World Class Standards

Spectrum and standardization

ITS Safety 2010 Symposium
Tokyo 23 – 27 February 2009

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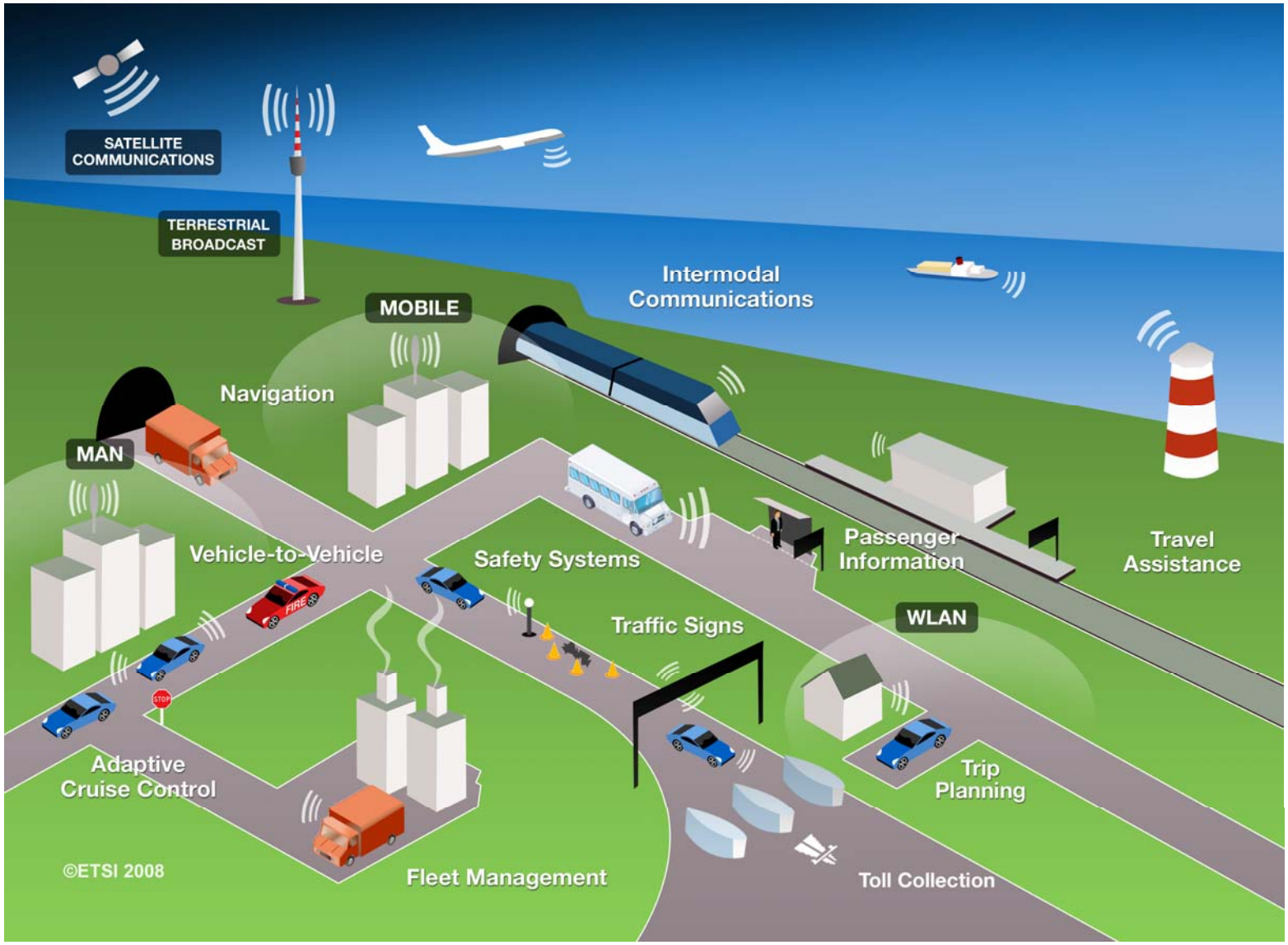
Chairman ETSI TC ITS

