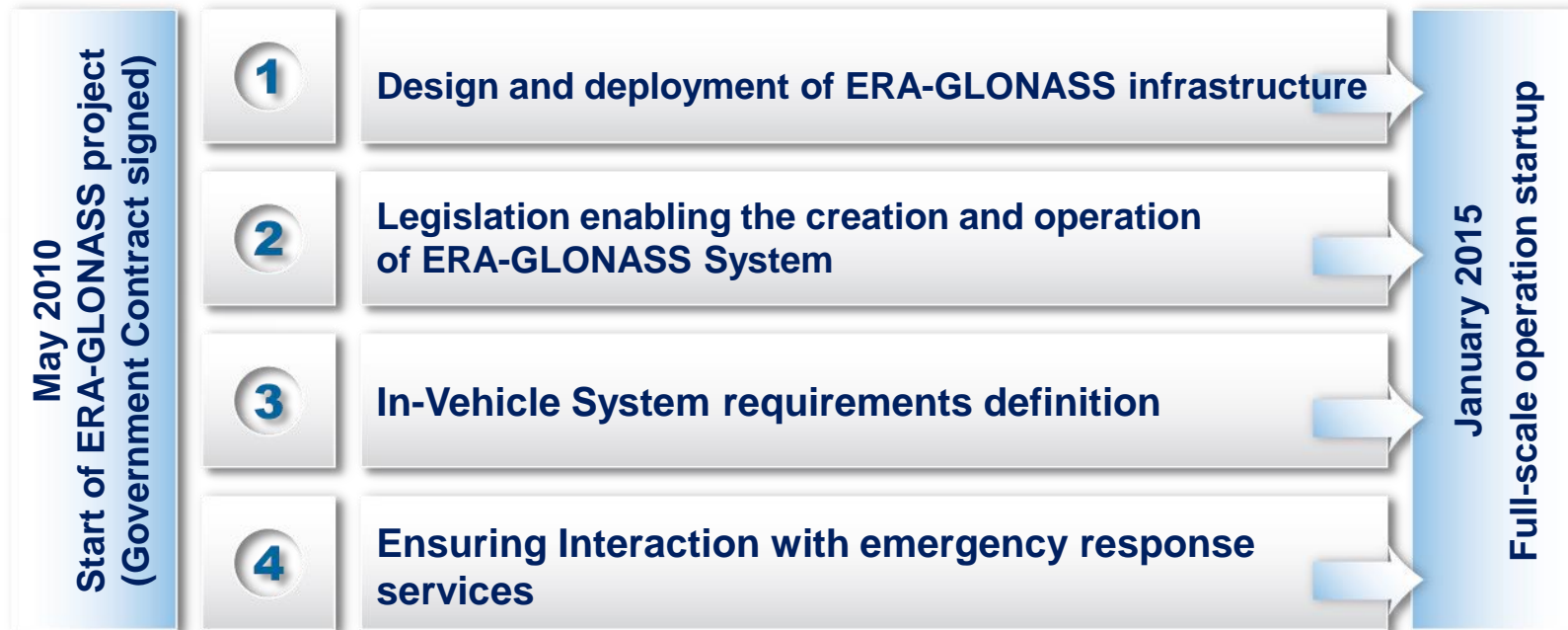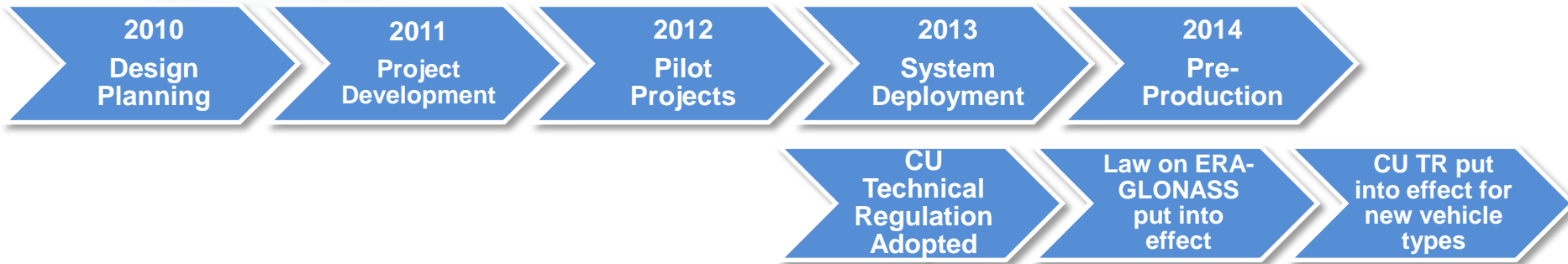**"GLONASS UNION"**

