

LIGHT RAIL PROJECTS - STATUS REPORT



Manchester Metrolink

The Docklands Light Railway

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The key driver for the UK in urban transport appears to be based on short or medium term cost benefit and not on technology or long term suitability and the measures advocated only integrate with other systems at one level. Non-light rail systems do not of course enable the re-use of existing disused, or lightly used, rail routes at minimal expenditure.

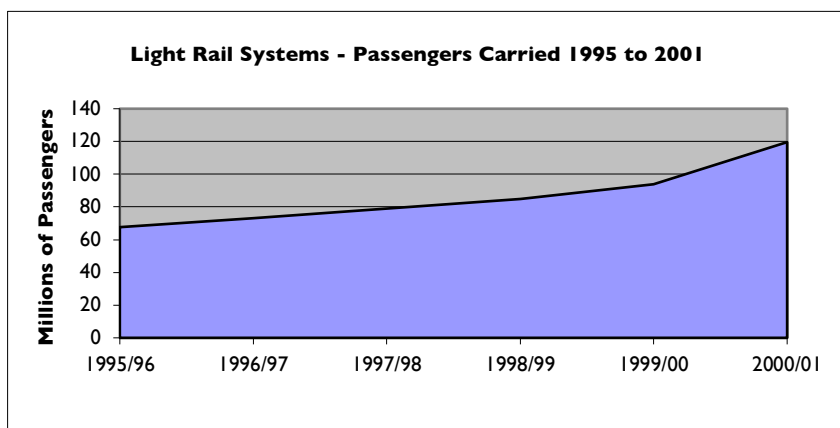
“Light rail, and similar rapid transit systems, can have a role to play in delivering integrated transport in urban areas - particularly if planned as part of an overall strategy. The capital costs of light rail systems are, however, high - particularly in comparison to bus priority measures and more modest guided bus schemes which may offer a more cost-effective alternative.”

“Funding for new major light rail schemes will therefore not be a priority and schemes will be supported only if they represent good value for money and form an integral and necessary part of a strategy in a local transport plan - demonstrating clearly that the objectives of the plan cannot be met in alternative ways.”

That said of course, in the past year or so, there has been some positive progress with proposed work that has been delayed or under investigation. That said, earlier this year, the DETR announced approval had been given to the major schemes planned for South Hampshire, Bristol & South Gloucestershire and of course the Leeds MRT. At the same time, according to the Government, the number of passenger journeys on light rail systems in England increased by 27% from 93.9 million in 1999/2000

to 119.6 million in 2000/01.

(See chart opposite)



Light Rail Systems - Passengers Carried 1995 to 2001						(Millions)
	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
Docklands	14	16.7	21	27.6	31.3	38.4
Tyne & Wear	35.8	35.4	35	33.8	32.7	32.5
Manchester	13	13.4	13.8	13.2	14.2	17.2
Sheffield	5	7.8	9.2	10.4	10.9	11.1
Midland					4.8	5.4
Croydon						15
TOTAL	67.8	73.3	79	85	93.9	119.6

Source: DETR Press Release 17th September 2001

This at least demonstrates the continuing success of the UK's light rail systems, both planned and implemented.

In many areas, the UK has been following the lead shown by the rest of Europe, where light rail, rapid transit systems have developed to bring this means of transport - very literally - even closer to the streets. The latest low floor vehicles are barely the breadth of a hand above the tarmac. UK suppliers have been directly involved too, with Bombardier Transportation (formerly Adtranz) in Derby supplying vehicles for the latest work in Strasbourg.

It is to this technology that the UK's latest systems have looked for inspiration and example to

overcome the growing problem of gridlock on town and city streets.

Back in the 1970s, the Tyne & Wear Metro – now known as “Nexus” was the pioneer of Britain's new generation of light rail and tramway systems. Of these too, perhaps the most known is Manchester's



Classic view of the 2nd generation of Manchester Metrolink vehicles, originally provided, along with the complete network by GEC Transportation Projects.

“Metrolink”, followed by the Sheffield Supertram, with the latest to take to the rails are Birmingham and Croydon with Nottingham not far behind following design and funding agreement in December 1998. London’s Dockland’s Light Railway - the first automated light rail system has been a great success and has grown again, with expansion across the Thames to Lewisham.

