



Market consultation for maintenance, life cycle management and extensions of the Dutch GSM-R network

28th January 2019



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Introduction

Introduction

Welcome to the market consultation of ProRail concerning its GSM-R network. ProRail is the operator of the railway infrastructure in the Netherlands. For more information please visit: www.prorail.nl. Please find enclosed a description of the ProRail GSM-R network and our objectives.

ProRail has to contract new suppliers for the maintenance, life cycle management and extensions of the GSM-R network in the coming years. To obtain more knowledge about the market, its suppliers and the technical possibilities, ProRail initiates this market consultation.

The market consultation documentation consists of:

- A brief overview
- A questionnaire (in English and Dutch)
- The market consultation conditions

Introduction

If you are interested in the market consultation, please reply by sending in your questionnaire. ProRail will process and consider all the reactions and might invite you or your organisation to make a presentation.

How to reply?

Please reply via Tendered “berichtenservice” or via the e-mail address: aanbestedingen@prorail.nl. Please use the reference: GSMR market consultation – for the attention of Mr. A. Bijleveld.

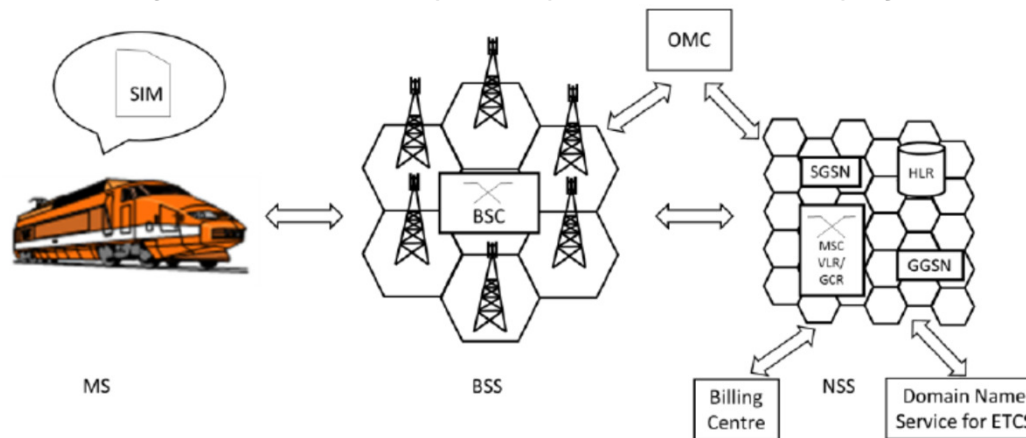
You may react to this market consultation until 21st of February 2019. Reactions beyond this date will not be considered valid. If you have any question please use the same method of communication via Tendered or the above mentioned e-mail address.

Thank you for your interest and we look forward to your reaction.

GSM-R overview

GSM-R highlights

- GSM-R is an international standard, with support guaranteed until 2030 by the industry partners.
- GSM-R provides coverage on all railway tracks and tunnels (maintained by ProRail), including HSL-Zuid.
- GSM-R is only used for railway specific communications. ProRail is one of the mobile network providers in the Netherlands.
- GSM-R uses a proprietary frequency band: 2x 4MHz R-GSM band.
- Public Roaming & Interconnection is provided.
- GSM-R maintenance is currently contracted (DBM) to MobiRail (a joint venture of KPN and Nokia)



GSM-R functional and system requirements

- System functions:
 - Voice (point-to-point, Group calls)
 - Priority services (eMLPP)
 - Short Message Service (SMS)
 - Circuit switched data
 - Enhanced GPRS
 - Barring incoming or outgoing calls & access matrix
- Main railway specific functions:
 - Location Dependent Addressing (LDA)
 - Functional Addressing by functional numbering
 - Shunting communication
 - Railway Emergency Call

GSM-R functional and system requirements

- Performance requirements:
 - Availability
 - Coverage level
 - Signal quality level (C/I)
 - Voice quality
 - Data transfer delay
 - Call setup success rate
 - Call setup times