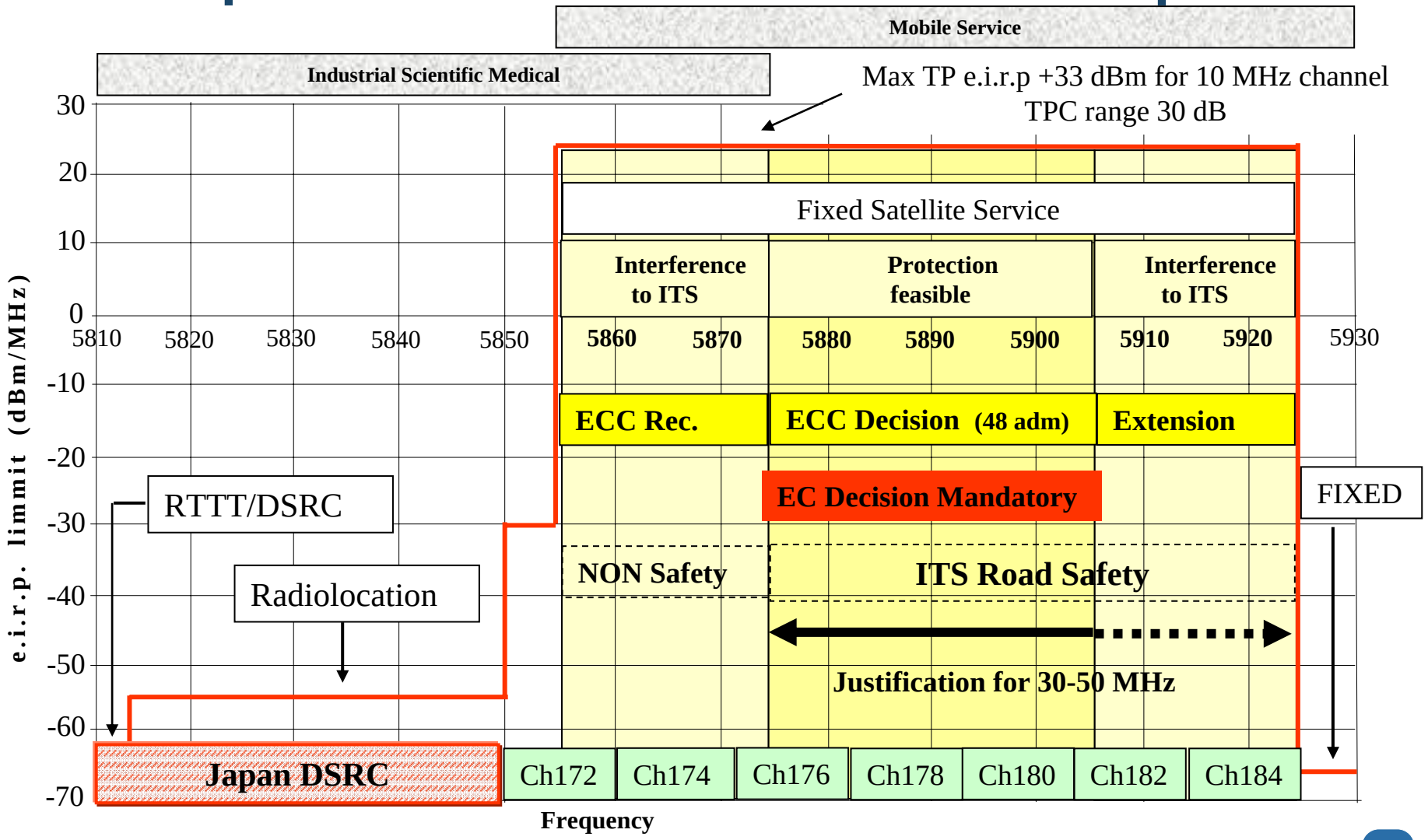
World Class Standards



Outline

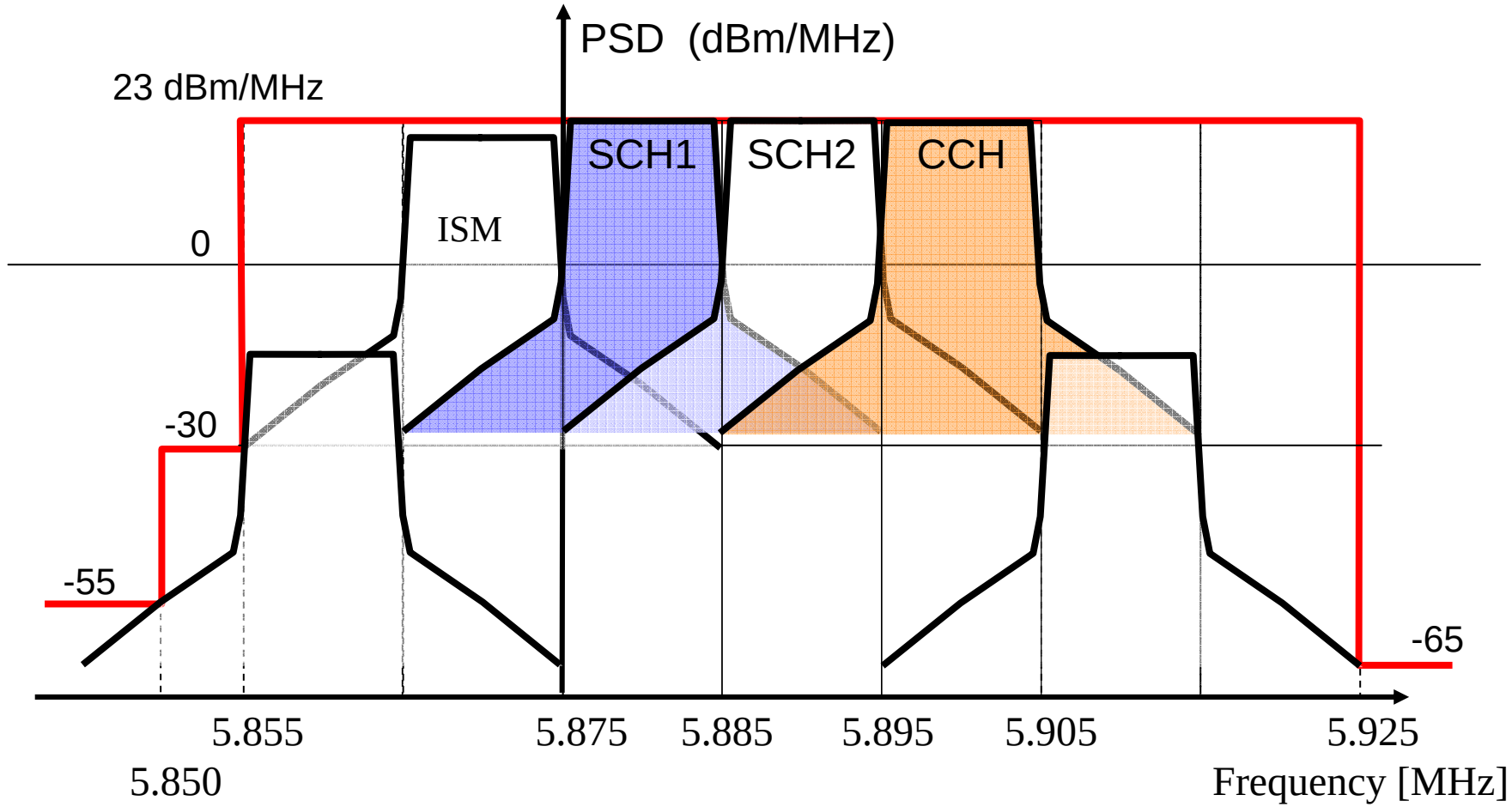
- Current focus on 5.9 GHz cooperative ITS systems
- Spectrum allocation for ITS in Europe
- Channel allocation in the 5.9 GHz band
- Standardisation activities
  - Application requirements
  - Architecture and crosslayer
  - Network and transport
  - Media
  - Security
- Roadmap for standardisation in Europe
- World wide cooperation

Spectrum allocation for ITS in Europe



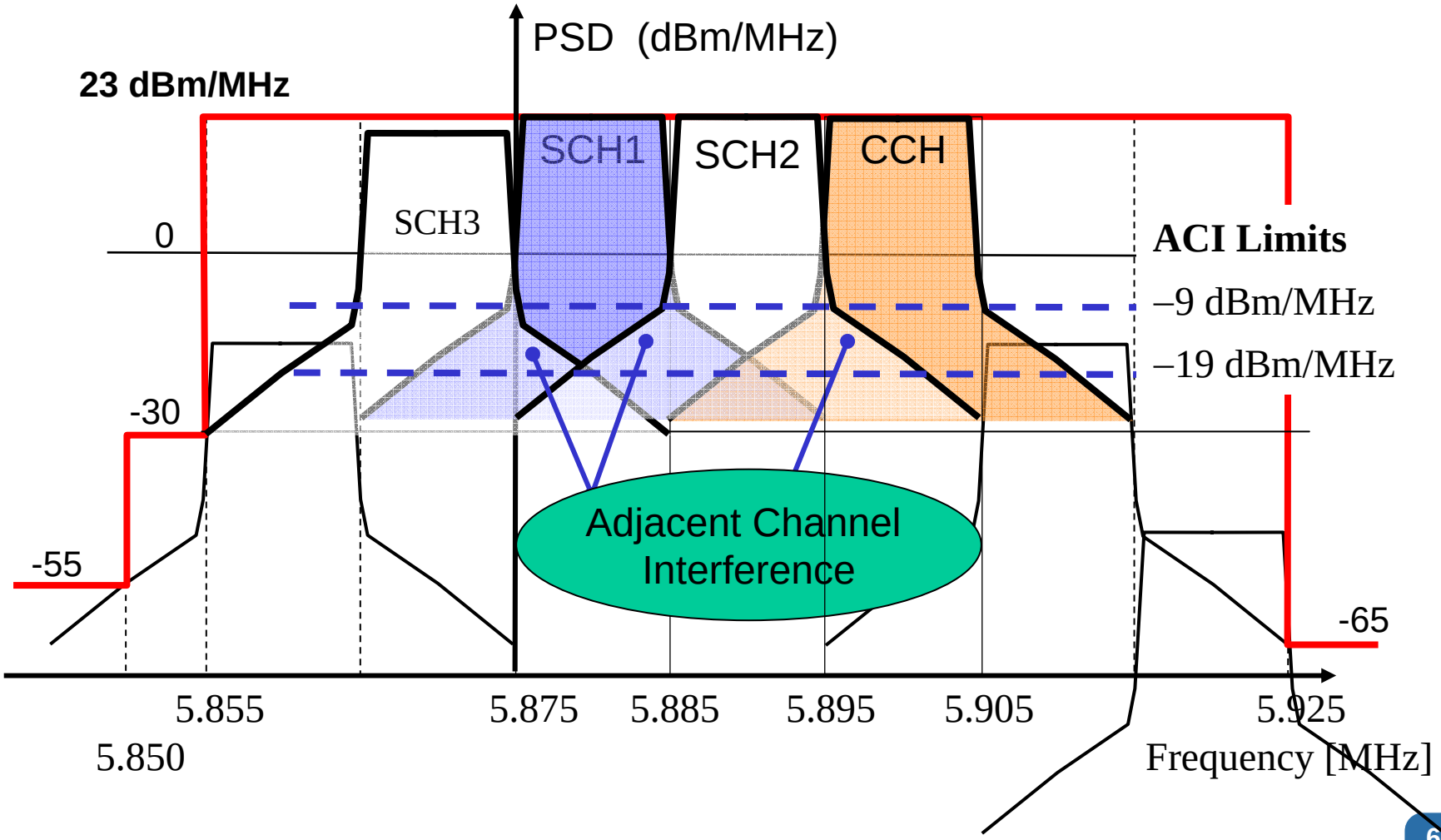
Channelisation in the 5.9 GHz band

using **reduced power levels** (2 W devices)



Channelisation in hte 5.9 GHz

Adjacent channel interference – protection of cooperative ITS band



Channel Usage (current proposal)

