 2	Contracted	2010	-	-	-	-	-	-
El Gourzi - Bordj BouArreridj	226	1 and 2	Contracted	2010						
El Khemis - Oued Sly	104	1 and 2	Contracted	2010						
Total	**426**									

Infrastructure

Total length of Rail Network	[km]	-
Planned GSM-R		-
Network Constructed		-
Network in Commercial Operation		-

Milestones

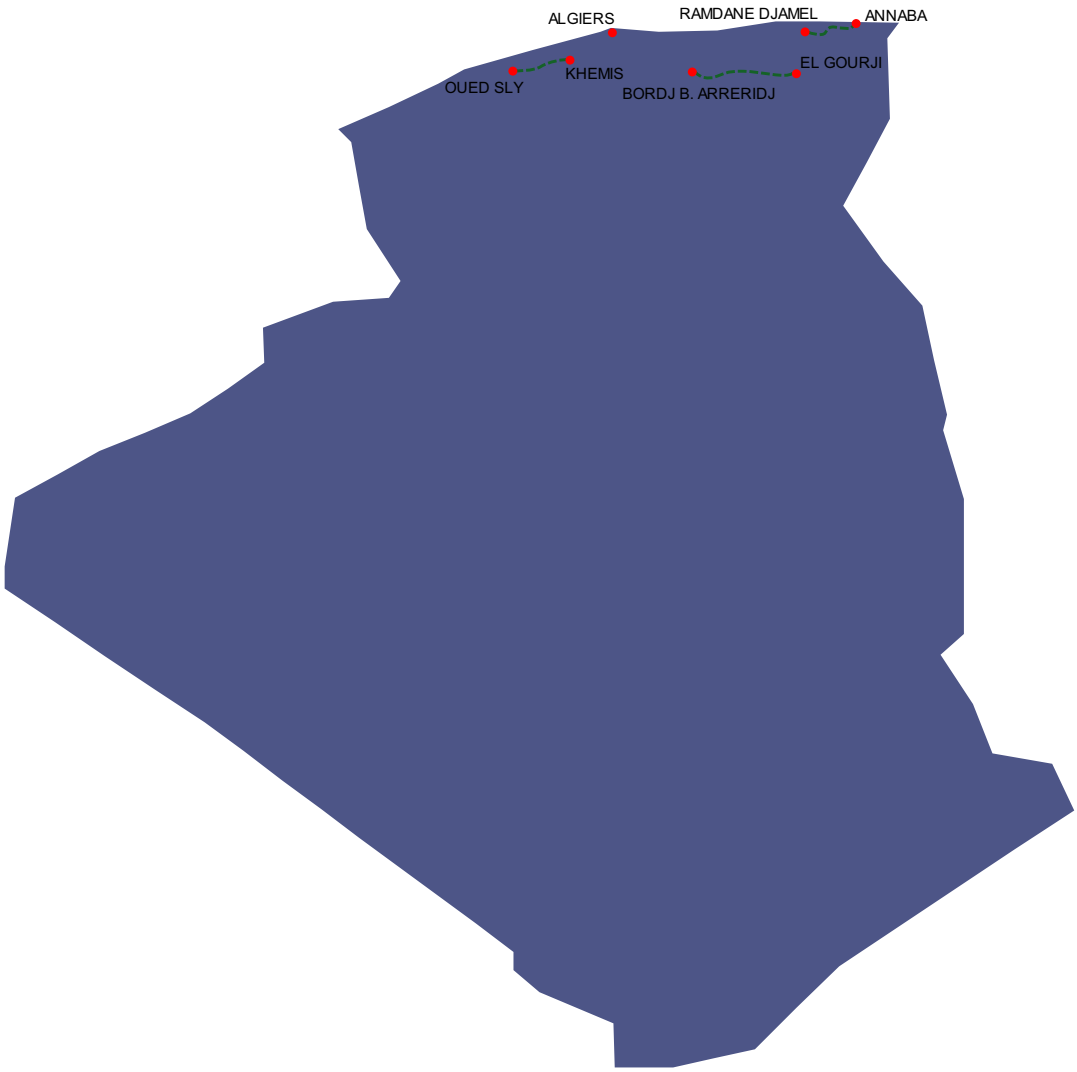
Start of Planning	[year]	-
Start of Implementation		2006
Ready for Operation		-
End of Migration		-

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		-	-
Dispatchers		-	-

Additional Information

The first GSM-R contract for the line EL-Gourzi – Touggourt has been awarded in 2006. Two new contracts were awarded in 2008: Tabia – Mecheria and Bordj-BouArreridj – M'Sila.



ETCS implementation status

Commercial operation L1
Contracted or Planned L1
Commercial operation L2
Contracted or Planned L2
Commercial operation L3
Contracted or Planned L3

AUSTRALIA

Line	Section Length (km)	ETCS Level	Status	Year
Penrith to Glenbrook	13,5	1	Pilot	2007
Wentworth Falls to Katoomba	11,5	1	Pilot	2007
Medlow Bath to Mt Victoria	15,3	1	Pilot	2007
Total	**40,3**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Pilot	EMU	V-set 4-car	1	Retrofitted	2007
Pilot	EMU	V-set 4-car	1	Retrofitted	2007
Pilot	EMU	V-set 4-car	1	Retrofitted	2007
Total			**3**		

Infrastructure

Total length of Rail Network	[km]	-
Planned GSM-R		-
Network Constructed		-
Network in Commercial Operation		-

Milestones

Start of Planning	[year]	-
Start of Implementation		2008
Ready for Operation		-
End of Migration		-

GSM-R

Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		-	-
Dispatchers		-	-

Additional Information

The first GSM-R project with an upgrade of the Victorian urban rail networks has already started.

ETCS implementation status

Commercial operation L1
Contracted or Planned L1
Commercial operation L2
Contracted or Planned L2
Commercial operation L3
Contracted or Planned L3

AUSTRIA

Line	Section Length (km)	ETCS Level	Status	Year
Wien to Hungarian border section Hegyesschalom	67	1	Commercial operation	2006
Total	**67**			
Wien - Salzburg Wels - Passau	394	1	Contracted	2009
Total	**394**			
Wien - Graz (Südbahn)	211			
Salzburg - Schwarzach - Wörgl	104	1	Planned	2012
		1	Planned	2013
Innsbruck - Bregenz	75			
Hohenau - Wien	83	1	Planned	2013
Wörgl - Innsbruck existing line+ new HS line	59	1	Planned	2013
		2	Planned	2012
Wien - St. Pölten New HS line	65			
		2	Planned	2012
Innsbruck - Brennero	54			
Total	**651**	1	Planned	2013

Status	Railcar Type	Model name	Quantity	Origin	Year
Commercial operation	Loco	ES64U2	13	Retroffited	2005
Total			**13**		
Planned	Loco	ES64U2	332	Retroffited	09/15
Planned	Loco	ES64U4	50	Retroffited	09/15
Planned	Single cab unit	OeBB 8633	10	Retroffited	09/12
Planned	Single cab unit	OeBB 8090	67		09/14
Planned	HST	ICE-T	3	Retroffited	09/12
Total			**462**		

Infrastructure

Total length of Rail Network	[km]	5500
Planned GSM-R		3500
Network Constructed		90
Network in Comercial Operation		80

Milestones

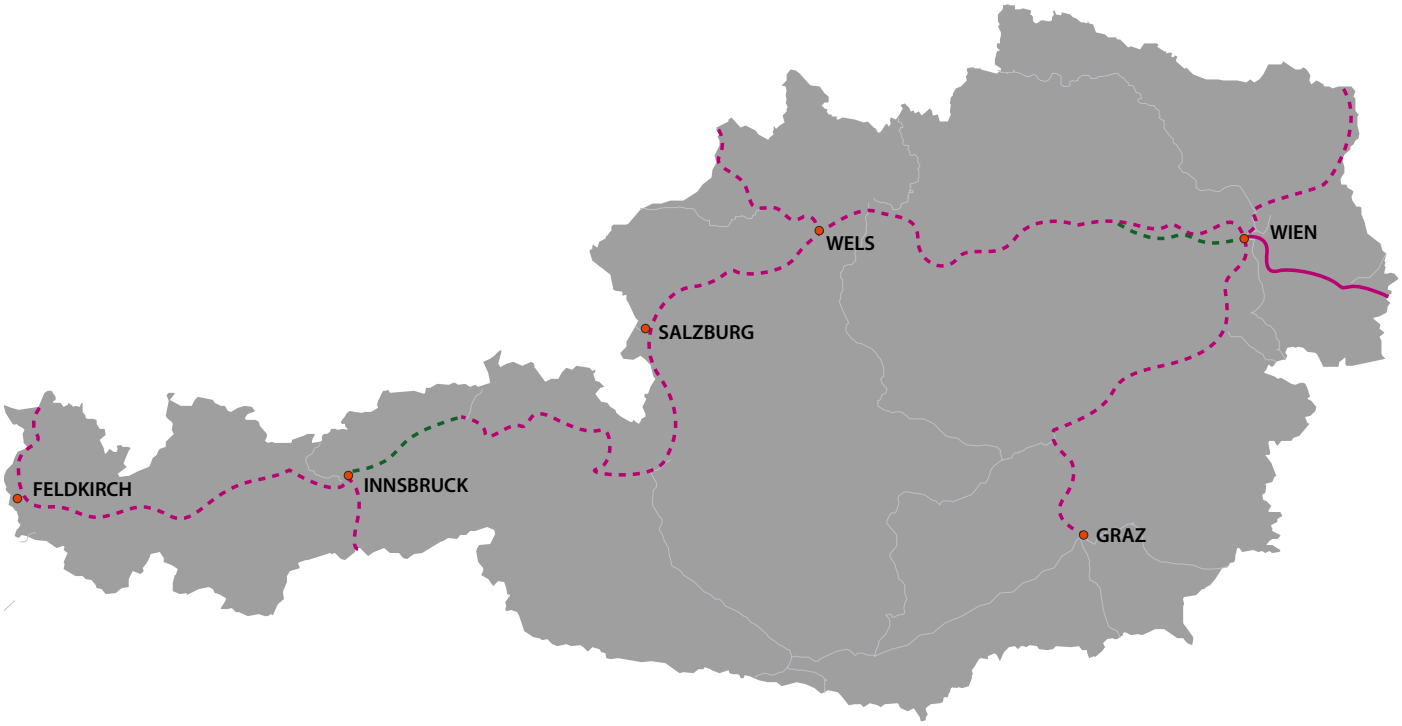
Start of Planning	[year]	2006
Start of Implementation		2007
Ready for Operation		2008
End of Migration		2013

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	15000	820
Cab Radios		1500	800
Dispatchers		250	6

Additional Information

Pilot is finalised. Implementation is ongoing according to Plan. OBB is one of the first implementers of the ATCA platform - IP Based NSS components.



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- ***0 - 30 %***
- *30 - 70%*
- *70 - 100%*

BELGIUM

Line	Section Length (km)	ETCS Level	Status	Year
HSL Antwerp -The Netherlands border	50	2	Pilot	2007
HSL Liège to German border	50	2	Pilot	2007
Total	**100**			
L36: Schaarbeek-Leuven	25	1	Contracted	2010
L36 N: Schaarbeek-Leuven	25	1	Contracted	2010
L35: Aarschot - Leuven	15	1	Contracted	2013
L139: Leuven - Ottignies	30	1	Contracted	2013
L25 Antwerpen-Luchtbal- Antwerpen-Berchem	6	1	Contracted	2013
L130: Auvelais - Namur	20	1	Contracted	2013
L166: Dinant - Bertrix	73	1	Contracted	2013
L165: Bertrix - Athus	70	1	Contracted	2013
L53: Mechelen - Leuven	24	1	Contracted	2013
L124+L130: Nijvel - Jemeppe/Sambre	48	1	Contracted	2013
Total	**336**			
L36+L37:Ans-Liège-Angleur	21	1	Planned	2015
L25+L27: Antwerpen-Vilvoorde	85	1	Planned	2013
L140: Ottignies-Fleurus	23	1	Planned	2013
L147: Fleurus - Auvelais	9	1	Planned	2013
L15: Antwerpen-Berchem - Lier	15	1	Planned	2013
L16: Lier - Aarschot	25	1	Planned	2013
L154: Namur - Dinant	28	1	Planned	2013
L28: Schaarbeek - Brussel-Zuid	6	1		
L50A: Brussel-Zuid - Denderleeuw	22	1		
L26: Vilvoorde - Linkebeek	12	1		
L124: Brussel-Zuid - Nijvel	28	1		
L161: Schaarbeek - Ottignies	30	1		
Port of Antwerp: L11,L11A,L10/2,L10	27	1	Planned	2015
L96N: Lembeek - Brussel-Zuid	16	1		
L161: Ottignies - Namur	32	1		
L144: Gembloux - Jemeppe/Sambre	15	1	Planned	2013
L162: Namur - Arlon (border to Luxemburg)	137	1	Planned	2013
L51(A): Zeebrugge - Brugge	14	1	Planned	2020
L50A: Brugge - Gent	41	1	Planned	2020
L58+L59: Gent - Antwerpen	64	1	Planned	2020
L35: Aarschot - Hasselt	39	1		
L34+L24: Hasselt - Montzen	72	1		
L50+L53: Gent - Mechelen	57	1	Planned	2020
L15: Lier - Mol	41	1		
L19: Mol - Hamont (Dutch border)	34	1		
Total	**893**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Commercial operation	Loco	G2000	19	New	2009
Total			**19**		
Contracted	Loco	HLE18* (ES60 U3)	120	New	2009
Contracted	Automotices	AM 08 (Desiro)	305	New	2011
Contracted	Voitures pilotes	M6	4	New	2009
Contracted	Loco	TRAXX**	40	Hired	2008
Total			**469**		

*Will be in commercial operation from 2nd semester 2009
**Will be in commercial operation end of 2009

Infrastructure

Total length of Rail Network	[km]	3400
Planned GSM-R		3000
Network Constructed		2800
Network in Commercial Operation		2020

Milestones

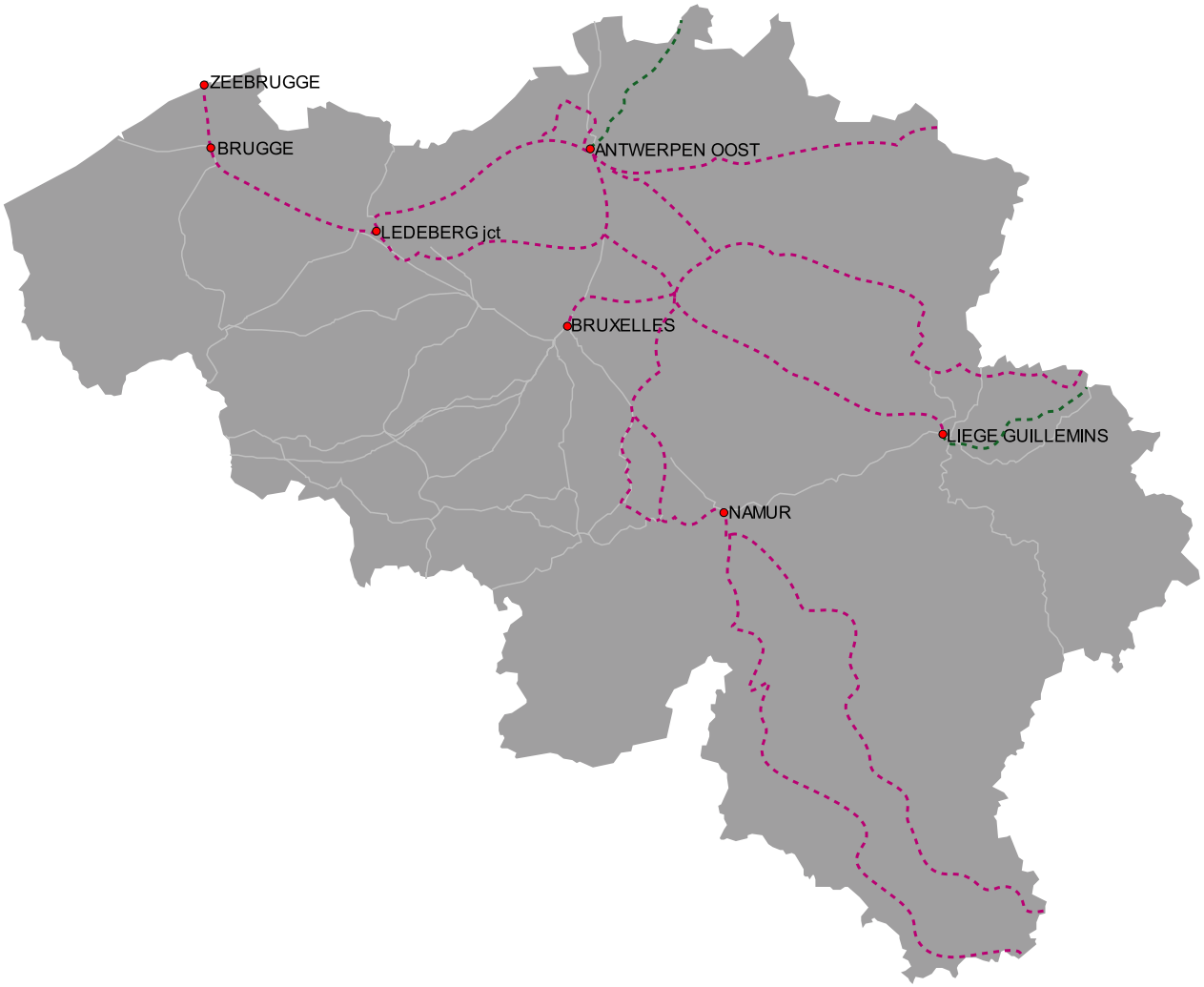
Start of Planning	[year]	2003
Start of Implementation		2005
End of Migration		2010

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	5000	400
Cab Radios		2000	750
Dispatchers		250	12

Additional Information

Advanced Implementation Stage, ongoing according to plan.



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- *0 - 30 %*
- ***30 - 70%***
- *70 - 100%*

BULGARIA

Line	Section Length (km)	ETCS Level	Status	Year
Plovdiv junction (Plovdiv - Filipovo - Skutare - Plovdiv)	30	1	Commercial operation	2006
Stara Zagora - Burgas	200	1	Commercial operation	2006
Total	**230**			
Plovdiv -Svilengrad - Turkish border	147	1	Contracted	2010
Total	**147**			
Plovdiv - Stara Zagora	114	1	Planned	2010
Kalotina Zapad - Sofia	57	1	Planned	2013
Sofia - Plovdiv	154	1	Planned	2015
Vidin - Sofia	276	1	Planned	2020
Sofia - Pernik - Radomir - Kulata	213	2	Planned	2020
Mezdra - Gorna Oryahovitsa	206	2	Planned	2025
Total	**1020**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Commercial operation	2-Cab Loco	68E	58	Retroffited	2005
Commercial operation	2-Cab Loco	Erd 651CL1	31	Retrofitted	2005
Commercial operation	EMU	3P 25	16	Retrofitted	2005
Total			**105**		

Infrastructure

Total length of Rail Network	[km]	4300
Planned GSM-R (step1)		151
Network Constructed		-
Network in Comercial Operation		-

Milestones

Start of Planning	[year]	2006
Start of Implementation		2007
Ready for Operation		2010
End of Migration		2011

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	175	-
Cab Radios		15	-
Dispatchers		22	-

Additional Information

General Project - "Reconstruction and electrification of 151 km line Plovdiv – Svilengrad", with GSM-R component; project dealine - November 2010. Actual stage for GSM-R - Preliminary design submitted.

ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- ***0 - 30 %***
- *30 - 70%*
- *70 - 100%*

CHINA

Line	Section Length (km)	CTCS Level	Status	Year
Wuhan-Guangzhou	1000	1	Contracted	2010
Zhengzhou-Xi'an	458	2	Contracted	2010
Shijiazhuang - Taiyuan	190	1	Contracted	2009
Beijing - Jinan - Zhengz-hou – Wuhan*	2132	1	Contracted	2009
Total	**3780**			
Beijing - Tianjin	116	1	Commercial Operation	2008
Total	**116**			

* Since no information was available on the precise path of this line, it is mentioned only in the tab.

Status	Railcar Type	Model name	Quantity	Origin	Year
Contracted	HST	CRH 3 type	30	New	2008
Contracted	HST	CRH 2 type	30	New	2008
Contracted	Other engines	Other engines	210		
Total			**270**		

Infrastructure

Total length of Rail Network	[km]	77084
Planned GSM-R		2968
Network Constructed		2665
Network in Commercial Operation		2665

Milestones

Start of Planning	[year]	2003
Start of Implementation		2004
Ready for Operation		-
End of Migration		-

GSM-R

Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	700 000	-
Cab Radios		20 000	907
Dispatchers		140 000	-

CTCS implementation status

Commercial operation L1
Contracted or Planned L1
Commercial operation L2
Contracted or Planned L2
Commercial operation L3
Contracted or Planned L3

CROATIA

Line	Section Length (km)	ETCS Level	Status	Year	Status	Railcar Type	Model name	Quantity	Origin	Year
Corridor X: Vinkovci - Tovarnik (state border)	34	1	Contracted	2008						
Total	**34**									
Corridor X: Savski Marof (state border) - Zagreb	26,8	1	Planned							
Corridor X: Zagreb - Dugo Selo	20,8	1	Planned							
Corridor X: Dugo Selo - Novska	84,2	1	Planned							
Corridor X: Zagreb - Sisak - Novska (parallel line with Zagreb - Dugo Selo - Novska)	117,4	1	Planned							
Corridor X: Novska - Vinkovci	151,1	1	Planned							
Corridor Vb: Botovo (state border) - Zagreb	79,1	1	Planned							
Corridor Vb: Zagreb - Karlovac	52,6	1	Planned							
Corridor Vb: Karlovac - Ogulin	56,5	1	Planned							
Corridor Vb: Ogulin - Rijeka (sea port)	119,7	1	Planned							
Corridor Vc: state border - Beli Manastir - Osijek	32,1	1	Planned							
Corridor Vc : state border - Beli Manastir - Osijek	18,4	1	Planned							
Corridor Vc: Strizivojna Vrpolje - Šamac - state border	22,7	1	Planned							
Corridor Vc: state border - Metković - Ploče (sea port)	22,8	1	Planned							
Total	**804,2**									

Infrastructure

Total length of Rail Network	[km]	2726
Planned GSM-R		1280
Network Constructed		-
Network in Commercial Operation		-

Milestones

Start of Planning	[year]	2004
Start of Implementation		2010
Ready for Operation		2011
End of Migration		-

GSM-R

Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	3320	-
Cab Radios		520	-
Dispatchers		13	-

Additional Information

Measurements of Coverage and Technical Documentation is finished for two corridors - 525 km.Tender for Pilot line is expected. Croatian Railways plan to start implementation of GSM-R network in the year 2010. The Pilot (part of corridor Vc) is expected to be finished end 2012.

ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- ***planned***
- *0 - 30 %*
- *30 - 70%*
- *70 - 100%*

CZECH REPUBLIC

Line	Section Length (km)	ETCS Level	Status	Year
Poříčany - Kolín	23.4	2	Pilot	2008
Total	**23.4**			
German border - Praha - Kolín	201	2	Planned	2013
Kolín - Brno - Austrian/Slovakian border	277	2	Planned	2011
Břeclav - Přerov	100	2	Planned	2013
Přerov – Petrovice u K.-Border CZ/PL	106	2	Planned	2014
Česká Třebová - Přerov	110	2	Planned	2014
Praha-Plzeň	114	2	Planned	2015
Plzeň - Cheb	106	2	Planned	2015
Dětmarovice – Mosty u Jablunkova – Border CZ/SK	53	2	Planned	2016
Polanka nad Odrou – Český Těšín	39	2	Planned	2015
Praha – České Budějovice	169	2	Planned	2015
České Budějovice – Border CZ/A	57	2	Planned	2016
Total	**1332**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Pilot		362	1	Retroffited	2007
Pilot		Comuter unit 471	1	Retroffited	2007
Total			2		
Planned	HST	Unit 680	7	New	2006
Planned		Unit 471	1	Retroffited	2008
Planned		Unit 362	1	Retroffited	2008
Planned	Loco	Unit 363	31	Retroffited	2013
Planned		Unit 380	20	New	2009
Total			**60**		

Infrastructure

Total length of Rail Network	[km]	9496
Planned GSM-R		5400
Network Constructed		537
Network in Commercial Operation		210

Milestones

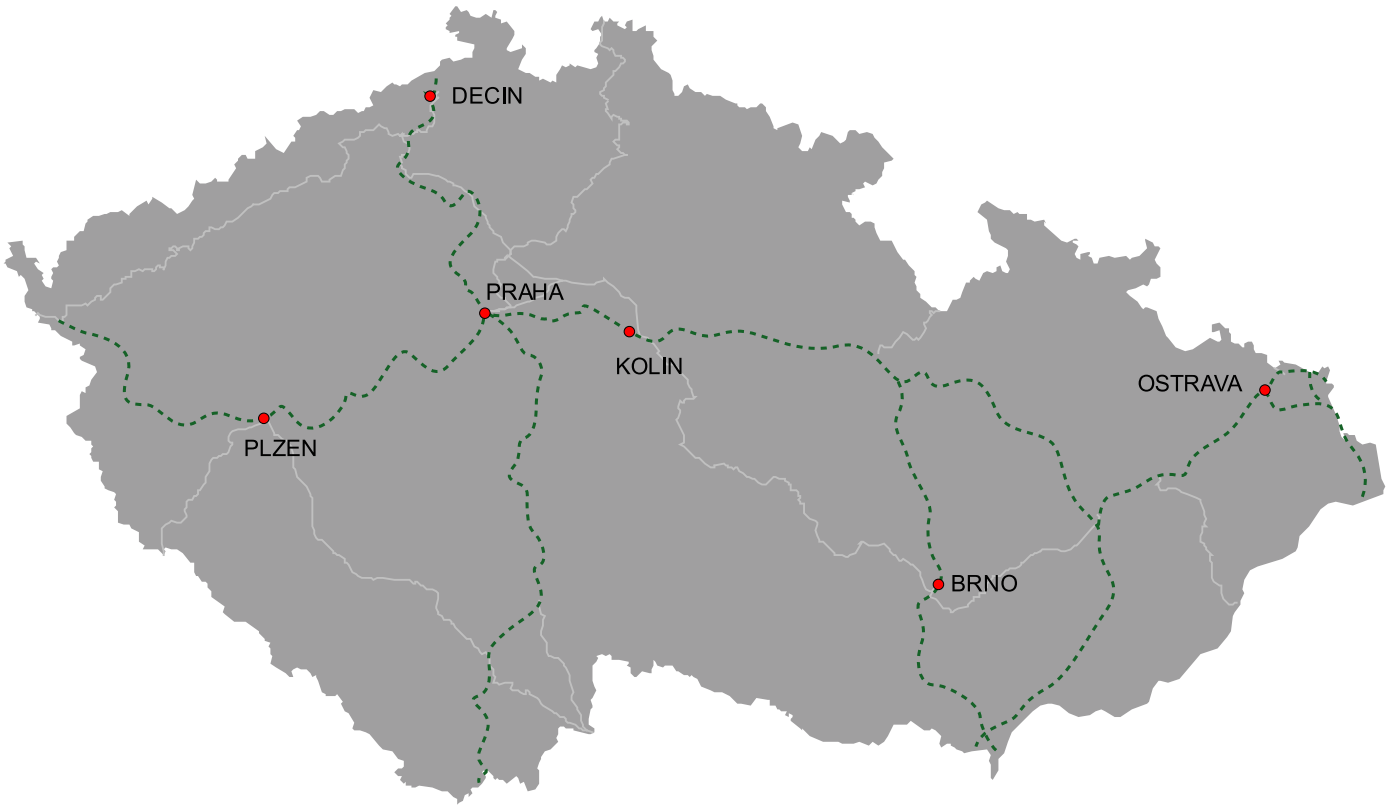
Start of Planning	[year]	2002
Start of Implementation		2004
End of migration (Voice, TEN-T)		2015
End of Migration (GSM-R for ETCS)		2020

GSM-R
Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	1000	300
Cab Radios		2000	162
Dispatchers		-	68

Additional Information

Pilot Finalised. Follow up project – Completion of 1st National railway corridor: Kolín – Česká Třebová – Břeclav [A/SK] & Prague connecting lines, 327 km, close to finish, will be completed until January 2009. 2nd National railway corridor Břeclav [A/SK] – Přerov – Ostrava – Petrovice u Karviné [PL], 206 km: Public tender will be put out until end of 2008, realization 2009-2010



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- ***0 - 30 %***
- *30 - 70%*
- *70 - 100%*

DENMARK

Line	Section Length (km)	ETCS Level	Status	Year
Langå-Aalborg-Frederikshavn	194	2	Planned	2018
Århus-Langå	46	2	Planned	2019
Fredericia-Århus	119	2	Planned	2019
Fredericia - Odense	73	2	Planned	2019
Odense-Ringsted-Roskilde	124	2	Planned	19/20
Roskilde -København - Peberholm-Swedish border	72	2	Planned	2020
Padborg - Fredericia	111	2	Planned	2019
Lunderskov-Esbjerg	58	2	Planned	2019
København G Vigerslev-Hvidovre F	7	2	Planned	2020
København H Helsingør	52	2	Planned	2021
Ringsted- Nykøbing F	77	2	Planned	18/19
Nykøbing F- Rødby	42	2	Planned	18/19
Roskilde - Holbæk	57	2	Planned	2020
Holbæk- Kalundborg	48	2	Planned	2020
Bramming - Tønder	68	2	Planned	2021
Vejle-Struer	148	2	Planned	2020
Struer-Thisted	74	2	Planned	2021
Langå-Struer	109	2	Planned	2020
Skanderborg - Herning - Skjern	113	2	Planned	2021
Esbjerg - Skjern - Holstebro	129	2	Planned	2021
Odense - Svendborg	51	2	Planned	2021
Sønderborg- Tinglev	41	2	Planned	2021
Århus-Grenaa	71	2	Planned	2021
Roskilde - Køge - Næstved	68	2	Planned	2017
Total	**1952**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Planned	EMU	ER	44	Retroffited	2016
Planned	EMU	ET	34	Retroffited	09/10
Planned	DMU	MF	96	Retroffited	2016
Planned	DMU	MG	83	Retroffited	2016
Planned	DMU	MP	23	Retroffited	2016
Planned	Loco	ME	18	Retroffited	2016
Total			**298**		

Infrastructure

Total length of Rail Network	[km]	2133
Planned GSM-R		2000
Network Constructed		-
Network in Commercial Operation		-

Milestones

Start of Planning	[year]	2000
Start of Implementation		2007
Ready for Operation		2011
End of Migration		2013

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	3100	-
Cab Radios		1500	180
Dispatchers		100	-

Additional Information

Finalization of radio planning documentation for the whole network, including ETCS Early Deployment and Private Railways is nearing completion. Work on the tender documents for both System Procurement and O&M is making good progress. The GSM-R frequencies have been leased.

ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- ***planned***
- *0 - 30 %*
- *30 - 70%*
- *70 - 100%*

FINLAND

Line	Section Length (km)	ETCS Level	Status	Year
Ring Rail Line Tikkurila - Vantaankoski	18	1 or 2	Planned	2019
Helsinki - Tikkurila - Kerava	29	1 or 2	Planned	2019
Kerava - Lahti	63	1 or 2	Planned	2019
Lahti - Kouvola - Luumäki - Vainikkala	153	1 or 2	Planned	2019
Kouvola - Juurikorpi - Kotka/Hamina	70	1 or 2	Planned	2019
Luumäki - Lappeenranta	27	1 or 2	Planned	2019
Parikkala - Joensuu	130	1 or 2	Planned	2019
Pieksämäki - Iisalmi	174	1 or 2	Planned	2019
Total	**664**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Planned	EMU	Sm3	18	New	-
Planned	EMU	Sm4	30	New	-
Planned	Loco	Sr2	46	New	-
Planned	DMU	Dm12	16	New	-
Total			**110**		

Infrastructure

Total length of Rail Network	[km]	5820
Planned GSM-R		4970
Network Constructed		4700
Network in Commercial Operation		-

Milestones

Start of Planning	[year]	2001
Start of Implementation		2003
Ready for Operation		2009
End of Migration		2010

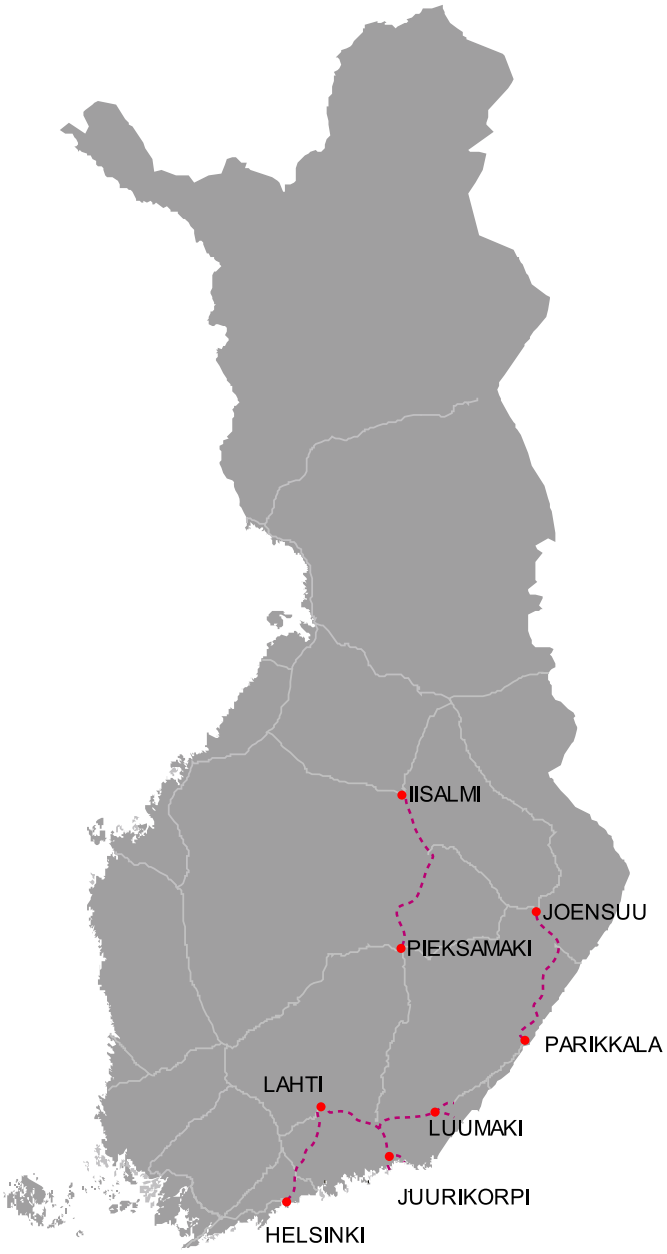
GSM-R

Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	3200	100
Cab Radios		1000	3
Dispatchers		-	64

Additional Information

Advanced implementation stage. BTS volume implementation mainly finished end 2008.GSM-R network (including dispatcher systems) is ready for country wide service beginning 2009.



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- ***0 - 30 %***
- *30 - 70%*
- *70 - 100%*

FRANCE

Line	Section Length (km)	ETCS Level	Status	Year
Paris - Strasbourg HSL	300	2	Contracted	2009
Total	**300**			
Rhin - Rhône East HSL	140	2	Planned	2012
Contournement Nîmes - Montpellier HSL	50	1 ou 2	Planned	2016
Paris - Lyon HSL	485	2	Planned	2018
South Europe Atlantique HSL	300	2	Planned	2016
Bretagne - Pays de Loire	200	2	Planned	2015
HSL Atlantique (Paris-Le Mans/Paris -Tours)	282	2	Planned	2017
Lyon - Torino Tunnel	50	2	Planned	2020
Luxembourg to Switzerland via Metz & Strasbourg	424	1	Planned	2015
Belgium to Lyon	821	1	Planned	2020
Lyon to Italy	253	1	Planned	2015
Lyon to Spain and Marseille	669	1	Planned	2020
International section of Paris Francfort corridor	56	1	Planned	2012
Feeding branches from Corridor D to port or freight terminal areas of Marseille	10	1		2020
Feeding branches from Corridor D to freight terminal areas of Avignon	3.5	1		2020
Feeding branches to port or freight terminal areas of Le Havre (Le Havre - Amiens - Lille)	312	1	Planned	2020
Feeding branches to freight terminal areas of Calais (Calais - Lille - Metz)	382	1	Planned	2020
Feeding branches to freight terminal areas of Paris (Paris - Amiens)	133	1	Planned	2020
Total	**4570.5**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Contracted	HST	TGV POS	19	New	2010
Contracted	HST	TGV PBA	9	Retroffited	2009
Contracted	HST	TGV PBKA	17	Retroffited	2009
Contracted	HST	TGV Dasye	49	New	2011
Total			**93**		

Infrastructure

Total length of Rail Network	[km]	32 000
Planned GSM-R		14 400
Network Constructed		2160
Network in Commercial Operation		1700

Milestones

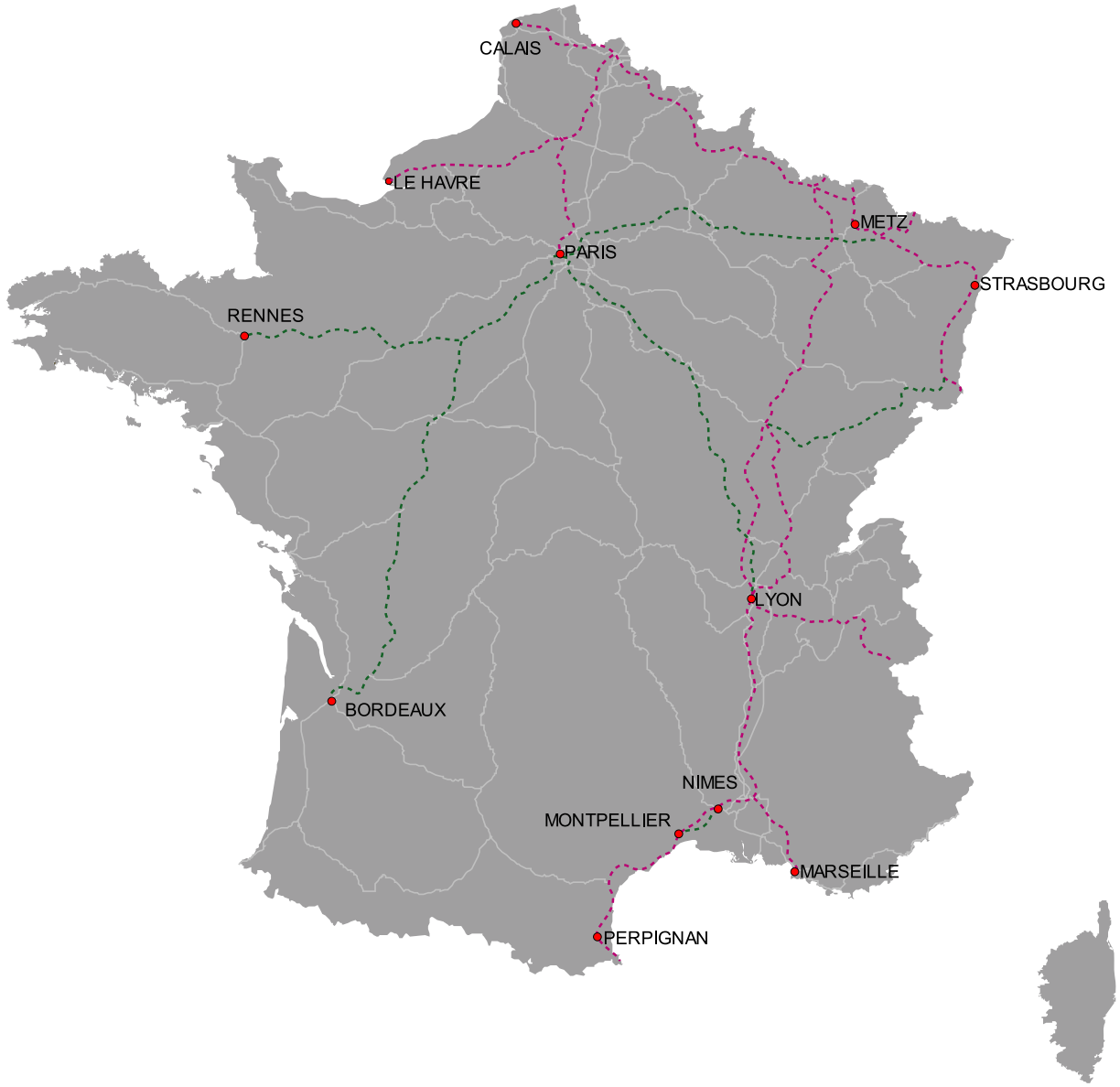
Start of Planning	[year]	2000
Start of Implementation		2003
Ready for Operation		-
End of Migration		2014

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		10 000	3000
GSM-R Line side Telephone Sets		6000	2215
Dispatchers		-	48

Additional Information

Step 1 (Tranche 1 - Eastern Part Roll Out) is under development, end of roll out expected mid 2009; for the rest of the network planned, the PPP - Private-Public Partnership is in final stage to be signed.



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- ***0 - 30 %***
- *30 - 70%*
- *70 - 100%*

GERMANY

Line	Section Length (km)	ETCS Level	Status	Year
Berlin - Halle/Leipzig	135	2	Commercial operation	2006
Total	**135**			
High Speed French Border - Saarbrücken -Mannheim	128	1 and 2	Contracted	2010
High Speed Nürnberg -Ingolstadt - München	170	2	Contracted	2010
Total	**298**			
Aachen - Belgian border	8	1	Planned	2009
High Speed Leipzig - Erfurt - Nürnberg	400	2	Planned	2017
Berlin - Rostock	120	1 LS	Planned	12 or 15
High Speed 3rd track Stelle - Lüneburg	30	2	Planned	2015
High Speed Berlin-Dresden	125	2	Planned	2018
Conventional Emmerich - Basel	680	1 LS and 2	Planned	2015
Conventional Aachen - Frankfurt (Oder)/Horka	1000	1 LS and 2	Planned	2020
Total	**2363**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Commercial operation	Loco	BR101	5	Retroffited	2005
Commercial operation	HST	BR401 (ICE1)	19	Retroffited	2006
Commercial operation	Loco	BR189	26	Retroffited	2007
Commercial operation	Loco	BR185	10	Retroffited	2007
Total			**60**		
Contracted	Loco	BR189	18	Retroffited	2009
Contracted	HST	BR409 (Thalys)	2	Retroffited	2009
Contracted	HST	BR406 (ICE3)	6	Retroffited	2011
Contracted	HST	BR406 (ICE3)	11	Retroffited	2011
Contracted		BR400	22	Retroffited	2008
Total			**59**		
Planned	HST	BR411	58	Retroffited	10/15
Planned	HST	BR415	11	Retroffited	2015
Planned	Loco	BR152	170	Retroffited	18/20
Planned	Loco	BR182	25	Retroffited	2013
Planned	Loco	BR185	372	Retroffited	13/20
Planned		BR186	20	Retroffited	18/20
Planned	Loco	BR189	46	Retroffited	10/20
Planned		E-Loco	210	New	20/22
Planned	Single cab unit	Driving T.	90	Retroffited	20/22
Planned	HST	BR403	50	Retroffited	16/19
Planned	EMU	EMU	501	Retroffited	20/22
Planned		BR18x	258	New	13/20
Planned		E-Loco	111	New	20/26
Planned		ICE X	130	New	13/18
Planned		Successor ICE 1/2	90	New	18/26
Planned	EMU	EMU	247	New	24/27
Total			**2389**		

Infrastructure

Total length of Rail Network	[km]	36 000
Planned GSM-R		29 300
Network Constructed		25 145
Network in Commercial Operation		24 710

Milestones

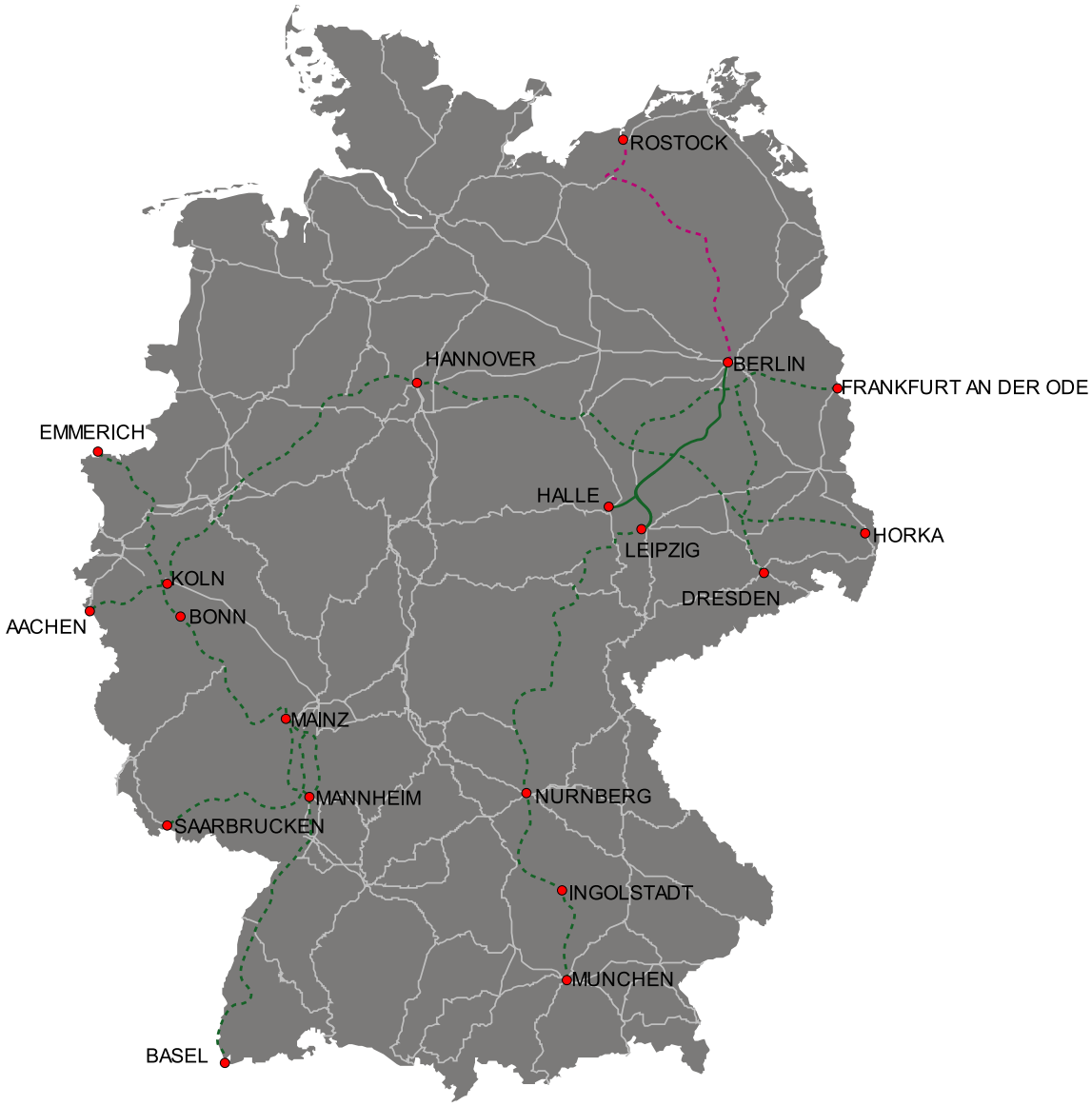
Start of Planning	[year]	2000
Start of Implementation		2004
Ready for Operation		2005
End of Migration (Step 1)		2007

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	31 346
Cab Radios		-	14 846
Dispatchers		-	421

Additional Information

Step 1- 24300 km was finalised end 2007. Step 2, additional # 5000 km are in implementation phase. Application for additional GSM-R frequencies (# MHz paired in the PMR/PAMR Band(Trunk Band)) sent to regulator. National designation expected soon.



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- *0 - 30 %*
- *30 - 70%*
- ***70 - 100%***

GREECE

Line	Section Length (km)	ETCS Level	Status	Year
SKA - Airport	40	1	Under test	2009
SKA - Korinth - Kiato	110	1	Under test	2009
Total	**150**			
Piraeus - Athens - SKA	18	1	Contracted	2009
SKA - Tithorea	148	1	Contracted	2010
Inoi - Chalkida	22	1	Contracted	2010
Domokos - Platy	195	1	Contracted	2010
Platy - Thessaloniki	41	1	Contracted	2010
Thessalonki - Promacho-nas	140	1	Contracted	2010
Total	**564**			
Thessaloniki - Idomeni	79	1	Planned	2010
Total	**79**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Contracted	DMU	GTW2/6 Rail bus	12	Retroffited	2010
Contracted	DMU	GTW2/6 Rail bus	5	Retroffited	2010
Contracted	DMU	Man 2000	15	Retroffited	2010
Contracted	Loco	Adtranz class 200 DE2000 IC200N	36	Retroffited	2010
Contracted	DMU	Intercity AEG DE-IC200N	16	Retroffited	2010
Contracted	Loco	High Per-formance Loco120 Hellas Sprinter	30	Retroffited	2010
Contracted	EMU	DESIRO	20	Retroffited	2010
Total			**134**		

Infrastructure

Total length of Rail Network	[km]	950
Planned GSM-R		707
Network Constructed (GSM-R)		-
Network in Comercial Operation		-

Milestones

Start of Planning	[year]	2006
Start of Implementation		2007
Ready for Operation		2009
End of Migration		2011

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	10 000	-
Cab Radios		630	3
Dispatchers		50	-

Additional Information

The network implementation is ongoing.

ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- ***0 - 30 %***
- *30 - 70%*
- *70 - 100%*

HUNGARY

Line	Section Length (km)	ETCS Level	Status	Year
(Vienna -) Hegyeshalom - Budapest	190	1	Commercial operation	2007
Hodos - Zalacséb-S.	27	1	Commercial operation	2003
Total	**217**			
Rajka - Hegyeshalom	15	2	Planned	2013
Szajol - Debrecen - Nyíregyháza-Záhony	226	2	Planned	2013
Boba – Székesfehérvár	120	2	Planned	2013
Székesfehérvár – Budapest	60	2	Planned	2013
Győr – Celldömölk - Boba	82	2	Planned	2013
Boba - Hodos	104	2	Planned	2013
Budapest- Cegéd-Szajol-Lökösházá	225	2	Planned	2013
Total	**832**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Commercial operation	Loco	V63	17	Retroffited	2005
Total			**17**		

Infrastructure

Total length of Rail Network	[km]	7500
Planned GSM-R		4360
Network Constructed		-
Network in Commercial Operation		-

Milestones

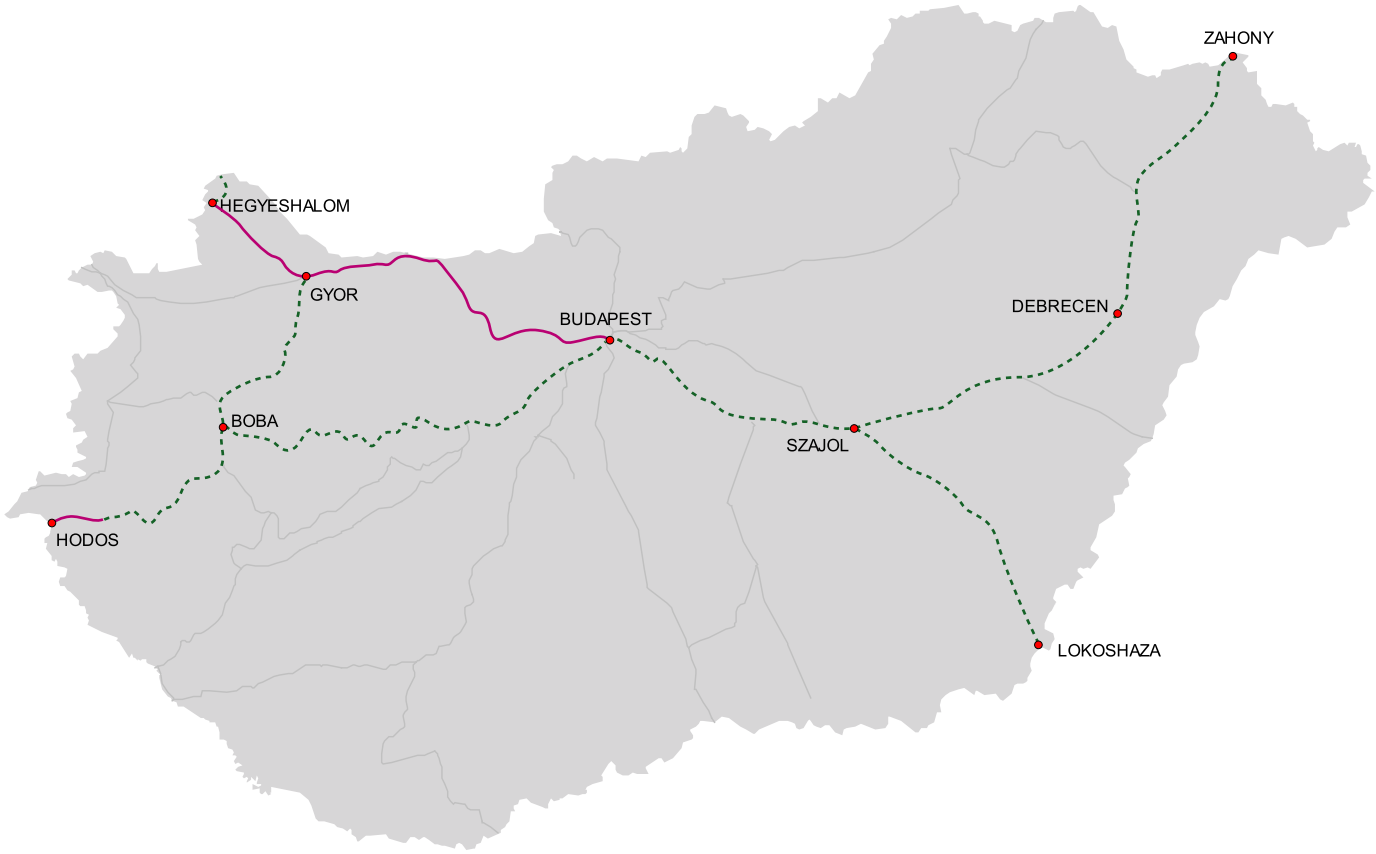
Start of Planning	[year]	2007
Start of Implementation		2009
Ready for Operation		2009
End of Migration		2013

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	14 800	-
Cab Radios		1500	-
Dispatchers		-	-

Additional Information

The GSM-R tender for Step 1 is in final phase.



