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Project website http://www.modurban.org

Contacts & partners

Coordinator
Mr von Wullerstorff Bernard
Association of European Railway Industries
221 Avenue Louise
BE 1050 Brussels
E-mail: bernard.von.wullerstorff @unife.org
Tel: +32 (0)2 626 12 60
Fax: +32 (0)2 626 12 61

Partners
ALSTOM Transport SA FR
Siemens Aktiengesellschaft DE
SIEMENS Transportation Systems FR
Bombardier Transportation (Holdings) Germany GmbH DE
VOSSLOH DE
ANSALDOBREDA S.p.A. IT
CSEE Transport SA FR
ALCATEL CIT FR
KNORR BREMSE Systeme fur Schienenfahrzeuge GmbH DE
KNORR BREMSE Rail System (UK) Ltd UK
Freinrail SA EUROTELEC FR
FRENSISTEMI srl IT
DIVISION IFE Doorsystem Knorr Bremse GmbH AT
DIMETRONIC S.A. Representing Invensys Rail ES
NAVECOM FR
Esterel Technologies FR
Regie Autonome des Transports Parisiens FR
Union Internationale des Transports Publics asbl BE
Berliner Verkehrsbetriebe DE
London Underground Limited UK
Metropolitano de Lisboa PT
The main target of the MODURBAN project is to design, develop and test innovative and open common core system architecture and its key interfaces, in preparation for the next generations of urban-guided public transport systems.

According to the ERRAC (European Rail Research Advisory Council) study, “Light Rail and Metro Systems in Europe: Current market, Perspectives and research implication”, there are 170 LRT networks and 36 metro networks in Western Europe. It is expected that the number of new LRT systems could expand by more than 50% over the next 20 years. For metros, the number of new systems is expected to be limited to around five, whereas 55% of existing metro networks are currently extending existing lines or planning new lines. Most of the existing metro systems will have their rolling and signalling equipment replaced over the next 20 years and/or transformed from driver to driverless operation. These figures are in line with the target of the ERRAC Railway Business Scenario 2020 and will be dwarfed by the number of new systems being put into operation in the rest of the world, which are being built using European norms and expertise. This could account for more than 50% of the production of the European rail industry over the same period. Passengers trips are expected to grow by 40% over the next two decades, across all the transport modes. ERRAC’s vision is that the rail market share could double and that the rail market volume could increase by more than a 150% in passengers over current volumes. To meet this expectation – which means a reverse in the current trends
of the last 20 years – it is of utmost importance to develop reliable, affordable, attractive
and even more energy-efficient urban rail systems for use in European cities. This calls
for innovative and interchangeable constituents and subsystems with common harmonised
interfaces. This will reduce the cost of ownership as well as the operation and
maintenance of rail installations. It is vital in view of the growing complexity of new IT
based subsystems that new products are developed along common interchangeable
modular principles.

Objectives
The main target of the project is to design, develop and test an innovative and open
common core system architecture and its key interfaces (this covers command control,
energy saving and access subsystems), paving the way for the next generations of urban-
guided public transport systems. This approach will apply to new lines as well as the
renewal and extension of existing lines, and will encourage cost-effective migration from
driver to driverless operation. This integrated approach will avoid the risk of new rolling
stock and subsystems being built from unproven prototype sub-assemblies. With regard to
passenger information and exchange at platforms, the objective is to harmonise the
displays and push buttons as much as possible, as well as the operational procedures.
Moreover, various energy saving methods (e.g. optimisation software, lightweight materials)
will be developed.

Description of work
The MODURBAN IP will define the necessary functional, electrical and mechanical
interfaces, and validation procedures necessary to deliver the range of interchangeable
modules that will make the next generation of affordable urban guided public transport a
reality. The principal elements to be defined in MODURBAN using end-user requirements
and validation are:
- onboard intelligent interfaces
- wayside intelligent interfaces
- passenger and access-related items
- communication systems
- energy savings related aspects
- system approach for functional requirements and technical specifications and global risk
  assessment.

Results
One of the main objectives for the first phase is to lay down the basic functional
requirements for the entire MODURBAN system. This is crucial, as it will then allow
adequate technical integration of the critical elements of the different subsystems.
Some other main achievements are the following:
- The ATP (automatic train protection) onboard specification and interfaces with the
  wayside, including the definition of the functional interfaces with the onboard ATP to
  other subsystems, determining their inputs and outputs to/from the onboard ATP.
The data communication system functional requirements defined to meet all the operator needs, so that a single communication system can be used instead of multiple communication systems often used in today’s mass-transit systems.

The list of relevant standards and requirements related to passenger information systems. This preliminary analysis addresses the functionalities of the passenger information system devices installed onboard for both metros and trams, giving special attention to emergency situations.

Description and specifications of the applicable solutions for onboard energy storage systems. Basic principles are presented and compared to one another. The given data of different vehicle types, various models of operational cycles and several train control strategies create a basis for deciding which combination of technologies is considered to be the most efficient.

First network report for the users group (European operators who are non-consortium members): the principal targets of the users group are to promote knowledge, stimulate debate and reach consensus.

Europe-wide – for the MODURBAN functional requirements and its technical specifications, safety concepts and procedures developed by the project at the various project stages.

**Additional details**
- **Total cost:** 19,418,225 €
- **EU contribution:** 10,400,000 €
- **Call:** FP6-2003-Transport 3
- **Duration:** 01.01.2005 – 31.12.2008
- **Duration:** 48 months
- **Sector:** Rail