EUPOS the success guarantee for rapid buildup the infrastructure in the countries of Central and Eastern Europe

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- *EUPOS* objectives and its current state
- *EUPOS* requirements
- *EUPOS* proposals for solutions

General

- *EUPOS* is an initiative to establish a uniform DGNSS basis infrastructure in Central and Eastern Europe (CEE)
- Partners are generally the authorities which are responsible for providing the national geodetic reference systems.
- The initiative is open for new partners that declare to follow the *EUPOS* principles.
- *EUPOS* is independent of private company solutions and uses only international standards.
- Available RTCM standards are used as obligatory *EUPOS* standards.

The organizational structure of *EUPOS*

International *EUPOS*®Steering Committee

Representatives of all member countries | Office

National *EUPOS*®Service Centres

***EUPOS*®provider**, if not the same

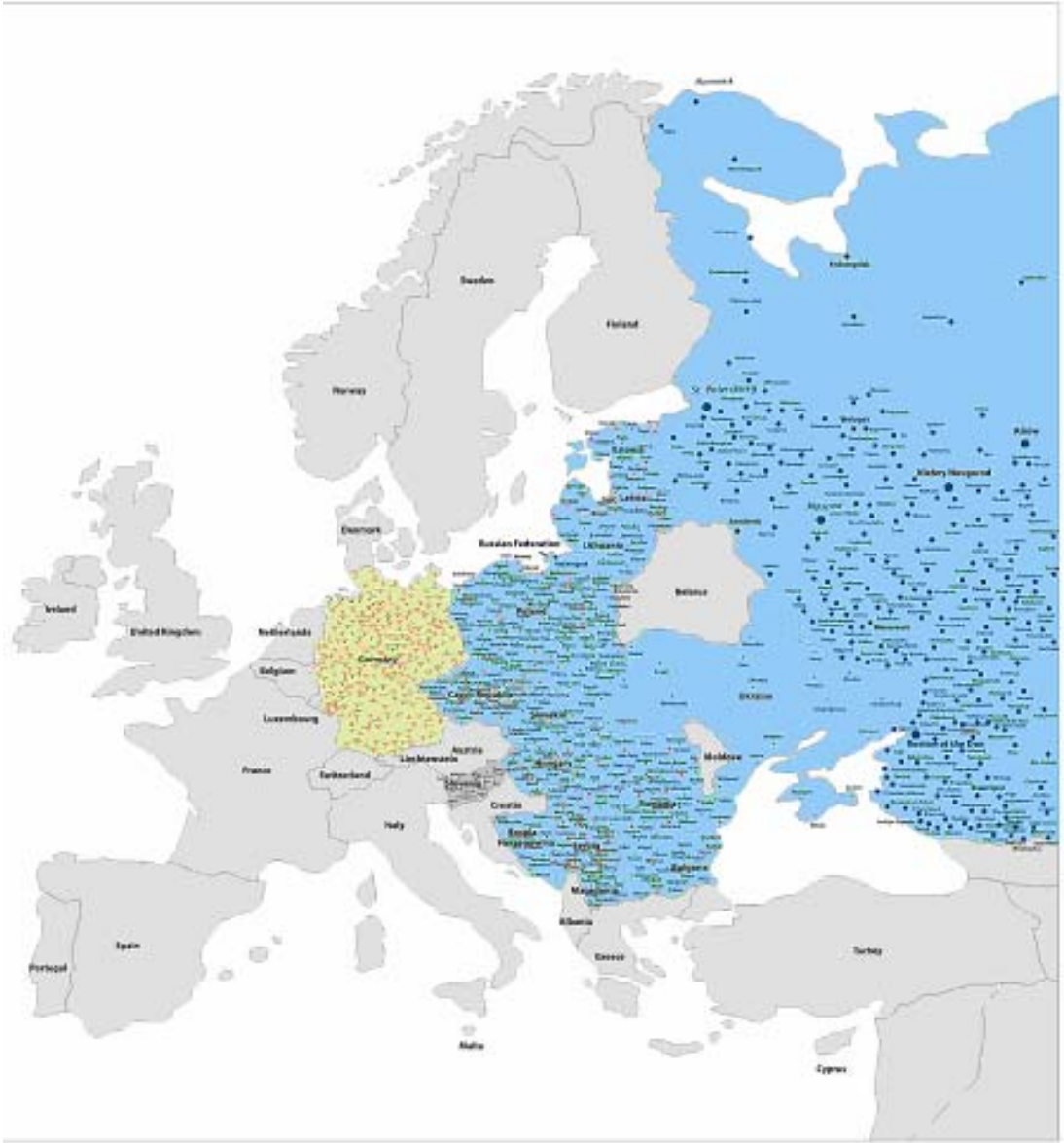
Authorised *EUPOS*®resellers

***EUPOS*®users**

Manufacturers of *EUPOS*®compatible hardware and software

Resellers of *EUPOS*®compatible hardware and software

EUPOS AVIABILITY - EUROPE



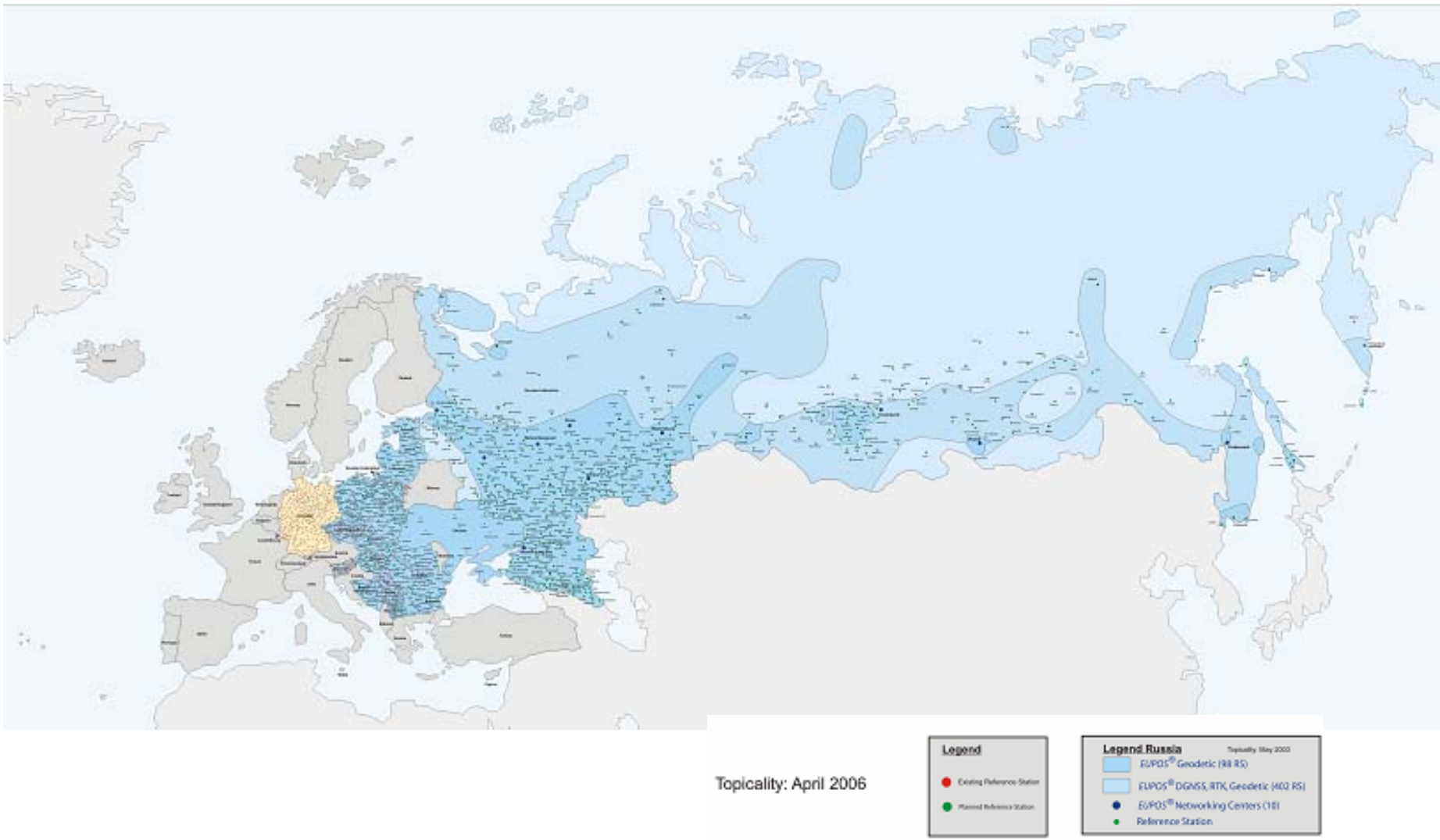
Bosnia and Herzegovina
Bulgaria
Czech Republic

