BHLS– Bus with High Level of Service

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Spectrum of Bus-Based Transit

- High performance, high capacity BRT
  - Major infastructure, rapid service, intensive services
  - Up to 1 million passengers/day
  - Bogota, Guangzhou, Istanbul, …
- High-performance, moderate capacity BRT
  - Major infastructure, rapid service, strong service
  - Range 100-250,000 passengers/day
  - Brisbane, Ottowa, Beijing, Mexico City, …
- Bus with High Level of Service (BHLS)
  - Moderate/little infrastructure, focus on reliability and quality
  - Range 25,000-65,000 passengers/day
  - Amsterdam, Gothenburg, Paris, …

What is BHLS?

- BHLS?
  - Derives from French term ‘BHNS’, maybe later another name
  - Generic term for a wide range of quality bus systems
- Is it BRT?
  - Not exactly, a different product in the spectrum of bus priority
  - Focus more on reliability/quality than on speed/capacity
- Holistic approach
  - Improved operating environment – reliability, better speed
  - Higher quality vehicles with better comfort and image
  - Improved passenger facilities – stops, terminals, …
  - Branding, marketing, ‘repositioning the product’

BHLS role in Europe

- European Context is different:
  - Mass transit is often already well provided by metro and tram
  - Bus is rarely assigned the 'mass transit' role
  - Constraints of space, roadwidth and alignment in city centres
- European cities have a different focus:
  - Restore reliability and operational effectiveness to bus
  - Enhance image of bus, reposition the product
  - High focus on quality of vehicles and stopping places
  - In France, focus on "urbanism" – improve host environment
- Strategic motivations for BHLS
  - Mostly to upgrade quality and ridership of existing bus lines
  - Sometimes alternative to tram/LRT, especially if finances tight

BHLS in Europe

Country	Cities with BHLS
England	Cambridge, Crawley, Dartford, Leeds
France	Lille, Lorient, Lyon, Nantes, Paris, Rennes, Rouen, Toulouse
Germany	Essen, Hamburg, Oberhausen
Ireland	Dublin
Italy	Brescia*, Pisa, Prato
Netherlands	Alkmaar, Almere, Amsterdam, Eindhoven, Twente, Utrecht
Spain	Barcelona*, Castellón, Madrid
Sweden	Gothenburg, Jönköping, Lund, Stockholm

European BHLS – Key Characteristics

City	System Identity	System Length (km)/ (Dedicated	Nature of Running Way	Passengers per day	Peak headway (Minutes)	Dedicated fleet?
Amsterdam	Zuid-Tangent	41 (33)	Bus-only road, bus lanes	40,000	6	Yes
Dublin	Quality Bus Corridor	12 (8.4)	Bus-lanes	34,000	< 1.5[4]	No
Gothenburg	TrunkBus	16.5 (7.5)	Bus-lanes	24,000	3.3	Yes
Hamburg	MetroBus	14.8 (4.0)	Bus-lanes	60,000	3.5	Yes
Helsinki	Jokeri Line	28 (6)	Bus-lanes (orbital route)	25,000	5	Yes
Madrid	Bus-VAO	16.1 (16.1)	Tidal segregated lanes	33,000[5]	< 1[4]	No
Nantes	BusWay	7 (6)	Bus-lanes	24,600	3.3	Yes
Paris	TVM	20 (19)	Bus-only road (suburban/orbital)	65,800	3.5	Yes
Prato	LAM	42 (15)	Bus-lanes	n/a	7	Yes
Stockholm	Blue Line	40 (12)	Bus-lanes	36,575[6]	5	Yes

European BHLS : Ridership gains

City	System Identity	BHLS Ridership Change[2]	Change in Operating Speed[4]	Peak-Period Headway Reduction	Network Restructuring in the corridor?	Major Tariff Restructuring as part of BHLS?	Unique Identity for BHLS services
Amsterdam	Zuid-Tangent	+47%	Significant	Yes	Significant	No	Yes
Dublin	Quality Bus Corridor	+125%	Major	Yes	Minor	No	No
Gothenburg	TrunkBus	+73%	Moderate	Yes	Significant	No	Yes
Hamburg	MetroBus	+20%	Minor	Yes	Minor	No	Yes
Helsinki	Jokeri Line	+100%	Significant	7 ⇨ 5	No	No	Yes
Madrid	Bus-VAO	+70-100%	+80-100%	Yes	Minor	No	No
Nantes	BusWay	+55%	Moderate	Yes	Significant	No	Yes
Paris	TVM	+134%.	Significant	5 ⇨ 3.5	Significant	No	Yes
Prato	LAM	+57%	+5%	15 ⇨ 7	Major	No	Yes
Stockholm	Blue Line	+27%	0	Yes	No	No	Yes

Technical Performance of BHLS

- Peak and daily ridership are comparable to many tram systems, rarely operating at full system capacity
  - 1,000 – 2,500+ pphpd
  - 23,700 – 65,000 px/day
- Commercial speed and frequency are good
  - 16 – 35 kph (10-22 mph)
  - 12-40 vehicles/hour
  - equal to or exceed that of European street tramways
- Seating ratio at peak is medium to high
  - 34-84%
- Investment cost of facility is low and quite affordable
  - $3-16.5 million/km

Case Study 1 : Nantes, France

- Opted for Busway rather than additional LRT
  - Started 2006, 7km, 15 stations
  - Designed to tram-style specification
  - 4 min frequency, 20 km/hr
  - 25,000 px.day
- Key design features:
  - 4 park'n'ride facilities
  - Articulated buses, CNG
  - Priority at traffic signals
  - High quality design in city centre
  - High-specification vehicle
- Like BRT in style, not in volume