- **CCH – Control Channel**
  - Cooperative Awareness Messages (CAM) (Network layer beacons)
  - Single hop messages (high priority) Emergency messages
  - 1st hop of multihop / geocast messages

Low Latency

Emergency **CAM**

- **SCH1 – Service Channel 1**
  - Geocast messages (from 2nd hop)
  - Single hop messages (low priority)

Long distance

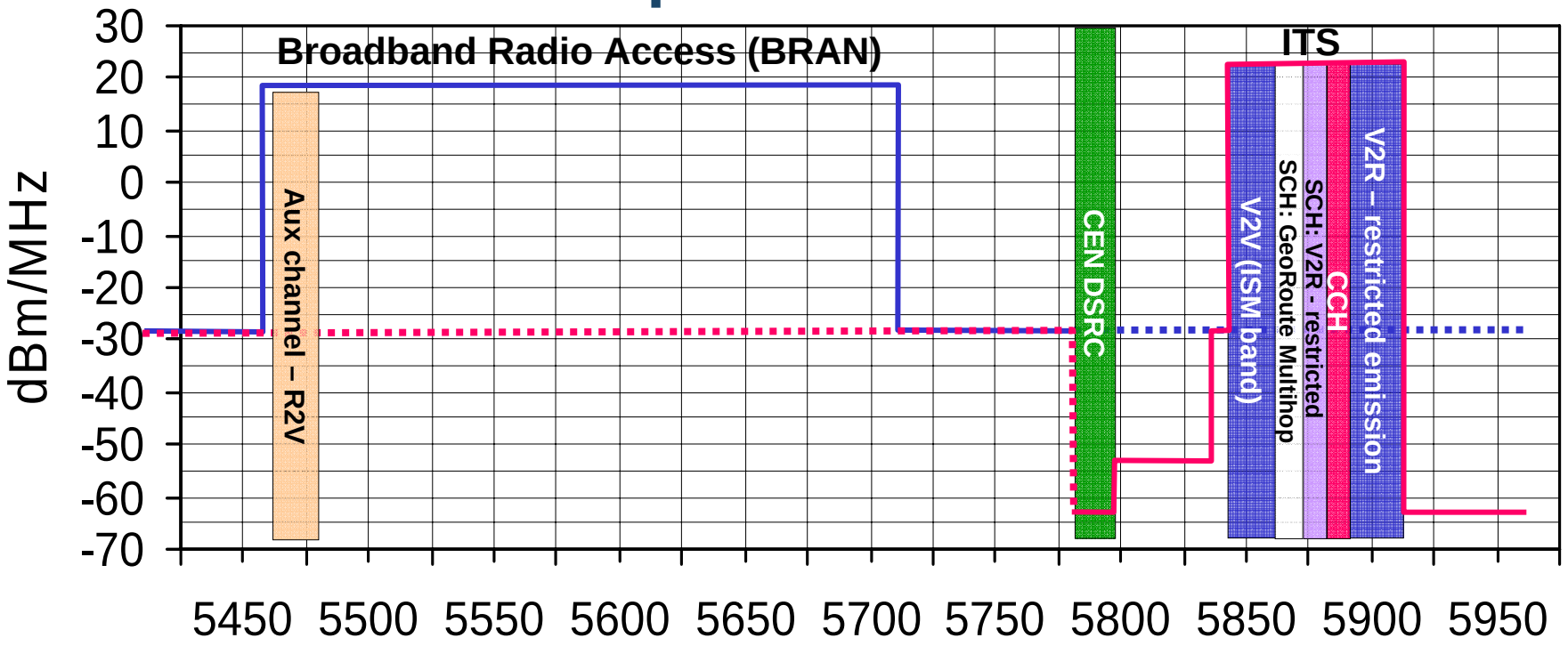
GEOCAST

- **SCH2 – Service Channel 2**
  - High throughput, short distance Unicast with RSU

High throughput
Short distance

RSU
Unicast

Channel specification in 5.9 GHz



Common Control Channel, Broadcast data, 10MHz@5900 (ch180) (Used by all)

Service Channel: GeoRoute multihopping, 10MHz@5880 (ch176) (Safespot/C2C-CC)

Aux Channel for roadside initiated data, 20MHz @5480+ (ch96) (CVIS/COOPERS)

Vehicle-Roadside data, 10MHz@5890 (ch178) (Safespot/C2C-CC, not used initially)

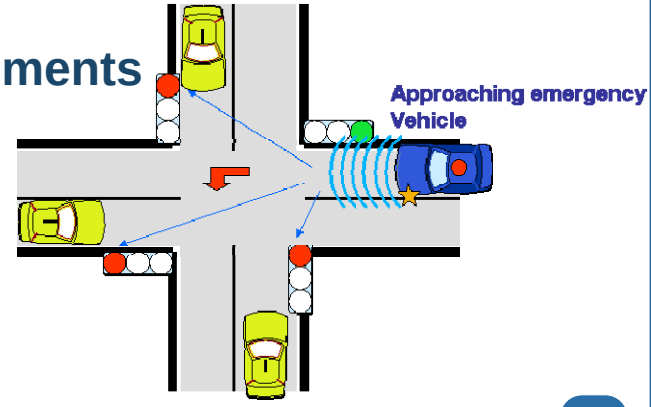
Blue line represent European spectrum mask for BRAN (conditional use for ITS)
Red line represents European spectrum mask for ITS 5.9

Application requirements standardisation

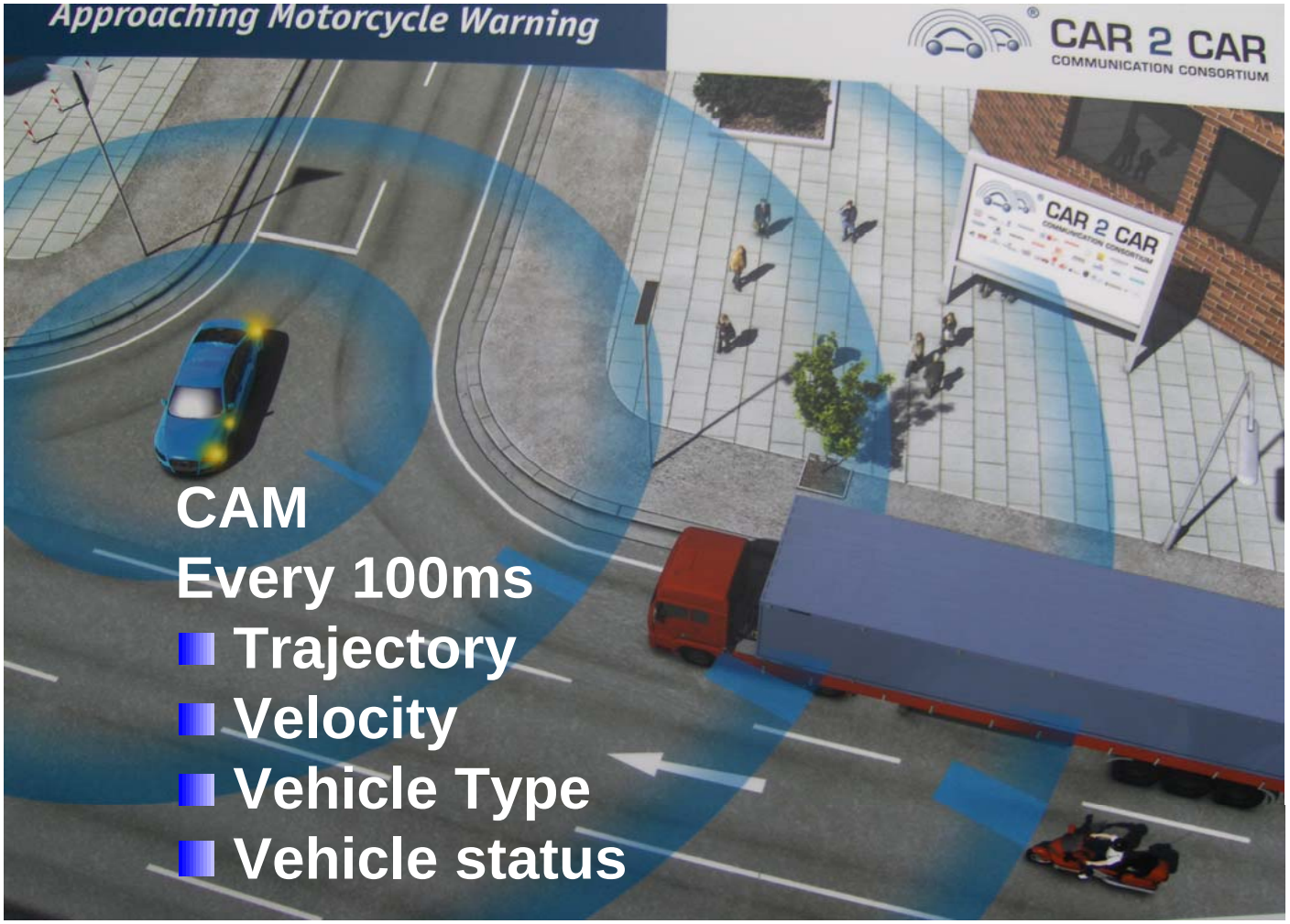
- Vehicular Communicaiton Basic Set of Applications (BSA) – Definition
- BSA Functional Requirements
- V2X Co-operative Awareness Message (CAM) standardisaiton
- V2X Decentralised Environmental Notification Message (DNM)
- BSA Operational Requirements Second Level

