

The three phases
of LibeRTiN

LibeRTiN setting the trend
for a European Revolution
in Light Rail

LibeRTiN working group
and priority areas

Working for LibeRTiN is
worth the time!

LibeRTiN - the Light Thematic Network

Funded by the European Commission

LibeRTiN is a thematic network aimed at the establishment of a truly European Internal Market for Light Rail Systems.

Its main goal is the search for a sector-wide consensus in fostering simplification, modularisation, interchangeability of light rail sub-systems.

This activity has the objective of increasing the cost competitiveness and reliability of light rail systems.

LibeRTiN is part of the EU 5th framework programme for sustainable growth and development. Since it started in September 2002, the first of three project phases has been completed.

The project is due to run for 30 months and has now entered it's second phase.

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ATKINS

SEMALY



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TTK

The three phases of LibeRTIN

The LibeRTIN project is conceived with 3 phases:

Phase 1 - Thematic Focusing Phase

This phase identified and ranked the technical and regulatory areas (“topics”) for LRT systems which provide the major opportunity for harmonisation within the project frame. Extensive consultation of UNIFE and UITP members and LRT experts was undertaken.

Phase 2 - Workgroup and Consensus Building

Working groups for the ten topics ranked the highest in phase 1 were established in early June 2003. Suggestions for standardisation, harmonisation and recommendations will be drafted throughout the second phase.

Phase 3 - Final Consensus building round

The drafts from phase 2 will be distributed to UITP and UNIFE members for comments and validation and results will finally be handed over to the relevant institutions (CEN, CENELEC, UITP, UNIFE, ERRAC, etc.). These drafts will be part of a successful effort for the promotion of a modular approach to Light Rail architecture and may well feed RTD implementation projects for the development of modular industry-wide prototypes.

LibeRTiN setting the trend for a European Revolution in Light Rail

The LibeRTiN consortium has carried out the following tasks during Phase I:

- **analysis and integration of the Obstacles to the Internal Market for Rail Mass Transit report (OIM Report¹)**, taking into account the status of priorities and recommendations set out in the report and focussing on the key priority areas for future contribution by the LibeRTiN TN;
- **starting a multi-criteria analysis on the benefits deriving from possible harmonisation / simplification / modularisation** by gathering feedback from industrial players;
- analysis of the key areas of intervention through the drafting of “**topic reports**” concerning areas of possible improvements as far as standardisation, conformity assessment and modularisation of key interfaces are concerned;
- activity started on the concept of **essential requirements** to help stakeholders think about the primary needs of any system and sub-system elements to be put on an internal EU market. This activity has been deemed useful, though not initially anticipated in the terms of the LibeRTiN contract;
- setting the **strategy to be implemented in Phase II** of the project aimed at looking at the priority areas resulting from the analysis of the “topic reports” **towards implementing a higher degree of modularisation of key interfaces and possible harmonisation of performance requirements** in the Light Rail System’s constituents.

(1) This report was commissioned by the European Commission to AEA Technology Rail in January 2000 to analyse the obstacles to the completion of the internal market for rail mass transit systems. It was delivered in October 2000.

The LibeRTiN consortium’s vision for phase 2 of the project sees the LRT domain as:

- a high growth market that can help reduce mobility problems in medium-to-large towns;
- one of the key solutions for public transport both in medium towns that cannot afford underground systems and in larger cities with LRT as an efficient high quality feeder system, complementary system or orbital links between suburbs ;
- a system where technological improvements driven by increased standardisation/modularisation and harmonisation of key interfaces and parameters can reduce the costs associated to RAMS (Reliability, availability, Maintenance, Safety) and make these systems attractive and affordable to local transportation authorities and local customers.

This is based on the largely accepted assumption that, in general, no operator is willing to purchase a completely standard product, but no objections are raised for purchasing products manufactured with standard components. These “visionary trends” have already been endorsed on a company wide basis by the railway suppliers through:

- *platform-based production systems*;
- *simpler adaptation to local requirements based on specific local constraints such as traffic requirements, infrastructure integration in the urban fabric, aesthetics etc..*
- *using modules to reduce the additional costs of tailor-made solutions*

The LibeRTiN consortium has a vision for the future against which the current work will be benchmarked and towards which results will be measured. This vision is based around three major (technological) trends (Figure 1):

- simplification of standards and interfaces;
- modularisation where possible and based on a collaborative approach;
- interchangeability of components where possible and based on a collaborative approach;
- common basic operational principles.

From these key technological trends, there a clear economic and technical advantages th are listed in the following illustration.

