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Automotive Electronics and Electrical Systems
Forum 2008

Quo Vadis eCall?
A Tier 1 supplier's perspective

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AGENDA

- Introduction

- In Vehicle Systems

- Engagement and Experience

- Additional Services and Features

- Summary

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Introduction

Introduction

WHAT is eCall?

▶ "eCall" is a synonym for "a pan-European automatic in-vehicle emergency call system"
▶ An eCall is generated either manually or automatically following an accident using GSM cellular service "112"

▶ When activated, the in-vehicle eCall device creates an emergency call carrying both voice and data directly to the nearest emergency services (nearest 112 Public Safety Answering Point, PSAP)

WHY eCall?

▶ eCall is part of the European eSafety Initiative to half the number of road victims by 2010 (compared to 2001, when the Commission published its White Paper on European Transport Policy)
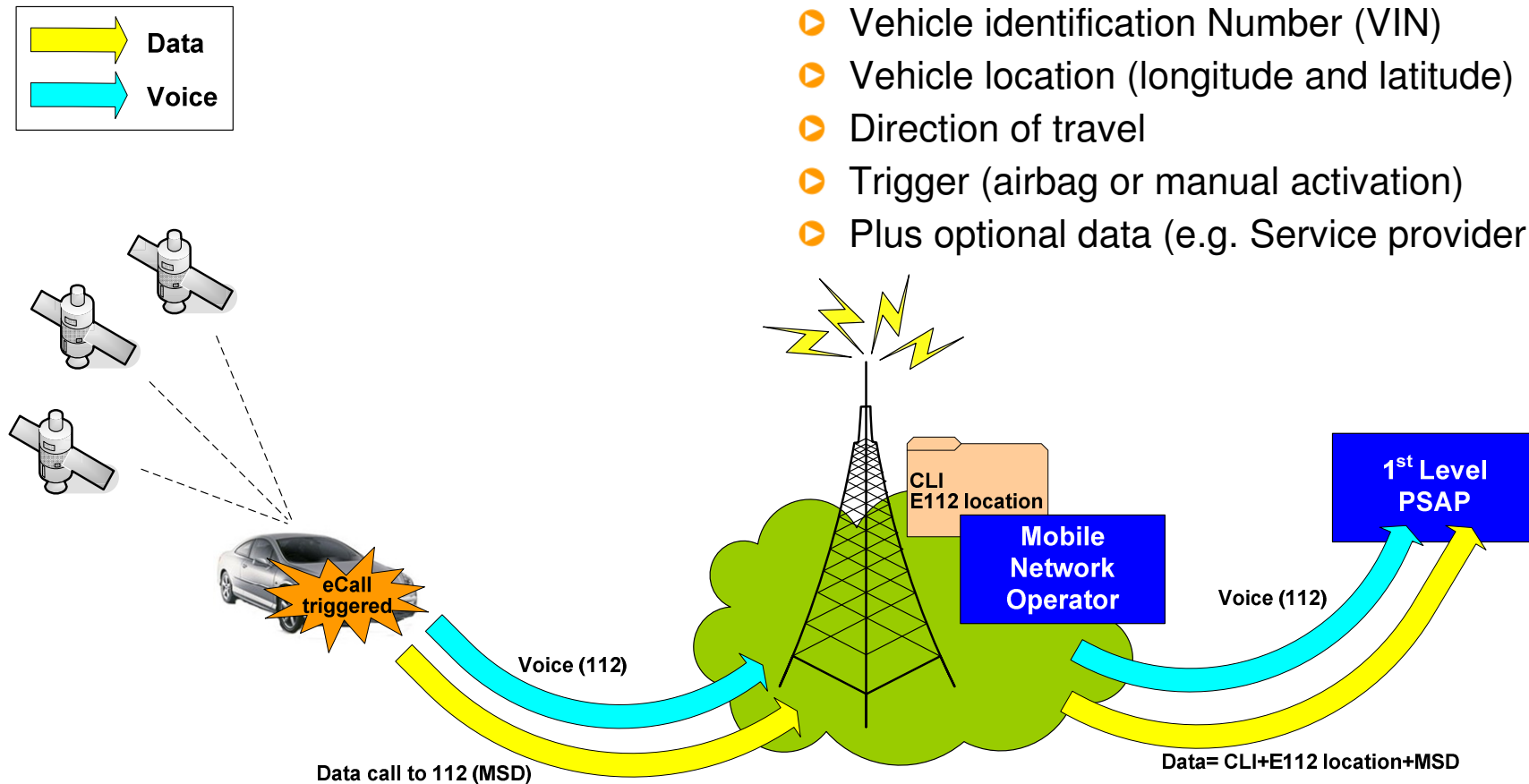
WHEN and **HOW**?