Berlin(ISCO)
Estonia
Hungary

Kazakhstan
Latvia
Lithuania
Macedonia
Poland
Romania
Russian Federation
Serbia and Montenegro
Slovakia
Slovenia (observer status)
Ukraine

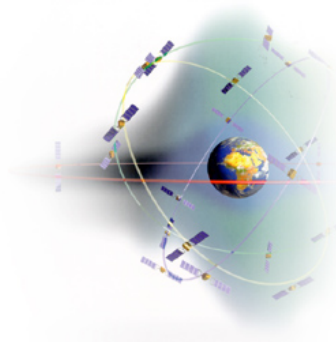
Turkey(invited guest)

EUPOS EXTENSION EURASIA



EUPOS Country (ISO 3166)	Area [km²]	planned RS	realised RS	*EUPOS* Country (ISO 3166)	Areal [km²]	planned RS	realised RS
BA	51,000	26	*(in 2009)*	LT	65,300	25	25
BG	110,950	23	12	MK (FYROM)	25,434	14	7
CZ	78,870	27	27	MD	33,700	15	2 *(in 2009)*
DE/ Berlin	891	4	4	PL	323,520	98	98
EE	45,220	17	9	RO	237, 500	73	58
HU	93,030	36	35	RU	17,075,400	n/a	n/a
KZ	2,724,900	500	0	RS	88,360	32	32
LV	64,600	19	19	SK	46,035	21	21
LV/ Riga City	307	5	5	UA	603,700	27	9
SI (Observer)	20,270	15	15	Sum	21,688,987	977+RU	404+RU

EUPOS technical specifications (selected)



- Uniform DGNSS reference station systems in 14 CEEC
- Uniform world-wide unlimited usable *EUPOS* standards, guaranteed backward compatibility
- Internet is standard medium for all sub-services (e.g. usable by mobile phone)

- Radio, TV broadcast etc. are optional media for *EUPOS* real-time sub-services
- Meter-, decimetre-, centimetre-accuracy in real-time and centimetre-, sub-centimetre-accuracy by post-processing
- Use of GALILEO (duty until availability), NAVSTAR-GPS (option) and GLONASS (option)

- Equal opportunities and investment security for the international industry
- Intended a guaranteed availability of at least 99 % per annum

EUPOS Real Time Services

- **_EUPOS_ DGNSS**
- For navigation and real time position determination with an accuracy of 3 m up to 0.5 m
- Compressed and encoded DGNSS correction data including networking reference station information
- *EUPOS* DGNSS data are provided via
  - Internet/GPRS (NTRIP/GPRS (General Packed Radio Service) / NTRIP/GSM (Global Standard for Mobile Communication) as basic standard
  - VHF 2 m or 4 m radio/radio broadcast/TV broadcast as optional additional standard

- **_EUPOS_ Network RTK**
- For precise real time position determination with an accuracy ≤ 2 cm
- Compressed and encoded DGNSS correction data including networking reference station information
- *EUPOS* Network RTK data are provided via
  - Internet/GPRS (NTRIP/GPRS (General Packed Radio Service) / NTRIP/GSM (Global Standard for Mobile Communication)) as basis standard
  - VHF 2 m or 4 m radio/radio broadcast/TV broadcast as optional additional standard

Networking

- FKP is the standard networking procedure
- VRS can be provided as optional additional standard
- MAC could be accepted when decided by the RTCM SC 104

Selected *EUPOS* activities

Technical matters

To continue the completion of the DGNSS ground-based augmentation systems in all *EUPOS* countries with entire regard to the *EUPOS* standards and guidelines.

To complete absolute antenna Phase Centre Variation (PCV) calibration of every *EUPOS* reference station .

EUPOS contributes to the Radio Technical Commission for Maritime Services, Special Committee 104 (RTCM 104), e.g. by development of Private Service Messages (RTCM data encryption against falsification or manipulation).

To develop a *EUPOS* self-certification procedure corresponding with the *EUPOS* technical standards, including measurements on the spot.

To develop a method to determine local multipath influences especially at GNSS reference stations.

To support the development of low-priced DGNSS-receivers (code phases) with an accuracy of about 50 cm in cooperation with appropriate GNSS companies.