Advantages of Modularisation

- **Modularization of product**
 - Less parts, pretested units, higher reliability, reduction of throughput time
 - Clear interfaces
- **Reduction of order-related engineering**
 - Re-use of proven designs
 - Short time to market
- **Exchangeability of parts, modules and systems/ assemblies**
 - Economies of scale
 - Better logistics

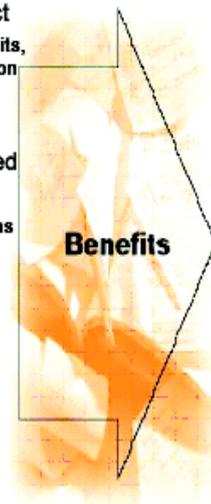


Figure 1 - Advantages of Modularisation

LibeRTiN working groups and priority areas

On June 10 and 11, 2003 the LibeRTiN Consortium held its first experts' workshop in Amsterdam with the support of the Amsterdam public transport operator GVB who provided facilities and meeting rooms for the working groups during day 11 June.

The workshop was very well attended with 74 experts from all over the European Union, Accession Countries and the Balkan region. The experts showed keen interest in the topics and actively participated in lively and constructive sessions.

On the first day introductory speeches were made by the European Commission representatives (Mr Joost De Bock - DG RTD, Mr Nunzio Bambara - DG ENTR), demonstrating the very high expectations the European Commission has for the project and the role that technical experts will have in making the project work and provide useful deliverables.

Mr Laurent Dauby (UITP) and Mr Loris Di Pietrantonio (UNIFE) presented the vision for the future of LibeRTiN and the fruitful contribution that the project could provide for design and simplification of technical standards for LRT systems. They also introduced a concept diagram illustrating links between the necessary modular approach of simplification of interfaces and the selected areas where the working groups are asked to contribute with their expertise (Figure 2- Road map to Modularisation).



Mr Nils Jänig (TTK, Project Coordinator) and Mr Yves Amsler (UITP) explained the process that brought the LibeRTiN consortium to select some priority areas during phase 1 of the project, and also presented the organisation for the future work on selected topics.

	Topic	Priority				Priority	Cluster
		OIM Report		Libertin T. Focus			
		Benefit	Cost	Benefit	Cost		
1	Fire Safety	High	Low	High	Low	1	T
2	Loading Parameters	High	Low	High	Low	1	D
3	Derailment / ride quality	(High)	(Low)	High	Low	2	A
4	Maintenance management	-	-	High	Low	2	T
5	Structure Gauging	High	Low	High	Low	2	A
6	Disabled Persons Provision	High	Low	High	Low	2	D
7	Noise	High		High	Low	3	AD
8	EMC	High	Low	High	Low	6	E
9	Air Conditioning	High	Low	High	Low	6	D
10	Heating and Ventilation	High	Low	High	Low	7	D
11	Coupling Type	Low	High	Low	Low	16	T
12	Emergency Equipment	Low	Low	Low	Low	16	T
13	Internal layout	Low	High	High	Low	16	DC
14	Traction and Control Systems	High	Low	Low	Low	19	E
15	Compatibility of Energy Supply Systems	-	-	Low	Low	19	E
16	Other environmental issues	Low	Low	Low	Low	21	T
17	Vehicle width/height/length	Low	High	Low	High	28	DA
18	Information systems	Low	Low	Low	Low	30	D
19	Crashworthiness	High	Low	High	Low	Special	T
20	Retractable couplings	High	High	Low	High	Special	T
21	Safety of energy supply systems			High	Low	Special	T
22	Lighting	-	-	Low	High	Special	D
23	Train Protection	Low	High	Low	High	Special	B
24	Emergency Brakes	High	Low	High	Low	X	E
25	Door Systems	High	Low	High	Low	X	D

Cluster	Name
A	Dynamics incl. Track characteristics and wheel rail interface
B	Command, control and signalling incl. train guidance and protection
C	Drivers (functional interface)
D	Passenger environment (incl. Disabled provisions)
E	Traction and braking
T	Tendering and acceptance procedures
T	Safety cases and approval

Mr John Welsby (Department of Public Enterprise, Republic of Ireland) provided an extensive presentation on safety cases and regulation for the construction of LRT systems in Ireland. Ireland is in the interesting position of not having had any on-going tramway and light rail tradition and therefore has to develop new standards and authorisation procedures based on best practice.

During the Amsterdam workshop, expert working groups were created to examine the priority areas and suggest solutions aimed at enhancing technical simplification and modularisation of LRVs.

The working groups' goals and major milestones are presented below.