▶ The *e*Safety partners (European Commission, industry, public authorities and other stakeholders) have agreed to introduce eCall as a **standard option** in all vehicles entering the market **after September 2010** (i.e. model year 2011)
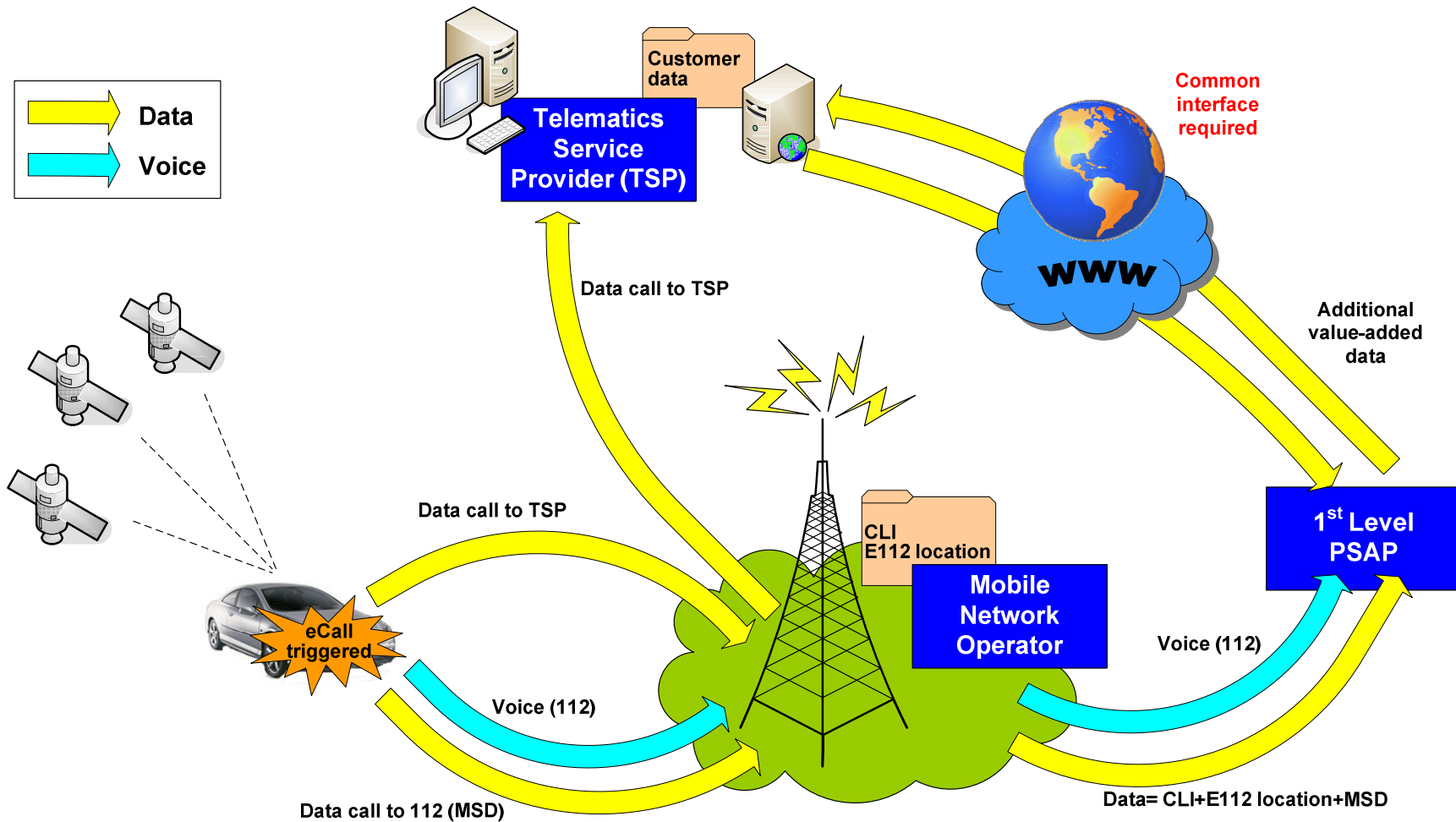
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eCall System – pan-European operation

MSD = Minimum set of data, including:

- ▶ Time
- ▶ Vehicle identification Number (VIN)
- ▶ Vehicle location (longitude and latitude)
- ▶ Direction of travel
- ▶ Trigger (airbag or manual activation)
- ▶ Plus optional data (e.g. Service provider IP address)