- Objective to select basic set of applications for deployment 2012-2015
- Deliverable by April 2009

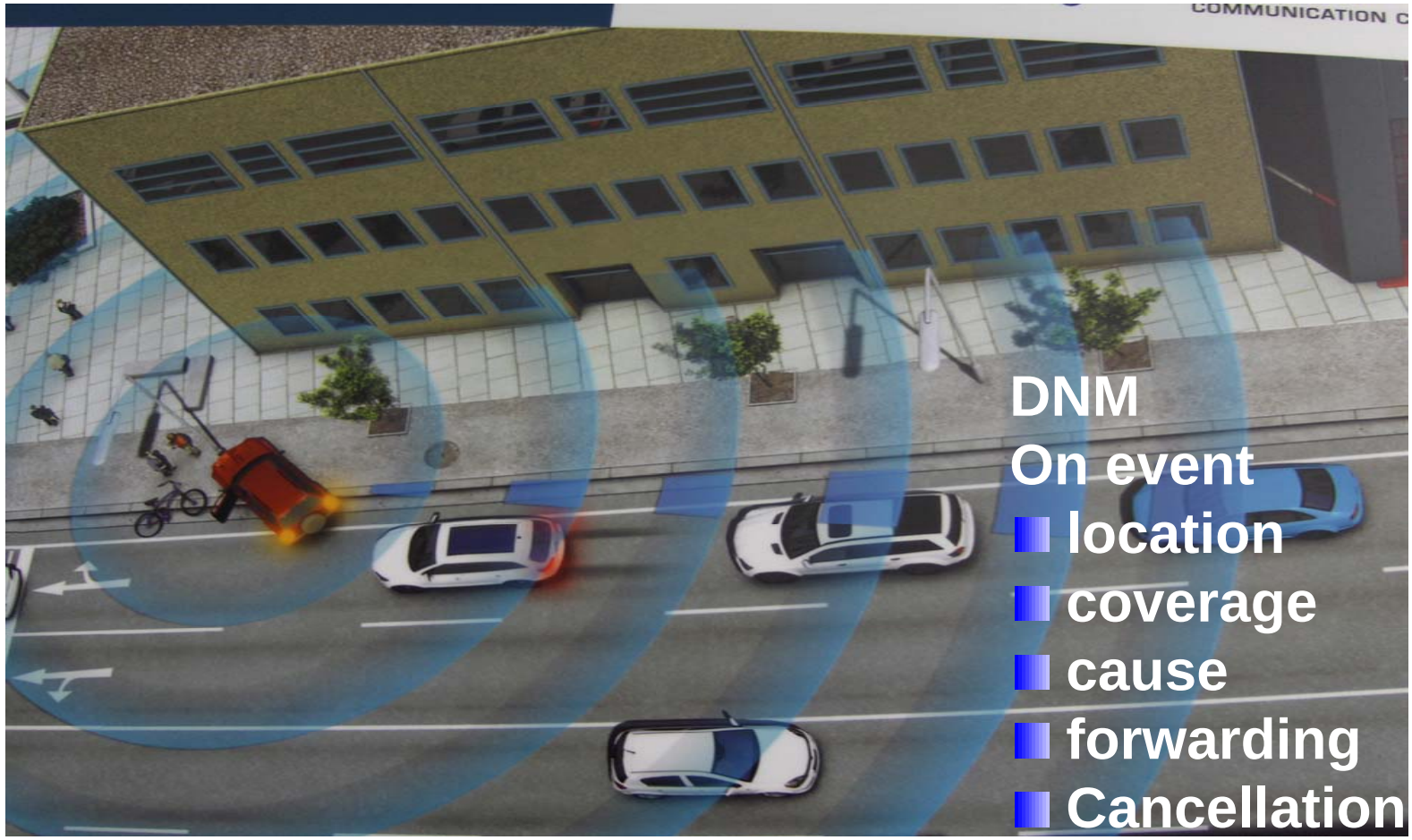
- Followed by extended set of application requirements



V2X / I2V Co-operative Awareness Message (CAM)