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- ***planned***
- *0 - 30 %*
- *30 - 70%*
- *70 - 100%*

INDIA

Line	Section Length (km)	ETCS Level	Status	Year
Chennai -Gummudipundi	50	1	Commercial Operation	2008
Total	**50**			
Delhi - Agra	196	1	Contracted	2007
Total	**196**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Contracted	Loco	WAP 5 & 7	35	Retroffited	2007
Contracted	EMU		84	Retroffited	2007
Total			**119**		

Infrastructure

Total length of Rail Network	[km]	63 332
Planned GSM-R		3200
Network Constructed		-
Network in Commercial Operation		-

Milestones

Start of Planning	[year]	-
Start of Implementation		2006
Ready for Operation		-
End of Migration		-

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		-	-
Dispatchers		-	-

Additional Information

GSM-R is planned for 3200 km. The implementation is on-going.

ETCS implementation status

Commercial operation L1
Contracted or Planned L1
Commercial operation L2
Contracted or Planned L2
Commercial operation L3
Contracted or Planned L3

ITALY

Line	Section Length (km)	ETCS Level	Status	Year
Torino-Novara	90	2	Commercial operation	2006
Roma-Napoli	200	2	Commercial operation	2005
Milano - Bologna	182	2	Commercial operation	2008
Total	**472**			
Bologna - Florence	90	2	Contracted	2009
Novara - Milan	34	2	Contracted	2009
Milan - Verona	112	2	Contracted	2013
Verona - Padova	77	2	Contracted	2013
Total	313			
Roma - Florence	260	2	Planned	2011
Corridor A	520	1	Planned	2015
Corridor B	428	1	Planned	2014
Corridor D	361	1	Planned	2014
Total	**1569**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Commercial operation	EMU	ETR470	15	Retroffited	2002
Commercial operation	EMU	ETR485	15	Retroffited	2007
Commercial operation	EMU	ETR500	30	Retroffited	2005
Commercial operation	EMU	ETR500	30	Retroffited	2005
Commercial operation	EMU	ETR600	12	New	2006
Commercial operation	EMU	ETR610*	14	New	2009
Commercial operation	Loco	Mitsui 189	15	Retroffited	2009
Total			**131**		
Contracted	Loco	E403 **	15	Retroffited	2009
Total			**15**		

*In pre operation
** Due in operation April 2009

Infrastructure

Total length of Rail Network	[km]	16 500
Planned GSM-R		9600 + 599
Network Constructed		8500 + 480
Network in Comercial Operation **(Conventional Line +HSL)**		8500 + 480

Milestones

Start of Planning	[year]	2001
Start of Implementation		2001
Ready for Operation		2004
End of Migration		2007

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	6000	3000
Cab Radios		3450	650
Dispatchers		1500	800

Additional Information

The GSM-R services are in operation on the whole commercial network (8300 km) and on additional 200 Km of low traffic side-lines. The GSM-R coverage project of additional 1100 Km (secondary lines) have been finalised (Project Targeted deadline: 1° Quarter 2010).

ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- *0 - 30 %*
- *30 - 70%*
- ***70 - 100%***

LITHUANIA

Line	Section Length (km)	ETCS Level	Status	Year	Status	Railcar Type	Model name	Quantity	Origin	Year
state border -Marijampolė	40	2	Planned	2015						
Vilnius - Kaunas, Vilnius - Kena, Kyviškes - Valčiūnai - Paneriai, Kaunas - Kybartai	270	1	Planned	2022						
Kaišiadorys - Radviliškis, Šiauliai - Klaipėda, Gaižiūnai - Palemonas	316	1	Planned	2025						
Total	**626**									

Infrastructure

Total length of Rail Network	[km]	1780
Planned GSM-R		1179
Network Constructed		-
Network in Commercial Operation		-

Milestones

Start of Planning	[year]	-
Start of Implementation		2008
Start of Migration		2011

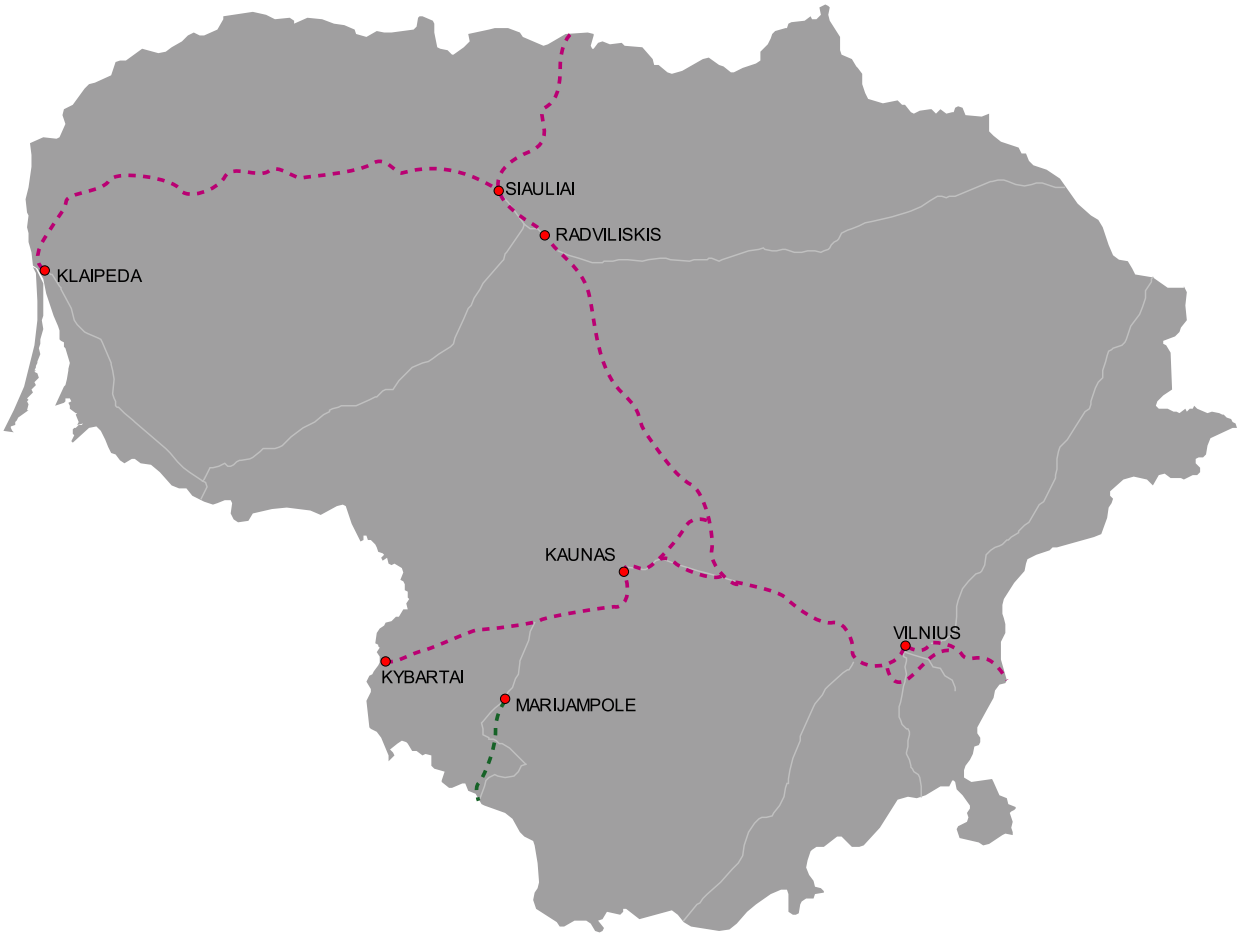
GSM-R

Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		-	-
Dispatchers		-	-

Additional Information

The GSM-R tender was granted middle 2008, implementation have started.



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- ***0 - 30 %***
- *30 - 70%*
- *70 - 100%*

LUXEMBOURG

Line	Section Length (km)	ETCS Level	Status	Year
Bettembourg - Dudelange/Usines -Volmerange	6	1	Commercial operation	2007
Luxembourg – Bettembourg frt. (Luxembourg - Berchem - Bettembourg frt.)	11	1	Commercial operation	2007
Ettelbruck - Luxembourg (Luxembourg - Dommeldange, Lorentzweiler, Mersch, Cruchten Ettelbruck)	40	1	Commercial operation	2005
Luxembourg – Oetrange (Luxembourg - Sandweiler)	10	1	Commercial operation	2005
Luxembourg Station	-	1	Commercial operation	2006
Total	**67**			
The remaining part of the network	214	1	Contracted	2010
Total	**214**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Commercial operation	EMU	CFL 2000 Type Z2	4	Retrofitted	2004
Commercial operation	Loco	CFL 3000	3	Retrofitted	2005
Commercial operation	EMU	CFL 2000 Type Z2	18	Retrofitted	2006/ 2007
Total			**25**		
Planned	EMU	CFL 2200 Type TER2-ng	12	Retrofitted	2011
Planned	Loco	CFL 4000	20	Retrofitted	2010
Planned	Single Cab Unit	CFL Trailer 2N	20	Retrofitted	2010
Planned	Loco	CFL 3000	16	Retrofitted	2011
Total			**68**		

Infrastructure

Total length of Rail Network	[km]	275
Planned GSM-R		275
Network Constructed		-
Network in Commercial Operation		-

Milestones

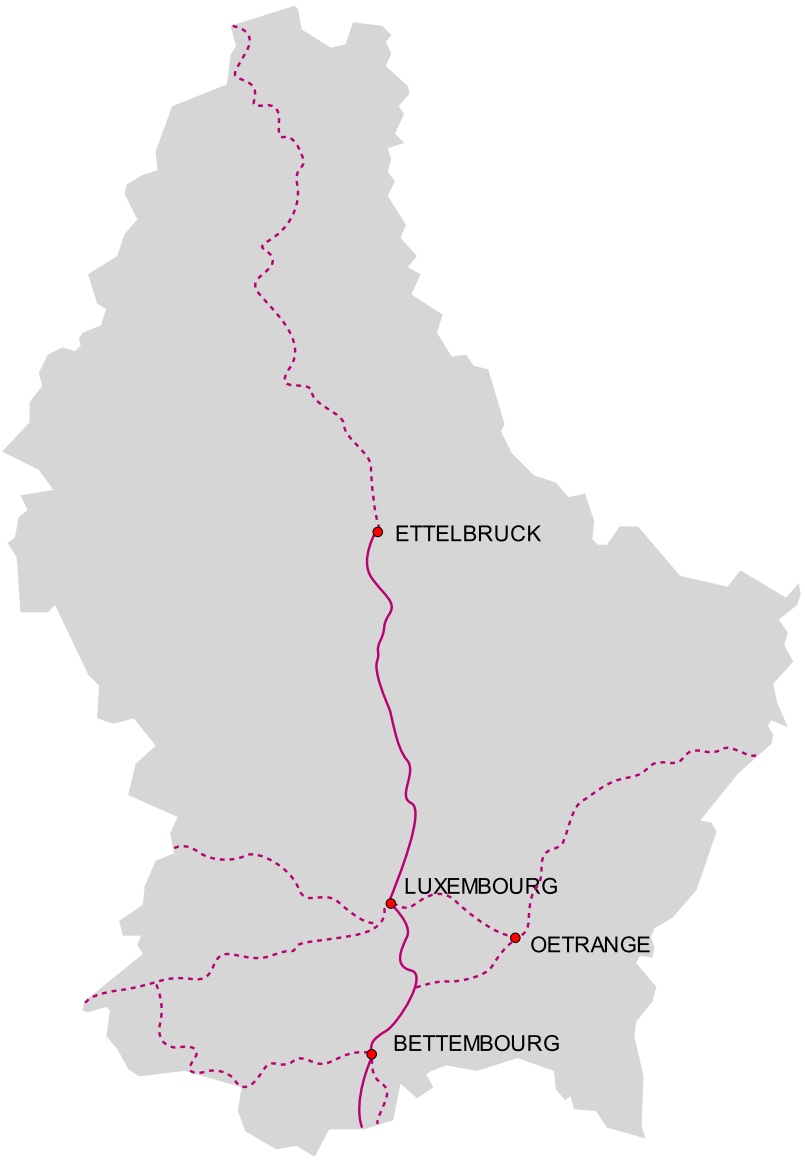
Start of Planning	[year]	-
Start of Implementation		-
Ready for Operation		-
End of Migration		-

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		-	-
Dispatchers		-	-

Additional Information

Radio planning made.



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- ***planned***
- *0 - 30 %*
- *30 - 70%*
- *70 - 100%*

MEXICO

Line	Section Length (km)	ETCS Level	Status	Year	Status	Railcar Type	Model name	Quantity	Origin	Year
Mexico City suburban line (Cuautitlán-San Rafael-Buenavista)	35	1	Contracted	2008	Contracted	EMU	CAF Serie 447	20	Retrofitted	2008
Total	**35**				**Total**			**20**		

Infrastructure

Total length of Rail Network	[km]	-
Planned GSM-R		-
Network Constructed		-
Network in Commercial Operation		-

Milestones

Start of Planning	[year]	-
Start of Implementation		-
Ready for Operation		-
End of Migration		-

GSM-R

Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		-	-
Dispatchers		-	-

ETCS implementation status

Commercial operation L1
Contracted or Planned L1
Commercial operation L2
Contracted or Planned L2
Commercial operation L3
Contracted or Planned L3

NORWAY

Line	Section Length (km)	ETCS Level	Status	Year
Østfoldbanen østre linje	80	2	Planned	2012
(Moss)-Kornsjø	109	2	Planned	2015
(Ski)-Moss, Lillestrøm-Charlottenberg gr.	150	2	Planned	2016
(Oslo)-Alna - Lillestrøm (inkl. Alnabru og Loenga)	51.9	2	Planned	2017
Hokksund-Kongsberg-Nordagutu, (Tønsberg)-(Nordagutu),	245.9	2	Planned	2018
(Nordagutu)-Kristiansand, (Drammen)-Hokksund-Hønefoss	351.7	2	Planned	2019
(Kristiansand)-Stavanger	230.5	2	Planned	2020
(Eidsvoll)-Hamar	58.6	2	Planned	2021
(Dombås)-Trondheim	210.8	2	Planned	2022
Jessheim-Eidsvoll, (Hamar)-Dombås, (Oslo)-Roa, Roa-Hønefoss	327.5	2	Planned	2023
(Hønefoss)-Bergen	492.9	2	Planned	2024
Narvik-Bjørnfjell	43.5	2	Planned	2025
(Oslo)-Gardemoen-Eidsvoll	65.1	2	Planned	2026
Osloområdet (GS-anlegget), (Oslo)-Ski	58.2	2	Planned	2027
(Oslo)-Asker, Asker-Drammen,	262.5	2	Planned	2028
Drammen-Tønsberg, Hell-Storlien gr., (Sandvika)-(Asker) og Askerbanen, (Asker)-Spikkestad	550.5	2	Planned	2029
Røros-Støren, (Trondheim)-Grong, Hamar-Elverum-Røros (Grong)-Mo i Rana, Mo i Rana-Bodø	508.8	2	Planned	2030
Total	**3797.4**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Planned	EMU	Type 69	51	Retroffited	2015
Planned	EMU	Type 70	16	Retroffited	2015
Planned	EMU	Type 72	36	Retroffited	2015
Planned	EMU	Type 73	22	Retroffited	2015
Planned	EMU	Type 74	50	Retroffited	2015
Planned	DMU	Type 93	15	Retroffited	2020
Planned	Loco	El18	22	Retroffited	2015
Total			**212**		

Infrastructure

Total length of Rail Network	[km]	4077
Planned GSM-R		3800
Network Constructed		3800
Network in Commercial Operation		3800

Milestones

Start of Planning	[year]	1998
Start of Implementation		2003
Ready for Operation		-
End of Migration		2007

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	5000	4420
Cab Radios		2000	1434
Dispatchers		16	16

Additional Information

Migrated to GSM-R end 2007. New features for on board staff implemented end 2008.

ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- *0 - 30 %*
- *30 - 70%*
- ***70 - 100%***

POLAND

Line	Section Length (km)	ETCS Level	Status	Year
Legnica –Miłkowice	9,826	2	Planned	2009
Miłkowice – Chojnów	8,473	2	Planned	2009
Chojnów – Okmiany	12,127	2	Planned	2009
Okmiany – Bolesławiec	14,99	2	Planned	2009
Bolesławiec – Zebrzydowa	13,708	2	Planned	2009
Zebrzydowa – Wegliniec	12,203	2	Planned	2009
Węgliniec – Bielawa Dolna	12,544	2	Planned	2009
Bielawa Dolna – Country Border	0,529	2	Planned	2009
Trakiszki – Suwalki – Sokólka – Bialystok – Malkinia - Warszawa	340,4	2	Planned	
Grodzisk Mazowiecki – Zawiercie	224	1	Planned	
Total	**648,8**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Planned	Loco	SU 46	2	Retroffited	2009
Planned	Loco	ET 22	2	Retroffited	2009
Planned	Loco	EN 57	2	Retroffited	2009
Planned	Loco	EU07/EU 08	2	Retroffited	2009
Total			**8**		

Infrastructure

Total length of Rail Network	[km]	19 500
Planned GSM-R		15 000
Network Constructed		-
Network in Commercial Operation		-

Milestones

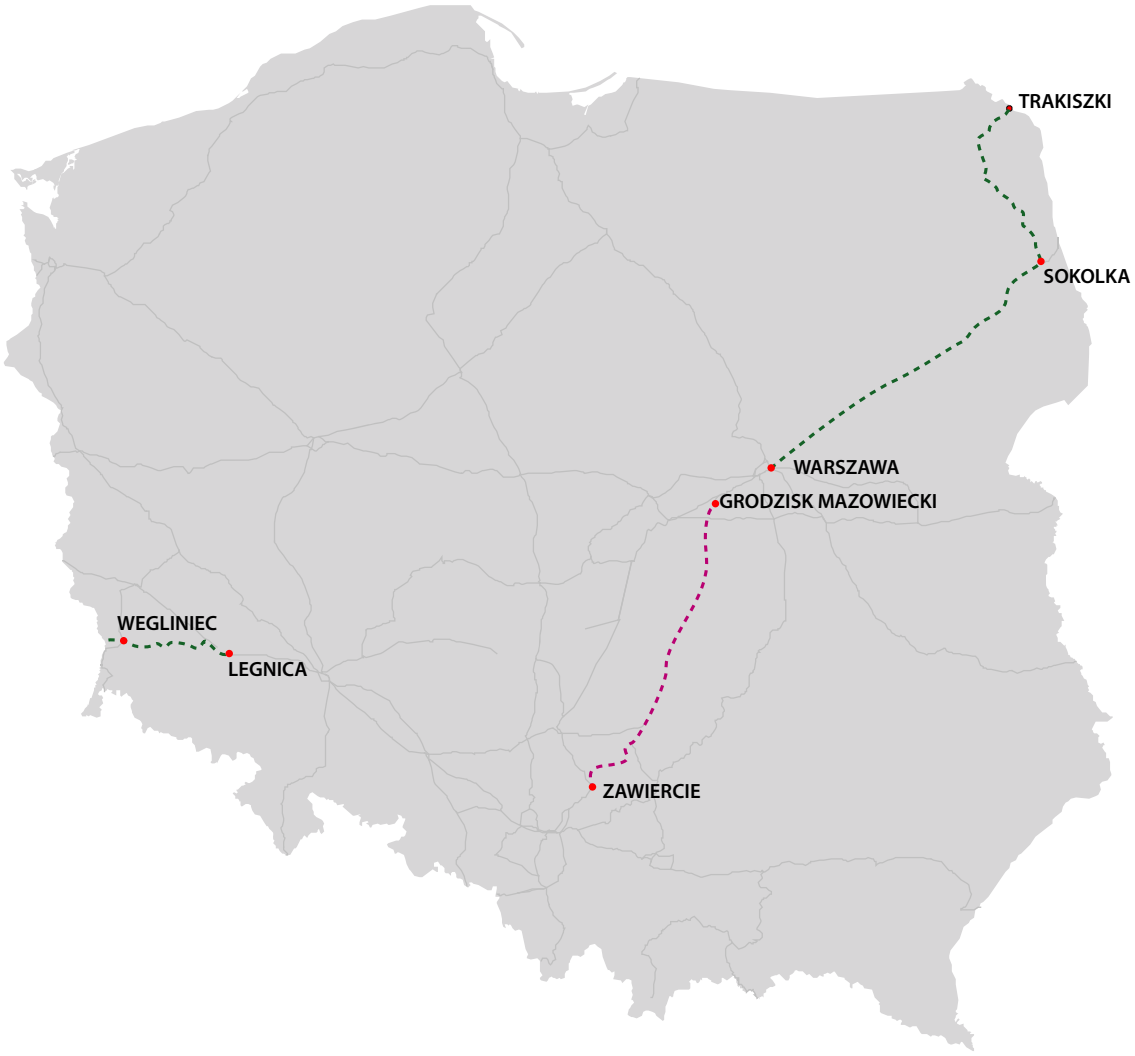
Start of Planning	[year]	2007
Start of Implementation		2008
Ready for Operation		2010
End of Migration		2015

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	40 000	-
Cab Radios		6500	-
Dispatchers		300	-

Additional Information

The first GSM-R Pilot, intended to be multivendor, is in tender process.