There are of course other mass transport rail systems in use around the UK, including the London, Glasgow and Liverpool undergrounds, whilst Blackpool still has its trams. Guided busways were a favourable option for some towns and cities, including, initially, for Leeds, Edinburgh, Chester and the Bristol area, together with a revamped trolleybus type scheme for Merseyside. However, in August 2001, the Light Rail scheme was given approval by the Merseyside passenger transport executive (Merseytravel).

The “MerseyTram” scheme proposed to the Government will have three routes. The first of these will link Kirkby - Gillmoss via Croxteth and a city centre loop serving the main bus and Lime Street rail stations, the Pier Head and the Royal Liverpool Hospital in a 12 miles long line at cost of around £200 to £250 million. The second line would follow the route of an earlier scheme backed by Arriva North West, through the city centre to

Page Moss and Old Swan. The original cost for this part of the scheme was estimated to cost £54m, and would involve Cegelec of France, who would provide the guidance system. The third route would serve the Speke and Garston areas, in addition to Liverpool Airport. In common with other light rail schemes, Alstom “Citadis” low-floor trams.

The South Yorkshire Supertram in Sheffield has the most obvious connection, with bus company Stagecoach taking over and operating the entire system. Stagecoach Supertram have even proposed a £10 million extension

to the Royal Hallamshire Hospital with the Passenger Transport Executive.



Adtranz built low-floor trams on their way from Derby to Strasbourg.

Technology of the Tram

In the UK, the technology of the new generation of trams and light rail vehicles began in 1984, with the arrival of the Docklands Light Railway. The most significant step forward was made in 1987, when “Project Light Rail” took place in Manchester. A DLR set was brought to Manchester, fitted with a pantograph, collecting d.c. from an overhead contact wire, with the objective of demonstrating the advantages of light rail to the people of



One of the new ultra low floor trams being built in 2000, with this example of the "Combino" design for Freiburg.

Manchester, local and national government representatives. The event was an example of co-operation between the various competitors in the railway industry and contributed greatly to the growth in interest in light rail systems around the country.

Today's light rail systems are light years apart from the old-style trams, although some essential features include an overhead contact arrangement (predominantly), with d.c and a.c. traction motors driving the wheels through reduction gearing. The vehicle bodies range from steel framed with aluminium panels, through wholly aluminium construction, with the latest ideas including much wider use of GRP and plastics. Typically, vehicles are arranged in articulated pairs, with three 4-wheel bogies carrying the load and distributing the driving forces. The current generation of vehicles are based on the European style, with overhead contact system, lightweight, low floor aluminium bodied cars, electronic control and a.c. drives.

A further step forward was made with the introduction of the "Eurotram" from Adtranz - now Bombardier Transportation. This design features current collection at 750V d.c. (For Strasbourg), with the use of inverter/induction motor drive to three-phase a.c. motors. This arrangement

gives significant operational savings over traditional d.c. drives. In fact, this year, Bombardier Transportation received the XIX Compasso d'Oro Award for best industrial design for its Eurotram Milan project. An order for 26 of these award winning vehicles for Milan's network will be completed in March 2002.

The Alstom "Citadis" vehicles feature common power systems technology with their larger, heavy rail locomotives and multiple units, using IGBT – "Onix" – inverters, to drive the AC traction motors. The earliest developments in these drives came from Voith and Siemens back in the early 1990s, and were first tested on Vienna's tramway network in Austria.

As with all designs for LRT vehicles, the layouts are very flexible in terms of carbody dimensions, front-end customisation, floor height and full or partial air-conditioning. Interestingly, the Alstom "Citadis" family contains a vehicle for operation in and out of the city with either electric or diesel / electric power

From the passengers' perspective, like all low-floor vehicles, there are few if any obstructions below the passenger seats, with ramps that are automatically lowered to street level at some doorways. These are the vehicles that are being supplied to Nottingham for the 14-km route of the Nottingham Express Transit.

Future Prospects



Light Rail Vehicle for Nottingham Express Transit (NET), UK

The first of the new low-floor vehicles for the Nottingham Express Transit (NET) scheme, from Bombardier Transportation.

The Government's white paper tends to contradict the reality in Britain today. The prospects for future expansion and development are very good, with a number of the guided busway schemes - such as that planned for Edinburgh, now having fallen by the wayside.

The successes of Manchester, Croydon, Birmingham and Sheffield will be met by the proposals already being planned for Leeds, Liverpool, Bristol, South Hampshire, Nottingham and elsewhere. The principal obstacles to be overcome do still seem to be that of funding and the short term thinking of a number of agencies.