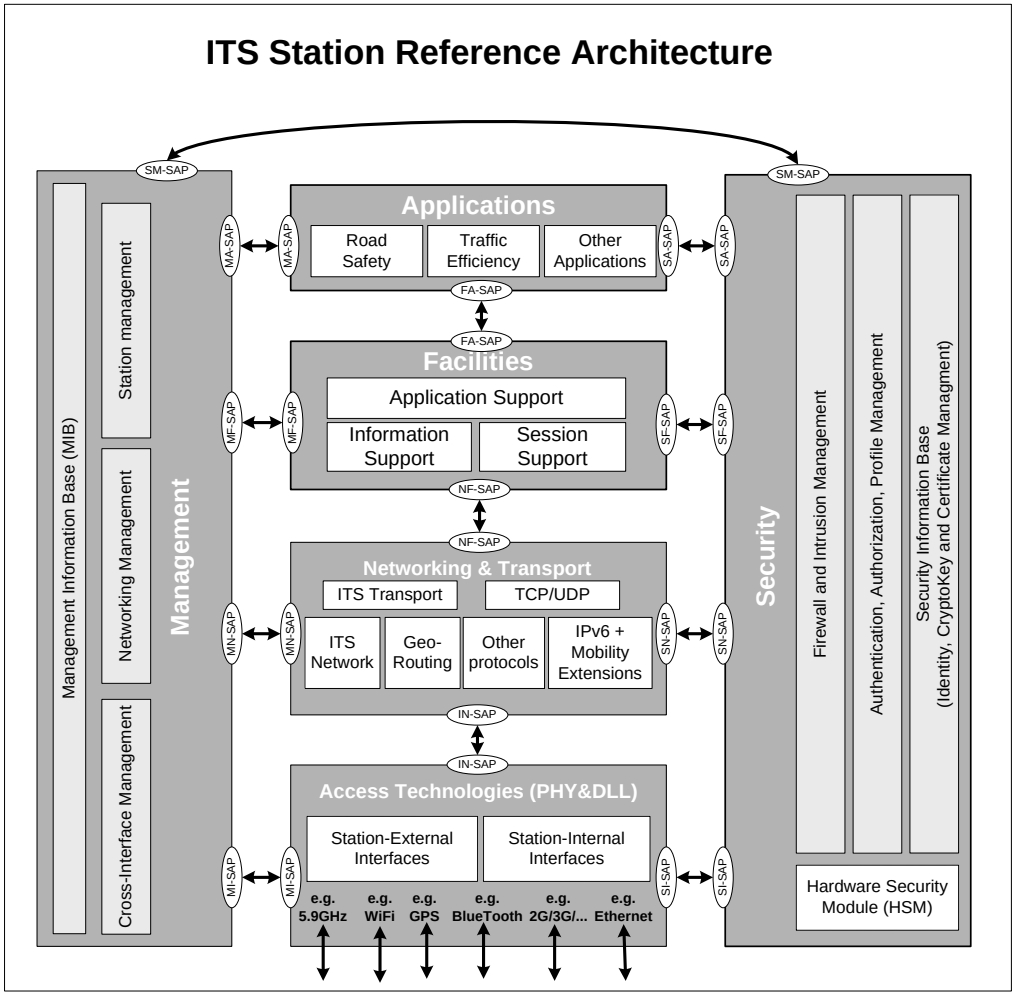


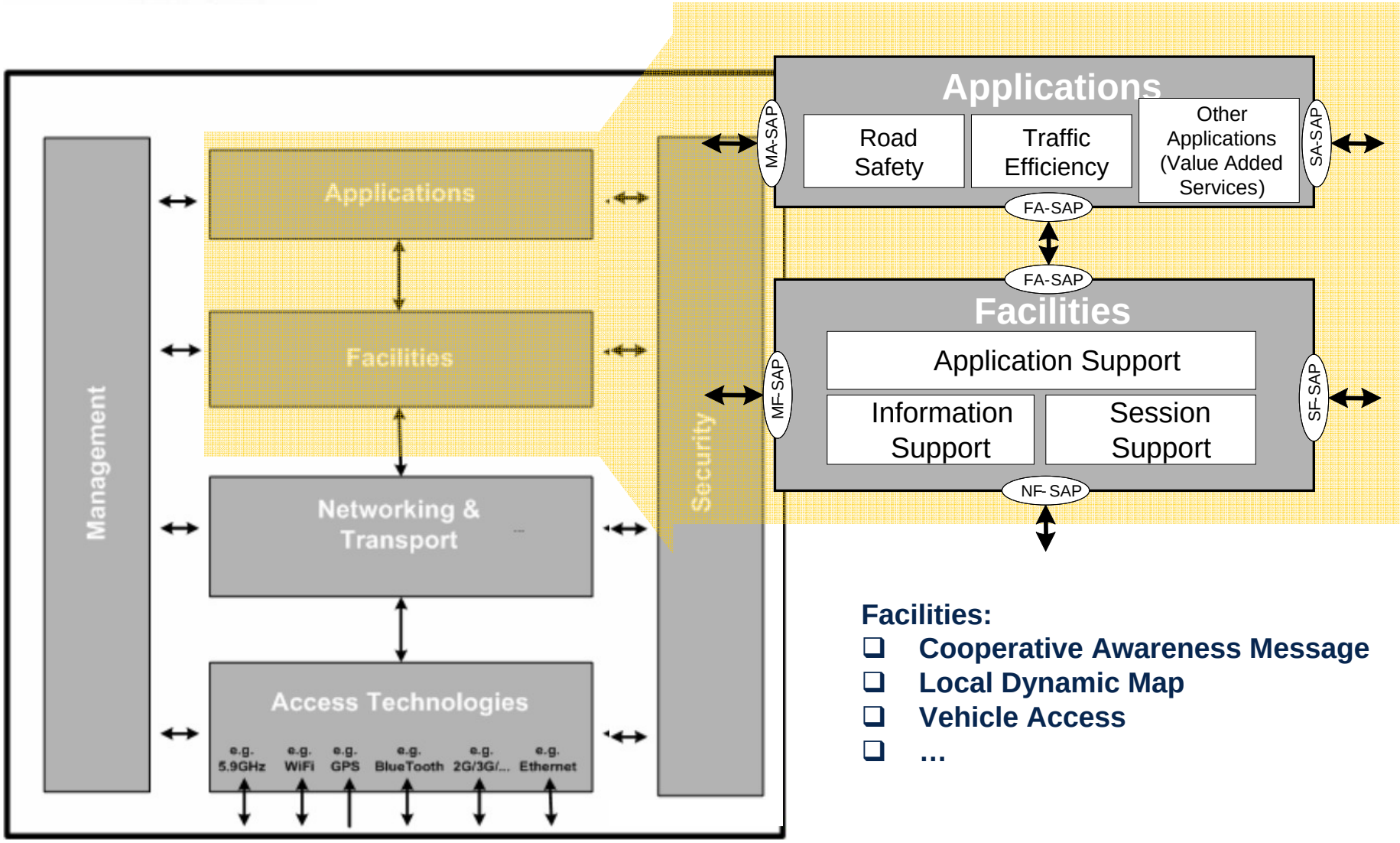
V2X / I2V Decentralised environmental notification (DNM)



ITS Communication Architecture

- Developed within COMeSafety
- Basis for Architecture work within ETSI TC ITS
- Coordinated internationally
- Considered for standardisation