ETCS implementation status

Commercial operation L1
Contracted or Planned L1
Commercial operation L2
Contracted or Planned L2
Commercial operation L3
Contracted or Planned L3

GSM-R implementation status
(% of the national railway network)

planned
0 - 30 %
30 - 70%
70 - 100%

PORTUGAL

Line	Section Length (km)	ETCS Level	Status	Year
High Speed Lisboa - Porto	300	2	Planned	2015
High Speed Lisboa - Madrid	200	2	Planned	2013
High Speed Porto - Vigo	100	2	Planned	2013
High Speed Aveiro - Salamanca		2	Planned	
High Speed Évora - Faro Huelva Corridor		2	Planned	
Conventional North South Corridor Porto - Sines	640	1	Planned	
Conventional South transversal Corridor Sinez - Elvas	200	1	Planned	2013
Conventional North transversal Corridor Pampilhosa - Vilar Formoso -Salamanca	200	1	Planned	
Total	**1040**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Planned	DMU	-	25	New	2009
Planned	EMU	-	36	New	2009
Total			**61**		

Infrastructure

Total length of Rail Network	[km]	3600
Planned GSM-R		2600
Network Constructed		-
Network in Commercial Operation		-

Milestones

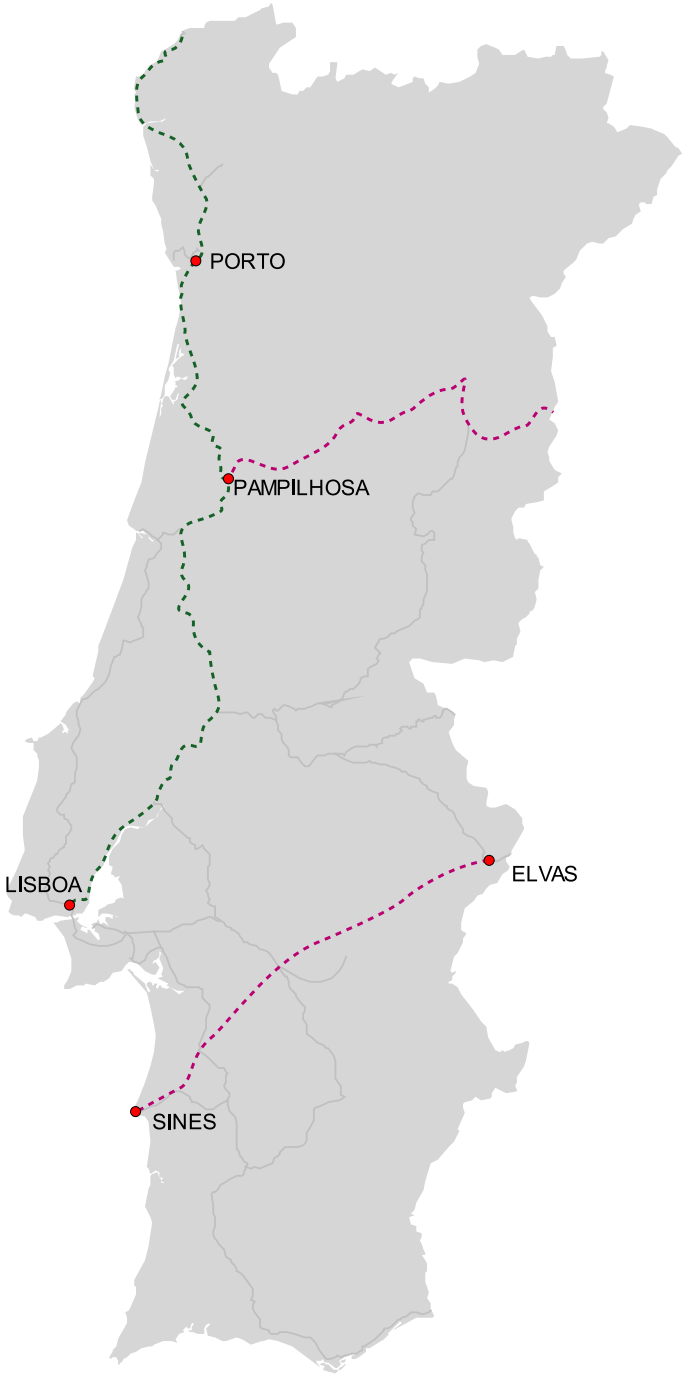
Start of Planning	[year]	2007
Start of Implementation		2009
Ready for Operation		-
End of Migration		2014

GSM-R
Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		650	-
Dispatchers		-	-

Additional Information

Final decision taken to install GSM-R all conventional line and on the HSL. Possible installation of GSM-R on some of the secondary lines in a second phase.Tender process for NSS started. National Telecomms GSM-R operation license for Refer Telecom in discussion be discussed until end 2008



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- ***planned***
- *0 - 30 %*
- *30 - 70%*
- *70 - 100%*

ROMANIA

Line	Section Length (km)	ETCS Level	Status	Year	Status	Railcar Type	Model name	Quantity	Origin	Year
Chitila - Crivina	30	2	Pilot							
Total	**30**									
Bucharest - Campina	92	1	Commercial operation	2004						
Total	**92**									
(Curtici -) Bekeskaba - Simeria	175	2	Planned	2010						
Simeria -Sighisoara - Brasow	310	2	Planned	2010						
Bukarest - Fetesti	150	1	Planned	2009						
Fetesti - Constanta	80	1	Planned	2009						
Total	**715**									

Infrastructure

Total length of Rail Network	[km]	11 380
Planned GSM-R		750
Network Constructed		-
Network in Commercial Operation		-

Milestones

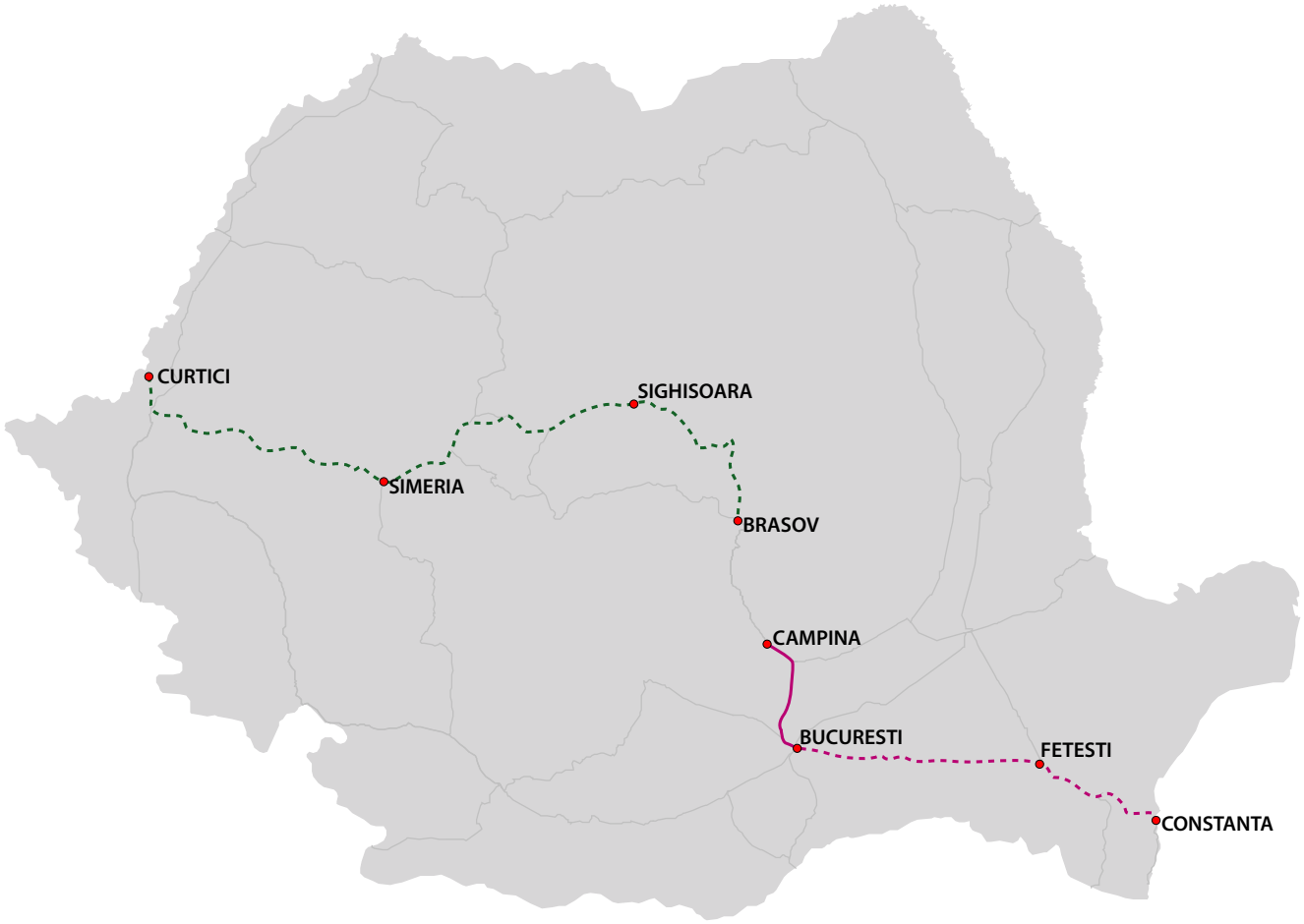
Start of Planning	[year]	2008
Start of Implementation		2009
Ready for Operation		-
End of Migration (Corridors)		2015

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		-	-
Dispatchers		-	-

Additional Information

The ERTMS L2 Pilot, with GSM-R component, is expected to be tendered first part of 2009.



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- ***planned***
- *0 - 30 %*
- *30 - 70%*
- *70 - 100%*

SAUDI ARABIA

Line	Section Length (km)	ETCS Level	Status	Year
Riyadh - Dammam	449	1	Contracted	2008
Makkah-Madinah Rail Link	444	1	Contracted	2012
North-South Railway project*	1600	2	Contracted	2012
Total	**2493**			

* This line doesn't appear on the map as its georeferenced path is not available yet.

Status	Railcar Type	Model name	Quantity	Origin	Year
Contracted	-	-	15	Retroffited	2010
Total			**15**		

Infrastructure

Total length of Rail Network	[km]	-
Planned GSM-R		-
Network Constructed		-
Network in Commercial Operation		-

Milestones

Start of Planning	[year]	-
Start of Implementation		-
Ready for Operation		-
End of Migration		-

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		-	-
Dispatchers		-	-

Additional Information

Saudi Railway Organisation commissioned a GSM-R project for the Dammam to Riyadh line in 2005.

ETCS implementation status

Commercial operation L1
Contracted or Planned L1
Commercial operation L2
Contracted or Planned L2
Commercial operation L3
Contracted or Planned L3

SLOVAKIA

Line	Section Length (km)	ETCS Level	Status	Year
Leopoldov - Nové M.n.V.*	36	1	Pilot	2009
Total	**36**			
Brat. hl. st.-Leopoldov	64	1	Commercial Operation	2009
Total	**64**			
Poprad – Margecany	66	2	Planned	2020
Margecany – Kysak	19	2	Planned	2020
Kysak – Košice	16	2	Planned	2015
Košice – Barca St.1	4	2	Planned	2025
Barca St.1–Čierna n. T.	91	2	Planned	2025
Zwardoň - Skalité	7	2	Planned	2020
Skalité - Čadca	13	2	Planned	2020
Čadca - Žilina	31	2	Planned	2015
Breclav - Kúty	7	2	Planned	2015
Kúty – Dev. N. V.	51	2	Planned	2015
Marchegg – Dev. N. V.	4	2	Planned	2015
Dev. N. V. – Bratislava	13	2	Planned	2015
Brat. hl. st. – Brat. Petrž.	18	2	Planned	2015
Brat. Petrž. – Rajka	15	2	Planned	2015
Brat. Petrž. – Kittsee	2	2	Planned	2015
Brat. hl. st. - Galanta	49	2	Planned	2018
Galanta – Nové Zámky	42	2	Planned	2018
Nové Zámky–Komárno	29	2	Planned	2020
Komárno – Komárom	5	2	Planned	2020
Nové Zámky – Štúrovo	44	2	Planned	2020
Štúrovo – Szob	14	2	Planned	2020
Nové M.n.V. - Púchov	59	2	Planned	2015
Púchov – Žilina	44	2	Planned	2018
Žilina – Vrútky	21	2	Planned	2020
Vrútky – Štrba	101	2	Planned	2020
Štrba – Poprad	19	2	Planned	2020
Total	**784**			

*This section is expected to be in commercial operation by May-June 2009

Status	Railcar Type	Model name	Quantity	Origin	Year
Planned	Loco	-	18	Retrofitted	2012
Total			**18**		

Infrastructure

Total length of Rail Network	[km]	3477
Planned GSM-R		-
Network Constructed		25
Network in Commercial Operation		25

Milestones

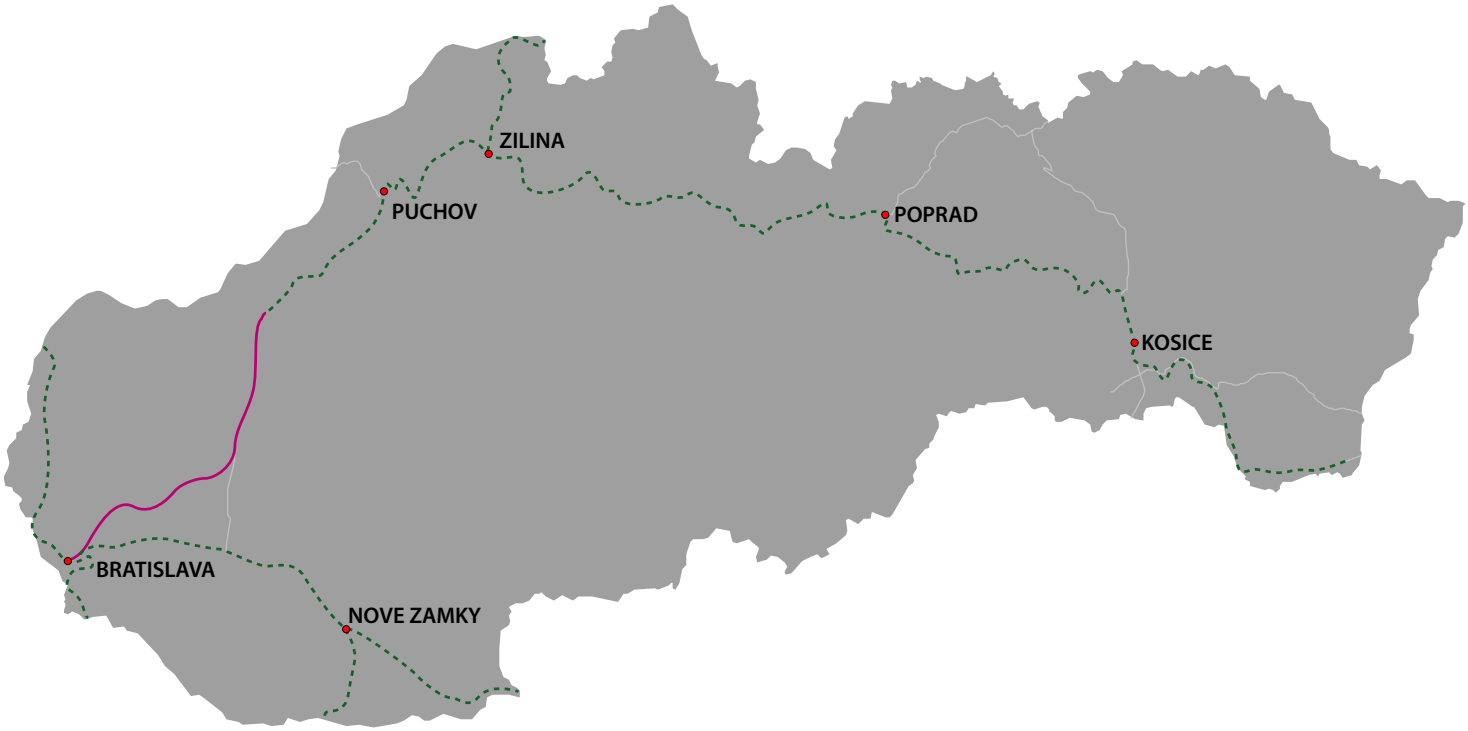
Start of Planning	[year]	-
Start of Implementation		2005
Ready for Operation		-
End of Migration		-

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		-	-
Dispatchers		-	-

Additional Information

Part of the Pilot (Bratislava to Nove Zámky) deployed - Bratislava to Senec.



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- ***0 - 30 %***
- *30 - 70%*
- *70 - 100%*

SLOVENIA

Line	Section Length (km)	ETCS Level	Status	Year
Ormoz – Hodos	69	1with radio infil	Pilot	2010
Hodos – border-Oriszebtpeter (Hungary)	2	1with bal infill after GSM-R -2	Pilot	2010
(Italy) border - Sezena	3	1 with radio infill	Pilot	2010
Sezena – Divaca/Harbor Koper	9	1 with radio infill	Pilot	2010
Total	**83**			
Feeding branches from Corridor D to port or freight terminal areas of Koper	5	2	Planned	2020
Feeding branches from Corridor D to freight terminal areas of Ljubljana	3	2	Planned	2020
Pragersko - Ormoz	40	1 with bal infill after GSM-R - 2	Planned	2013
(Austria) border - Jesenice	7	2	Planned	2014
Jesenice – Ljubjana	64	2	Planned	2016
Zidani most - Dobova border (Croatia)	98	2	Planned	2016
Ormoz – Sredisce / (border Croatia)	12	2	Planned	2017
Pragersko - Maribor	19	2	Planned	2017
Maribor - border (Austria)	16	2	Planned	2017
Branch Koper - Koper (2020)	16	2	Planned	2020
Trieste border - branch Koper (2020)	10	2	Planned	2020
Divaca - branch Koper (2020)	11	2	Planned	2020
Pivka - Ilirska Bistrica - d.m.	24	2	Planned	2017
(Zalog - Ljubljana) P3	3	1 with bal infill after GSM-R - 2	Planned	2013
(Zalog - Ljubljana) P4	4	1 with bal infill after GSM-R - 2	Planned	2013
(Zalog - Ljubljana) P5	4	1 with bal infill after GSM-R - 2	Planned	2013
Lok Zidani Most	1	2	Planned	2013
Lok Tezno - Maribor Studenci	2	2	Planned	2017
Lok Pragersko	1	1 with bal infill after GSM-R - 2	Planned	2013
Lok Divača	1	1 with bal infill after GSM-R - 2	Planned	2013
Jesenice - Sežana	130	Regional	Planned	2018
Prvačina - Ajdovščina	15	Regional	Planned	2018
Grosuplje - Ljubljana	21	Regional	Planned	2019
Grosuplje - Kočevje	49	Regional	Planned	2019
Trebnje - Grosuplje	36	Regional	Planned	2019
Sevnica - Trebnje	31	Regional	Planned	2019
(Croatia) border - Metlika - Trebnje	68	Regional	Planned	2019
Ljubljana Šiška - Kamnik Graben	23	Regional	Planned	2018
Celje - Velenje	37	Regional	Planned	2020
Grobelno - Stranje - Sv. Rok ob Sotli - border (Croatia)	37	Regional	Planned	2020
Stranje - Imeno - border (Croatia)	14	Regional	Planned	2020
Maribor - Prevalje - border (Austria)	83	Regional	Planned	2020
Divaca - Presnica	16	1 with radio infill	Planned	2013
Presnica - Harbor Koper	32	1 with radio infill	Planned	2013
Divaca to Pivka (Harbor Rijeka)	24	1 with radio infill	Planned	2013
Pivka – Ljubljana	80	1 with radio infill	Planned	2013
Ljubjana – Zidani Most	64	1 with radio infill	Planned	2013
Zidani most - Celje	25	1 with bal infill after GSM-R - 2	Planned	2013
Celje - Grobelno	14	1 with bal infill after GSM-R - 2	Planned	2013
Grobelno - Pragersko	34	1 with bal infill after GSM-R - 2	Planned	2013
Total	**1174**			

Note: the georeferenced path of the Regional lines is not yet available, the lines are there-fore mentioned in the tab only.

Status	Railcar Type	Model name	Quantity	Origin	Year
Pilot	Loco	E Loco 541	1	Retrofitted	2009
Pilot	Loco	E Loco 363	1	Retrofitted	2008
Pilot	Loco	D Loco	1	Retrofitted	2008
Total			**3**		
Planned	HST	HST 310	3	Retrofitted	2011
Planned	EMU	EMU 312	30	Retrofitted	2015
Planned	DMU	DMU 713	25	Retrofitted	2014
Planned	Loco	E Loco 541-2	12	New	2013
Planned	Loco	E Loco 541-3	8	New	2015
Planned	Loco	E Loco 541-4	30	New	2023
Planned	EMU	EMU 312-2	14	New	2017
Planned	Loco	D Loco 645	20	New	2022
Planned	Loco	D Loco 646-1	30	New	2017
Planned	Loco	D Loco 646-2	12	New	2020
Planned	DMU	DMU 610	6	New	2016
Planned	DMU	DMU 810	30	New	2019
Planned	DMU	DMU 811	25	New	2025
Planned	Loco	E Loco 541	19	Retrofitted	2012
Planned	Loco	E loco 363	34	Retrofitted	2013
Planned	Loco	D Loco 664	19	Retrofitted	2013
Total			**317**		

Infrastructure

Total length of Rail Network	[km]	3809
Planned GSM-R		1226
Network Constructed		-
Network in Commercial Operation		-

Milestones

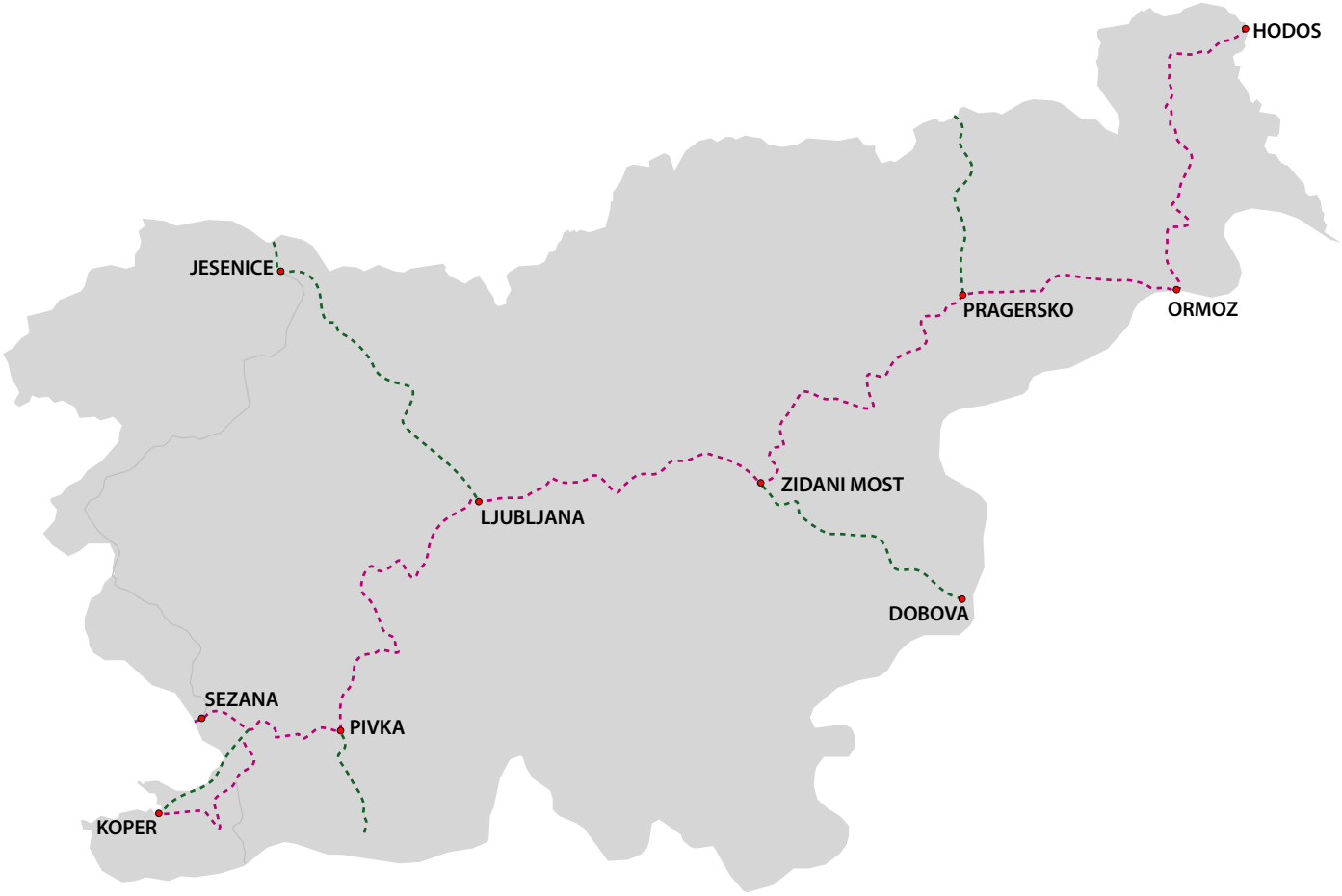
Start of Planning	[year]	2011
Start of Implementation		2013
Ready for Operation		-
End of Migration		2017

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	2700	-
Cab Radios		410	-
Dispatchers		170	-

Additional Information

Tendering for project engineering and consultant in progress



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- ***planned***
- *0 - 30 %*
- *30 - 70%*
- *70 - 100%*

SPAIN

Line	Section Length (km)	ETCS Level	Status	Year
Albacete - La Encina	93	1	Pilot	
Total	**93**			
Madrid - Zaragoza - Lérida	460	1*	Commercial operation	2006
Lérida - Tarragona - Barcelona	190	1*	Commercial operation	2008
Madrid Valladolid	180	1*	Commercial operation	2007
Córdoba - Málaga	155	1*	Commercial operation	2007
Total	**985**			
Zaragoza Huesca	79,5	1	Contracted	2006
International Section Perpignan Figueres	44,5	1 and 2	Contracted	2006
La Sagrada - Toledo	21	1 and 2	Contracted	2006
Madrid commuters lines	160	1 and 2	Contracted	2008
Madrid - Albacete - Valencia	470	1 and 2	Contracted	2008
Barcelona - Figueras	132	1 and 2	Contracted	2008
Total	**907**			

* These lines will switch to level 2 soon

Status	Railcar Type	Model name	Quantity	Origin	Year
Commercial operation	HST	S-103	16	-	2004
Commercial operation	HST	S-102 Duck	16	-	2005
Commercial operation	HST	S-120 Shuttle	12	-	2006
Commercial operation	HST	S-104 Shuttle	33	-	2008
Commercial operation	HST	S-121	6	-	2009
Total			**83**		
Contracted	HST	S-102 (S/112)	30	-	
Contracted	HST	S-103 ICE	10	-	
Contracted	HST	S-120	16	-	
Contracted	HST	S-121	23	-	2009
Contracted	HST	S/114	13	-	
Contracted	HST	S-130 Duckling	45	-	2009
Contracted	HST	S-100 TGV	24	-	
Contracted	HST	S-490 Alaris	10	-	
Contracted	EMU	S-446	31	-	2010
Contracted	EMU	S-447	43	-	2010
Contracted	EMU	S-450	20	-	2010
Contracted	EMU	S-465 Civia	123	-	2010
Total			**388**		
Planned	Loco	252	15	-	
Planned	Loco	253	15	-	
Total			**30**		

Infrastructure

Total length of Rail Network	[km]	11 775 + 1530
Planned GSM-R		8659 + 1530
Network Constructed		22 + 1530
Network in Comercial Operation (Conventional Line +HSL)		22 + 1530

Milestones

Start of Planning	[year]	2000
Start of Implementation		2003
Ready for Operation		2003
End of Migration		2006

GSM-R Mobile stations

		Planned	Activated
Mbile Users Planned	[unit]	-	1900
		-	700
Cab Radios		-	10
Dispatchers			

Additional Information

5 Projects (2459 km) for Conventional Lines are ready to be tendered; HSL Madrid-Valencia (450 Km) in construction (Q2 2010)

ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- *0 - 30 %*
- ***30 - 70%***
- *70 - 100%*

SOUTH KOREA

Line	Section Length (km)	ETCS Level	Status	Year
HSR Gyeongbu Phase 1 (Seoul-Deagu)	238,6	1	Commercial operation	2004
Total	**238,6**			
Honam Line (Daejon-Mokpo)	252,5	1	Contracted	2008
HSR Gyeongbu Phase 2 (Daegu-Busan)	151,6	1	Contracted	2010
Total	**404,1**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Contracted	430	-	-	-	2007
Total	**430**				
Commercial operation	45				
Total	**45**				

Infrastructure

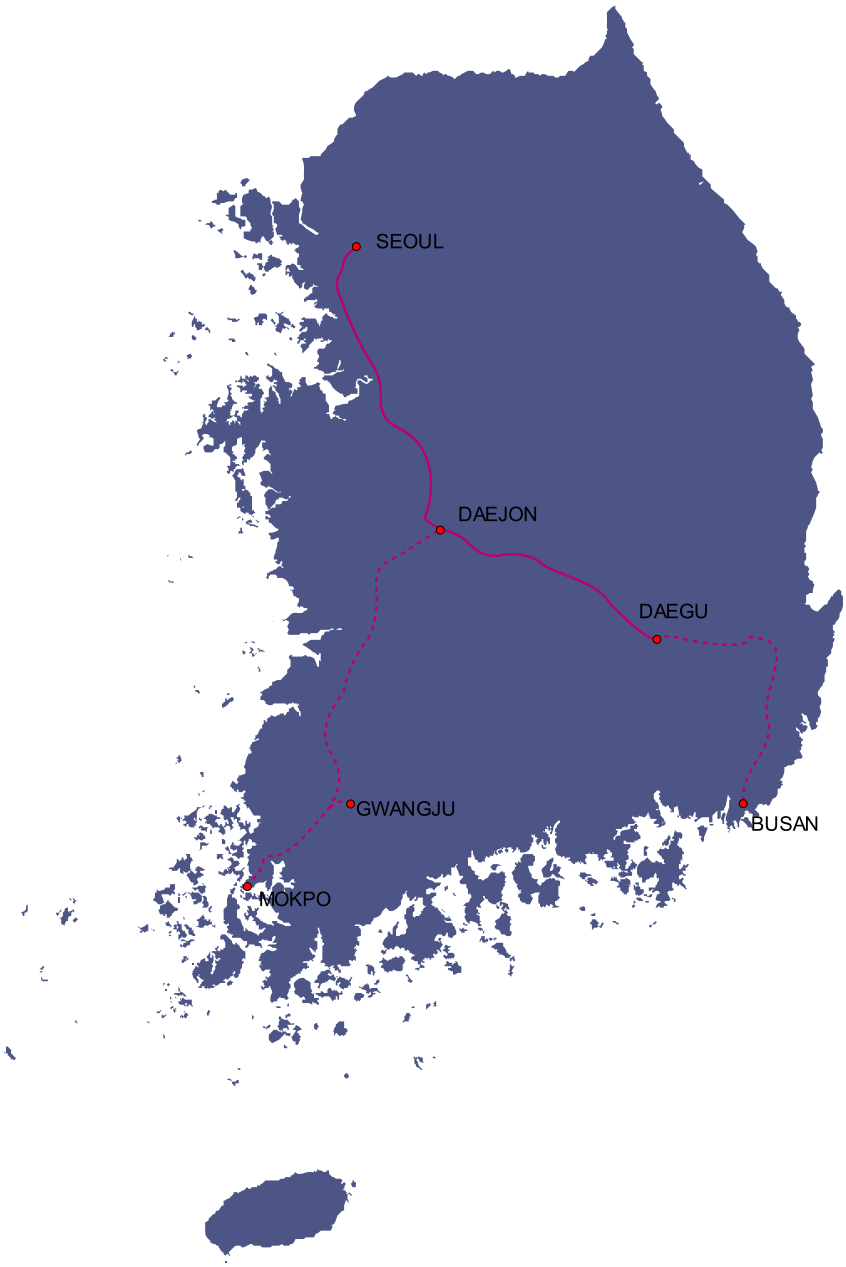
Total length of Rail Network	[km]	-
Planned GSM-R		-
Network Constructed		-
Network in Commercial Operation		-

Milestones

Start of Planning	[year]	-
Start of Implementation		-
Ready for Operation		-
End of Migration		-

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		-	-
Dispatchers		-	-



ETCS implementation status

Commercial operation L1
Contracted or Planned L1
Commercial operation L2
Contracted or Planned L2
Commercial operation L3
Contracted or Planned L3

SWEDEN

Line	Section Length (km)	ETCS Level	Status	Year
Botnia Line (Ůmea - Ornskoldsvik - Västeras-pby)	190	2	Contracted	2010
West Dalarna Line (Rep-bäcken - Malung)	134	3	Contracted	2010
Ådalsbanan (Sundsvall - Västeraspby)	180	2	Contracted	2010
Haparandabanan (Boden - Haparanda)	156	2	Contracted	2011
Malmö Central Station Upgrade	10	1	Contracted	2012
City Tunnel project	6	2	Contracted	2012
The remaining part of the network	2218	2 or 3	Planned*	2030
Total	**2894**			

*These sections are closer to the "Contracted" than to the "Planned" status, although no contract has been awarded yet to a specific supplier. The time frame mentioned depends on the Swedish deployment plan.

