

GALILEO. Applications for rail.

Roadmap for implementation

Table of contents

1	Executive summary.....	4
2	List of abbreviations and acronyms	7
3	Table of contents	8
4	Introduction.....	10
5	Structure of the document	11
6	Assessment of performance – state of the art	12
7	Differences between GPS, GNSS and GALILEO	14
8	Application classes and requirements.....	16
8.1	Commercial, mass market, tracking and tracing and public information....	16
8.1.1	Examples of currently running applications based on GPS	16
8.1.2	Improvements expected from GALILEO	17
8.2	Professional, civil engineering, infrastructure construction and maintenance, localisation failures in track and overhead.....	17
8.2.1	Currently railway applications served by GPS	18
8.2.2	The benefits of GALILEO	18
8.3	Safety related applications	18
8.3.1	Performance requirements	19
8.3.2	Examples of applications that can use the GNSS combinations with EGNOS integrity.....	20
8.3.3	Examples of applications with GALILEO alone (SoL service):.....	21
9	From GPS to GNSS and GALILEO	23
10	Roadmap to GALILEO	27
10.1	Criteria and constraints on implementation.....	27
10.2	Strengths and opportunities of GALILEO	30
10.3	Weaknesses	31
10.4	Threats for GALILEO applications to rail	31
10.5	Promoters	33
10.6	Roadmap	33
10.6.1	First phase (until November 2005)	34
10.6.2	Next phase (2006 – 2008)	35
11	Conclusion	36
12	Recommendations for action	36
12.1	Certification for safety applications	36
12.2	Economic use	36
12.3	Application of GEORAIL.....	37
12.4	Carry out of promoting actions	37
Appendix A: GALILEO services and their designed performance		38
A1	The Open Service	38
A.2	The Commercial Service.....	38
A.3	The Safety of Life Service	39
A.4	The Public Regulated Service	39
Appendix B: Technical comments		41
Appendix C: Definitions of critical notions		46
Appendix D: References		50

Index of tables

Tableau 1: Indicative scores of satellite system fulfilment of applications' requirements.....	24
Tableau 2: Aspects of implementation of satellite technology for various railway applications	29

Index of figures

Figure 1: Main differences between GALILEO, GPS and GNSS.....	15
Figure 2: Degree of fulfilment of rail application requirements from each of the individual satellite navigation systems and combination of them	25
Figure 3: From GPS to GALILEO – evolution of functionality, safety integrity and guarantees.....	26
Figure 4: Implementation scores for applications, based on five criteria for acceptance (maximum score = 50)	28
Figure 5: Roadmap for implementing the GNSS and GALILEO to rail	34