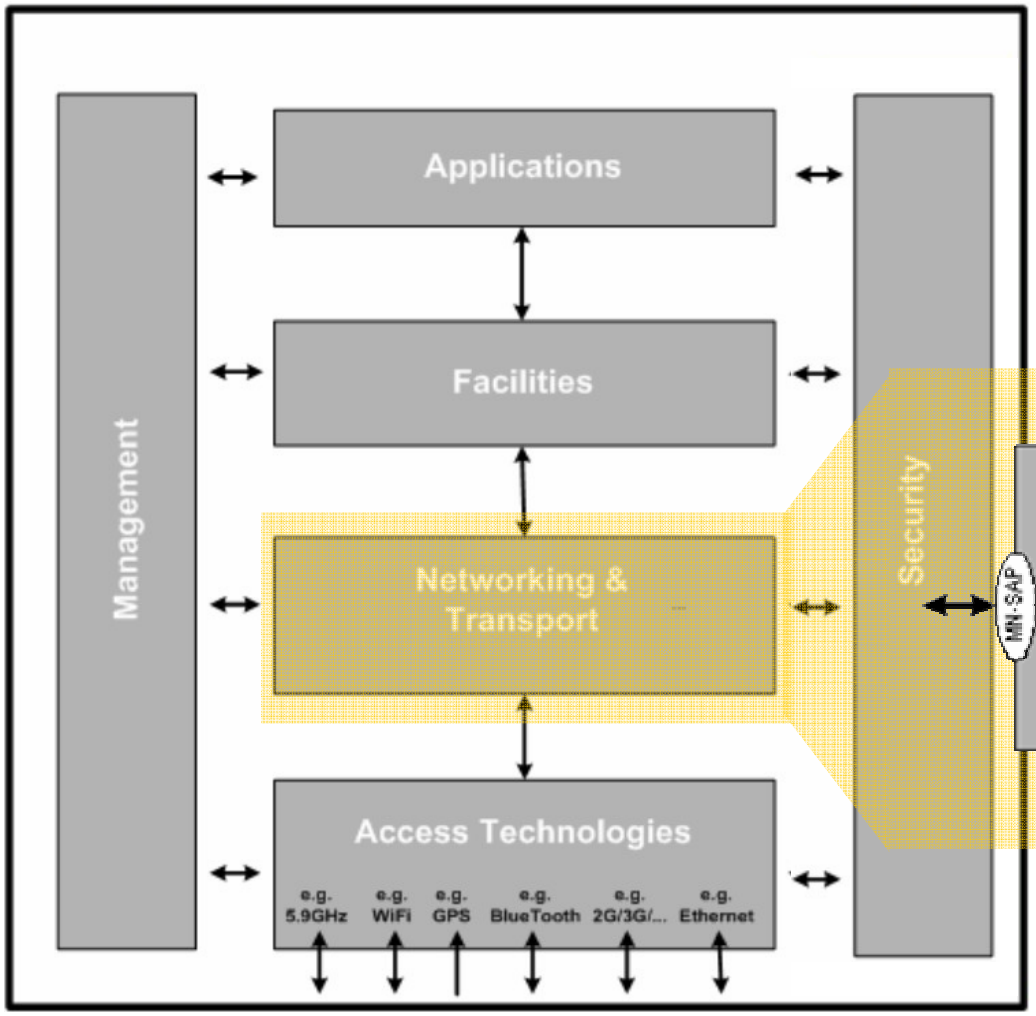


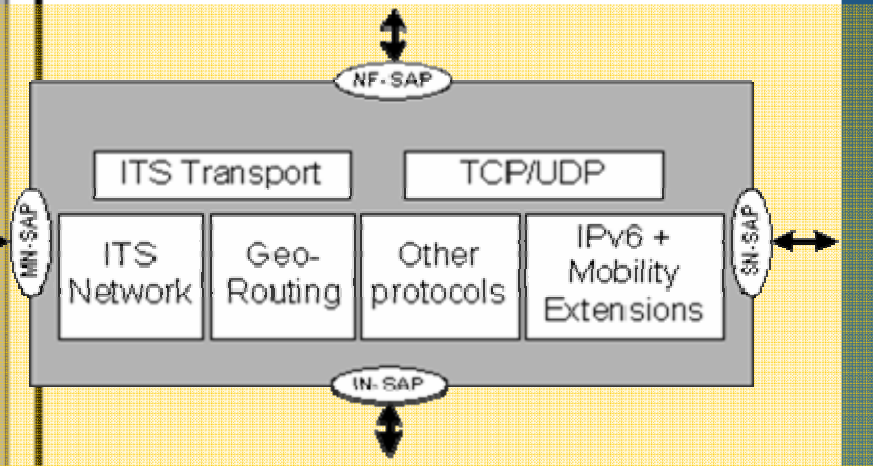


Facilities:

- **Cooperative Awareness Message**
- **Local Dynamic Map**
- **Vehicle Access**
- **…**