Data

Voice

eCall triggered

CLI E112 location

Mobile Network Operator

1st Level PSAP

Voice (112)

Voice (112)

Data call to 112 (MSD)

Data= CLI+E112 location+MSD

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eCall System – Augmentation with TSP (optional)

Data

Voice

Telematics Service Provider (TSP)

Customer data

Common interface required

WWW

Data call to TSP

Additional value-added data

Data call to TSP

eCall triggered

CLI E112 location

Mobile Network Operator

1st Level PSAP

Voice (112)

Voice (112)

Data call to 112 (MSD)

Data= CLI+E112 location+MSD

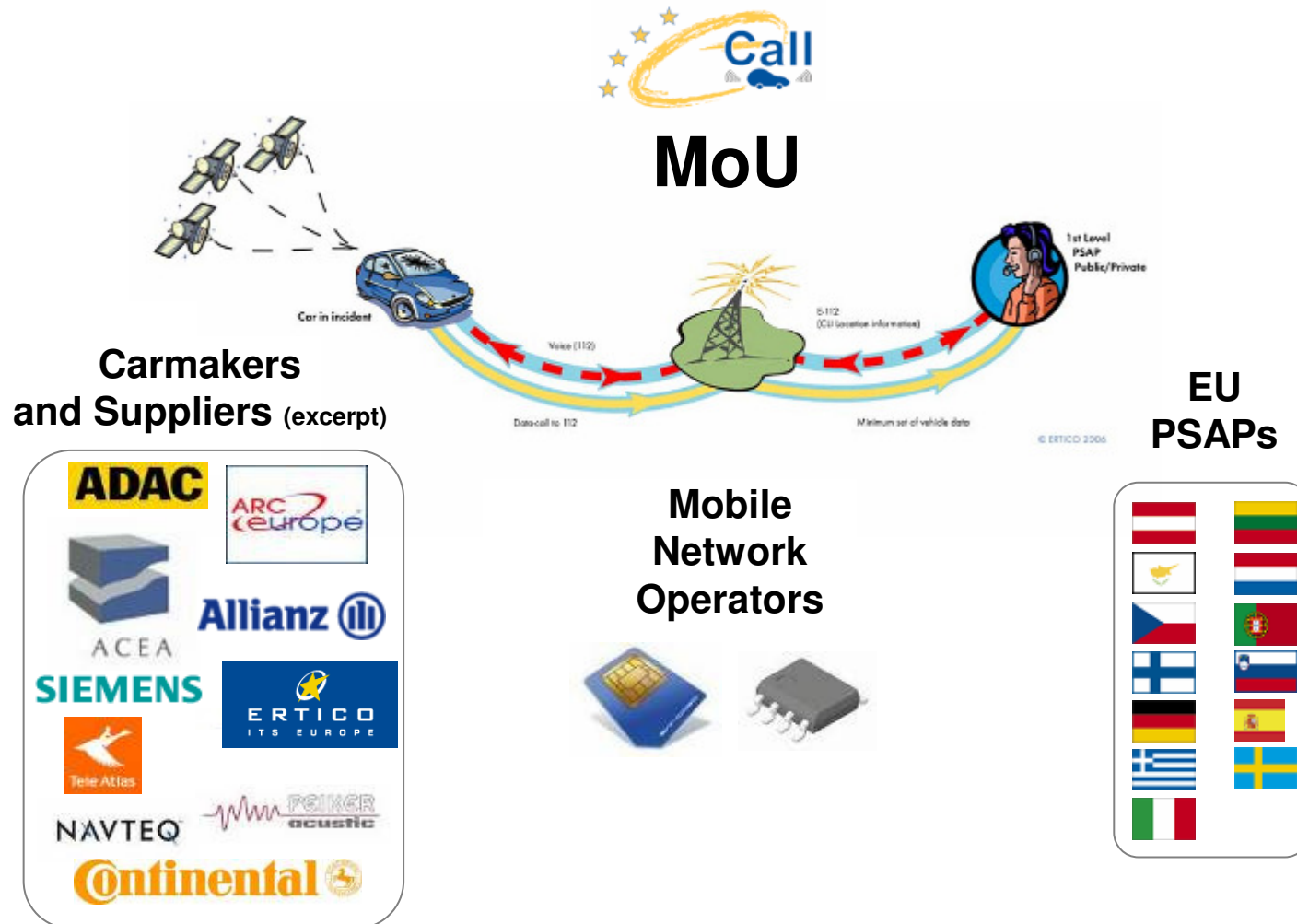**Ontinental**

eCall Memorandum of Understanding

EU Member Countries		Signed MoU?
1	Austria	05. Jun 07
2	Belgium	
3	Bulgaria	
4	Cyprus	08. Dez 05
5	Czech Republic	18. Sep 07
6	Denmark	
7	Estonia	
8	Finland	22. Sep 04
9	France	
10	Germany	05. Jun 07
11	Greece	18. Okt 05
12	Hungary	
13	Ireland	
14	Italy	18. Okt 05
15	Latvia	
16	Lithuania	18. Okt 05
17	Luxembourg	
18	Malta	
19	Netherlands	08. Nov 07
20	Poland	
21	Portugal	18. Sep 07
22	Romania	
23	Slovakia	
24	Slovenia	18. Okt 05
25	Spain	18. Sep 07
26	Sweden	20. Jun 05
27	United Kingdom	

Other EU Countries		Signed MoU?
1	Iceland	11. Dez 06
2	Norway	08. Jun 06
3	Switzerland	22. Nov 04

Division I, BU Connectivity

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eCall Memorandum of Understanding

MoU

Carmakers and Suppliers (excerpt)