In-Vehicle Emergency Call Systems:
From National Deployment to International Harmonization

Evgeni Meilikhov, *PhD*

05 March, 2015

ERA-GLONASS System:
Four Years from Concept to Operation

"GLONASS UNION"

2010 Design Planning	2011 Project Development	2012 Pilot Projects	2013 System Deployment	2014 Pre-Production

CU Technical Regulation Adopted	Law on ERA-GLONASS put into effect	CU TR put into effect for new vehicle types

May 2010
Start of ERA-GLONASS project
(Government Contract signed)

1 Design and deployment of ERA-GLONASS infrastructure

2 Legislation enabling the creation and operation of ERA-GLONASS System

3 In-Vehicle System requirements definition

4 Ensuring Interaction with emergency response services
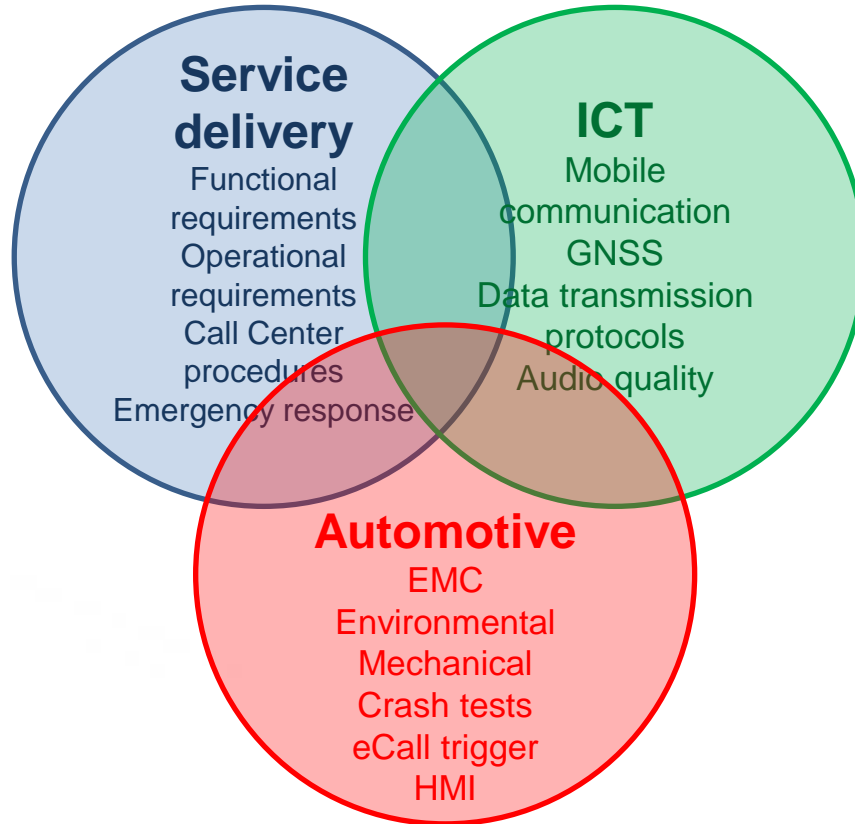
January 2015
Full-scale operation startup

First vehicles equipped with ERA-GLONASS devices are undergoing certification and are expected on the roads in Q2 2015

Development of the UNECE Regulation for Vehicle Emergency Call Systems

- **The World Forum for Harmonization of Vehicle Regulations (WP 29) at the 159th session,** March 2013: the Russian Federation announced its intent to propose a new UN Regulation governing emergency call systems.