Status	Railcar Type	Model name	Quantity	Origin	Year
Planned	EMU	X61	48	New	-
Total			**48**		

Infrastructure

Total length of Rail Network	[km]	10 000
Planned GSM-R		9850
Network Constructed		8500
Network in Commercial Operation		8500

Milestones

Start of Planning	[year]	1997
Start of Implementation		2000
Ready for Operation		-
End of Migration		2007

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	7000	4300
Cab Radios		-	2130
Dispatchers		-	80

Additional Information

The Swedish Network is finalised end 2007.

ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- *0 - 30 %*
- *30 - 70%*
- ***70 - 100%***

SWITZERLAND

Line	Section Length (km)	ETCS Level	Status	Year
Mattstetten Rothrist (Olten - Berne)	45	2	Commercial operation	2007
Löstchberg base tunnel between Frutigen - Visp (Bern - Brig)	35	2	Commercial operation	2007
Total	**80**			
TEN-T,Corr. A	1410	1	Planned	2012
TEN-T, Corr. C	8	1	Planned	2015
Gotthard tunnel	57	2	Planned	2016
Ceneri tunnel	15	2	Planned	2018
Feeding lines	10	2	Planned	
Whole network	1400	1	Planned	2016
Total	**2900**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Commercial operation	Loco	SBB Tm 234	6	Retrofitted	2006
Commercial operation	Loco	SBB Re 420	63	Retrofitted	2006
Commercial operation	Loco	BLS Re 425	20	Retrofitted	2006
Commercial operation	Loco	Crossrail Re436	5	Retrofitted	2007
Commercial operation	Loco	SBB Re 460	119	Retrofitted	2006
Commercial operation	Loco	BLS Re 465	18	Retrofitted	2006
Commercial operation	Loco	SBB Re 484	10	Retrofitted	2012
Commercial operation	Loco	BLS Class 485	20	Retrofitted	2007
Commercial operation	Loco	SBB Re 620	63	Retrofitted	2006
Commercial operation	Loco	SBB Am 841	5	Retrofitted	2006
Commercial operation	Loco	SBB Am 843	6	New	2007
Commercial operation	EMU	SBB RABDe 500	44	Retrofitted	2006
Commercial operation	Single-Cab	Bt EW IV	90	Retrofitted	2006
Commercial operation	EMU	Bt IC 2000	40	Retrofitted	2006
Commercial operation	EMU	ETR 470	18	Retrofitted	2007
Commercial operation	EMU	ETR 610	12	New	2009
Commercial operation	Loco	LRZ SBB	3	Retrofitted	2007
Commercial operation	Loco	LRZ BLS	1	Retrofitted	2007
Commercial operation	Loco	SBB Diagnosis	1	Retrofitted	2007
Commercial operation	Loco	BLS Tm 235	2	New	2007
Commercial operation	Loco	BLS Re 486	10	New	2010
	Total		**556**		

Infrastructure

Total length of Rail Network	[km]	3000
Planned GSM-R		2360 + 740
Network Constructed		1180
Network in Commercial Operation (SBB Coverage+Roaming Agreement)		925

Milestones

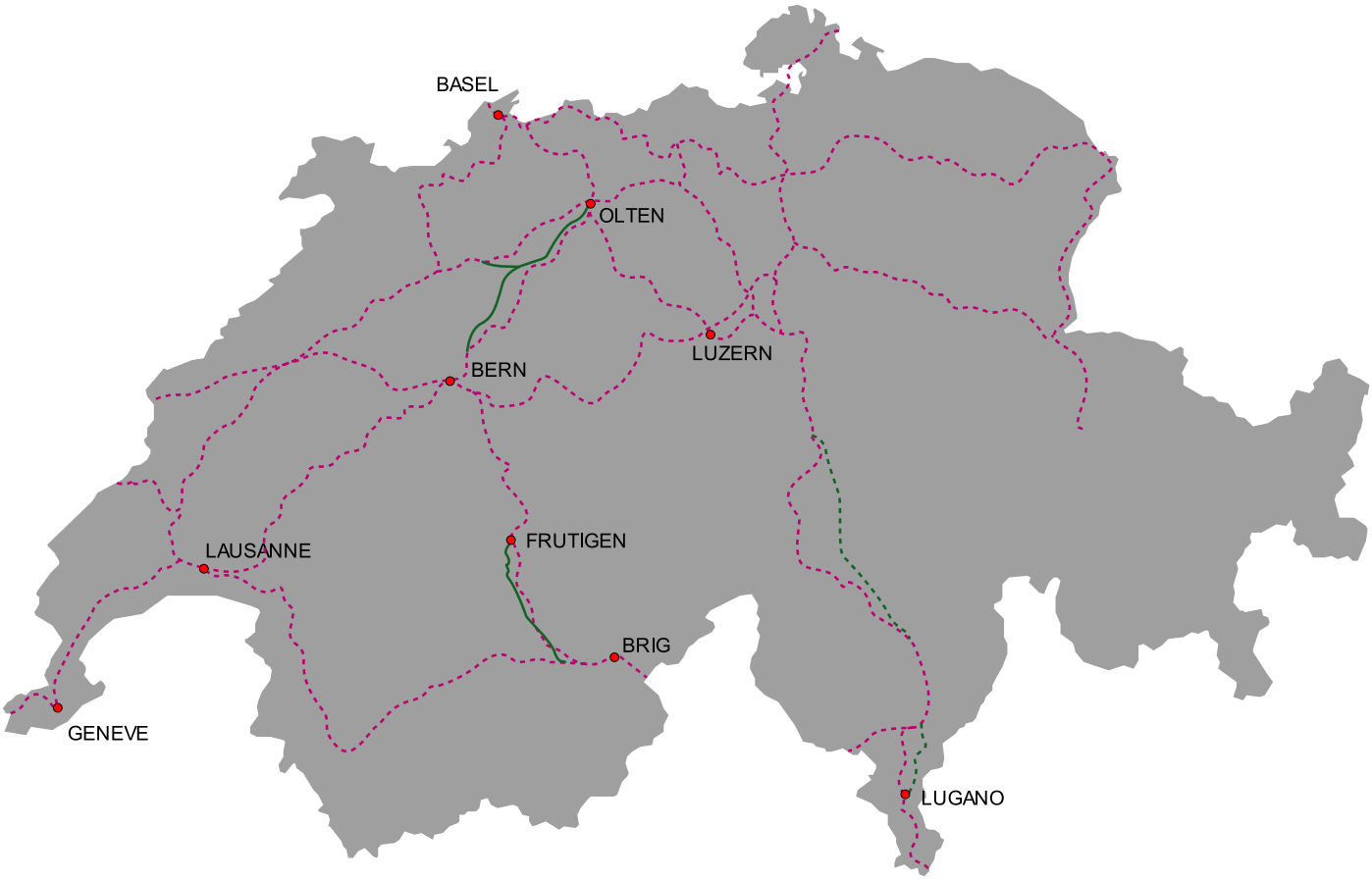
Start of Planning	[year]	2000
Start of Implementation		2003
Ready for Operation		2004
End of Migration		2012

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	8600	5100
Cab Radios		2533	1383
Dispatchers		600	100

Additional Information

Advanced implementation stage. The project is on track in terms of dates.



ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- *0 - 30 %*
- ***30 - 70%***
- *70 - 100%*

TAIWAN (CHINA)

Line	Section Length (km)	ETCS Level	Status	Year
Total network	1200	1	Commercial operation	2007
Total	**1200**			

Note: only the high speed Taipei-Kaohsiung was represented as the georeferenced map of the overall network is not available yet.

Status	Railcar Type	Model name	Quantity	Origin	Year
Contracted	EMU	EMU700	43	New	2007
Total			**43**		
Commercial operation	Various engines	-	768	Retrofitted	2007
Total			**811**		

Infrastructure

Total length of Rail Network	[km]	-
Planned GSM-R		-
Network Constructed		-
Network in Commercial Operation		-

Milestones

Start of Planning	[year]	-
Start of Implementation		-
Ready for Operation		-
End of Migration		-

GSM-R

Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		-	-
Dispatchers		-	-

ETCS implementation status

Commercial operation L1
Contracted or Planned L1
Commercial operation L2
Contracted or Planned L2
Commercial operation L3
Contracted or Planned L3

THE NETHERLANDS

Line	Section Length (km)	ETCS Level	Status	Year
Betuwe Line Rotterdam - Zevenaar	110	2	Commercial operation	2007
Total	**110**			
Amsterdam - Utrecht	30	2	Contracted	2009
HSL South Amsterdam Belgian border	93	2	Contracted	2008
Total	**123**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Contracted		Série 189	46	Retroffited	2008
Contracted	EMU	DE6400	22	Retroffited	2008
Contracted		Sprinter Light Train	35		2008
Contracted		Class 66s/G1 206	23	Retroffited	2008
Total			**126**		

Infrastructure

Total length of Rail Network	[km]	3050
Planned GSM-R		3050
Network Constructed		3050
Network in Commercial Operation		3050

Milestones

Start of Planning	[year]	1999
Start of Implementation		2001
Ready for Operation		2003
End of Migration		2006

GSM-R Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	8000	6900
Cab Radios		2500	2500
Dispatchers		200	2

Additional Information

Telerail - Old Analogue Radio Network switched off beginning 2007. Interconnection lines with Germany, Belgium in operation. Roaming with Germany, Belgium, Franc and Switzerland in operation. Roaming with at least Italy and Austria is planned for 2009.

ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- *0 - 30 %*
- *30 - 70%*
- ***70 - 100%***

TURKEY

Line	Section Length (km)	ETCS Level	Status	Year
HS Ankara - Istanbul 1st phase (Sincan-Esenkent and Hasanbey-Inönü)	57	1	Contracted	2010
HS Ankara - Istanbul 1st phase (Esenkent-Hasan-bey)	196	1	Contracted	2009
HS Ankara - Istanbul 2nd phase (Inönü-Vezirhan)	54	1	Contracted	2011
HS Ankara - Istanbul 2nd phase (Vezirhan-Köse-koy)	95	1	Contracted	2011
HS Ankara - Konya	212	1	Contracted	2010
Bogazkopru-Yenice ve Mersin Toprakkale	419	1	Contracted	2012
HS Ankara - Istanbul 2nd phase (Gebze-Halkali)	77	1	Contracted	
Total	**1110**			
HS Ankara - Istanbul 2nd	56	1	Planned	
phase (Kösekoy-Gebze)	554	1	Planned	
HS Ankara - Sivas				
Total	**610**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Contracted	HST	YHT65000	12	New	2007
Total			**12**		

Infrastructure

Total length of Rail Network	[km]	-
Planned GSM-R		-
Network Constructed		-
Network in Commercial Operation		-

Milestones

Start of Planning	[year]	-
Start of Implementation		-
Ready for Operation		-
End of Migration		-

GSM-R
Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	-	-
Cab Radios		-	-
Dispatchers		-	-

Additional Information

Two GSM-R projects Ankara – Eskisehir and Palatli – Konya have started.

ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

- *planned*
- ***0 - 30 %***
- *30 - 70%*
- *70 - 100%*

UNITED KINGDOM

Line	Section Length (km)	ETCS Level	Status	Year
Cambrian Line : Shrewsbury to Machynlleth, then North to Pwllheli to Aberystwth	218	2	Contracted	2009
Total	**218**			
London - Bristol	200	2	Planned	2017
London - Doncaster	250	2	Planned	2018
Total	**450**			

Status	Railcar Type	Model name	Quantity	Origin	Year
Contracted	DMU	Class 158	17	Retrofitted	2008
Contracted	Loco	Class 37	4	Retrofitted	2008
Total			21		
Planned	DMU	158	186	Retrofitted	2015-2021
Planned	DMU	165	75	Retrofitted	2015-2016
Planned	DMU	166	21	Retrofitted	2015-2016
Planned	DMU	168	19	Retrofitted	2024-2026
Planned	DMU	170	139	Retrofitted	2012-2021
Planned	DMU	175	27	Retrofitted	2017-2018
Planned	DMU	185	51	Retrofitted	2019-2020
Planned	DMU	332	14	Retrofitted	2023-2024
Planned	DMU	333	14	Retrofitted	2024-2025
Planned	DMU	334	40	Retrofitted	2024-2025
Planned	DMU	350	67	Retrofitted	2024-2027
Planned	DMU	360	26	Retrofitted	2024-2027
Planned	DMU	365	40	Retrofitted	2017-2018
Planned	DMU	375	112	Retrofitted	2021-2027
Planned	DMU	376	36	Retrofitted	2021-2027
Planned	DMU	377	182	Retrofitted	2021-2027
Planned	DMU	378	44	Retrofitted	2021-2027
Planned	DMU	395	29	Retrofitted	2021-2022
Planned	DMU	450	172	Retrofitted	2020-2023
Planned	DMU	460	8	Retrofitted	2020-2023
Planned	DMU	465	157	Retrofitted	2020-2023
Planned	DMU	466	43	Retrofitted	2020-2023
Planned	Loco	57	32	Retrofitted	2014-2016
Planned	Loco	59	25	Retrofitted	2012-2017
Planned	Loco	60	100	Retrofitted	2012-2017
Planned	Loco	66	415	Retrofitted	2012-2017
Planned	Loco	67	30	Retrofitted	2012-2017
Planned	Loco	92	46	Retrofitted	2012-2017
Planned	HST	43	96	Retrofitted	2014-2019
Planned	HST	180	14	Retrofitted	2017-2018
Planned	HST	220	34	Retrofitted	2016-2020
Planned	HST	221	44	Retrofitted	2016-2020
Planned	HST	222	27	Retrofitted	2016-2020
Planned	HST	390	53	Retrofitted	2026-2027
Planned	DMU	17 X	613	New	2008-2018
Planned	EMU	3 XX	1344	New	2008-2020
Planned	Loco	6 X	414	New	2008-2020
Planned	Loco	Track Plant	376	New	2008-2020
Total			**5165**		

Infrastructure

Total length of Rail Network	[km]	16 450
Planned GSM-R		14 780
Network Constructed		9699
Network in Commercial Operation		464

Milestones

Start of Planning	[year]	2000
Start of Implementation		2002
Ready for Operation		2011
End of Migration		2014

GSM-R

Mobile stations

		Planned	Activated
Mobile Users Planned	[unit]	19 000	8452
Cab Radios		8790	102
Dispatchers		1000	20

Additional Information

GSM-R in implementation stage, all over the network. End 2008 results: Routeworks 65% complete; core transmission rings in the south are priority commissioning. Sitework 30% complete with priority to work in the south & TENS routes. 100 sites completed before end 2008.

ETCS implementation status

- *Commercial operation L1*
- *Contracted or Planned L1*
- *Commercial operation L2*
- *Contracted or Planned L2*
- *Commercial operation L3*
- *Contracted or Planned L3*

GSM-R implementation status
(% of the national railway network)

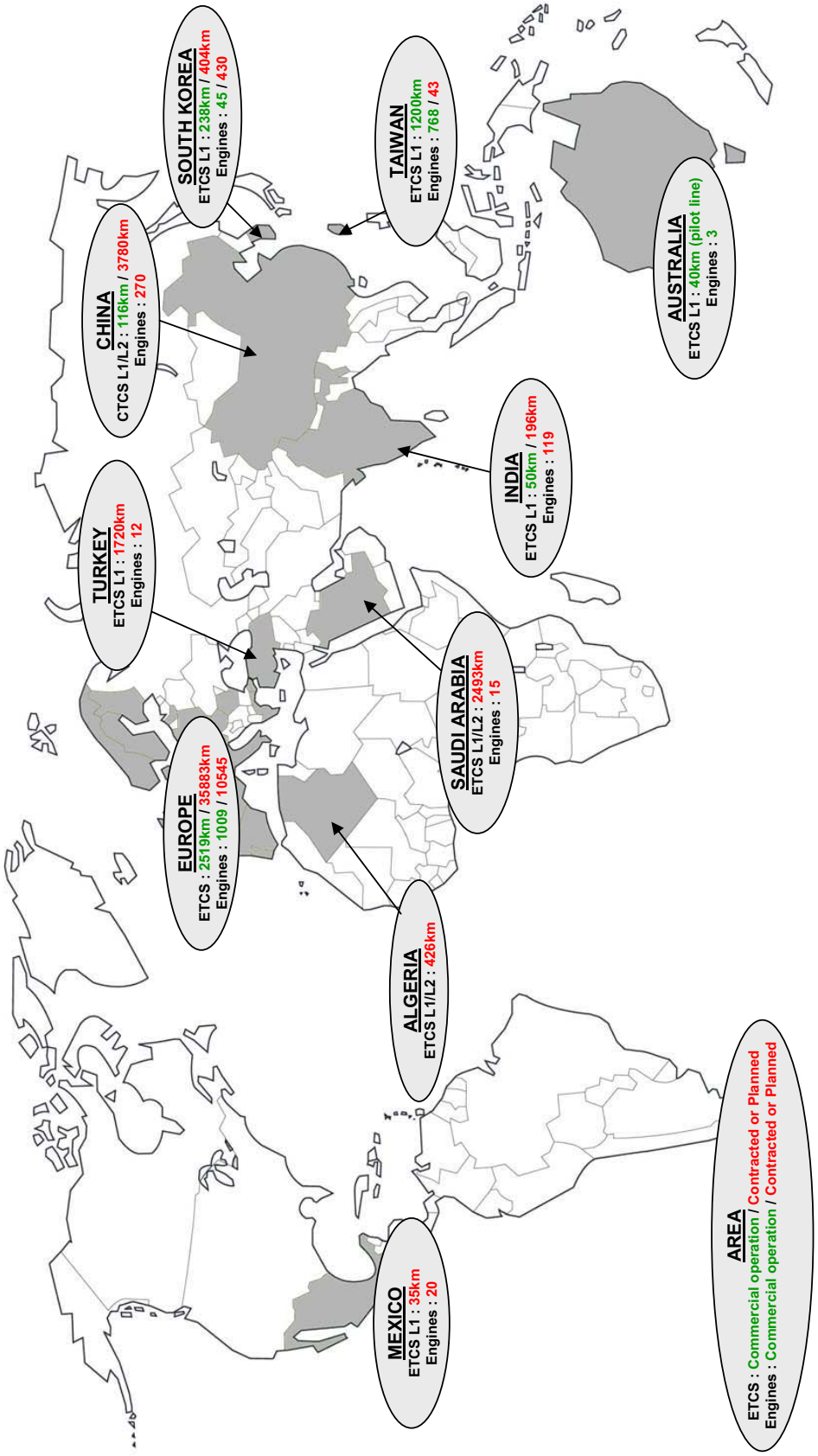
- *planned*
- ***0 - 30 %***
- *30 - 70%*
- *70 - 100%*

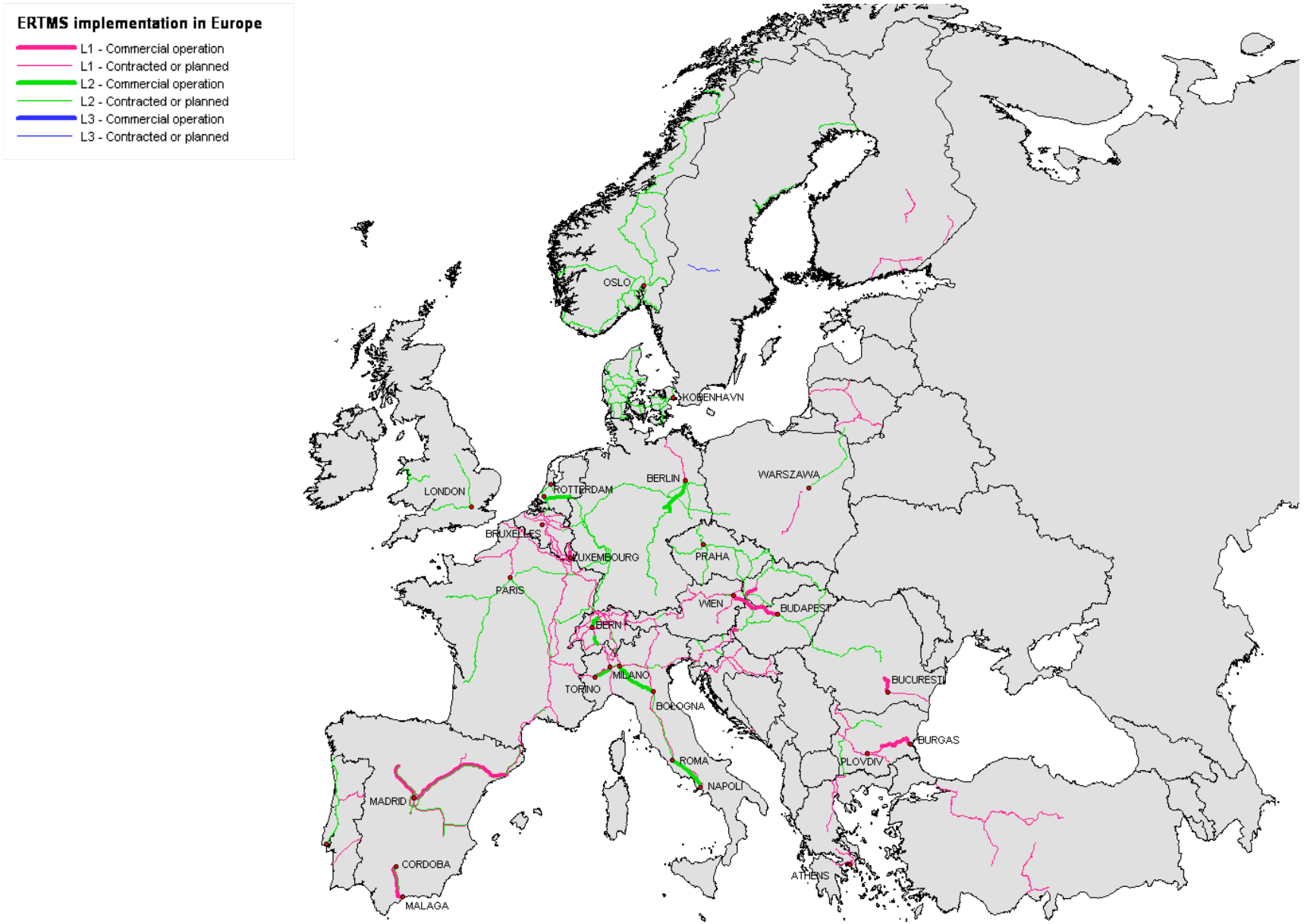
Some statistics on ETCS

We present here below the global figures on ETCS at a worldwide level. Since the last edition, new lines were put in commercial operation (revenue service): they are detailed in the following table.