LibeRTiN working Groups

1. Fire safety



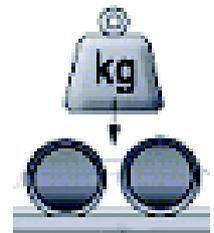
A presentation was given on the scope and principles of the future norm EN 45545 “Fire protection on railway vehicles”. The results obtained by a French, German and Luxemburg working group under the auspices of UITP were also been presented to the experts. Although the principles of the French and German norms differ significantly, a comparison could be made between the two and the requirement for a potential cross-border tram-train drafted. Experts stressed the very demanding norms applicable to railways (and subsequently to light rail) in comparison with the less demanding norms applicable to road vehicles. The need to consider the fire safety issue from a system and operational point of view was also pointed out by the participants. The group agreed the following:

- Libertin will not duplicate CEN work but just ensure that specific aspects of light rail are taken into account.
- Libertin will concentrate its efforts on a system and operational approach to fire safety (covering vehicles, infrastructure and tunnels, as operation and maintenance)
- The economic impact of the demanding rules for light rail versus road vehicles needs to be evaluated.

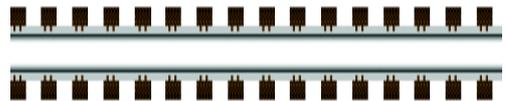
2. Loading Parameters

During the session in Amsterdam the group defined its goals as follows:

- aim at changing the loading values quoted in EN 12663 to a fixed value instead of the current vague figures
- The norm should include a fixed value in N / m^2 rather than P / m^2
- an agreed calculation method for the areas that should or shouldn't be included in the standing area on every vehicle needs to be agreed on and included in the standard
- Propose a set of general guidelines of loading figures for system design and dimensioning. For this existing UITP will be reviewed and adapted if necessary.



3. Derailment and Ride Quality



The wheel-rail interface is key to this topic and to the related topics of noise (and vibration) and maintenance management. It was agreed that before any guidelines can be produced on wheel profile, ride quality or derailment prevention it was necessary to produce the track specifications first.

Action plan:

- Translate existing German standard and review for scope and applicability to countries not involved in its preparation.
- Understand how current CEN work fits in.
- Hold a further workshop in the autumn, possibly including the German standard authors.

Potential to progress into more detailed topics if time and budget allow

Topic Leader – Edwin Marks, AEA Technology Rail, edwin.marks@aeat.co.uk

4. Maintenance Management

The focus of this working group lies in developing guidelines to summarise best practices and explain the “Do’s and Don’ts” regarding the following aspects:

- Procurement specifications regarding system performance guarantees (LCC, RAMS, Quality)
- Design to maintenance
- Easy field data gathering procedures
- Economical Maintenance management systems



Milestones:

June 2003	First Working Group session during first joint experts' workshop in Amsterdam
November 2003	Second Working group session (discussion of collected data/information/best practices)
February 2004	Internal Working group meeting (preparation of draft guidelines)
May 2004	Joint experts' workshop (finalising guidelines)

Working Group Leader: Lars-Erik Walther l.walther@ingenieurwerkstatt.de

5. Structure Gauging



The experts attending the Amsterdam workshop recognised that the different rules, traditions or national standards used in Europe need harmonization. A UIC 505 leaflet adaptation is seen as one possible basis for such harmonization. With regards to railways however, several specific aspects of light rail were identified and need to be considered in a future standard. Mr Legrand (CEN) informed the participants that a CEN working group was preparing a standard on the subject. As a consequence, it was decided to collect from the participants detailed information about the best scope for harmonization and specific aspects of light rail versus railways in this field. A meeting will then be organized with the CEN working group in order to make sure that light rail will be satisfactorily covered by the future standard.

6. Noise



The noise session was attended by 16 experts with different background, representing operators, manufacturers and noise experts in general - including members of a number of EU-working groups and standardisation organisations.

The discussion was lively and many issues were covered regarding noise, vibration and structure borne noise. However, prEN ISO 3381 on internal noise and its adoption to LR-systems was not discussed in detail. The work should focus on type testing and transferability to "average" city situations, probably by recommending standard track systems representing typical LR tracks. In addition, there was a great interest in considering short term noise problems, especially squeals. It was decided to put more focus on the VDV paper 154 -UITP position paper on "Noise standards for railway vehicles for short-distance traffic".

Contact should be made to other EU- projects and standardisation organisations working in this field - in order to benefit from ongoing and existing work e.g. within heavy rail.

7. Access (Disabled Persons Provision)



The work group considered following access aspects:

1. Boarding/alighting,
2. Circulation within the vehicle,
3. Seating accommodation,
4. Access to the facilities and services on the vehicle,
5. Layout and facilities of stations or stops,
6. Provision of information and
7. Training of staff.