GSM-R main application areas

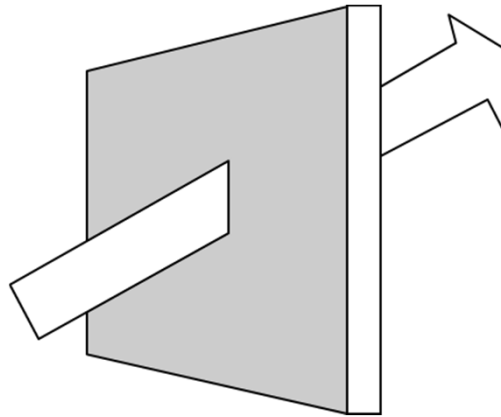
- Driver to Controller communication (voice)
- Railway Emergency Call
- Bearer services for ERTMS (circuit switched data and packet switched data)
- Infoplus panels at stations (GPRS)
- Various telemetry applications (CSD, GPRS or SMS)
- Specials (CSD, GPRS or SMS)

Vision on the future of GSM-R maintenance

Vision on the future of GSM-R maintenance 2025-2030

Initial situation

- Existing design, build and maintenance contract with Mobilrail
- Poor market conformity of maintenance costs in annual benchmark
- Mission criticality especially regarding the introduction of ERTMS

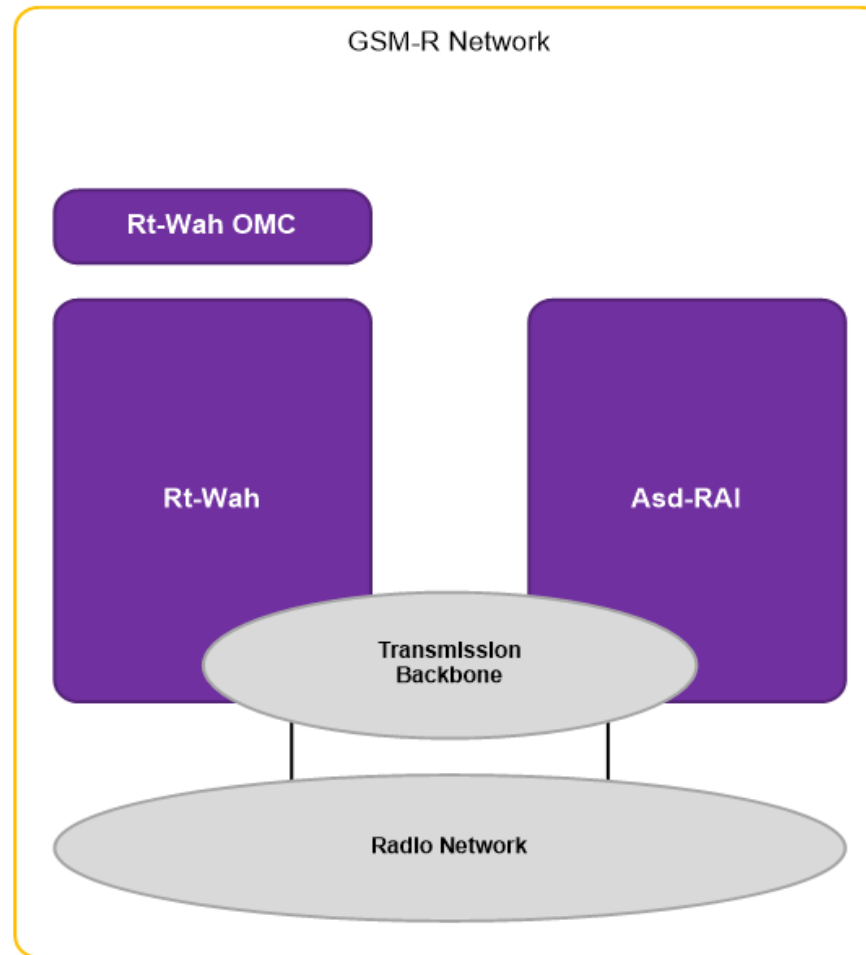


Objectives

- Reduce operational costs (achieve market conformity; have a reasonable position in the RTC GSM-R cost benchmark)
- Increase level of cost control
- Increase level of control and governance of the GSM-R domain
- Create contractual flexibility and adaptation to future operation (alignment with ERTMS, FRMCS)
- Increase quality of network operations