- **WP 29 at the 160th session,** June 2013: an informal working group (IWG) was established under the Working Party on General Safety (GRSG) for developing the new UN Regulation for emergency call systems.

- **IWG on automatic emergency call systems** started its work chaired by the Russian Federation.

- The UN Regulation draft discussed at IWG meetings:
    - **08 – 10 October 2013 (Geneva)**
    - **05 – 06 December 2013 (Paris)**
    - **26 – 28 February 2014 (Moscow)**
    - **28 – 30 April 2014 (Paris)**
    - **02 – 04 September 2014 (Turin)**
    - **18 – 20 November 2014 (Prague)**
    - **25 – 27 February 2015 (Paris)**

- The next IWG meeting to discuss the UN Regulation scheduled for
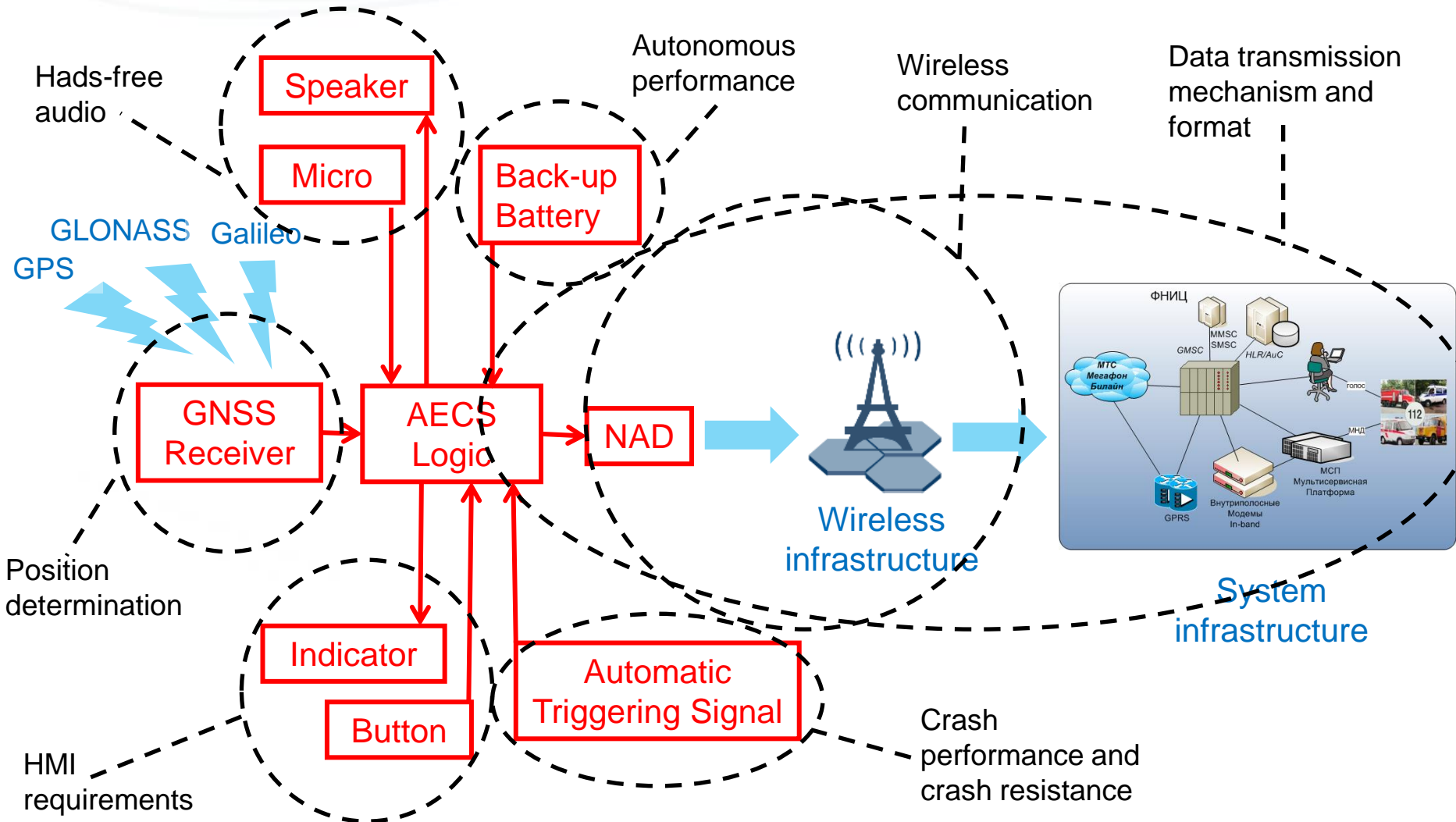   - **31 March – 2 April 2015 (Rüsselsheim)**