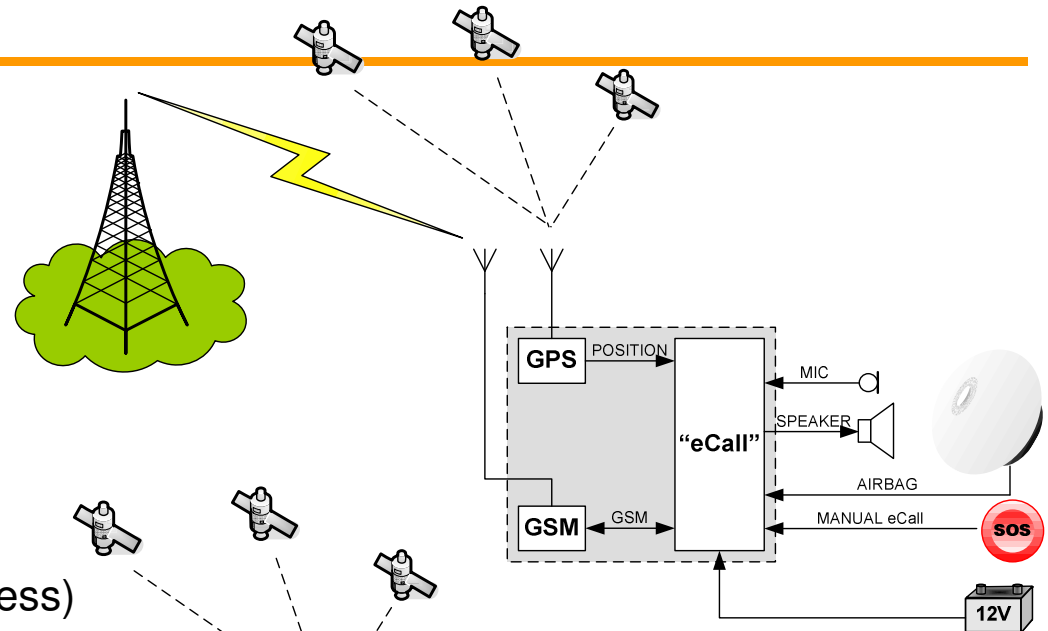**Mobile Network Operators**

EU PSAPs
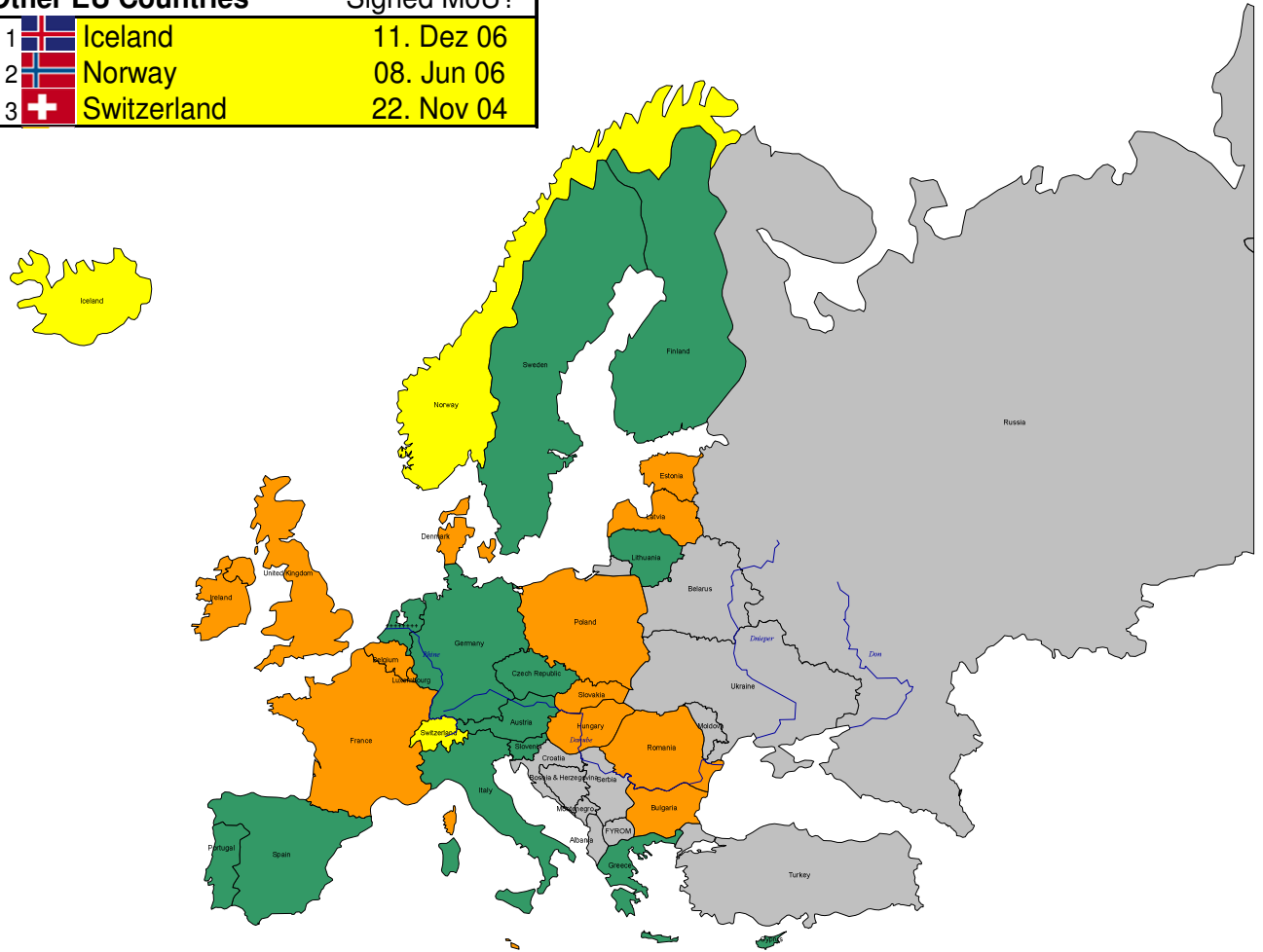
In Vehicle Systems

eCall In-Vehicle Systems

In an active, but non-triggered state:

- Monitor and track vehicle position

- Monitor available mobile telephone networks

In the event of an eCall trigger:

- Detect eCall trigger