Actual technical documents of the *EUPOS* ISC

European Position Determination System

EUPOS Technical Standards
revised second edition, 24 April 2008

EUPOS Guidelines for Single Site Design
Version 2.1, 4 June 2008

Guidelines for *EUPOS* Reference Frame Fixing
Version 1.0, 21 September 2007

EUPOS Guidelines for Cross-Border Data Exchange
Version 1.0, 21 September 2006

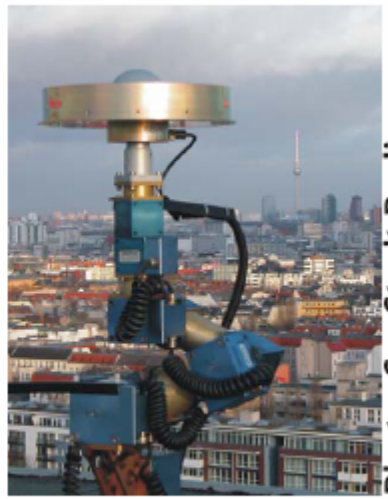


Photo: SenStadt Berlin

EUPOS/SA*POS*-based precise positioning for operations linked with state visits, escorting of jeopardized persons, demonstrations, parades etc.

- precise timely traffic control measures
- flexible change of routes, precise guiding
- operation control, location-dependent safety or other precautions

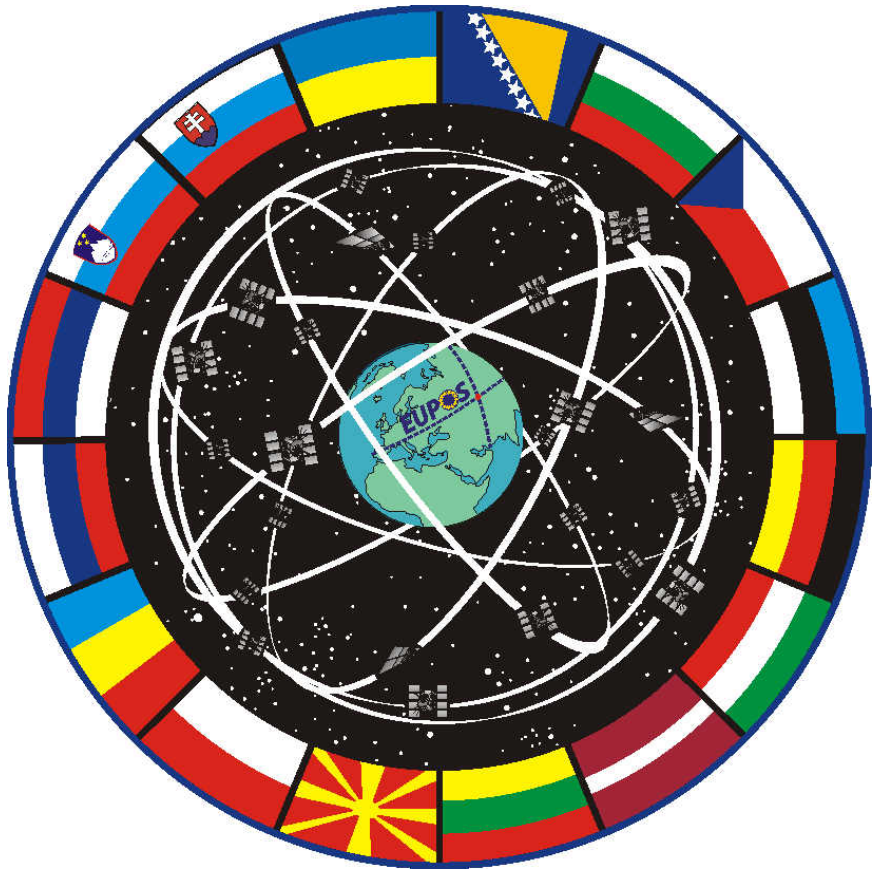
SA*POS*-based Autonomous Fleet Management and Operating Control System (MOFIS)

photos: Hamburg fire brigade

Hamburg
Fire Brigade

EUPOS/SA*POS*-based Vehicle Scheduling and Control System of the Berlin Public Transport Company Berliner Verkehrsbetriebe (BVG)

- punctuality, connection quality
- dynamic passenger information
- influence on traffic lights
- acceleration measures
- flexible change of routes
- increased safety for passengers and drivers
- reduced costs



Thank you very much for your attention!