eCall/ERA-GLONASS Standardization Challenge

Service delivery
Functional requirements
Operational requirements
Call Center procedures
Emergency response

ICT
Mobile communication
GNSS
Data transmission protocols
Audio quality

Automotive
EMC
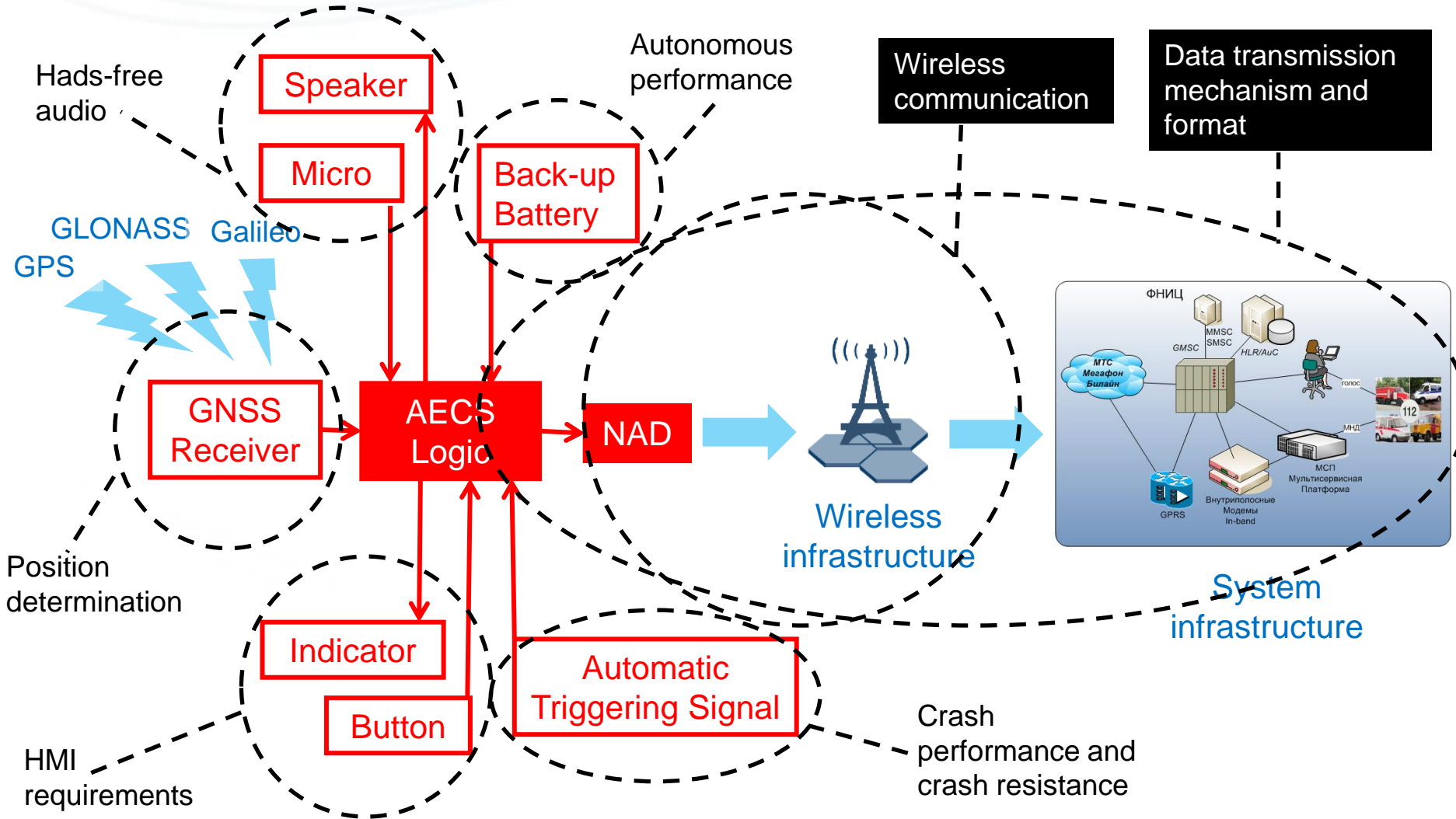Environmental
Mechanical
Crash tests
eCall trigger
HMI