Country name	Line	Section length (km)	Maximum speed (km/h)	ETCS Level
Austria	Wien to Hungarian border section Hegyesschalom	67	160	1
Bulgaria	Plovdiv Junction (Plovdiv - Filipovo - Skutare - Plovdiv)	30	-	1
	Stara Zagora - Burgas	200	200	1
Hungary	Hodos - Zalacséb-S.	27	120	1
	(Vienna -) Hegyeshalom - Budapest	190	160	1
Luxembourg	Bettembourg - Dudelange/Usines -Volmerange	6	80	1
	Luxembourg – Oetrange (Luxembourg - Sandweiler)	10	120	1
	Luxembourg – Bettembourg frt. (Luxembourg - Berchem - Bettembourg frt.)	11	140	1
	Ettelbruck - Luxembourg (Luxembourg - Dommeldange, Lorentzweiler, Mersch, Cruchten Ettelbruck)	40	120	1
	Luxembourg Station	-	120	1
Romania	Bucharest - Campina	92	160	1
Slovakia	Brat. hl. st.-Leopoldov	64	160	1
Spain	Madrid - Valladolid	180	300	1
	Córdoba -Málaga	155	300	1
	Lérida - Tarragona - Barcelona	190	300	1
	Madrid - Zaragoza - Lérida	460	300	1
	Total Europe Level 1	**1722**		
Germany	Berlin - Halle/Leipzig	135	200	2
Italy	Milano – Bologna	182	300	2
	Roma-Napoli	200	300	2
	Torino-Novara	90	300	2
The Netherlands	Betuwe Line Rotterdam - Zevenaar	110	120	2
Switzerland	Mattstetten Rothrist (Olten - Berne)	45	200	2
	Löstchberg base tunnel between Frutigen - Visp (Bern - Brig)	35	250	2
	Total Europe Level 2	**797**		
	Total Europe	**2519**		
China	Beijing - Tianjin	116	350	1
India	Chennai -Gummudipundi	50	80	1
South Korea	HSR Gyeongbu Phase 1 (Seoul-Deagu)	238,6	300	1
Taiwan	Total network	1200	-	1
	Total Asia	**1604,6**		

The following maps are an illustration of the situation, with a zoom on the European map, representing all the projects.




ERTMS implementation in Europe
L1 - Commercial operation
L1 - Contracted or planned
L2 - Commercial operation
L2 - Contracted or planned
L3 - Commercial operation
L3 - Contracted or planned
OSLO
KOBENHAVN
LONDON
ROTTERDAM
BERLIN
WARSZAWA
BRUXELLES
LUXEMBOURG
PRAHA
PARIS
WIEN
BUDAPEST
BERN
MILANO
TORINO
BUCURESTI
BOLOGNA
BURGAS
ROMA
PLOVDIV
NAPOLI
MADRID
CORDOBA
ATHENS
MALAGA

Along with these already operated lines, many other sections were contracted to suppliers to equip them with ETCS. For Europe, the breakdown between the levels is as follows:

- 1768,5 km of ETCS Level 1;
- 2621,5 km of ETCS Level 2 ;
- 134 km of Level 3/Regional.

Zone/Country	Europe	Algeria	China	India	Mexico	Saudi Arabia	South Korea	Turkey
Contracted sections (km)	4524	426	3780	196	35	2493	404	1110

After contract awarding, and before putting into commercial service, the section is tested during a certain period. These non-commercially operated but nevertheless equipped lines represent 515 km in Europe, and 40 km in Australia.

In addition to these sections, one can also mention the priority lines that will be potentially equipped with ETCS, but for which no contract has been awarded yet (international corridors are typically classified within this category): 610 km outside Europe (Turkey mainly), and 31359 km in Europe in the long term (some countries transmitted plans up to 2030).

This leads to a total of 7558 km of lines directly impacted by ERTMS in Europe, and 10049 km outside Europe.

However, this classification does not always fit to each national context; in particular, there is in Europe a certain number of sections classified as “planned” which are rather closer to the *Contracted* status. When this is taken in account, it can be reasonably considered that in Europe, there are actually 9776 km of lines that are concerned by ERTMS for the short and medium term.

In Europe there are 1009 engines in commercial service with ERTMS, to which we can add 1305 contracted (either retrofitted or newly bought) engines. The table below gives the amount of rolling-stock directly concerned by ERTMS at a worldwide level, including the rolling stock under the *pilot/test* status. Spain is playing an important role, together with Switzerland, Germany and Italy.

Zone / Country	Europe	Australia	China	India	Mexico	Saudi Arabia	South Korea	Taiwan (China)	Turkey
Quantity (Engines)	2319	3	270	119	20	15	475	811	12

Outside Europe, the biggest fleets are located in Taiwan, South Korea, China and India. Turkey also expressed its interest for high speed trains.

The perspectives of ERTMS

If we intent to sum up the figures gathered at the end of this data collection campaign, we can finally say that the following table is a reasonable snapshot of the actual situation of ETCS worldwide:

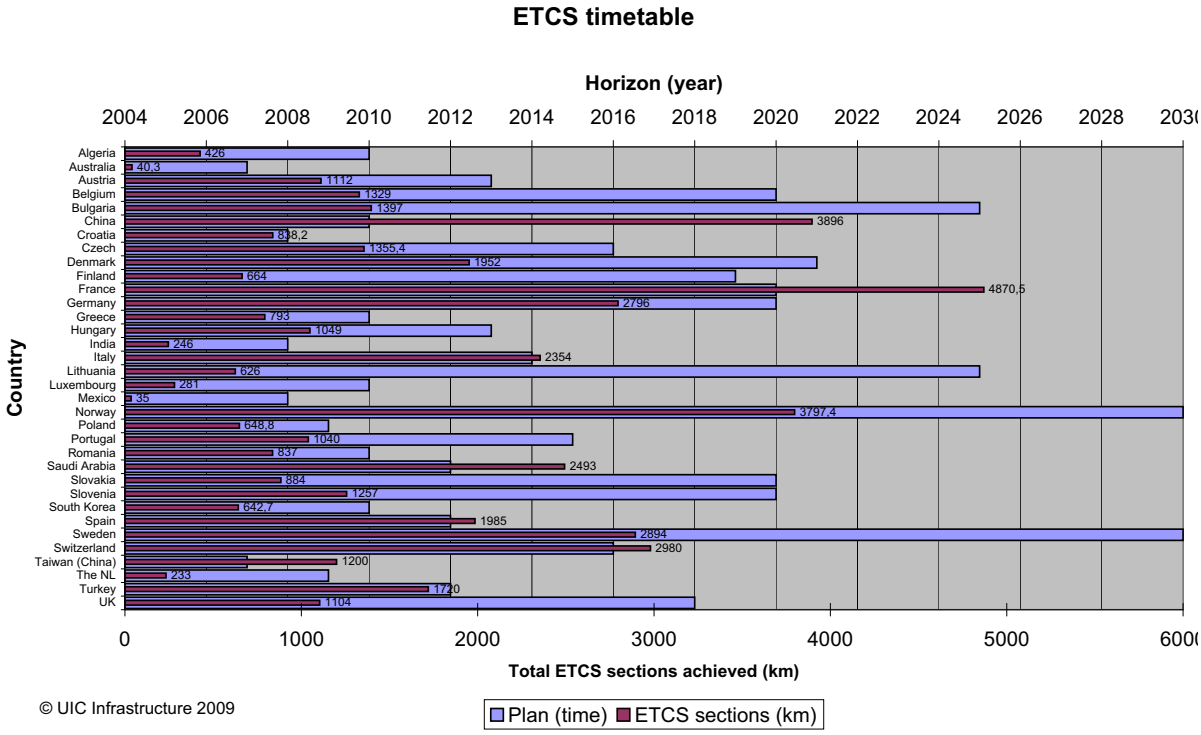
	ETCS network short and medium perspective[1] (km)	ETCS network long term perspective[2] (km)	Rolling-stock short and medium perspective (engines)	Rolling-stock long term perspective (engines)
Africa, America, Asia, Australia	10049	610	1725	-
Europe	9776	31359	2319	9240

These aggregated figures can be considered as an expression of the UIC members’ feeling concerning ETCS and show a rapid growth of ETCS, especially in the countries outside Europe.

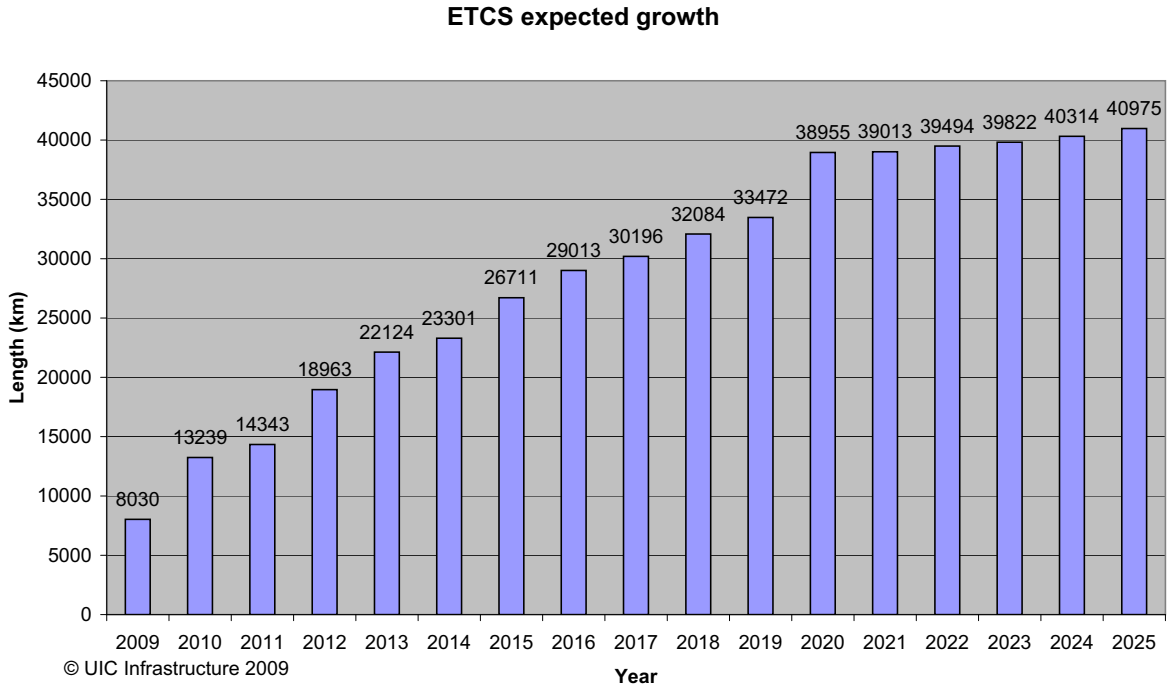
The following chart shows the ETCS timetable per country and takes into account all mentioned project in the countries. Taking the example of Algeria, it should be read as follows: Algeria will have achieved 426 km of ETCS sections (bottom horizontal axis) by 2010 (top horizontal axis).

1 Sections in commercial operation + contracted ones.

2 Planned sections; some countries transmitted plans until 2030.



We also tried to visualize the possible growth of the ETCS network around the world and we were able to produce the chart below depicting its worldwide evolution by 2025.



The success of ETCS outside Europe is likely to continue: for example in Australia, the improvement of the Melbourne's rail network capacity and safety may be a potential application for ETCS in the coming years. Another example is Morocco which has been already considering the implementation of ETCS for its current fleet and infrastructure. In 2008, the European Union granted "advanced status" to this country. Because the construction of a tunnel between the Cherifian Kingdom and Spain is still being discussed, ETCS can be considered as a potential solution for its Maghribi & Atlantic High Speed links. The latter will therefore be the first high speed line in Africa and Arab world, if completed before the Mecca-Madinah project.

Finally, the following tables recapitulate the per country and per status data gathered this year:

Country	Commercial operation (in km)
Austria	67
Bulgaria	230
China	116
Germany	135
Hungary	217
India	50
Italy	472
Luxembourg	67
Romania	92
Slovakia	64
South Korea	238,6
Spain	985
Switzerland	80
Taiwan (China)	1200
The Netherlands	110

Country	Contracted (in km)
Algeria	426
Austria	394
Belgium	336
Bulgaria	147
China	3780
Croatia	34
France	300
Germany	298
Greece	564
India	196
Italy	313
Luxembourg	214
Mexico	35
Saudi Arabia	2493
South Korea	404,1
Spain	907
Sweden	676
The Netherlands	123
Turkey	1110
United Kingdom	218

Country	Planned (in km)
Austria	651
Belgium	893
Bulgaria	1020
Croatia	804,2
Czech Republic	1332
Denmark	1952
Finland	664
France	4570,5
Germany	2363
Greece	79
Hungary	832
Italy	1569
Lithuania	626
Norway	3797,4
Poland	648,8
Portugal	1040
Romania	715
Slovakia	784
Slovenia	1174
Sweden	2218
Switzerland	2900
Turkey	610
United Kingdom	886

Country	Total ETCS network in km *(pilot + commercial operation + contracted + planned; horizon 2030)*
Algeria	426
Australia	40,3
Austria	1112
Belgium	1329
Bulgaria	1397
China	3896
Croatia	838,2
Czech Republic	1355,4
Denmark	1952
Finland	664
France	4870,5
Germany	2796
Greece	793
Hungary	1049
India	246
Italy	2354
Lithuania	626
Luxembourg	281
Mexico	35
Norway	3797,4
Poland	648,8
Portugal	1040
Romania	837
Saudi Arabia	2493
Slovakia	884
Slovenia	1257
South Korea	642,7
Spain	1985
Sweden	2894
Switzerland	2980
Taiwan (China)	1200
The Netherlands	233
Turkey	1720
United Kingdom	1104

Some statistics on GSM-R

GSM-R Implementation Status in Europe

Background

For the readers not having seen the 2007 Atlas of the ERTMS Implementation, we would like to remind that GSM-R have been generally deployed on national basis, in many cases replacing the old analogue systems. GSM-R is covering therefore more lines then the ones foreseen for ETCS. In case of ETCS Level 1, GSM-R is assuring the voice traffic, while for ETCS L2 an higher, GSM-R is assuring both voice and data traffic.

Consequently, GSM-R status information is given by the color of the map which is showing different implementation phases at global national level. In the Atlas annex, you can find more detailed maps.

We wish thank the ERIG member's who has supported us in producing this work, as well as to the GSM-R Industry Group, who supported us in some of the outside of Europe cases.

GSM-R Status in Europe, end 2008

GSM-R's deployment has continued since 2007. There are 17 implementers end 2008: Austria, Belgium, Lithuania, Bulgaria, Czechia, Finland, France, Germany, Greece, Italy, Netherlands, Norway, Slovakia, Spain, Switzerland, Sweden, United Kingdom. Denmark, Poland, Portugal, Romania are preparing for tender.

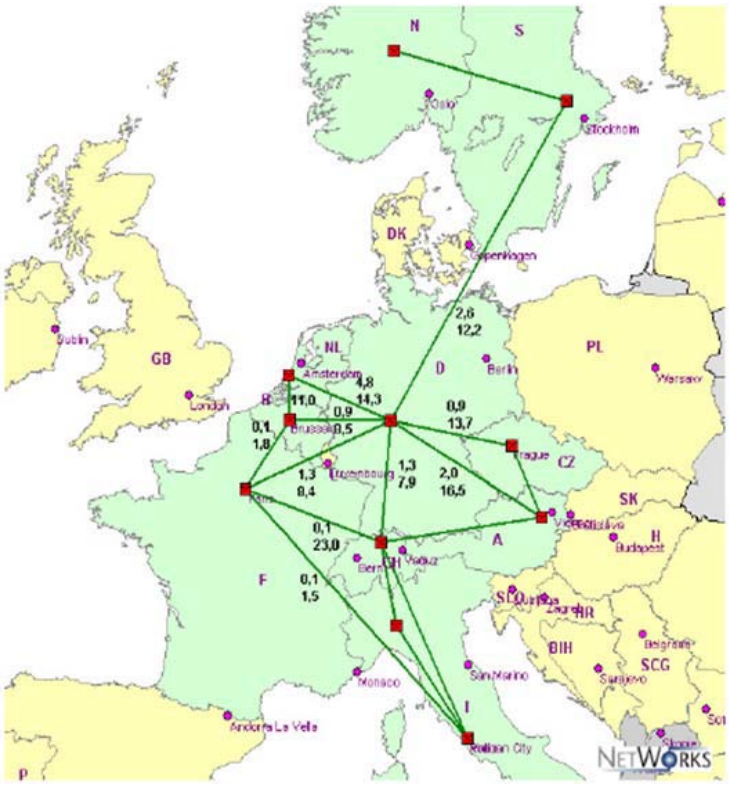
Outside Europe, GSM-R is installed in China, and is under deployment in Algeria, India, Turkey and Saudi Arabia. It is under discussion in Australia.

GSM-R - crossing the borders

In Europe, the International interconnections and the related traffic started to grow.

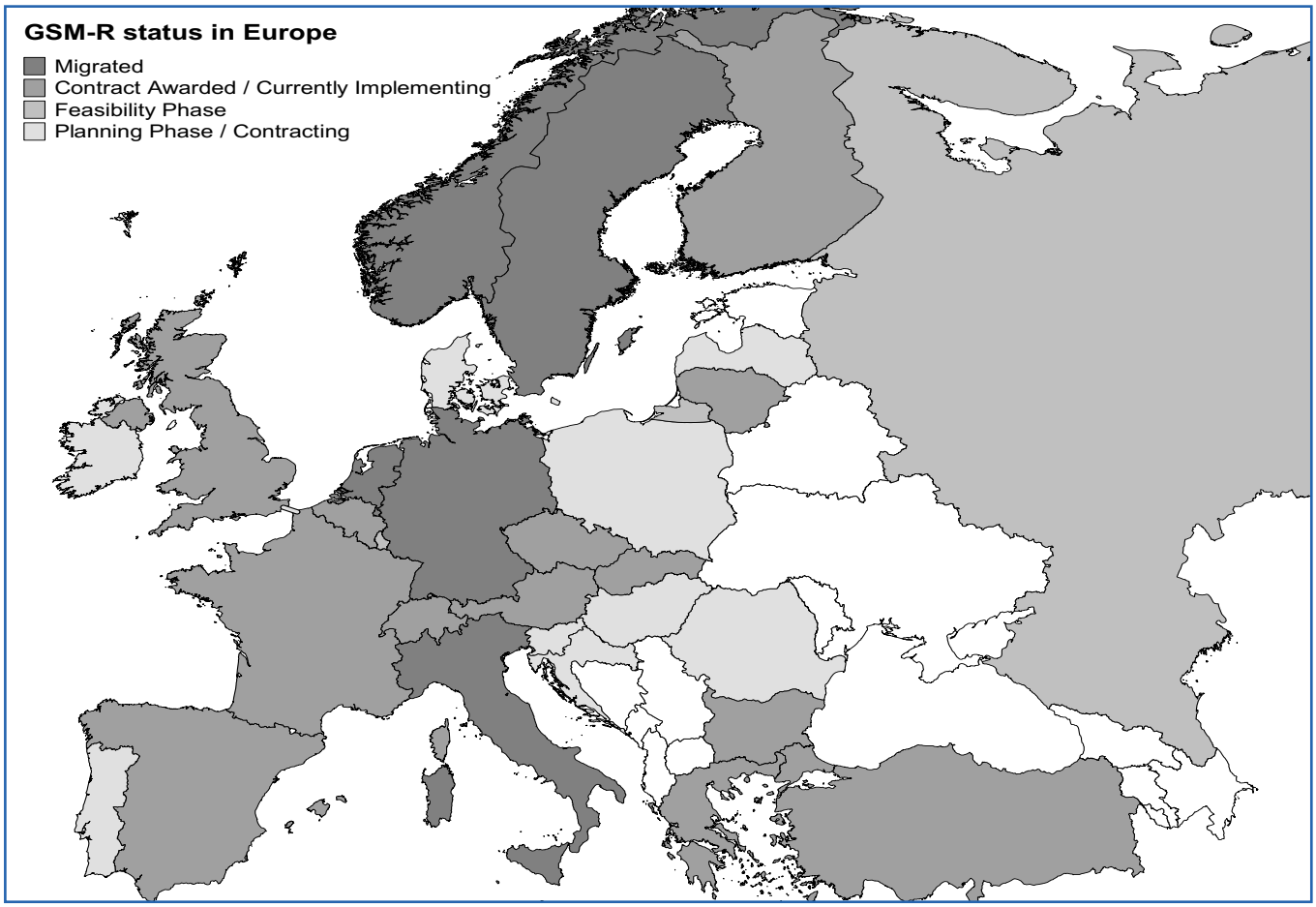
You can see here, below, the actual existing interconnections, and traffic measured beginning 2009. The values are still small, but we can see a 90 % increase, compared with the average traffic load beginning 2008.

#	Source	Destination	Load_Avg [%]	Load_Max [%]
1	Czech Republic	Germany	0,9	13,7
2	Belgium	Germany	0,9	8,5
3	Germany	Netherlands	**4,8**	14,3
4	Switzerland	Germany	1,3	7,9
5	France	Germany	1,3	8,4
6	Austria	Germany	2,0	16,5
7	Germany	Sweden	2,6	12,2
8	Italy Milan	Switzerland		
9	Italy Rome	Switzerland		
10	Netherlands	Belgium		11,0
11	Norway	Sweden		
12	France	Switzerland	0,1	**23,0**
13	Belgium	France	0,1	1,8
14	Austria	Switzerland		
15	France	Italy Rome	0,1	1,5
16	Austria	Czech Republic		
	Italy Rome	Italy Milan		
		Max	**4,8**	**23,0**



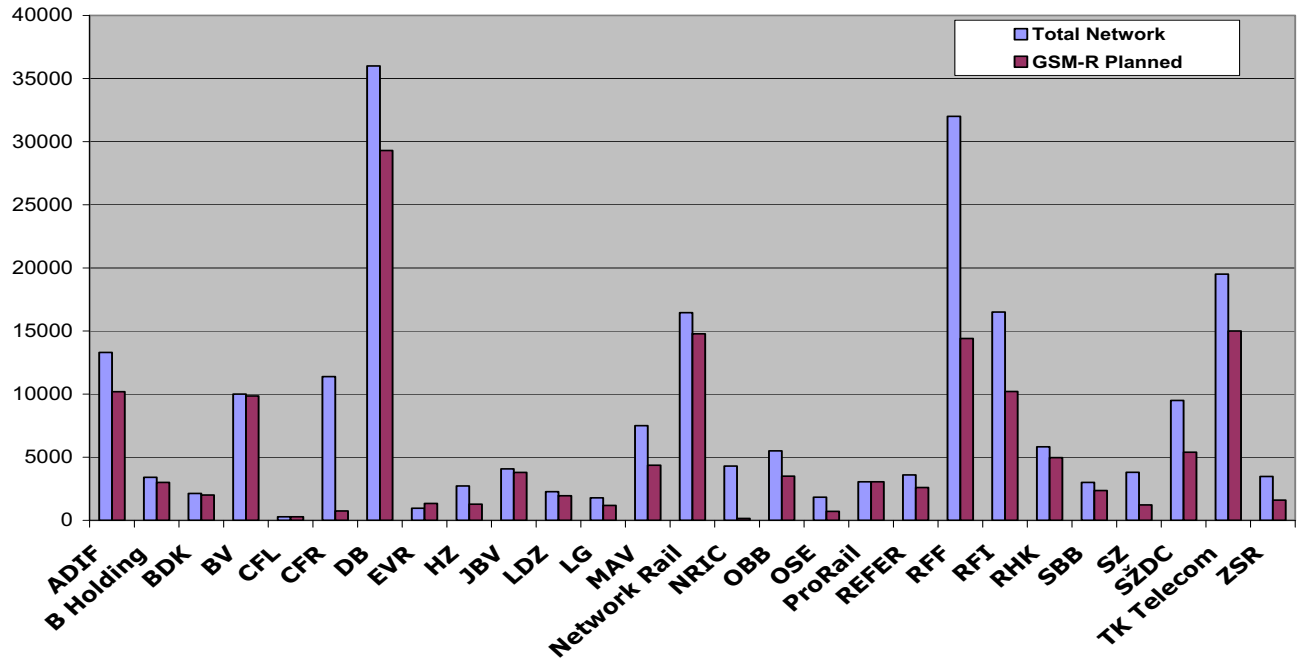
UIC Infrastructure 2009

GSM-R is taken into account in all of Europe, and not only. It is now in tendering/planning phase in all European Countries. Here below, we have represented all countries in their actual implementation status.

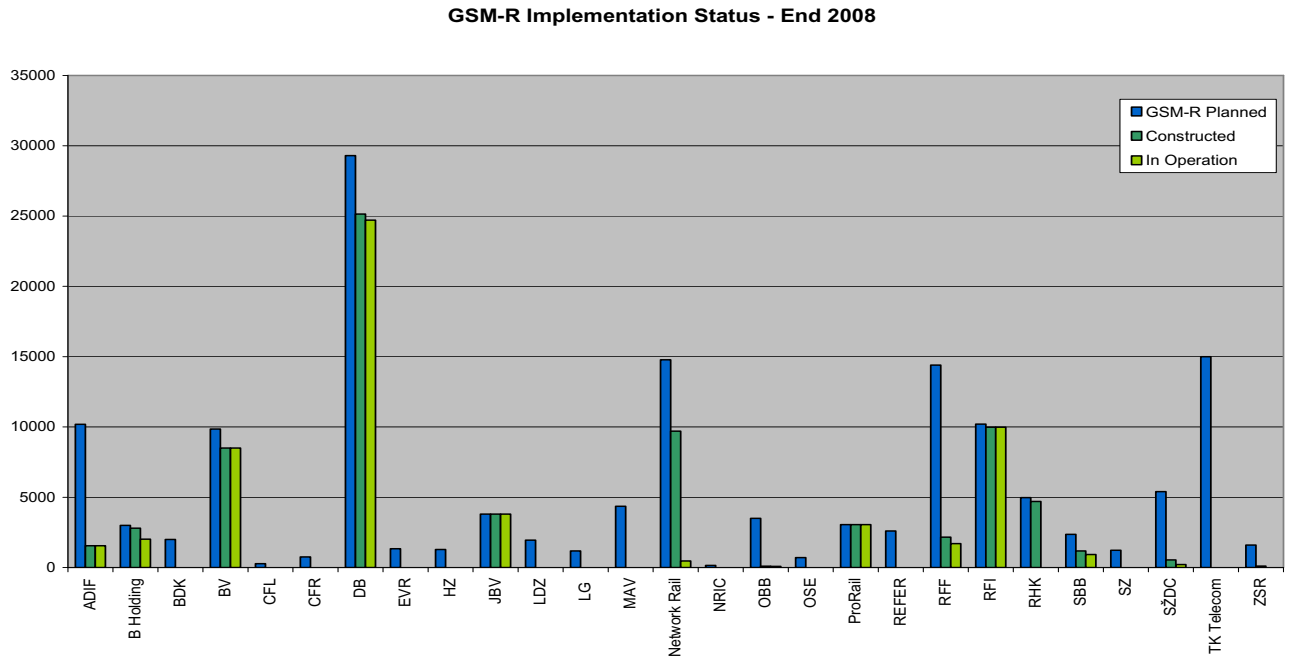


In Europe, GSM-R is planned to be deployed for 149210 km; taking into account the networks where such plans are prepared (224135 km of Railways), it means that 66, 57% of the European Railway Network is planned to be covered with GSM-R.