Besides aspects 1-4, infrastructure should definitely be taken into account as well. Aspects not or only partly covered should refer to other existing documents. There was agreement on Libertin producing guidelines for this topic rather than standards. The updated workplan will be discussed with the experts from June onwards.

8. Electro-Magnetic Compatibility

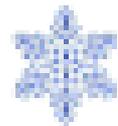


Attendance at this meeting was good, with 16 persons present and 8 unable to attend.

The EMC group will use existing standards ENV 50121 and 50238 to be the starting point and TC9X Urban Traffic Study Working Group is reviewing these documents with respect to EMC. Contact will be made with this group regarding the perceived gaps in these standards to cover Light Rail Vehicles.

New work has been identified to assist system integrators to look at the “whole life” cost issue by detailing compatibility options with regard to selection of power supply systems, signalling systems and traction package options.

9. Heating and Ventilation and Air-Conditioning (HVAC)



The main target of this working group is to build consensus between operators, vehicle manufacturers and HVAC system suppliers regarding modularity and harmonisation of system requirements. If possible this work should lead to standardised HVAC systems that can operate on a “plug and play”-basis with standard electrical, mechanical and logical interfaces.

Milestones:

June 2003	First Working Group session during first joint experts’ workshop in Amsterdam
August 2003	Meeting with Vehicle manufacturers, HVAC-system suppliers and operators
November 2003	Second Working group session (preparation of scope document)
May 2004	Joint experts’ workshop (finalising detailed documents)

Working Group Leader: Lars-Erik Walther l.walther@ingenieurwerkstatt.de

10. The Tendering Process

This topic sets out to review the tendering processes used to procure Light Rail systems across Europe with the following objectives:

- Simplify the Tendering Process
- Reduce development period of LRT schemes
- Reduce Tendering Costs (for promoter and applicant)
- Ensure process “gets scheme right”



Action Plan

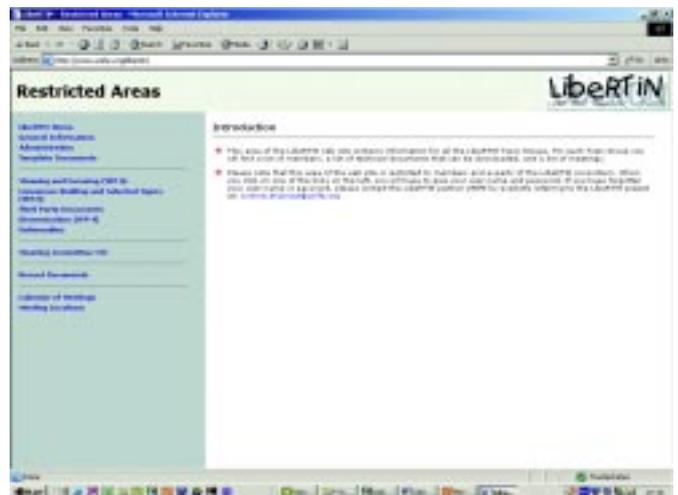
- Collate research, reactions and ideas on current European practices
- Review best practice, good examples eg France, Germany
- Prepare draft proposals and draft documents
- Meet to discuss Proposals – 9th October, Oporto (Provisional-to be confirmed)
- Initiate a trial and obtain feedback
- Feedback
- Obtain National Audit Office UK survey results
- Interim Report for November joint Workshop

Topic Leader – Ian Ambrose, AEA Technology Rail, ian.ambrose@aeat.co.uk

Working for LibeRTiN is worth the time! The LibeRTiN web-site : www.libertin.info

Working for LibeRTiN is easy and cost-effective. Through its comprehensive web-site LibeRTiN allows experts to work remotely from any location through the use of the Internet. Physical meetings, travel costs and time are therefore minimised for the benefit of the entities involved.

The web site is publicly accessible through the internet address www.libertin.info where the experts and the general public are able to find the LibeRTiN remits, main goals and relevant documentation. A member's area is restricted to the active experts through a password protected gateway. Experts are therefore able to closely follow and interactively contribute to the project activities through easy documentation exchange. By a simple click on the milestones and meeting calendar, they are able to see the development of concerned documents and deliverables.



If you would like to get more information about LibeRTiN or if you are interested in contributing as an expert and receiving passwords to log on to the LibeRTiN intranet, please visit the LibeRTiN website (www.libertin.info) or contact the LibeRTiN co-ordinator (libertin@ttk.de).

LibeRTiN is brought to you by the LibeRTiN consortium and the European Commission.

LibeRTiN picture gallery! Images from the Amsterdam workshop (June 2003)



Light Rail Thematic Network