- Cross-disciplinary standardization required
- Competency spread in different industries
- Regulated environment
- International standardization due to global nature of the car industry
- Interoperability requirements (vehicles cross borders)
- Adjacent areas / applications should be taken into account
- Customer perception matters

Minimum requirements do not always work due to a complex service chain
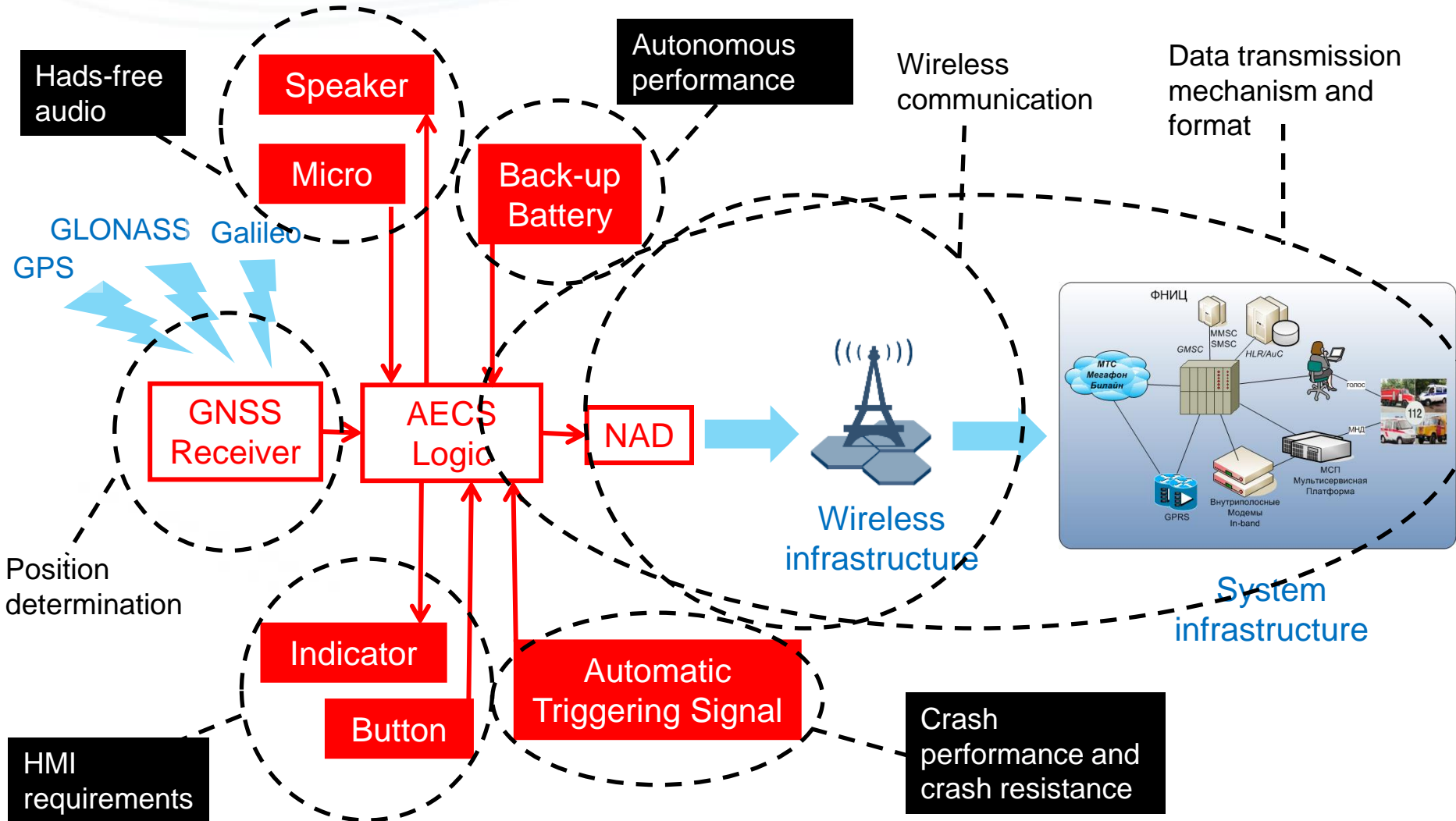
4