Tabel 1
The GSM-R European Planning



From this, 73.293 km are already constructed (49, 12 % from the planned), and 56.991Km are in operation (38, 5%)!



As installed Network Elements,

BTS (Base transceiver Station)	pcs.	9188
BSC (Base Station Controller)	pcs.	146
MSC (Mobile Station Center)	pcs.	33
HLR (Home Location Register)	pcs.	26
IN (Intelligent Node)	pcs.	17
NMC (Network Management Centre)	pcs.	19

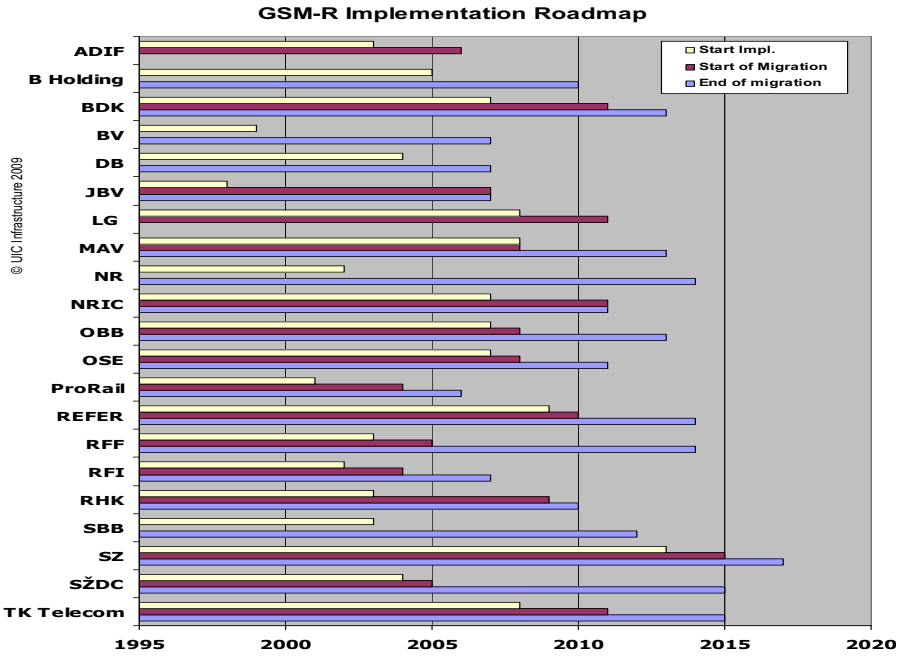
On the mobile side, 198.525 mobiles are planned, from which 65.318 are activated (32, 9%) (This refers to Cab Radios, EDOR's (ETCS Only Data Radio), Handhelds – GPH (General Purpose Handheld), OPH (Operational Purpose Handheld), OPS (Operational Purpose for Shunting) and Modems)

From this, 27.943 are activated cab radios, which include also EDOR's.

As for Dispatchers, 5.063 are planned, from which 1.557 are activated, which means 30, 7%.

For 2009, we expect a continuous advance of the implementation, according to plans. Denmark, Portugal, Poland, Hungary and Romania should start/finalize the tenders, and start the implementation. The international traffic is expected to grow, on a more abrupt curve then 2007/2009. The applications using GSM-R will also grow and diversify.

Here below, you can see the implementation roadmap, according to National Implementation Plans:



LIST OF ABBREVIATIONS

ASFA Anuncio de Señal y Frenado Automático (Spanish CC-system)

ATB Automatisch Train Beïnvloeding (Dutch CC-system)

ATP Automatic Train Control System

BACC Blocco Automatico Correnti Codificate (Italian CC-system)

BSC Base Station Controller

BTS Base Station Transceiver Station

CC Control-Command

Ebicab CC-system used in Sweden and other countries

ERTMS European Rail Traffic Management Sytem

ETCS European Train Control System

ETSI European Telecommunication Standardization Institute

EU European Union

Eurocab ETCS on-board device

EVM Hungarian CC-system

GIS Geographical Information system

GPRS General Packet Radio Service

GSM Global System Mobile

GSM-R Global System Mobile – Railway

HLR Home Location Register

hom. P. homologation process

IN Intelligent Node

KVB Contrôle de Vitesse par Balise (French CC-system)

LS Czech CC-system

LTM Loop Transmission Module

LZB Linienzugbeeinflussung (CC-system used in Germany and other countries)

Memor II+ CC-system used in Luxembourg

MoU Memorandum of Understanding

MSC Mobile Switching Centre

NMC Network Management Centre

PZB Pünktförmige Zugbeeinflussung (CC-system used in Germany and other countries)

RBC Radio Block Centre

SCMT Sistema per il Controllo della Marcia dei Treni (Italian CC-system)

SHP Samoczynne Hamowanie Pociągu (Polish CC-system)

Signum Swiss CC-system

STM Specific Transmission Module

TBL Transmission Balise Locomotive (Belgian CC-system)

TEN Trans European Network

t.p. tender process

TPWS Train Protection and Warning System (British CC-system)

TSI Technical Specification for Interoperability

TSI CC&S TSI for control-command and signaling

TVM Transmission Voie Machine (CC-system used in France and in other countries)

UIC Union Internationale des Chemins de fer

UNIFE Union des Industries Ferroviaires Européennes

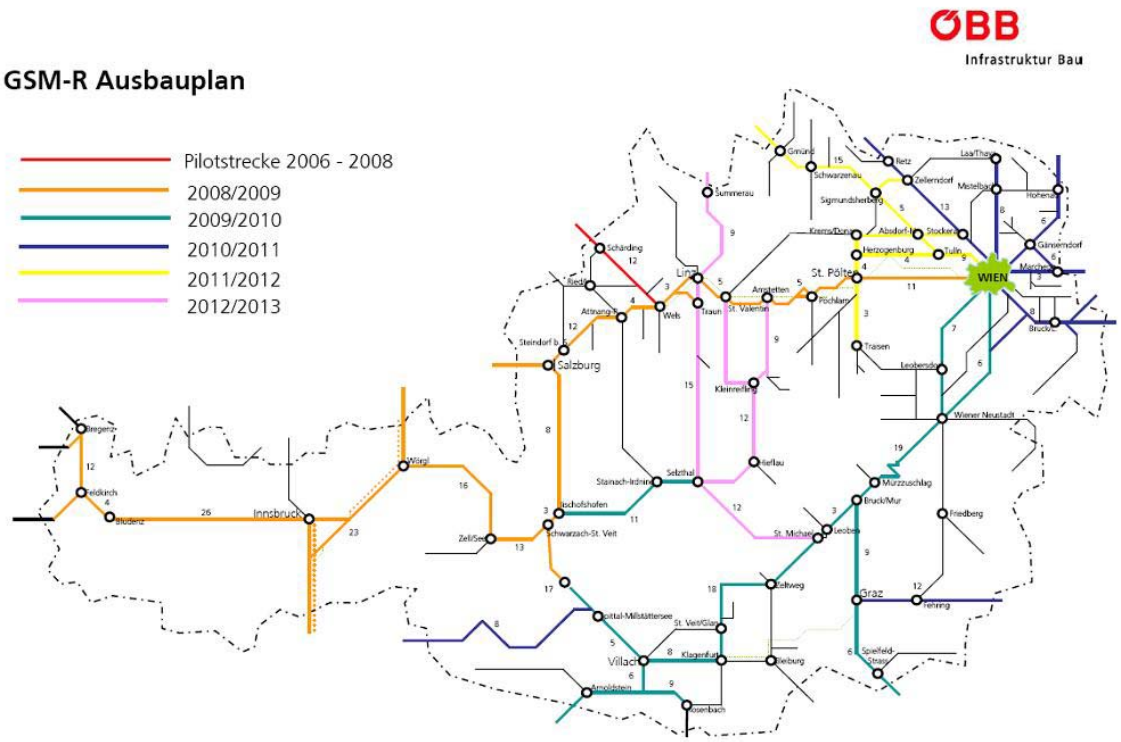
UNISIG Union Industry of Signalling

ZUB Zugbeeinflussung (CC-system used in Denmark and Switzerland)

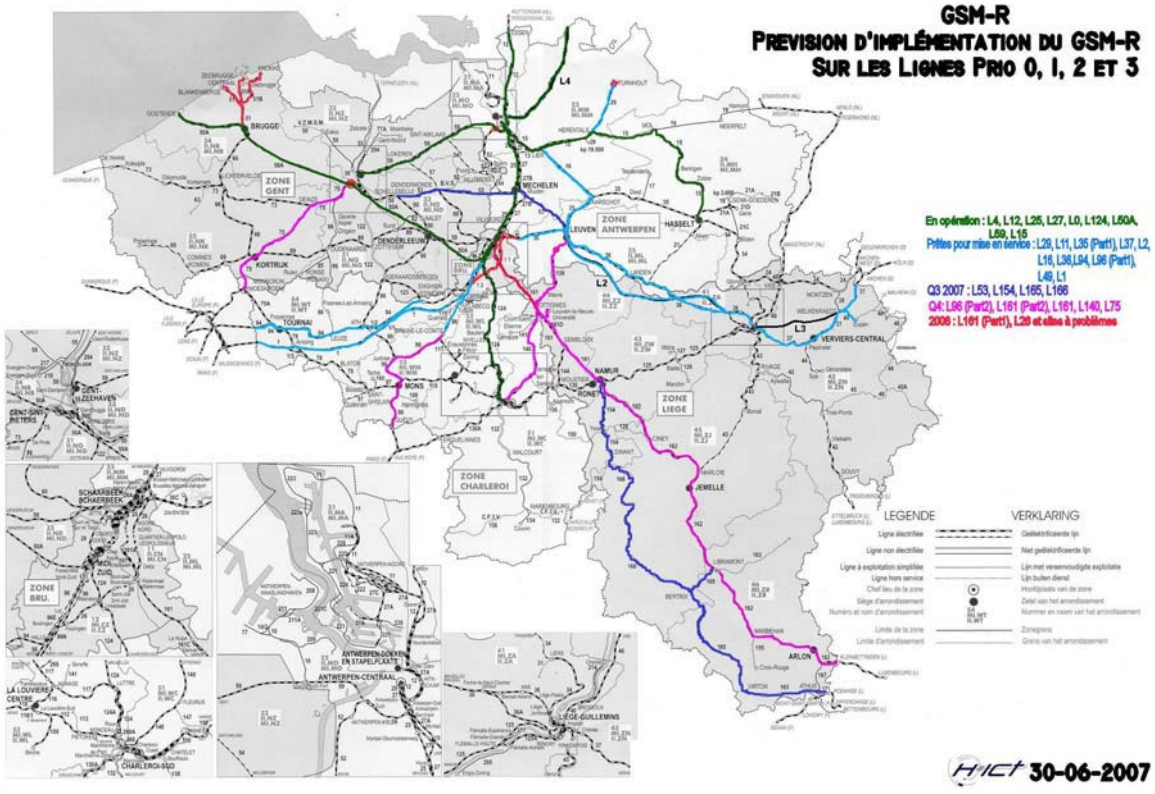
ANNEX: detailed GSM-R maps

ANNEX: detailed GSM-R maps

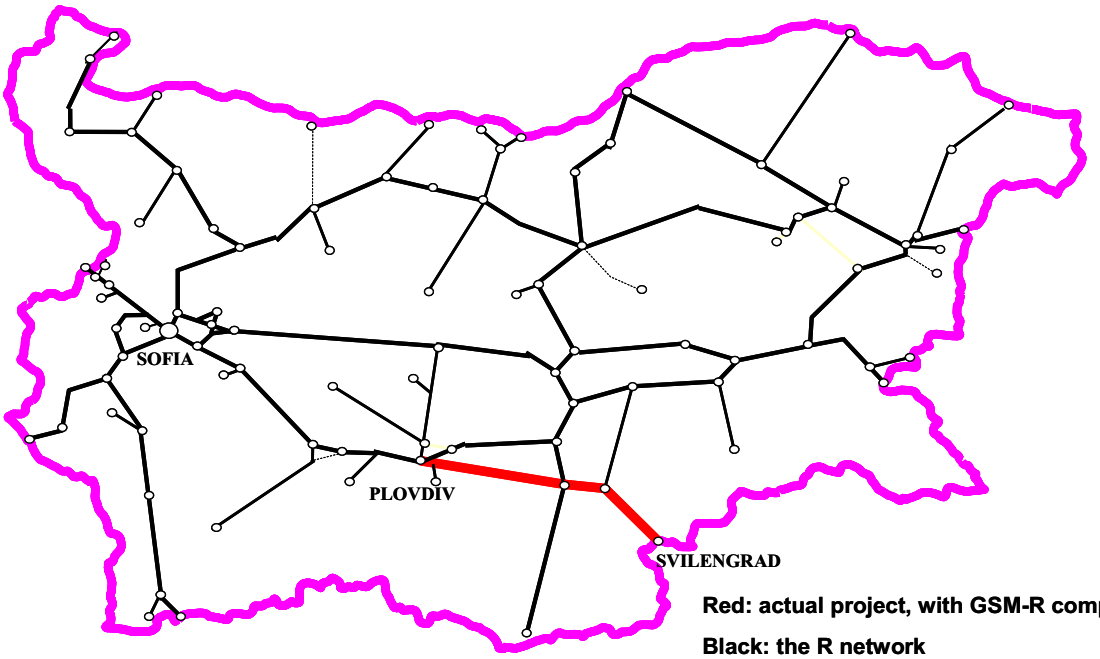
AUSTRIA



BELGIUM



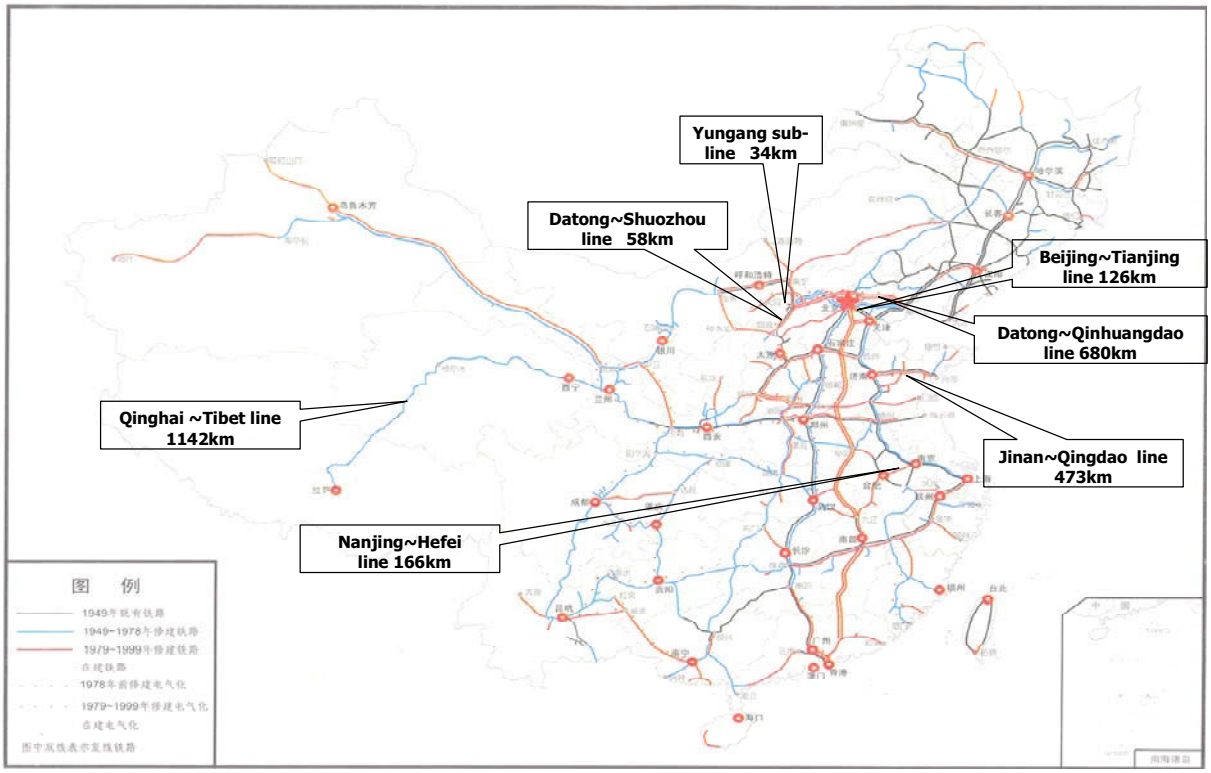
BULGARIA

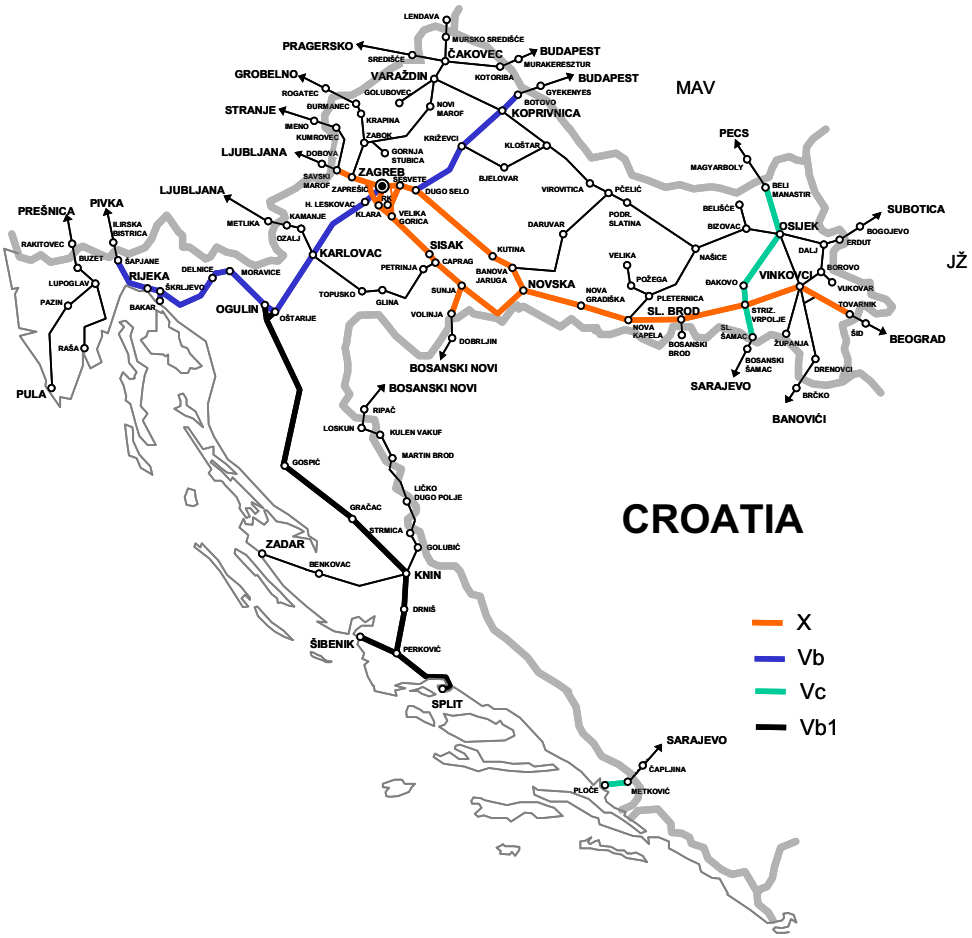


Red: actual project, with GSM-R component

Black: the R network

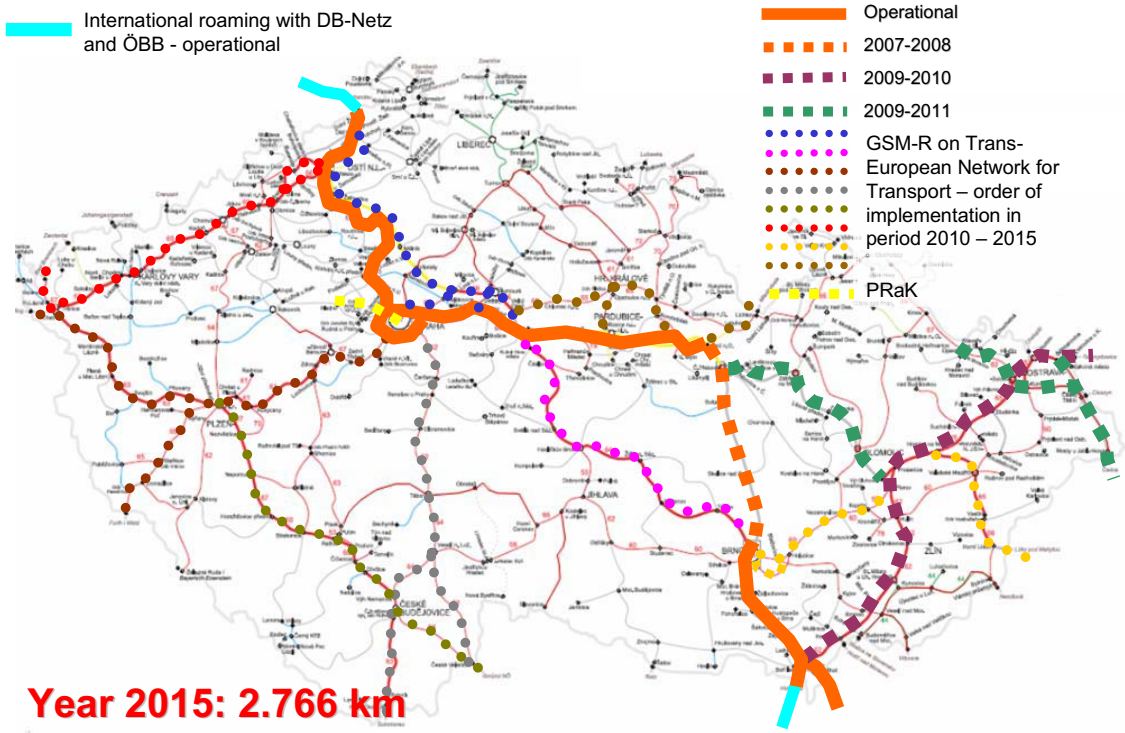
CHINA



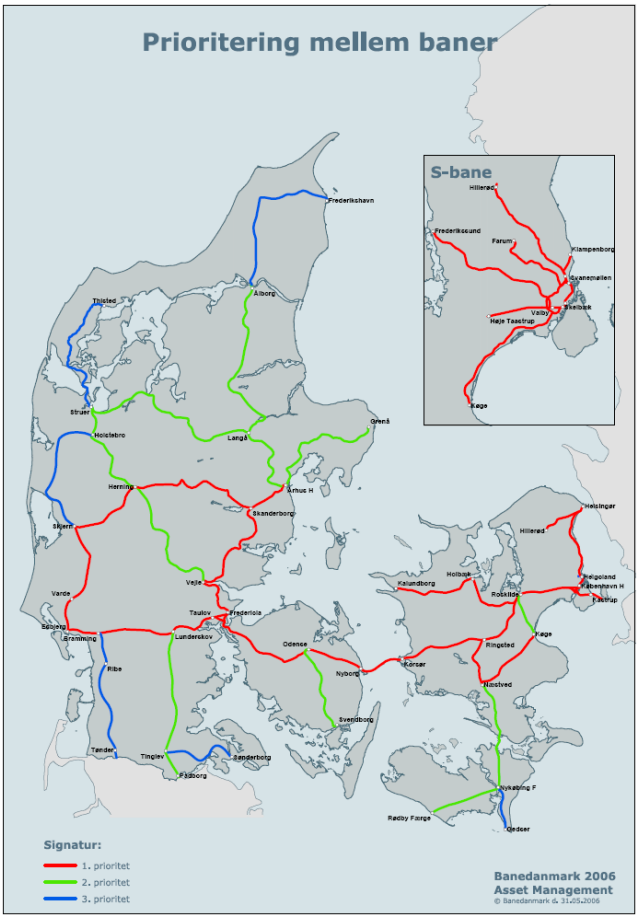


CROATIA

CZECH REPUBLIC



DENMARK

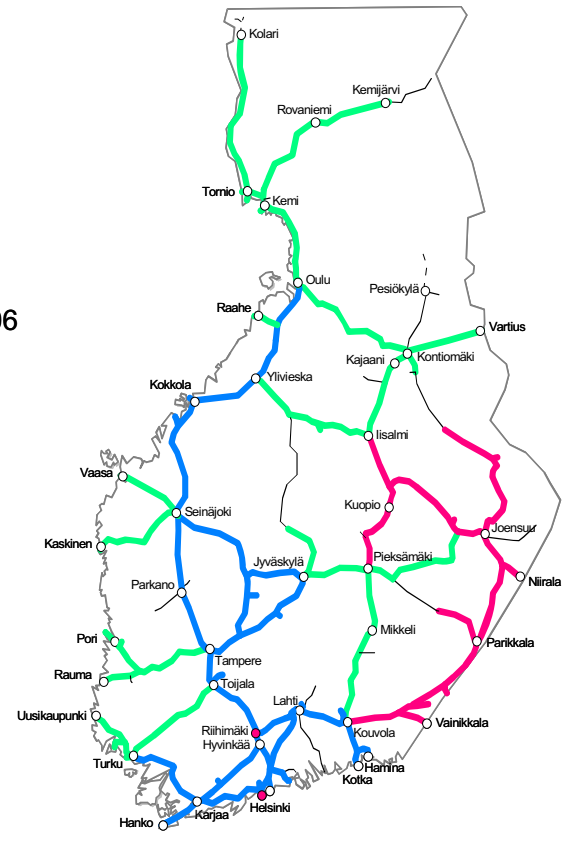


FINLAND

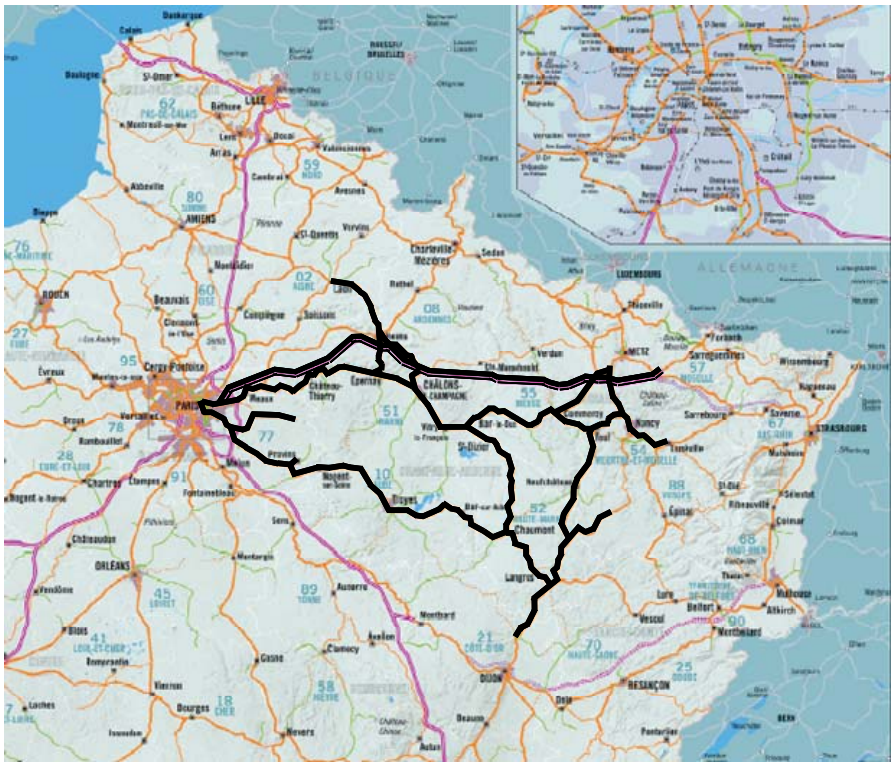
= Network implemented by the end of 2006