  (e.g. airbag deployment or manual button press)

- Aggregate and prepare data (MSD)

- Initiate GSM 112 voice call

- Send data

- Audio management for voice call

- HMI, provide audio and/or visual feedback to

  vehicle occupants

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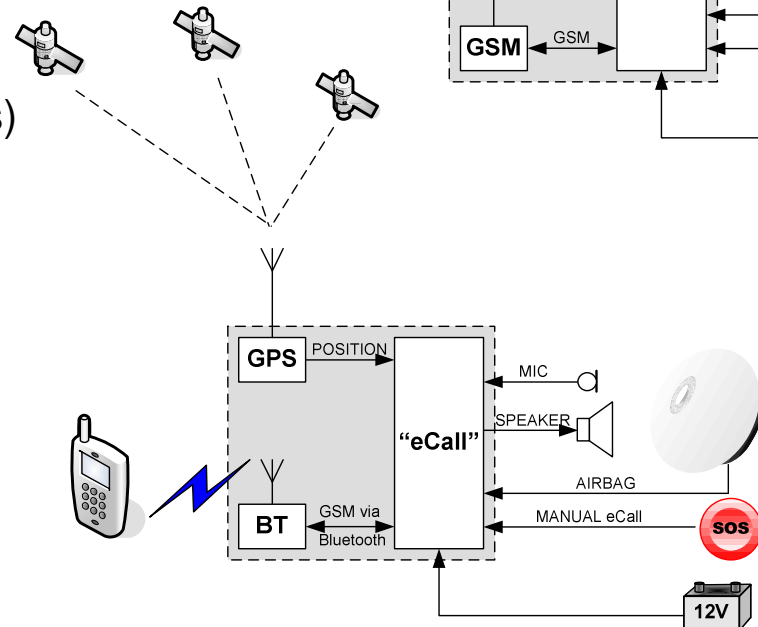
Approaches to eCall Legislation