AECS Functions and Regulation Scope

"GLONASS UNION"

Speaker

Micro

Back-up Battery

GNSS Receiver

AECS Logic

NAD

Indicator

Button

Automatic Triggering Signal

GLONASS
Galileo
GPS

Hads-free audio

Autonomous performance

Wireless communication

Data transmission mechanism and format

Wireless infrastructure

System infrastructure

Position determination

HMI requirements

Crash performance and crash resistance

Legacy Networks and System Infrastructure Define Minimum Requirements

"GLONASS UNION"

Hads-free audio

Speaker

Micro

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Autonomous performance

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Data transmission mechanism and format

GLONASS Galileo
GPS

GNSS Receiver

AECS Logic

NAD

Wireless infrastructure

System infrastructure

Position determination

Indicator

Button

Automatic Triggering Signal

HMI requirements

Crash performance and crash resistance

Europe: 2G, in-band data transmission directly to PSAP
Russia: 2G & 3G, in-band and SMS data transmission, dedicated system infrastructure
Japan: 3G, packet data transmission, dedicated system infrastructure

6

Self-Consistent Components Benefit from 'Traditional' Approach

Hads-free audio

Autonomous performance

Wireless communication

Data transmission mechanism and format

Speaker

Micro

Back-up Battery

GLONASS   Galileo

GPS

GNSS Receiver

AECS Logic

NAD

Wireless infrastructure

ФНИЦ

System infrastructure

Position determination

Indicator

Button

Automatic Triggering Signal

HMI requirements

Crash performance and crash resistance

Hands-free audio: good chance to sync with P.emergency ITU-T recommendation
Crash performance and resistance: well established crash testing methods (Reg 94 & 95)
HMI requirements: defined in UNECE Reg. 121

