Some key-recommendations at European level:

Twente

- To continue the extensive deployment of BHLS lines or to develop BHLS networks, it is essential to get political support at an early stage.
- To integrate the BHLS within the urban planning and to gain citizen and community acceptance.
- To provide priority for BHLS in its right of way , on the same basis as a tramway. Where relevant, to adapt road traffic regulations and to harmonise signage for tramway and BHLS priority.
- To improve the EU bus regulation for BHLS features – e.g. for bi-articulated buses, for doors at both sides, for bicycle racks at the vehicle-front (as in USA/Canada).
- To promote further research and evaluation regarding BHLS components such as economic, social, urban and environmental impacts, quality measurements, safety, specific BHLS bus market.

For more information, please refer to the COST TU0603 Final Report – November 2011

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Octobre 2011

Past COST actions (on the bus vehicle): COST303 – Trolleybus bi-mode ; COST322 – Accessible city bus ; COST349 – Accessible coach

Mise en page CETE de Lyon - Groupe communication

BUSES WITH A HIGH LEVEL OF SERVICE

Fundamental characteristics and recommendations for decision-making and research.

COST Action TU 0603 **April 2007/October 2011 - www.bhls.eu**

Introduction

All across Europe, new urban bus schemes of high quality are being implemented. These are known as BHLS – "Bus with High Level of Service". They are not necessarily "new solutions" or some innovative form of transport looking for a market. Many BHLS systems restore the efficiency buses had for most of the 20th Century when there were no congestion problems. They improve the network attractivity with the addition of significant investment in system reliability, customer support and marketing.

The bus is the primary form of public transport both in Europe and globally[1]. Where demand is high it is normally transported by Metro and LRT. One of the greatest paradoxes of modern transport planning has been the excessive focus on very expensive projects of limited scope (although effective at their point of application), while ignoring the degraded conditions for the vast majority of public transport customers. These are the result of poor urban structure and form, and greatly exacerbated by urban sprawl. This has contributed to the degradation of economic and financial conditions of the majority mode of public transport in the last four decades of the 20th century, with great loss from public to private forms of transport. Very large public expenditures are then required to try to regain fractions of the lost business. BHLS can help to change part of this context, and it is now important to understand the key factors for the bus revival.

The objectives of this COST[2] action (October 2007 – October 2011) were:

- **To highlight the strengths and the various scopes of the BHLS market, by analysing 35 European BHLS schemes (of which 25 were visited and documented by this COST action).**
- **To define some useful method tools, such as the "system" approach with its key performance indicators and conflicting requirements.**
- **To define what could cover the High Level of Service for such means of transport.**
- **To collect key recommendations / messages for promoting and strengthening this market.**

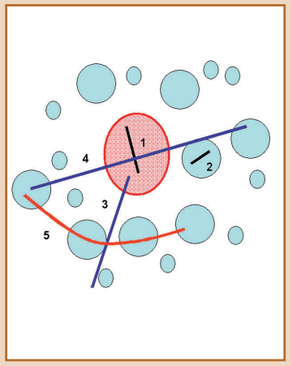
The final report of the action will be available end of November 2011.

[1] Around 50% of the vehicle-km are made by bus in EU cities with over 250 000 inhabitants, and the percentage attains 100% in small and medium sized cities. The European average of the bus market share is estimated at 50 to 60%. Worldwide, it is 80% - source UITP.

[2] COST is an intergovernmental European framework for international co-operation in research and technology. COST activities are administered by the COST Office and is endorsed by the FP7. For further information, visit: www.cost.esf.org

A wide spectrum of BHLS solutions

Bus lines have different functions within the network itself. They are then operated in different urban contexts, with different capacity requirements and then different operational requirements:



1	Urban (CBD) routes: operating within the core urban area	Nantes (BusWay), Castellón, Hamburg, Madrid (line 27),
2	Local or Distributor routes: locally in the inner or outer suburbs, including feeder routes	Almere, Ebsfleet Kent (Fastrack)
3	Collector or Radial routes: connecting one suburban area or the hinterland with the centre of the urban area	Madrid (Bus VAO), Purmerend
4	Cross-city routes: connecting different parts of the urban and suburban areas via the main city centre	Lorient, Twente, Cambridge, Rouen (TEOR)
5	Peripheral/tangential routes: connecting suburban areas without entering the centre	TVM, Zuidtangent, Jokeryline

Oberhausen

This wide range includes solutions on trunk section, and cases where tram and buses are operated on the same corridors (Gothenburg, Stockholm, Oberhausen, Essen, Lisbon, Zurich).