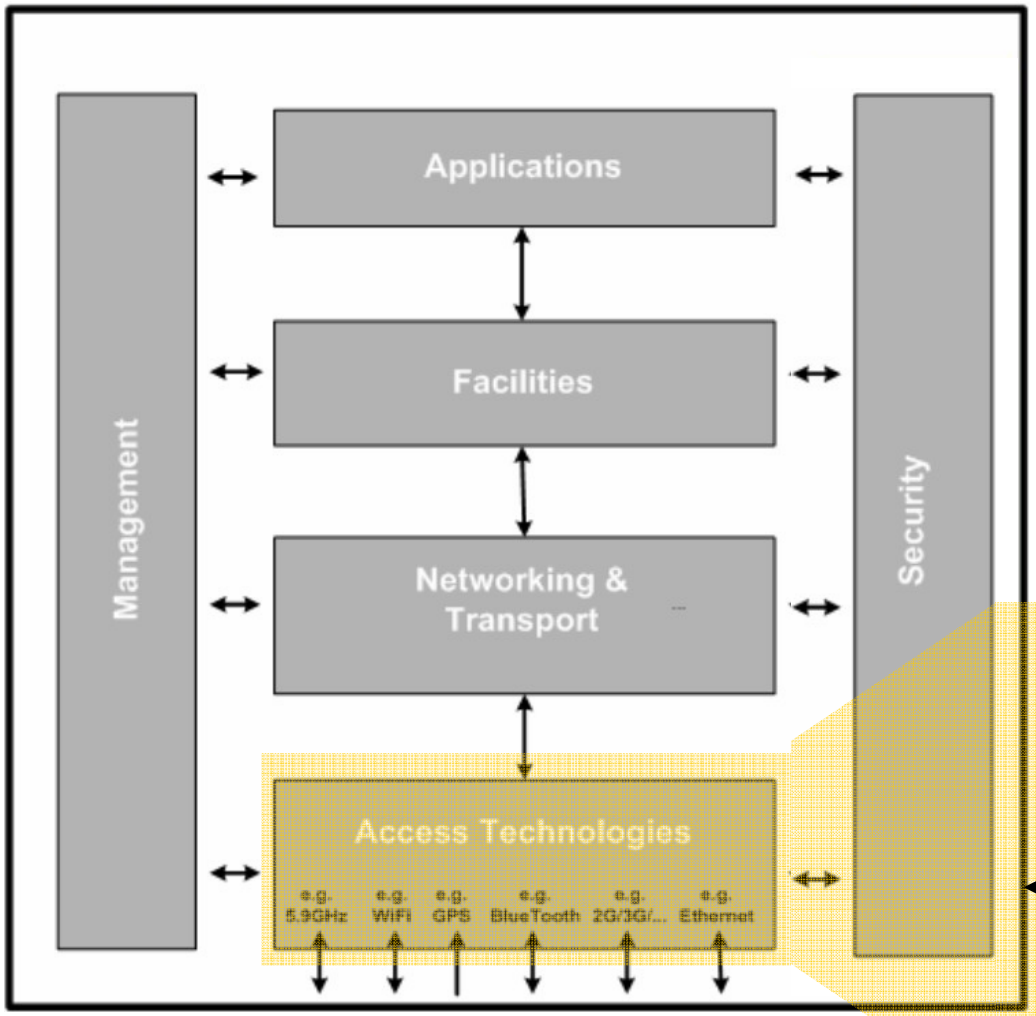
World Class Standards



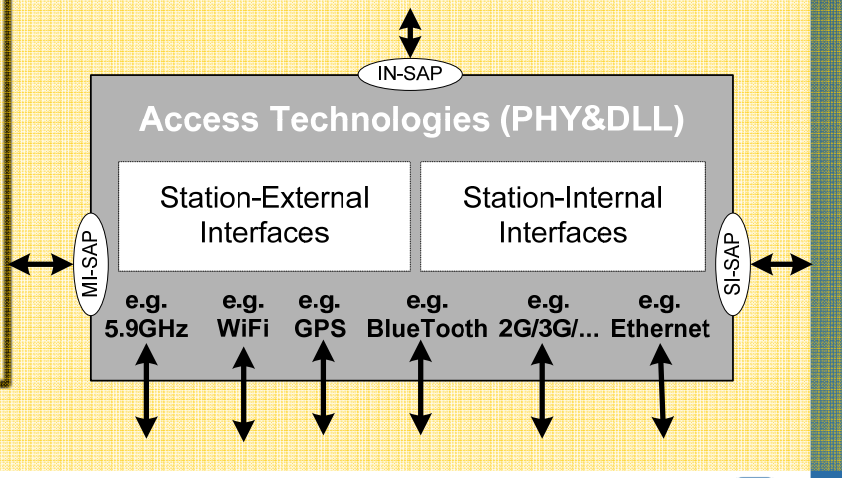


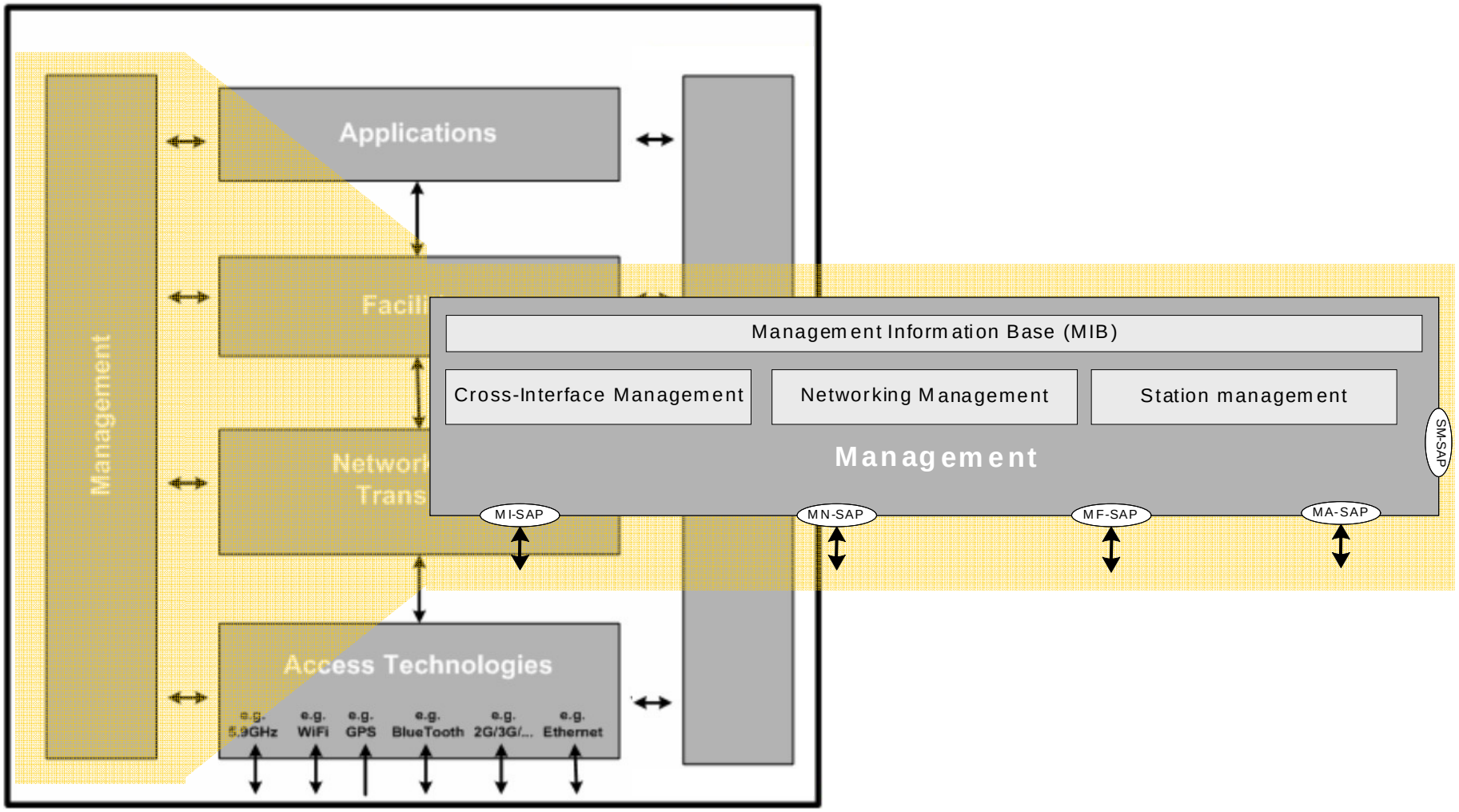
- **ITS Transport: Support for Lightweight Ad-Hoc Communication**
- **TCP/IP: Interaction with Internet Services**

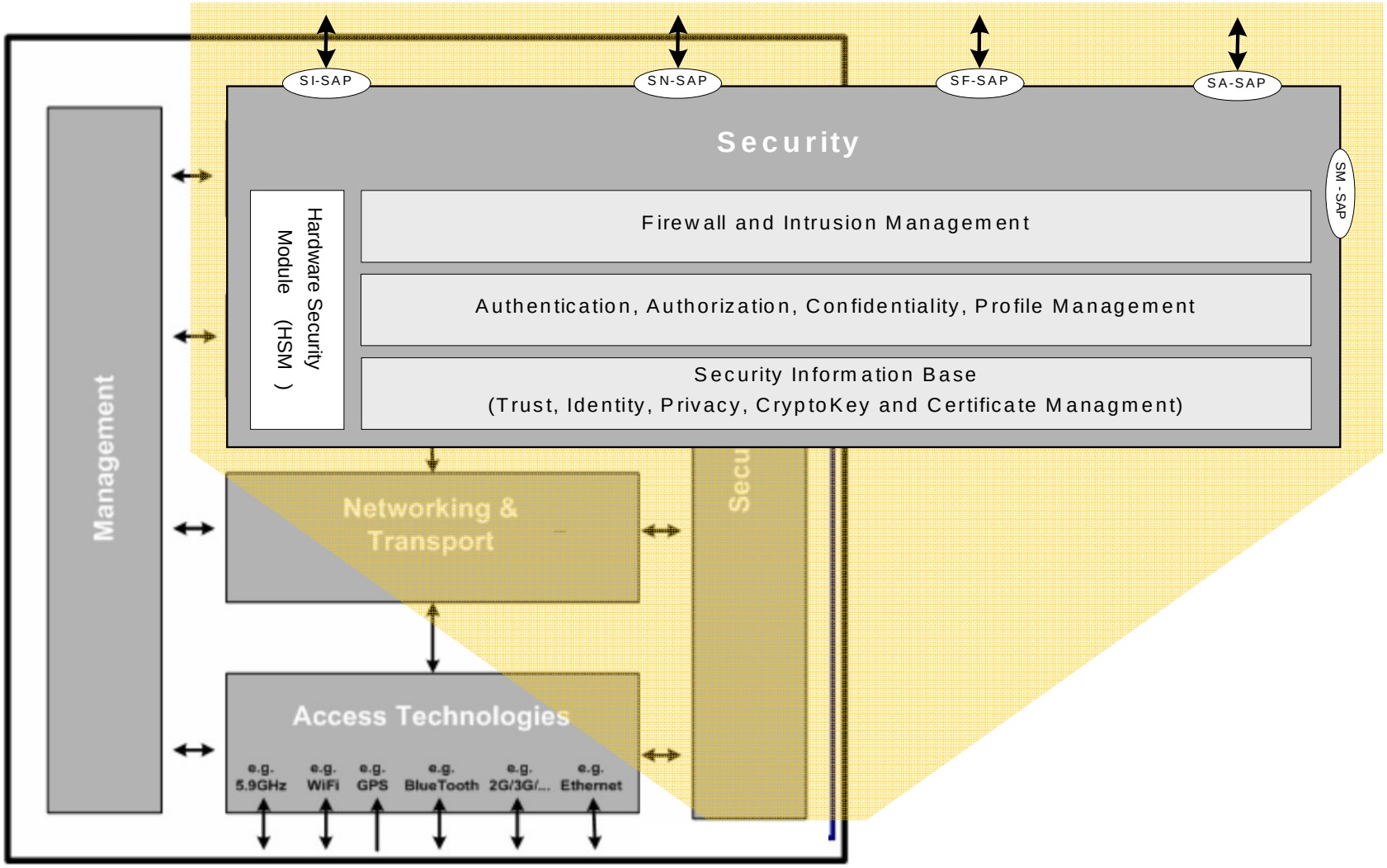
World Class Standards



- **Available Access Technologies outlined in Architecture Document**
- **No prescribed technologies for applications**



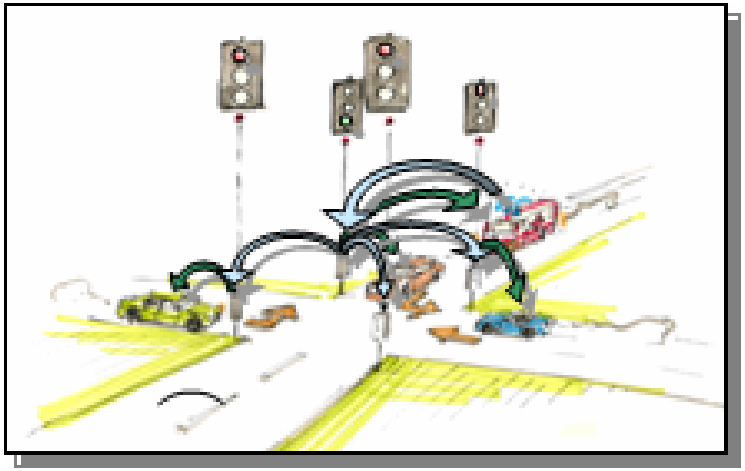

Management
Applications
Facili
Networ
Trans
Access Technologies
e.g. 5.9GHz
e.g. WiFi
e.g. GPS
e.g. BlueTooth
e.g. 2G/3G/...
e.g. Ethernet
Management Information Base (MIB)
Cross-Interface Management
Networking Management
Station management
Management
SM-SAP
MI-SAP
MN-SAP
MF-SAP
MA-SAP


SI-SAP
SN-SAP
SF-SAP
SA-SAP
Security
SM - SAP
Hardware Security Module (HSM)
Firewall and Intrusion Management
Authentication, Authorization, Confidentiality, Profile Management
Security Information Base
(Trust, Identity, Privacy, CryptoKey and Certificate Managment)
Management
Networking & Transport
Access Technologies
e.g. 5.9GHz
e.g. WiFi
e.g. GPS
e.g. BlueTooth
e.g. 2G/3G/...
e.g. Ethernet