# Can Position Determination Requirements be Performance-Based?
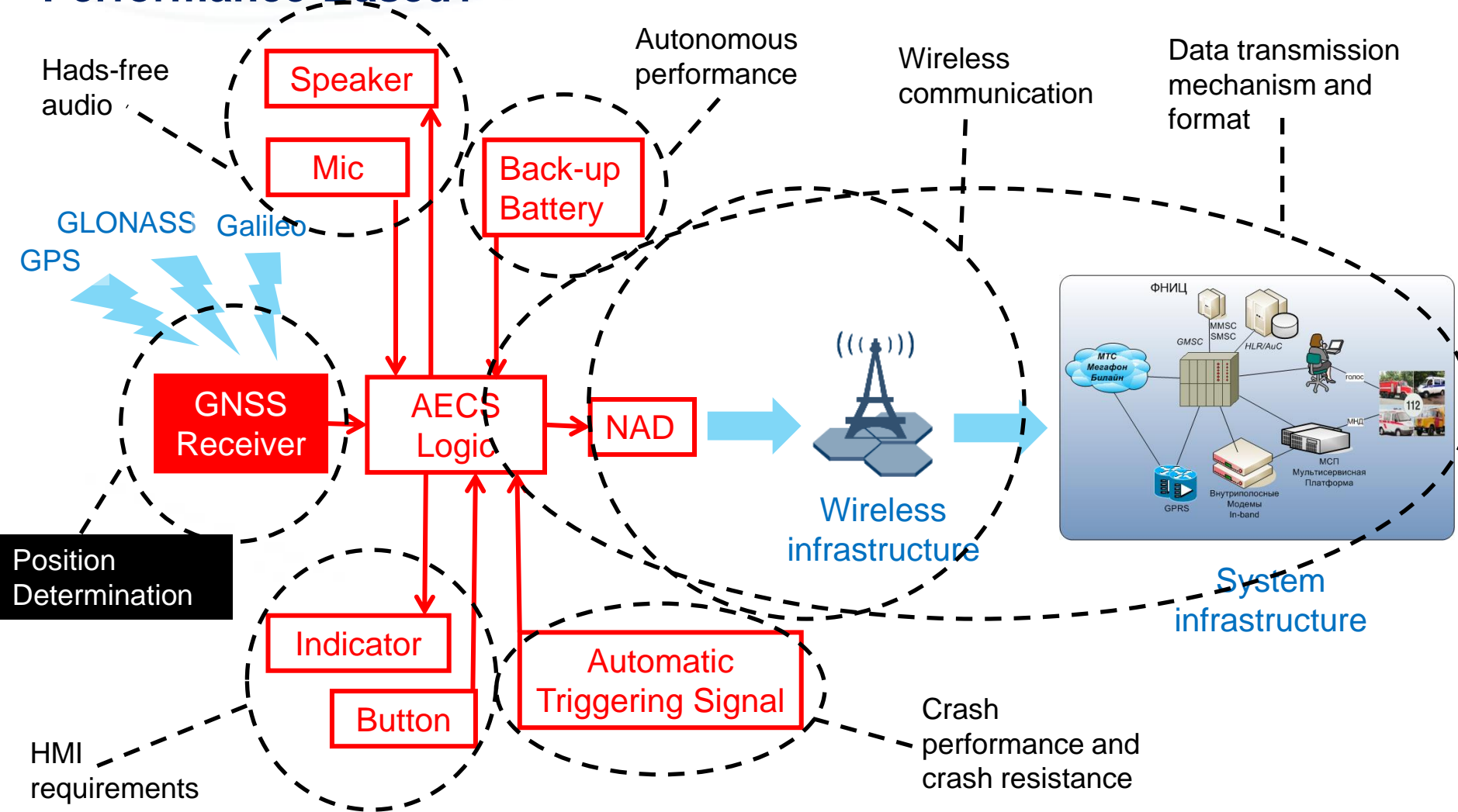
GNSS coverage is global, so no barrier for harmonization.
However, test methods are technology-dependent.

GNSS Requirements are Technology-Related

- Horizontal position accuracy:
  - Open sky conditions shall not exceed 15 m
  - Urban canyons conditions shall not exceed 40 m
  - PDOP not more than 2.5 and 4 respectively
  - 95% of the measurements done
  - Speed up to 140 km/h

- Sensitivity:
  - Acquisition: at least minus 144 dBm
  - Tracking: at least minus 155 dBm
  - Reacquisition: at least minus 150 dBm

- Time to first fix not to exceed:
  - 60 sec for signal level down to minus 130 dBm
  - 300 sec for signal level down to minus 140 dBm

- Re-acquisition time after block out of 60 sec not to exceed:
  - 20 sec at signal level down to minus 130 dBm

Technology-neutral test methods could hardly be defined

AECS Regulation:
First Attempt to Regulate Networked Car

- **Connected Car technologies are rapidly developing**
  - V2V
  - V2I
  - Driving automation

- **Standalone performance criteria are insufficient**
  - Selected technologies must be supported
  - Compatibility with infrastructure is required
  - Focus on performance in cooperative systems