BRT Running Way - Nantes

Nantes – Station and Running Way

Nantes –city centre stops

Nantes - vehicles

Nantes - Vehicles

Nantes – high quality bus interior

Nantes – Precision docking

Nantes – Easy access

Nantes – park'n'ride

Case Study 2 : Zuidtangent, Netherlands

- Priority channel for buses
  - Dedicated lanes between Haarlem and Schiphol, then bus priority
  - 24 km, 1.8 km in tunnel, 35 km/hr
  - Intervals 6-8 minutes, 24/7
  - 40,000 passengers daily
  - Use normal buses, normal contracts
- Additional features:
  - Integration with rail at many places
  - Efficient stop dwell times
  - Euro 5 emissions, standard models
  - Unique design elements, identity

BRT running way - Amsterdam

Precision docking – Amsterdam

BRT Vehicle – Amsterdam

BHLS - Bicycle facilities

- Bike'n'Ride
- Extensive bike parking
- Amsterdam, Almere
- Bike on bus is rare

Case Study 3 : Cambridge, UK

- Bus-VAO / Bus-HOV lane
  - Operates on inter-urban artery
  - Links suburban Madrid to City
  - Major interchange at Moncloa
  - Suburban , long-distance buses
  - 251 buses on 21 routes
  - Vehicles of 2+occupants
- Key features
  - Tidal flow lanes
  - Bus-VAO lanes carry 33,000 px in peak v. 18,000 in other 4 lanes
  - 16 km in 13.8 minutes
  - Few access points, no bus stops

Cambridge : Busway

Source : Cambridgeshire County Council

Cambridge : Busway track

Source : Cambridgeshire County Council

Cambridge : Park'n'Ride

Source : Cambridgeshire County Council

BHLS - Customer comfort - Cambridge

- WiFi on bus
- Socket for PC, phone
- Leather seats
- CCTV for security

Case Study 4 : Lund, Sweden

- Lundalänken
  - Prioritised bus link from Central Station to University, Business Park
  - Total 6 km length
  - 600 m new build, some dedicated road
- Priority to normal buses
  - Services of City and Region
  - Regular bus routes, regular buses
  - Give the bus space, it will perform
- Not just a pretty face …
  - Lundalänken extended to outer area
  - City owns the land, will benefit

Lund - Vehicle

Lund – bus information at train exit

Lund – train information at bus exit

Lund – access to dedicated bus link

Lund – dedicated bus link

Lund – key interchange stop

Lorient – running way in city centre

Lorient – roundabout cut-through in city

BHLS - Real-time information – at stops

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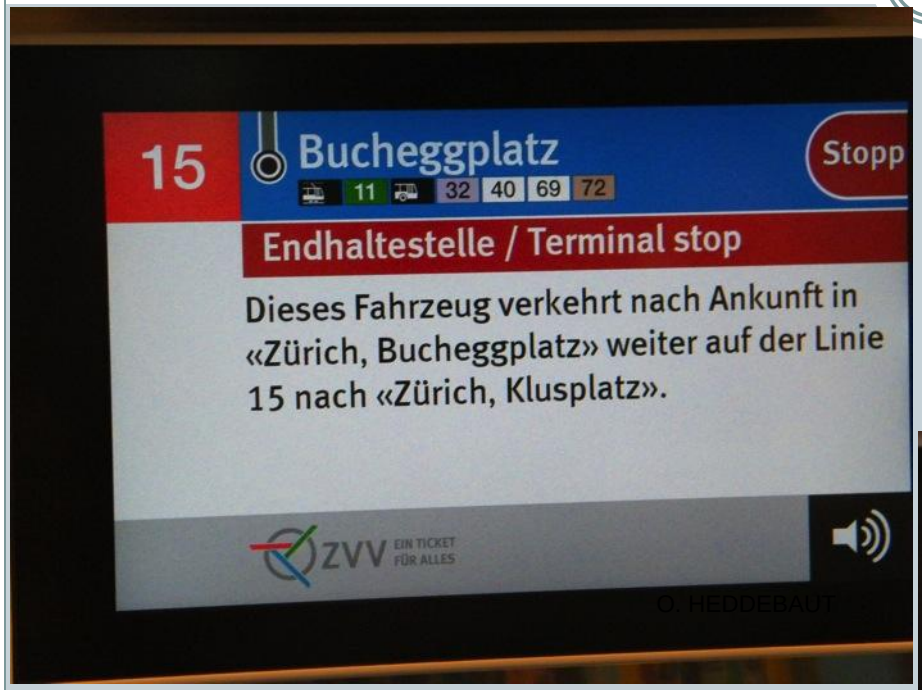
BHLS - Real-time information – in-vehicle



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- Next stop
- Transfer routes, times
- Announcements

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Information resources for BRT, BHLS

- ITDP – www.itdp.org
  - BRT Planning Guidelines (2007, v.4 in 2012)
  - Review of US BRT, case studies
- EMBARQ – www.embarq.org
  - Case study materials, usage guidance, evaluation
- COST Action on BHLS - www.bhls.eu
  - Final report available 11/2011 (at POLIS Annual Conference)
- US National BRT Institute – www.nbrti.org
- SUTP – www.sutp.org
- Volvo Centre of Excellence, Santiago – www.brt.cl
- US TRB/TCRP - www.trb.org/TCRP/Public/TCRP.aspx
- World Bank, APTA, UITP, …
- Thredbo 12 (conference) – www.thredbo-conference-series.org