- Minimum Support - **Lowest cost**
    - OEM will provide eCall only to satisfy expected legislation
    - Tendency for <u>Mobile Phone</u> (Bluetooth) solution
    - Integration to existing Bluetooth solutions likely (Head Units, hands free solution)
    - Liability and System Reliability need careful consideration

- Marketing Opportunity – **Early Adopters**
    - Differentiate from other OEM due to „safety advantage" awareness
    - Focus on <u>Embedded NAD</u> solution
    - Build on eCall with additional services
        - Stolen vehicle tracking
        - Door Unlock
        - Diagnostics
        - Breakdown call, to increase OEM and customer added value
        - Combine entertainment with safety!
        - ……

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Possible eCall Solutions

"Nomadic" Solution		Advantages	Disadvantages
Communication	Via user phone (Bluetooth)	No extra SIM required	Phone can be damaged (during accident), battery empty, phone is ... IOP issues
Positioning	- Via cell po... - From navig... - GPS (if su...		...uracy from 200m ...rural areas (if no ...)
Services	none (only v...		...t recovering ...hones provides potential vulnerability uncertainty in terms of liability

> **BUT** high & **continuing** maintenance **costs**
> for Bluetooth Interoperability
> need **to be considered**

"Embedded" Solution		Advantages	Disadvantages
Communication	Via embedded phone (NAD-Network Access Device)	Higher availability of service (RF – external antenna, Transmitter presence), "crash proof"	Costs for NAD chipset
Positioning	Via integrated GPS	Highest accuracy, known well performance	Costs for GPS chipset
Services	Pay per drive, stolen vehicle tracking, combination with distance control systems (pre-alarm) possible	Scalable according user requests and services provided	none

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eCall Safety and Reliability rating by Björn Steiger Stiftung

eCall – Automotive Solutions

100% Safety = Black box dual system

75% Safety = Mobile phone in charger station

50% Safety = Mobile phone pairing with CAN

25% Safety = Mobile phone pairing with airbag

Björn Steiger Stiftung

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Engagement and Experience

Continental eCall Engagement

▶ Collaborating with industry leaders for demonstrations and field test activities

  ▶ **March 2007**
  Geneva Auto Show: first End-to-End eCall demonstration with in-band modem technology

  ▶ **June 2007**
  ADAC field trial: Proving eCall feasibility

  The 2007 ADAC field trial was the first end-to-end field implementation, proving the European eCall concept to work and can be implemented according given requirements

  ▶ **2007**
  OEM field trials: Enable "first hand" OEM eCall experience and further enlarge Continental's eCall competency

  ▶ **December 2007 / January 2008**
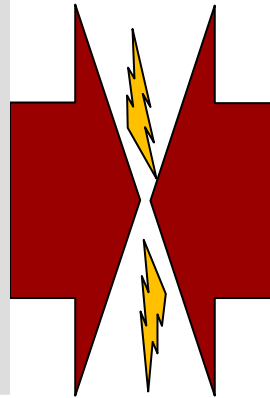 Bjoern Steiger Stiftung field test

  ▶ **2008**
  Support OEM and/or European or National Field Operational Trials

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Continental NAD Experience

● Continental own NAD development & production

| **Automotive industry**		**Consumer industry**
● low volume		● high volume
● long life cycles		● short life cycles
● long development cycles		● short development cycles
● hard and high quality requirements		● reduced quality demands

Continental has learned from real experience

As a supplier to the automotive world with our own NAD development
we ensure **automotive hardened components**, fitting
the **automotive lifecycle** with its **quality requirements**

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Additional Services and Features

Vertical Markets Share Common In-Vehicle Components
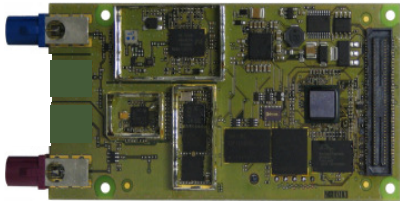
	eCall	PAYD / Road Tolling	Remote Door Control	Remote Diag-nostics	Stolen Vehicle Tracking	Fleet Mgm.	Other	
Embedded Phone	✓	✓	✓	✓	✓	✓	✓	
Nomadic Phone	✓		(✓)				(✓)	
Positioning / GPS	✓	✓	✓	✓	✓	✓		
Vehicle Network Connection	✓	✓	✓	✓	✓	✓		
Back-up Battery	(✓)				✓	(✓)		

Potential for synergies through similar
core components for value added services

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Proposal

- Three main scenarios assumed to be of interest to OEMs:

  - 1 - Reliable, fully integrated eCall solution

  - 2 - eCall solution with additional services

  - 3 - Entertainment product including eCall

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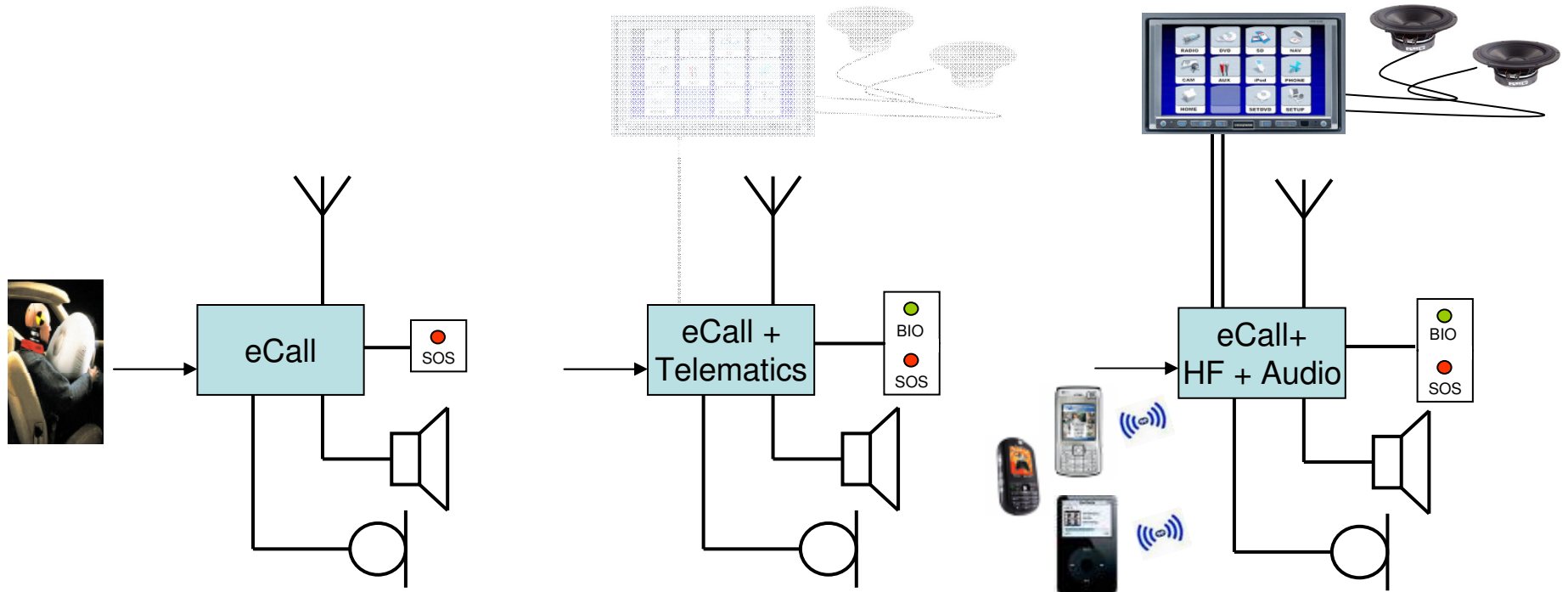
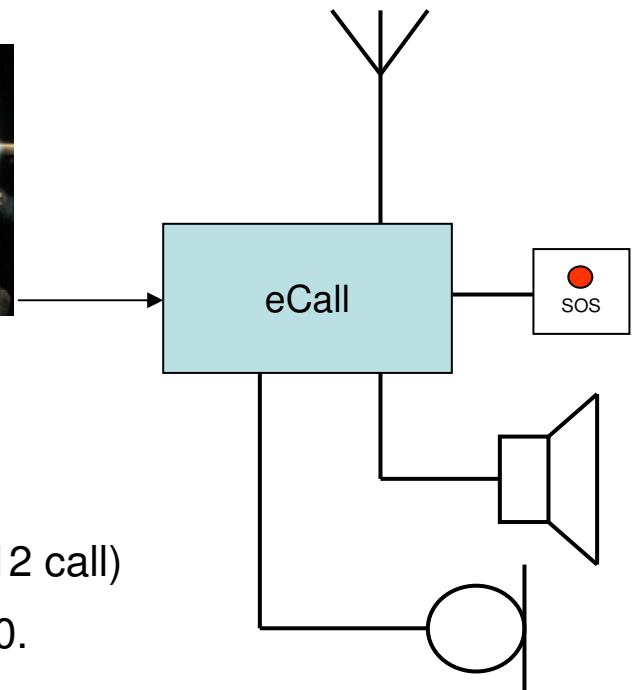# Proposal 1 - Reliable, fully integrated eCall solution

- Functions
    - Embedded GSM network access device (NAD)
    - GPS location
    - eCall MSD processing
    - Microphone input / speaker output
    - Airbag, Button/LED interface
- TSP required
    - No, if implementation follows EU directive (data and voice via 112 call)
    - Yes, if implementation based on SMS already for MY09 or MY10.
- Vehicle Integration
    - Low. Only speaker, microphone and button (incl. indicator) need to be fit.