- **Non-functional criteria matter**
  - Security
  - Privacy
  - Data integrity and reliability
  - Driver distraction
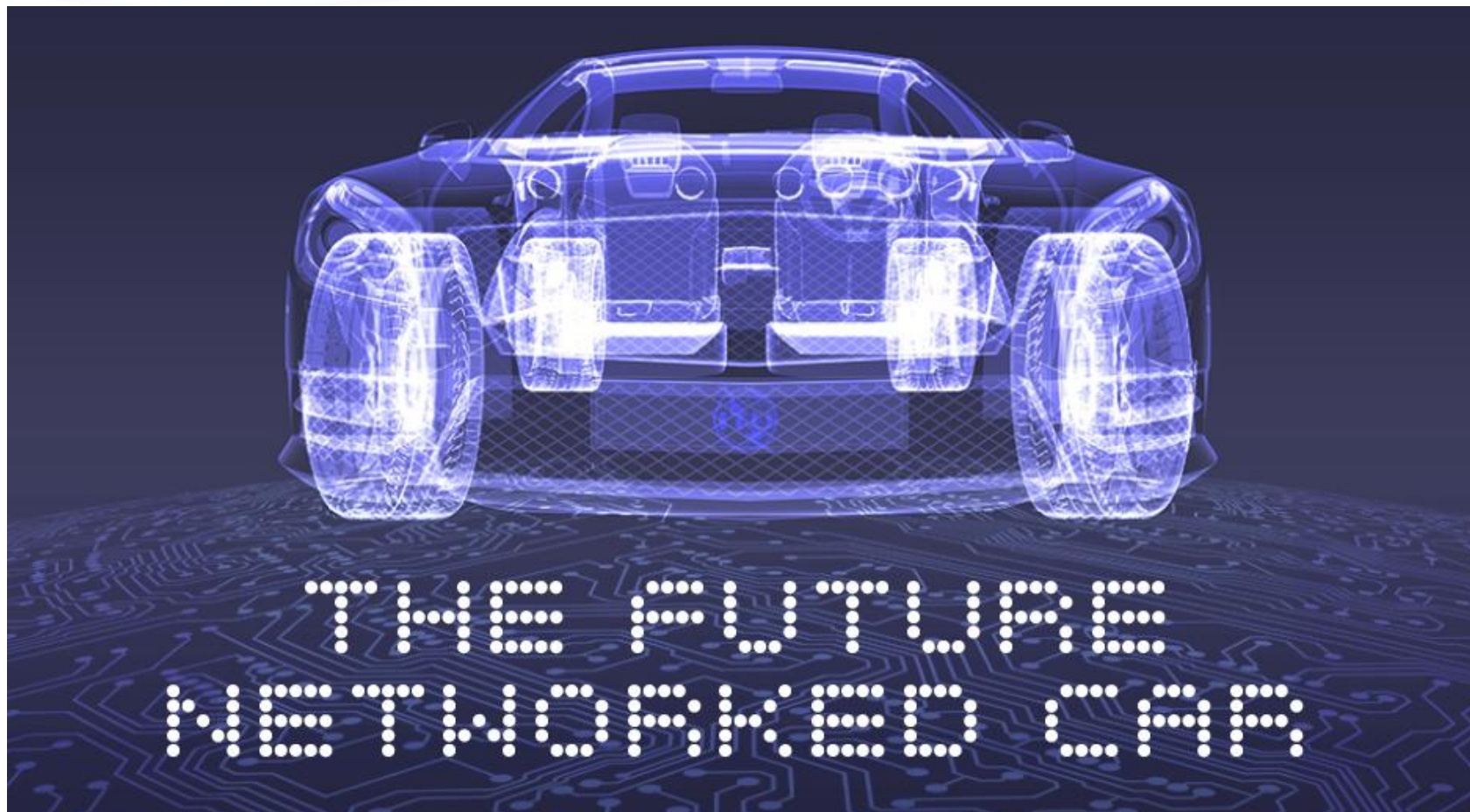
Can the Networked Car be regulated as a network element?

Thank you

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