BHLS as a tool for bus network hierarchisation

Our survey results have highlighted the motivations and objectives for launching a bus network hierarchy. These are mainly:

- To make the functional and structural bus network clear and more "easy to use" for passengers
- To tackle congestion and to ease environmental issues
- To prioritize infrastructure investment, according to the potential capacity (higher capacity justifies higher investment)
- To increase the cost coverage (some weak bus lines can be then withdrawn)

Financial reasons remain very important in all these "hierarchy" approaches (Paris, Nantes, Hamburg, Prague, Barcelona). The cases of Nantes and Hamburg, already into service for some years, show a very good impact on ridership increase. Some hierarchisation (e.g. Nantes) is based on a strong identification of the BHLS lines. Other examples (e.g. "Metrobus" in Hamburg), where buses and stops are not really different to those of other lines, have some advantage of a lower operating cost (no dedicated fleet).

The Right of Way, with a good intermodality PT system among the other structuring modes remains the backbone of the system.

Intermodality with the "active" modes such as walking and biking is seen as a strong trend in the new schemes in Sweden, Netherlands and UK.

Kent Thameside (East London)

Agglonet Twente

Regularity, the main Key Performance indicator (KPI)

Availability, regularity or punctuality are essential to provide high level of service. These attributes are typically the main KPIs (with different ways of calculation) used by management boards and in service contracts.

Observed European practice uses reliability targets in the range 80-95%. The European Norm CEN 13816 proposes a value of not less than 80%. Experience with BHLS demonstrates that a target of 95% of passengers "having a bus on time" is achievable. This is also important for managing an efficient high frequency service (avoid bunching), and consequently reach the high capacity expected.

Hamburg

	Reliability target (regularity, punctuality)	Threshold achieved
Nantes (Busway)	90% (i+2min)	98 %
Fastrack (B)	95% (H-1min;H+5min)	97,5 %
Twente (line 2, 3)	80% H-1min;H+5min	94,7 / 97,6 %
Paris (TVM)	90% (i+2min)	95,8 %
Grenoble (line 1)	90% (H-1min;H+5min)	95
Leeds	95% (H-1min;H+5min)	93 %
Almere (network)	80% H-1min;H+3min	91,4 %

Legend: where i=interval (regularity objective) and H = scheduled time (punctuality objective)

Benefits are always observed, among the studied BHLS

Gothenburg

Regarding the ridership increase, a wide variation from 15% up to 150% has been observed, although it can take several years (3 to 4 years) until results are significant.

- The case of Jokerilinja (Helsinki), a long peripheral line, is impressive, with an increase of 150% within 5 years.
- In the case of Hamburg (increase by 15% within 3 years) this was achieved on an existing busy line when better branding and improvements were made.

The ridership increases arise from a combination of several factors, improved reliability, shorter travel time, increased volume of service, better image and marketing, and focussed car constraint policies. There is not an observed direct relationship with the percentage of Right of Way, even if it is often the fundamental factor.

Data has been collected highlighting that BHLS schemes can achieve high modal shift rates from the car, from 5% up to 30%. This depends obviously on the urban specific context, mainly on the car use of the corridor concerned.

Jönköping

	Trips coming from cars	Trips coming from biking	From other modes
Busway (Nantes)	30 %		
Fastrack (Ebsfleet Kent Thameside)	19 %		
Malahide corridor (Dublin)	17 %		
Bus VAO corridor , all lines (Madrid)	15 %		
The Jokerilinja 550 (Helsinky)	12 %		
3 lines "Citybussarna" (Jönköping)	6 %	5 %	13% new trips
Line 2 and 3 (Twente)	6 %	24 %	
Trunk network (Stockholm)	5 %		60% from metro