EBSF – General Information

- Large Scale Integrated Project funded by the European Commission DG-RTD (DG Research)
- The first about Urban BUS
  - Budget Total/ Funding: 26 MEUR (16 MEUR)
  - 7th Framework Programme of the EU
  - 4 years project 2008-2012
- 47 European Partners from 11 Countries
  - 5 Leading European bus manufactures, supply industries, SME
  - Transport operators, National Associations, Public Transport Authorities
  - European Research centers, Universities and Consultancy firms
- Coordinator: UITP-International Association of Public Transport
  - UITP represents over 3,400 PT members in 92 countries worldwide
“The whole is more than the sum of its part”

Aristotle, Metaphysics
EBSF– Objectives

- “System Approach” applied to urban bus service to design...
  - ...an **intelligent** system...
    - efficient use of information
    - different **bus system solutions** adapted to specific needs of all stakeholders
  - ...with **innovative** vehicles...
    - providing improved comfort and accessibility
    - making smart use of energy on board
  - ...**integrated** in the modern European Urban scenarios
    - adapted to different urban contexts
    - taking into account the future mobility trends
    - featuring new services for passengers and operators
    - part of the whole transport network
- Increase **attractiveness** and **image** of urban bus systems
EBSF – Logic

Key Innovations Development

SP 1 – System definition

SP 2 – Vehicle

SP 3 – Infrastructure, Operations

SP 4

Strategy
vision, exploitation, standardization, harmonization...

Use Cases and Validation

2008 2010 2012

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EBSF– System Definition

- The “Vision”
  - Expert brainstormings and experiences

- The “System Definition”
  - EBSF Basic Functions
  - Main areas of conflict and associated Trade-offs
  - EBSF System Architecture
  - Main line for Innovation of existing Bus solutions

- The “Analytical work”
  - Collection of the Needs of the main Bus System stakeholders
  - EBSF System and Subsystem Requirements (Vehicle, Infrastructure and Operation)
  - Key Performance Indicators

EBSF Compendium and EBSF Vision documents are available via website [www.ebsf.eu](http://www.ebsf.eu) or email: maeva.zebrowski@uitp.org
Key Innovations: vehicle

- Accessibility
  - Flow, Layout, Speed
  - VOLVO, MAN

- Energy Management
  - MAN, VOLVO

- Driver Workplace
  - EVOBUS

- Internal / External Modularity
  - IRISBUS, MAN

- Handling and Guidance system
  - IRISBUS

- IT platform on-board
  - VEOLIA, IRISBUS, EVOBUS, MAN
Key Innovations: infrastructure and operations

- Interexchange stations design and success factors
- Intermodality with other PT and complementary transport modes
- Transport policies and Traffic rules for urban bus services
- Impact of collection of information, fare collection, ticket validation on the efficiency of travel
- Optimisation of crossing Bus lines monitoring operations
- Back-Office and Test-bench
- Bus Stop / Station
Seven EBSF Use Cases (2010-2012)

**ROME**
- Internal Modularity
- Remote Maintenance
- Depot Organisation

1 IRISBUS concept bus
50 CNG operative bus
Back-office applications

**BRUNOY**
- Telediagnostic
- Remote Maintenance
- New Maintenance Procedures

10 IRISBUS operative bus
Back-office and depot

**BREMERHAVEN**
- On-board Communication
- Information to Passengers
- Integrated Information Services

1 EVOBUS demonstrator bus +
13 operational buses
Back-office
Bus-stop

**GOTHENBURG**
- Accessibility

1 VOLVO concept bus
Bus stop design
Driver training

**ROUEN**
- Bus Guidance
- Accessibility

2 IRISBUS TEOR bus
Bus-stop

**MADRID**
- Multimodal Information to Passengers and Driver
- Underground Vehicle Localisation
- Information Integration in Central-Office

30 operative buses
Central back-office integrator

**BUDAPEST**
- Accessibility
- Energy Saving
- On-board Communication

1 MAN demonstrator bus
Bus-stop

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Since the years 90s, IT has been seen in EU like a strategic need for Public Transport

AVMS (Advanced Vehicle Monitoring System) developed with very few references to standards

First generation of telematic equipments
- equipped after-sale
- Vertical and proprietary,
- inextensible with updated applications,
- difficult to maintain and to set-up.
Future overall organization in urban and in suburban areas

Geographical organization

Institutional organization

Bus Service operational scenarios is becoming very complex!

Vertical IT architectures makes difficult the development of common applications for the coordination of multi-fleet and dis-homogeneous vehicles

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Tomorrow, the operator or authorities will buy a pre-equipped vehicle with basic standard architecture.

Specific applications can be developed independently and installed like “plug and play”.

Vehicle would be supervised easily from an operator and/or PTA to another.

In addition, the evolution of mobile telecommunications will make the vehicle interacting with the passengers mobiles.
Joined effort by **seven** major specialist suppliers in IT domain from 5 European Countries

- Lead by VEOLIA Research

**A flexible vision:**
- A common base over which specific application are developed

**IT Standard platform:**
- Standard interfaces for onboard IP telematic architecture
- Standard rules for multi channels communications between vehicle and infrastructure
- Parameters depending of vehicle configuration and operation status like external modularity, bus, metro or trams

**Responses to Operators and Authorities**
- Flexibility for new functions
- Ready for equipments / application renewal
- Interoperability
Innovations on-board

- MADT: Multi Applications Driver (single) Screen
- Multi-page screen DPI (Dynamic Passenger Information)
- Improvement of equipments integration
- Sharing of key vehicle data on the IP network with standard communication protocols
- Support Energy Management
Back-Office innovation: Remote Diagnostic

Multi fleet coordination center with different telematic applications

- **Remote Diagnostic** application
  - Vehicle
    - data acquisition (Bus-FMS)
    - pre-processing and initial analysis
  - Data Transmission
    - Real-Time (for red faults)
    - Periodic (for events & data logging)
  - Back-office analyses
    - Life-time reports
    - Telemetry
Back-Office innovation: AVMS (Advanced Vehicle Monitoring System) Integrator

CITRAM developed according to EBSF specifications

Integrate information from all transport modes + interchange stations

Essential tool for safety and security management
A test-bench is in development to:
- Integrate and test the hardware components of the EBSF IT standard architecture
- Validate the specifications
- Test use case scenarios

Test-bench is composed of:
- Two buses simulators
- Two back-office architectures
- One back-office architecture with remote control

Open demonstration in June 2011 in Paris
Application to the EBSF Use-Cases

- Use-case “Telediagnostic” in Brunoy (France)
  - 10 vehicles equipped for Telediagnostic
  - Back-office architecture for Telediagnostic

- Use-case in Rome (Italy)
  - 50 CNG buses for Telediagnostic
  - Back-office architecture for Telediagnostic

- Use-case in Bremerhaven (Germany)
  - Passenger information on 13 retrofit busses and one new EVOBUS demonstrator bus

- Use-case in Madrid (Spain)
  - Intermodal Passenger information for 30 busses
  - Vehicle information integration in management center
- EBSF to complete and improve the current standards EN13149 for the next decade public transport telematic architecture

- This work will take place inside the technical committee CENTC278 WG3 SG1 (Public Transport Standards / Onboard Data Transmission)
  - Specifications provided, review on-going

- The goal is to achieve a European standard in 2013
THANKS FOR YOUR ATTENTION!

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