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Proposal 2 - eCall solution with additional services
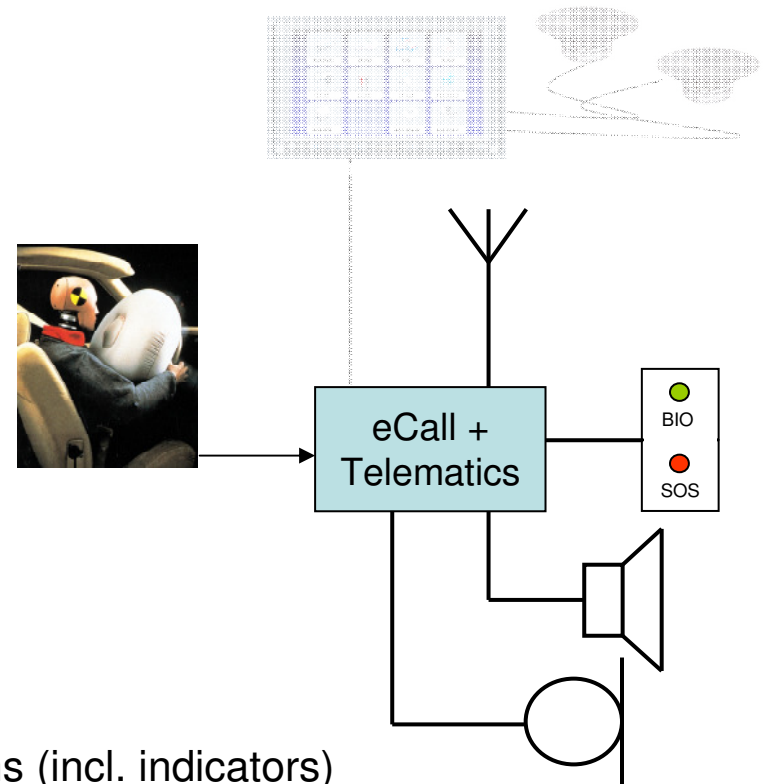
- ◗ Functions
    - ◗ Embedded GSM network access device (NAD)
    - ◗ GPS location
    - ◗ eCall MSD processing
    - ◗ Microphone input / speaker output
    - ◗ Airbag, Button/LED interface
    - ◗ Remote diagnostics service
    - ◗ Breakdown/Operator call
- ◗ TSP required
    - ◗ Yes
- ◗ Vehicle Integration
    - ◗ Medium. In addition to speaker, microphone and buttons (incl. indicators) a network connection to selected remotely diagnosed control units is required.

eCall + Telematics

BIO

SOS

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Proposal 3 - Infotainment product including eCall

- Functions
    - Proposal 2 plus …
    - Advanced Voice Recognition
        - Telephony and audio functions
    - High quality noise reduction
    - Echo cancellation audio processing
    - BT connectivity with hands free (HFP)
    - Advanced audio streaming (A2DP) profiles
    - USB and iPod connectivity

- TSP required

    - Similar to proposal 1 or 2

- Vehicle Integration
    - High. In addition to microphone and buttons (incl. indicators) telephone audio, a mute signal and stereo audio outputs are required to connect to the vehicles audio system.
    - If USB and iPod connectivity include song/artist and directory browsing, a dedicated user interface on the radio/instrument cluster would be required.

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Summary

Summary

- The European eCall introduction in 2010 is challenging but still feasible
  - IVS is not the most challenging system component
- Suggestion to focus on embedded eCall solutions enabling synergy effects
- eCall standardization is progressing
- Continental´s eCall activities are focused on:
  - Supporting the EU Commission's position on the need for eCall in Europe
  - Assisting OEMs in defining their eCall strategy proactively **ahead of legislation**
  - Advocating embedded solution as the most robust and reliable solution
  - Continuing to participate in field trials with the goal to validate the reliability and feasibility of solutions
  - Drive cost down in order to offer affordable entry level eCall systems

Continental Automotive Systems is ready to support with solutions that allows an early introduction of eCall

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Thank You!

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