= Network implementation in 2007

= Network implementation in 2008



FRANCE (Tranche 1 – EE-HSL)



DB Netz AG
GSM-R - digitaler Zugfunk

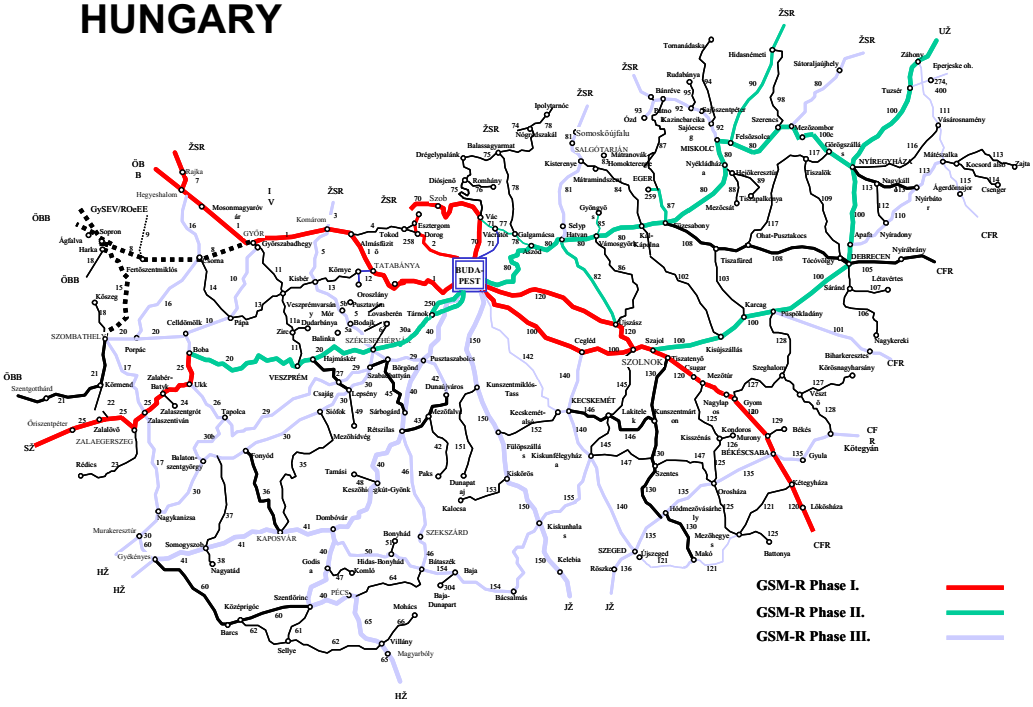
GERMANY

Basic package + additional lines package 1.1
~ 24.000 km + ~ 1000 km

Additional lines package 2
~ 4.000 km

GREECE

HUNGARY

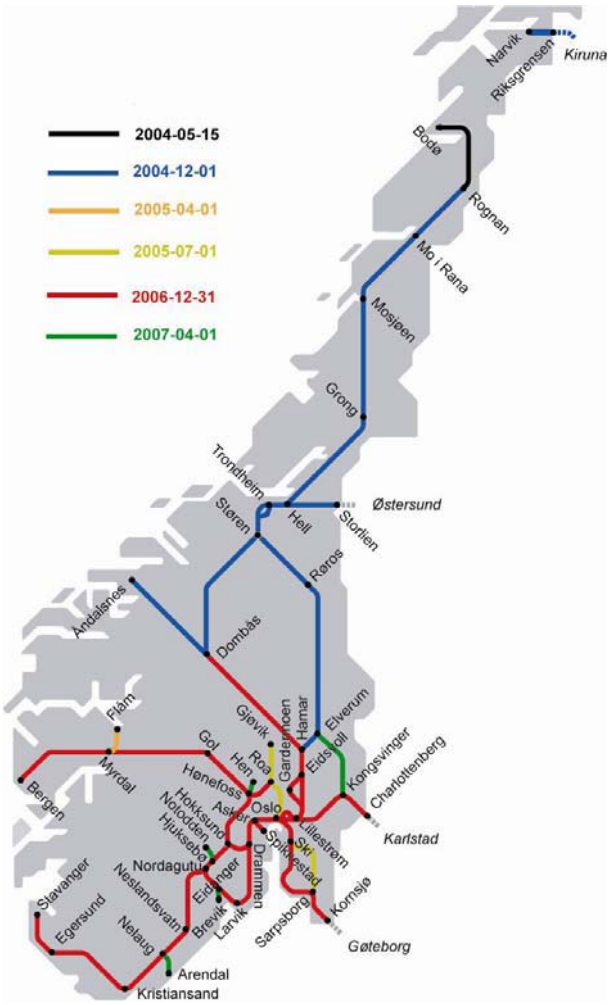


In service

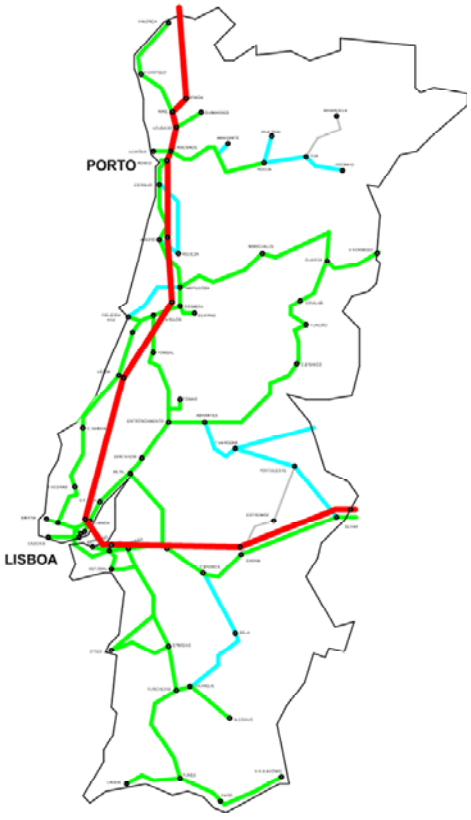
In construction

ITALY

NORWAY



POLAND

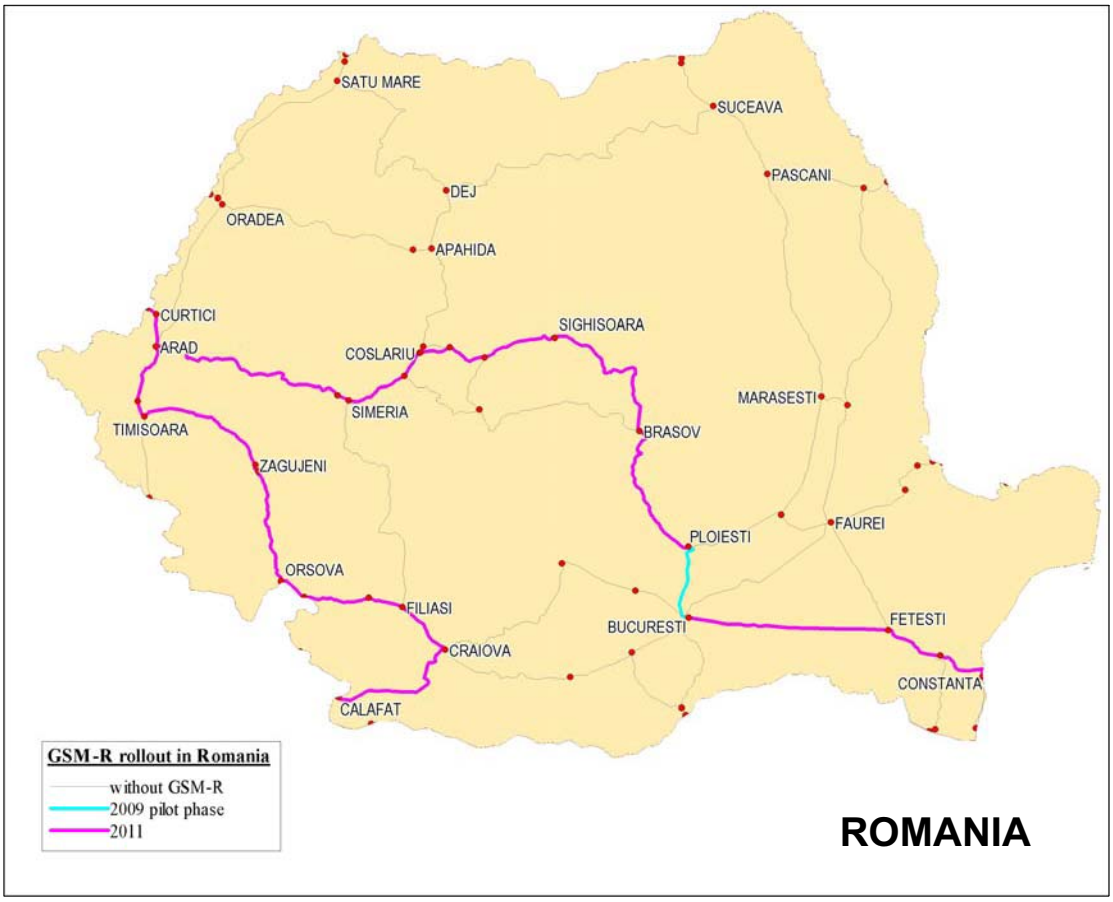


GSM-R – Conventional lines

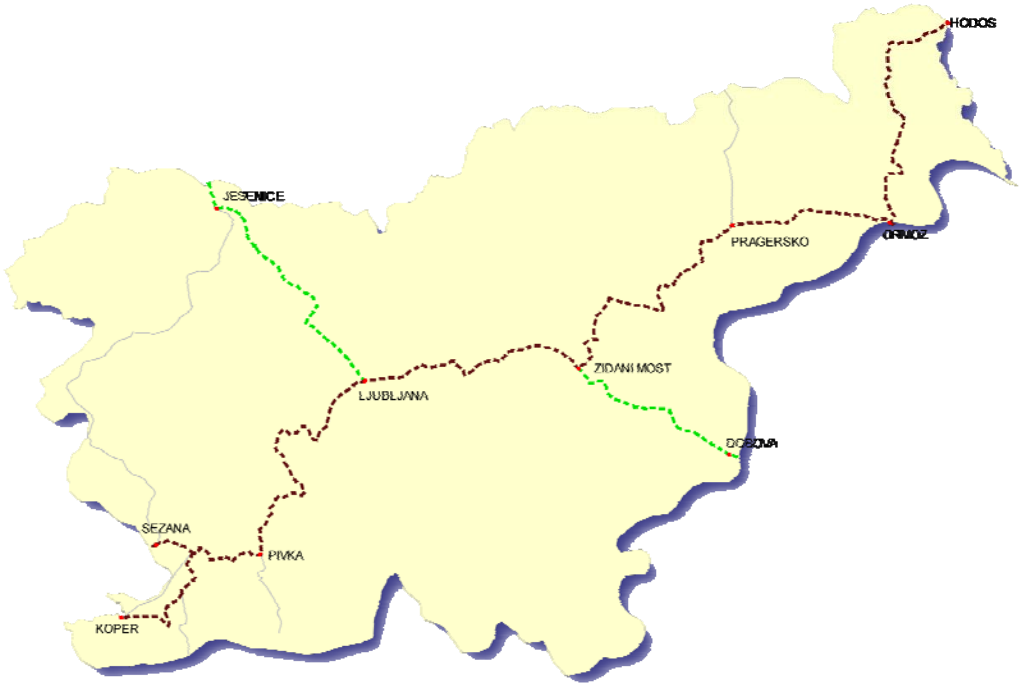
GSM-R – High Speed lines

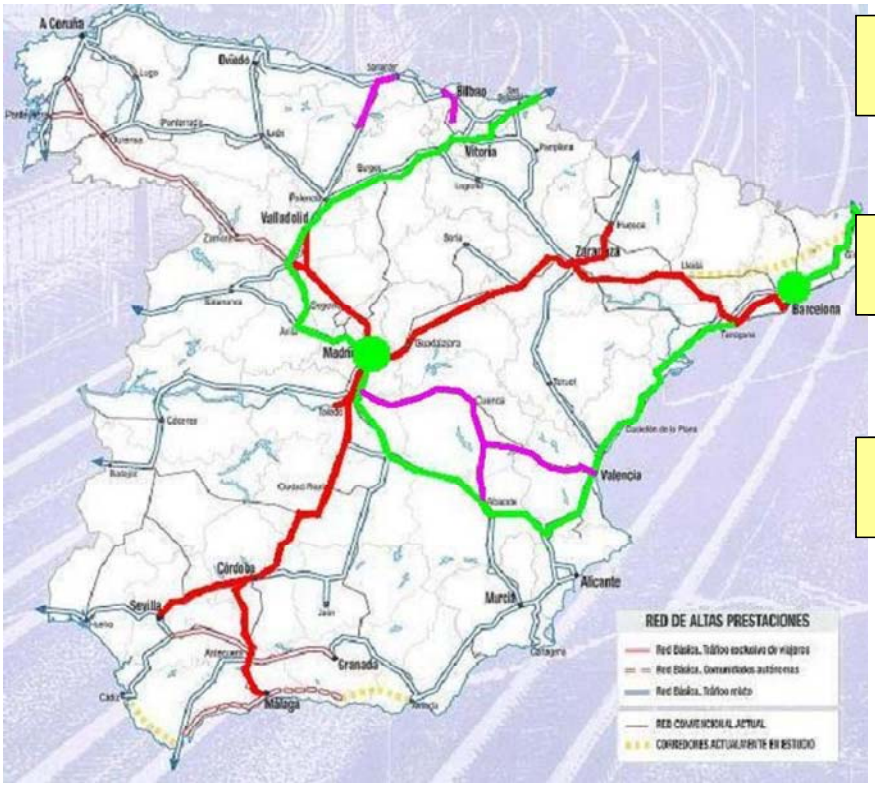
Secondary Lines – Public GSM

PORTUGAL


SATU MARE
SUCEAVA
PASCANI
DEJ
ORADEA
APAHIDA
CURTICI
ARAD
SIGHISOARA
COSLARIU
SIMERIA
MARASESTI
TIMISOARA
BRASOV
ZAGUJENI
FAUREI
PLOIESTI
ORSOVA
FILIASI
BUCURESTI
FETESTI
CRAIOVA
CONSTANTA
CALAFAT
GSM-R rollout in Romania
without GSM-R
2009 pilot phase
2011
ROMANIA

SLOVENIA


HODOS
JESENICE
PRAGERSKO
ZIDANI MOST
LJUBLJANA
SEZANA
PIVKA
KOPER



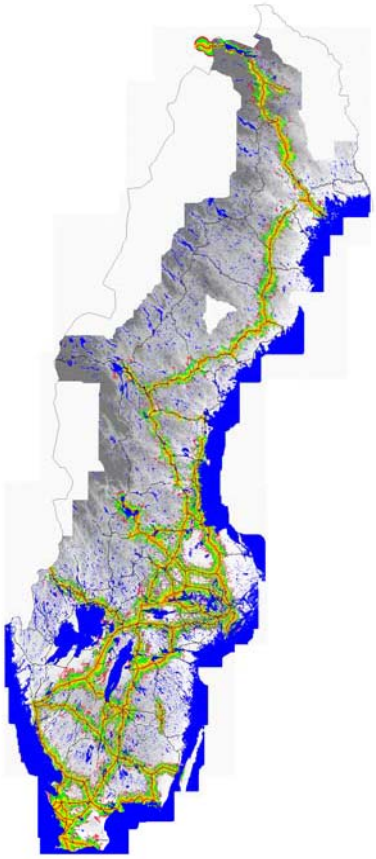
In service

In construction

In project

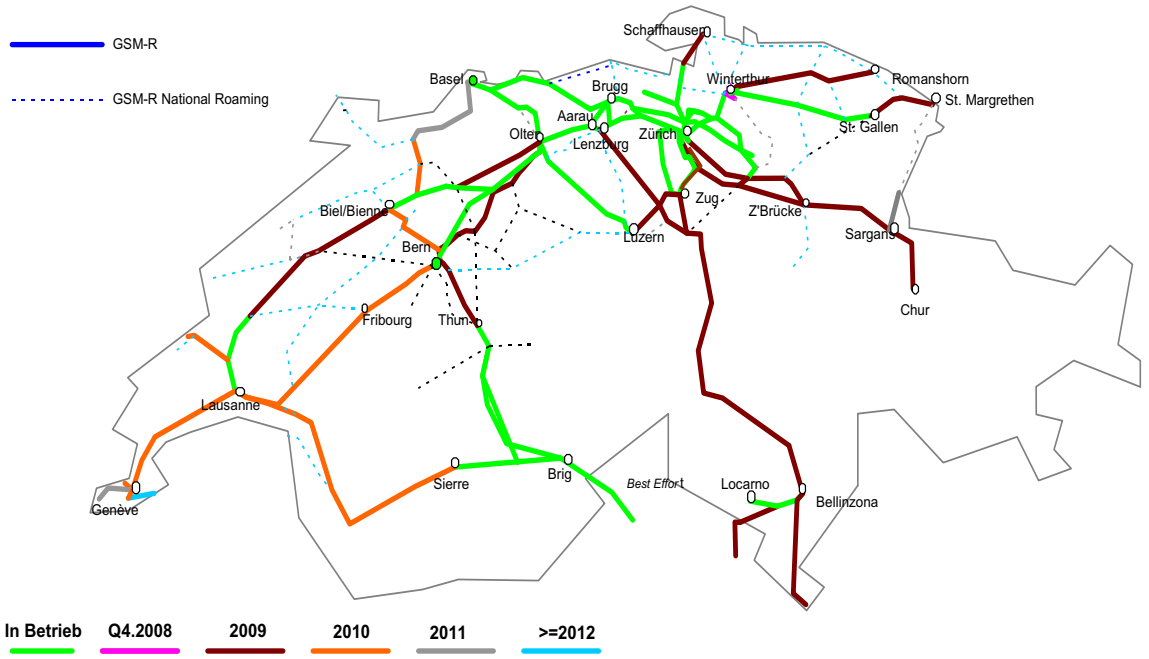
SPAIN

SWEDEN

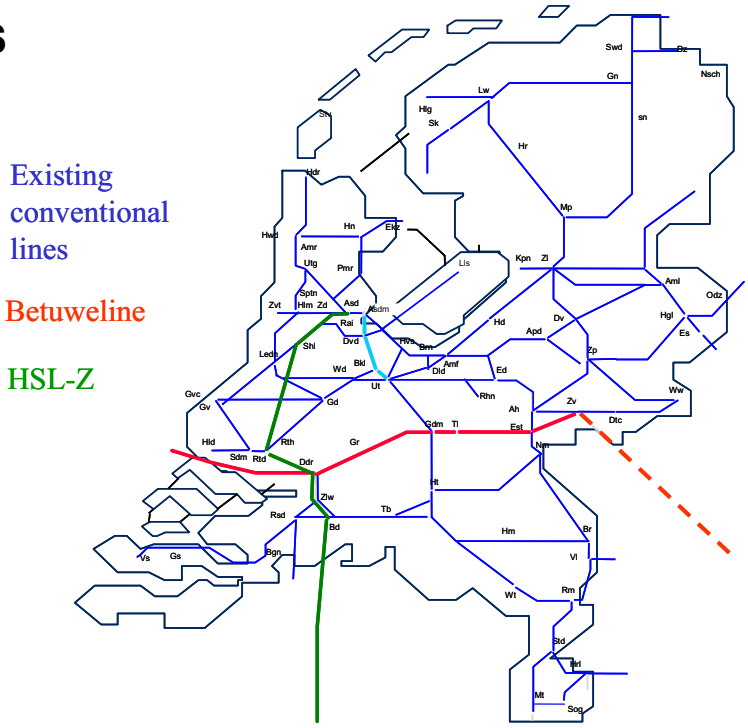


Planerad MobiSIR täckning september 2004
Planned MobiSIR coverage September 2004

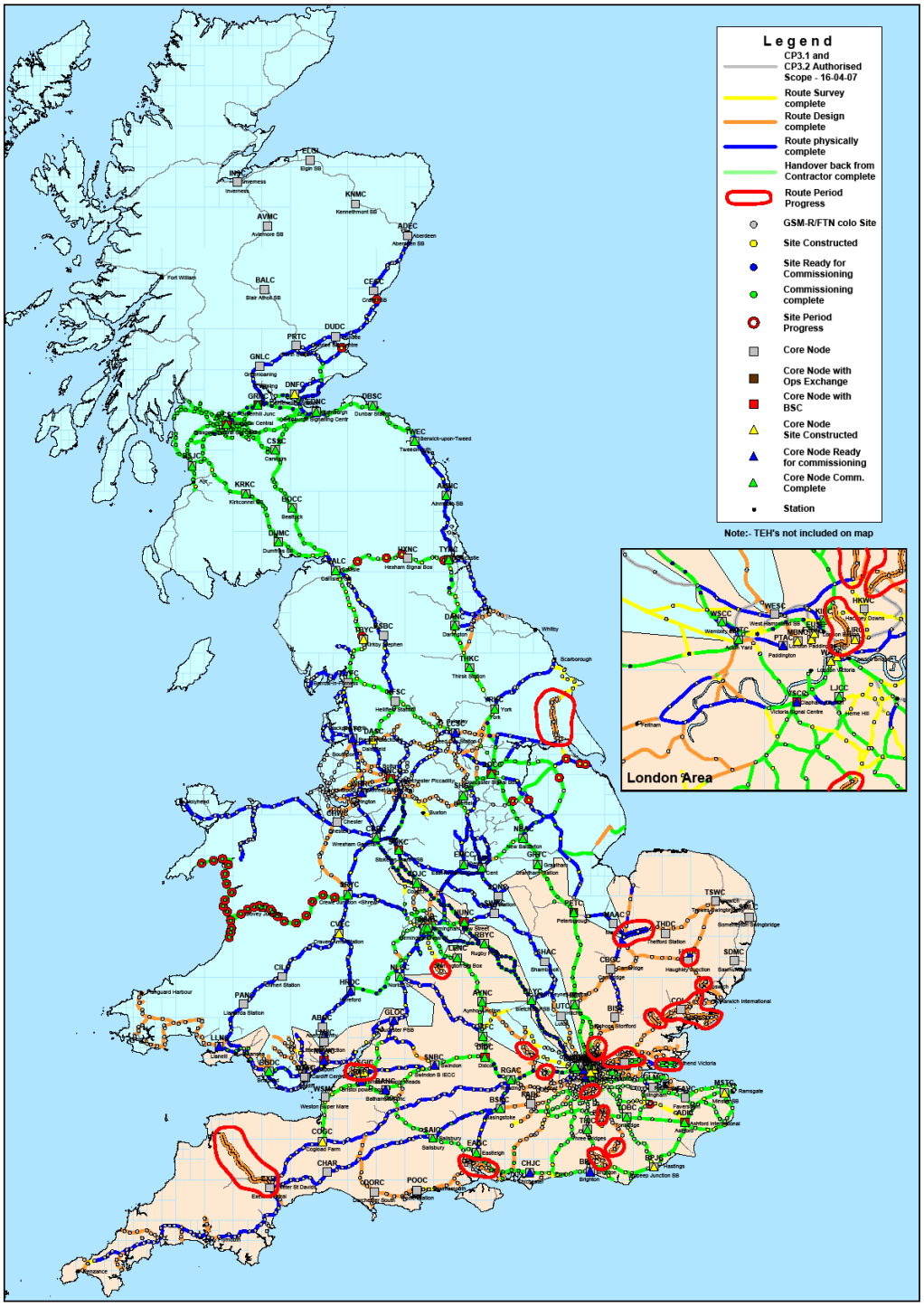
SWITZERLAND



THE NETHERLANDS



UNITED KINGDOM



AKNOWLEDGMENTS

Such a document would never have been produced without collaboration between numerous participants. Therefore, the UIC would like to thank all its members throughout the world for providing the data leading to this Atlas, together with the UIC ERIG (European Radio Implementers Group) for GSM-R data, and UNIFE.

For further details you can contact:

UIC - International Union of Railways

Paolo de Cicco *(responsible for co-ordination ERTMS Platform): decicco@uic.asso.fr*
Françoise El Alaoui *(Communications): elalaoui@uic.asso.fr*
Dan Mandoc *(GSM-R data): mandoc@uic.asso.fr*
Khalid Agrou *(ETCS data): agrou@uic.asso.fr*
Florian Lesné *(GIS): lesne@uic.asso.fr*
Marija Petkovski *(Design): petkovski@uic.asso.fr*

Sources

UIC members - ERIG - UNIFE

Printed by
Lienzo Gráfico Impresores
Avda. de Hytasa, 14. Polg. Hytasa.
c/Lienzo, 10. 41006 Sevilla - España
March 2009
Dépôt légal March 2009

ISBN 978-2-7461-1630-6 (English version)

INTERNATIONAL UNION OF RAILWAYS
UNION INTERNATIONALE DES CHEMINS DE FER – INTERNATIONALER EISENBAHNVERBAND
16 rue Jean Rey – F 75015 PARIS
http://www.uic.asso.fr