Technical background of the GSM-R network

Abstract GSM-R network overview



Rt-Wah- Network core location 1
Asd-Rai –Network core location 2

GSM-R Core network

- The GSM-R Core network is a georedundant solution which provides ProRail with the required functionality to perform train operation. It supports railway safety voice applications, provides the bearer for ETCS and provides packet switching for a large number of ProRail telemetry applications.
- The core network consist of a CS and PS core, a radio platform, an IN solution, SMS and voicemail functionality. The current platform supports 20.000 mobile subscribers.
- The OMC systems are also included in the core. In addition, performance monitoring solutions are provided.
- To connect the two core sites, a transmission backbone is used (using ProRail dark fiber). Also ProRail's MPLS network is used to connect the core network to ProRail application networks.
- ISDN connectivity is provided to other networks: ProRail, public, or foreign GSM-R networks (Germany and Belgium).

GSM-R GeoRedundant Inttel (GRI)

- GeoRedundant Inttel is a georedundant, customized telephony system used at the traffic control locations and ProRail.
- There is a production GRI configuration (in 2 core locations) and a test configuration.
- GRI is used for driver to controller communication and for controller to controller communication.
- The core system is provisioned for 300 consoles and connected with 13 controller locations.

GSM-R Base Station Subsystem (BTSs and BSCs)

- Appr. 360 sites are equipped with BTSs. Two types are installed:
 - Siemens BTSs;
 - Nokia Flexi BTSs.
- A part of the radio network are tunnels. In the tunnels both GSM-R and C2000 (TETRA) services are provided over the same High Frequency system.

Transmission systems

- ProRail uses its own transmission services but also public services.
- Currently the Siemens BTS are connected via public E1 leased lines and via Microwave. This will be migrated to IP (Packet Abis) connectivity when the Nokia Flexi BTSs are implemented. Around 270 public IP connections are expected.
- For connectivity for ETCS RBCs still E1 connections are required (4 connections).
- All other transmission links are provided by ProRail

Transmission availability and SLA requirements

- Two types of connections:
 - High availability (>99,9%)
 - High availability en disaster tolerant (physical independent routes to POP locations)
- Connections on the GSM-R Cores must be redundant and disaster tolerant.
- Repair time is 95% in 3:45 hours, 99% in 6 hours and 100% in 24 hours, 24/7 and 365 days.

GSM-R LCM and Projects

LCM:

- Replacements of various core elements, both HW and SW, to cover LCM.
- LCM Radionetwork, phase 2: In the period 2019-2024 all the Siemens BTS are intended to be replaced by Nokia Flexi BTSs

Projects:

- The ERTMS programme where ETCS over GPRS is introduced.
- Extensive end-to-end monitoring approach.

Market consultation questions ProRail

Questions for suppliers

1. What are your current services?
2. If you were ProRail, how would you organise the maintenance, life cycle management and extension of the GSM-R network?
3. Which parts of the maintenance, life cycle management and extension of the GSM-R network are interesting for you to possibly offer to us?
4. Which pre-requisites are relevant to you for the maintenance, life cycle management and extension of the GSM-R network?
5. Which main factors determine the price of the segments you consider offering?
6. How do these price determining factors relate to each other?

Vragen aan marktpartijen (Dutch Version)

1. Wat is uw huidige dienstverlening?
2. Als u ProRail zou zijn, hoe zou u het beheer, life cycle management en uitbreidingen van het GSM-R netwerk organiseren?
3. Welke delen van het beheer, life cycle management en uitbreidingen van het GSM-R netwerk is voor u, als leverancier, interessant om aan te bieden?
4. Welke randvoorwaarden ziet u, als leverancier, om het beheer, life cycle management en uitbreidingen van het GSM-R netwerk te realiseren?
5. Wat zijn de prijs bepalende factoren van de aan te bieden delen?
6. Hoe verhouden deze prijs bepalende factoren zich tot elkaar?

Market consultation conditions

Market consultation conditions

- The market consultation is voluntary. There is no obligation to participate in this market consultation.
- This market consultation is not a part of a European tender. Participation is voluntary and has no relation with a European tender which will be published at a later stage.
- There will be no compensation for costs for participating in the market consultation.
- It is up to ProRail to stop this market consultation and/or the following tendering process at any time.
- All published information is confidential and may not be used outside this market consultation. ProRail will treat the received information in this market consultation likewise.
- A market consultation report is part of the process. The report will list ProRail's main conclusions of the market consultation. The report will be included in the tendering documents, together with the ProRail market consultation documents.