Planned Developments

Scheme	City	Lines	Construction/opening date
Tyne and Wear Metro Extension to Sunderland	Newcastle to Sunderland	1 line	Construction began February 2000--opens 2002
Nottingham Express Transit	Nottingham	1 line	Construction began June 2000--opens 2003
Manchester Metrolink Extensions	Manchester	3 lines	Construction to start early 2002--planned to open in 2006
South Hampshire Rapid Transit	Fareham to Portsmouth	1 line	Construction to start late 2003-04--planned to open in 2006.
Leeds Supertram	Leeds	3 lines	Construction to start 2002--planned to open in 2006.
Docklands Light Railway to City Airport	London	1 line	Construction to start early 2002 subject to outcome of Transport and Works Act (TWA) application--aim to open during 2004-05.
Bristol and South Gloucestershire Light Rapid Transit	Bristol	1 line	Provisional construction start 2004 subject to successful economic appraisal and any subsequent TWA application--provisional completion date 2006.
Midland Metro Extensions	Birmingham	2 lines	Construction to start 2003-completion in 2006.



A pair of the new Nottingham trams from Bombardier at work on the city streets.

Only a couple of years ago, the European Commission planned to review the transport options for Edinburgh, Glasgow and Merseyside with "a pilot study to benchmark the performance of local transport systems". As the LRTA (Light Rail Transport Association) commented at the time, the recent rejection in these areas of light rail schemes "give the impression that in Britain at least, light rail as a transit mode is steadily losing ground to the bus". Given the success and benefits that the



Not to be outdone, the West Midlands Metro system for Birmingham was the next in line for the 20th or 21st century transport network

technology and system has brought to major UK conurbations, it is almost inevitable to ask – why?

Throughout Europe and elsewhere in the world, light rail continues to make inroads into urban and suburban traffic and transportation problems, the technology of the low-floor tram is highly successful. There are a number of agencies

pressing for its wider adoption - including the Light Rail Transport Association, local government and transport authorities throughout the UK - and, manufacturing industries such as Alstom, Siemens, and Bombardier Transportation continue to win orders.

In the UK, under Bombardier's Europe wide manufacturing strategy, Derby retains its core place, building bodies and bogies, and will become the European centre for "Metro".

Where We Are Today

HM Government's view of the situation was outlined in a written reply to parliament on 16th July this year:

The Transport Secretary referred to a number of schemes (see *Table above*), and commented as follows:

"We are also aware of proposals for new light rail lines in Merseyside, Hull, Bath, East Lancashire and Blackpool and for further extensions to the Manchester Metrolink, the South Yorkshire Supertram, the Midland Metro, Nottingham Express Transit and the Tyne and Wear Metro. There are proposals for guided bus schemes between Luton and Dunstable, in Northampton and in Cambridge.

For London, the Mayor's Transport Strategy includes proposals for four tram or bus transit schemes—East London Transit, Greenwich Waterfront Transit, Uxbridge Road Transit and Cross River Transit. The Mayor and Transport for London will consult on each of these proposals to decide which, if any, should be taken forward, with a view to completing planning, determining funding and financing and starting the construction of any preferred scheme or schemes by 2004."

Now it seems the guided busways are the exception, with fairly limited application. Most limited of all are overhead railways or monorails - the "Bennie Railplane" in Glasgow, the Liverpool Overhead are perhaps the oldest examples from a bygone era. Even so, they have been joined by a proposal to construct such a system in Hull. Partnered by Florida based Skytrain Corporation, this is a unique proposal today. It remains to be seen whether Hull's venture will be realised.

As the current plans, construction and expansion work in hand for light rail across the UK indicate, staying at street level appears to be a far easier more attractive approach. Construction is already well under way on the Nottingham Express Transit, where the trams will be the tried and tested "Eurotram" design from Bombardier. Schemes such as that for East Lancashire are well into the planning and evaluation phases, but perhaps the most eagerly awaited is the Leeds proposal, with construction set to begin in 2002. We will follow this and the other work in progress with great interest.



Old, but not forgotten – the Tyne & Wear Metro was also being expanded, and with new vehicles, providing more evidence of the benefits of the new generation of trams and tramway technology.

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And the latest thing in light rail technology was the fully automated Docklands Light Railway. Though it is hard to say how this will develop – driverless trains.