Network and Transport standardisation

- Requirements
- Network Scenarios
- Network architecture
- GeoNetworking
- Transport protocols
- Internet Integration
- Interoperation of IP version 4 and 6
- Network management

- Deliverable October 2009



Media standardisation

- STF on 5.9 GHz profile standard
  - Based on 802.11p CALM M5 (21215) PHY and MAC layer
  - Approval envisaged April 2009 – publication July 2009
  - Follow up with protocol conformance testing
- Technical specification on channel use
- Technical specification on transmitter power control
- Technical Report on 5.8/5.9 GHz mitigation technique
- 63-64 GHz spectrum – ECC Decision in March 2009
- Harmonised standard on the use of 63-64 GHz by end 2009

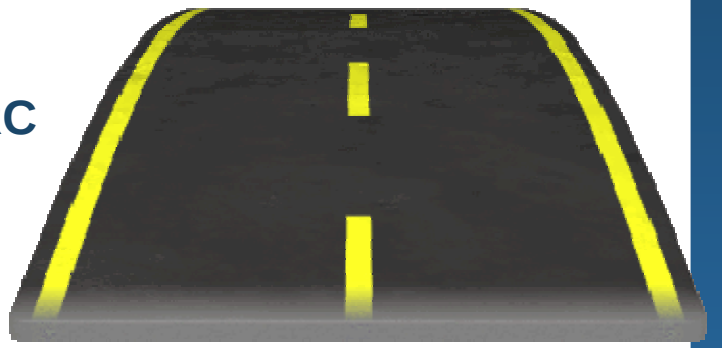
Security standardisation

- ITS security – Threat Vulnerability and Risk Analysis (TVRA)
- Objectives and functional requirements for TVRA – stage 2
- TB approval envisaged September 2009

- STF on ITS Security development – 5GHz
  - Provide TS on ITS security for 5 GHz systems
  - Provide TS for security objectives and requirements
  - Provide ITS security TVRA
  - Review application of IEEEE 1609.2 (WAVE) security application for the ETSI security framework
  - Planned deliverable September 2009

Other current activities

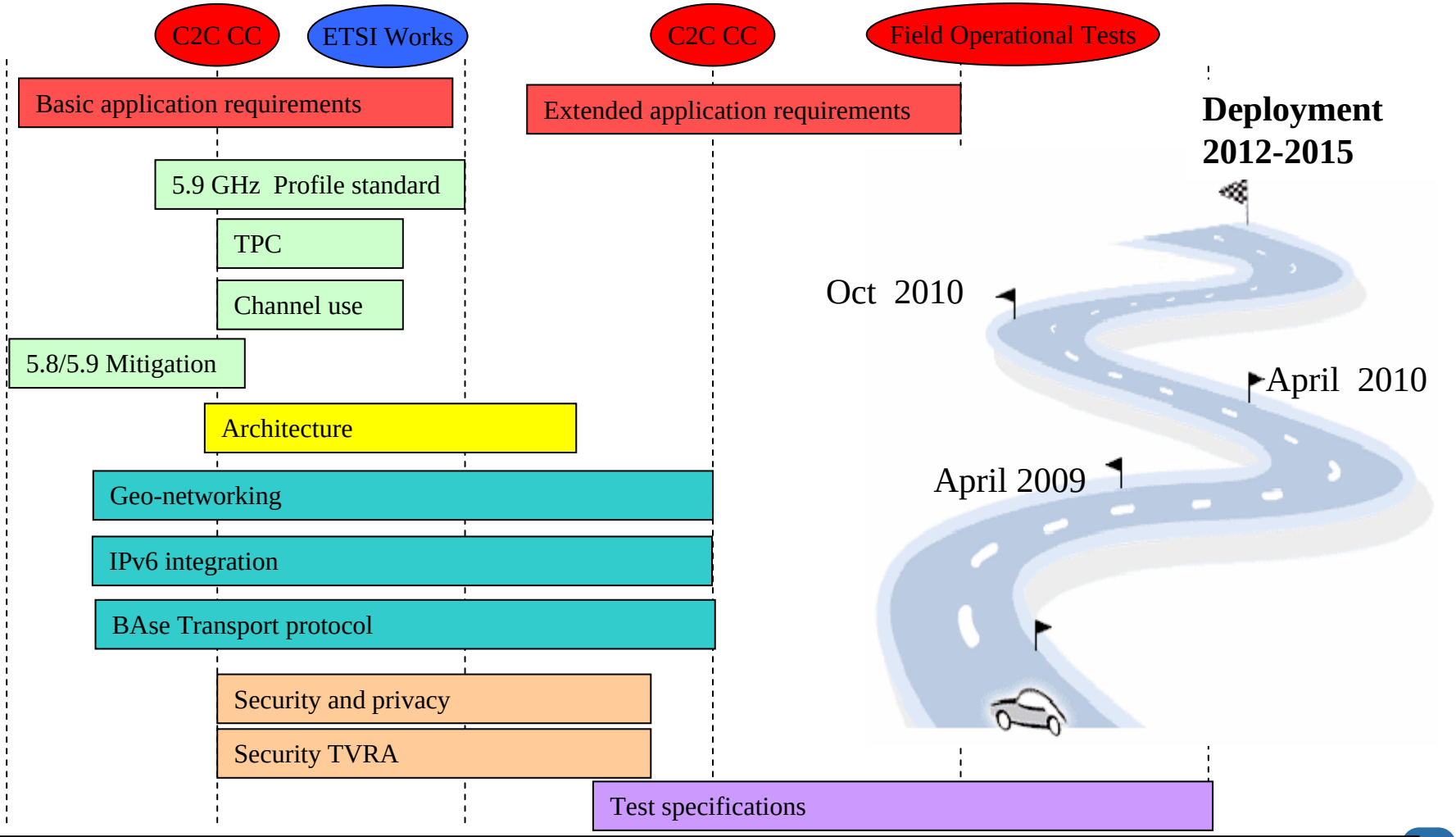
- STF 353 – on ICT in Cars
- STF 359 – Profile standard
- STF 365 - Conformance testing ISO 21218
- STF 372 - Conformance testing on Italian DSRC
- STF 373 on Security



- Conformance testing – Plug tests
- Comprehensive field operational tests in Europe

- ETSI TC ITS workshop
- Coordination activities with R&D projects and C2C CC

Roadmap for current ETSI TC ITS activities



TC ITS Workshop 4-6 February 2009

- 125 participants
- ETSI members – European projects – European Commission
- TC 204 – Japan – Korea – USA – ITU-T – ITU-R

R&D Projects
European Commission
ITS in place
Activity discussions from WGs
Road operators / Infrastructure
Test Interoperability and FOT
International cooperation

Increased standardisation activity in 2009 – 2010
Political pressure on depolyment
Commission Directive/Mandate
Global standardization aspects
ETSI ready to lead

Next workshop – 10-12 February 2010

Global coordination and standardisation

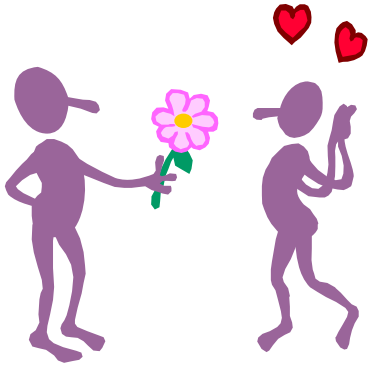
Joint standardisation
- ETSI TC ITS
- ISO TC 204
- IEEE 1609 and 802.11p
- IETF MEXT

Work areas
- Radio 5 GHz based on 802.11p
- Geo-networking
- IPv6 networking
- Other networking (e.g. WAVE)
- Security
- Architecture

Objective
- Joint development of standards
- Avoid overlapping standards
- Regional profile standards
- Bottom – up approach
- Work by email and web meetings

European initiatives
- European Architecture proposal
- Global support from SDOs
- Executive session in Stockholm
- Ongoing contacts Workshops etc
- Japan – Korea – China invited

Thank you for your attention



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