THE INTERNATIONAL LIGHT RAIL MAGAZINE

# TRAMWAYS & URBAN TRANSIT

FORMERLY *LIGHT RAIL & MODERN TRAMWAY*

2955

IT LOOKS OLD – BUT IT'S BRAND-NEW!

## METRO OPENS: 24 MAY?

## LIGHT RAIL TUNNEL UNDER THE RIVER

## GERMANY, UK CITY TRANSPORT COMPARED

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# Word from WESTMINSTER

**Peter Moore's** incisive look inside the world of the politics of transport.

The Palace of Westminster went into its Easter recess with all but the last promised White Paper 'daughter document' on road safety now in the public domain.

Not that this means an end to the process of policy development - on the contrary, each daughter looks like becoming a mother itself as consultation on issues and sub-issues within each proliferates.

With elections to the Scottish Parliament, Welsh Assembly and local authorities almost upon us, a further round of discussion and debate can also be expected in the affected nations and regions. March saw the publication of the last of the major policy documents on bus policy.

One of the least controversial if not least important daughter documents, the title of 'From Workhorse to Thoroughbred' itself was evidence of the Government's concern to raise the image as well as the profile on the bus within transport policy. The focus on buses may be a disappointment to supporters of the more exotic and ambitious modes of public transport but Deputy Prime Minister John Prescott made his position clear at the launch of the latest policy with the statement that "buses represent the best opportunity for leading a renaissance of public transport in this country".

Political opponents including the Liberal Democrats and some local authorities have expressed disappointment at the absence of a promise of early legislation to underpin the widely accepted objectives of the Government's policy. However, while the shortage of Parliamentary time available for legislation is certainly an issue, there is also a genuine willingness to give Quality Partnerships the chance to work. This said, the enabling powers to impose Quality Contracts will be sought eventually to address under-performance in individual locations. While a national system of re-regulation is therefore off the agenda for the time being, operators would be wrong to assume that abuses of the system by operators will go unnoticed in the absence of legislation. The tone of the Government's recent pronouncements on the bus industry -notably warmer compared to the rail industry, despite the fact that a number of key players now operate in both markets - indicates that Prescott enjoys good relations with some figures in the industry, despite the vitriolic attacks mounted by Labour in opposition.

Given the level of subsidy to the industry, this is perhaps even more surprising. With the door open for franchise renegotiations and this month seeing the establishment of the shadow Strategic Rail Authority, it will be interesting to see if the barons of integrated transport can persuade the Government to hand over public money as gracefully for their future rail services as they currently do for their bus operations. More importantly, with the Government effectively restricting competition in the interests of integration, can they repay the favour to the satisfaction of Ministers whose commitment to value for money for the taxpayer is clear?

**Peter Moore is a director of a public affairs consultancy advising clients in the public and private sectors on their relations with Government. He can be contacted at GPC Ltd, 7 The Sanctuary, Westminster, London SW1P 3JS. Tel: 0171 460 7848. e-mail:** ***peter.moore@gpcma.com***

## *Political Diary*

| | |
|---|---|
| **12 April** | *House of Lords returns from Easter recess* |
| **13 April** | *House of Commons returns from Easter recess* |
| **13 April** | *Oral Questions to DETR Ministers* |
| **6 May** | *Scottish Parliament, Welsh Assembly and local council elections* |

## In the House

The reaction to the Budget by the road haulage industry spurred Her Majesty's Opposition into action with a debate in the Commons entitled "the Government's failed roads policy". Given the Conservative's keen sense of history or irony, this title was naturally greeted by a chorus from the current Government's back benches of "which Government?"


## 'FLASH' TRAMWAY ATLASES

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**If you're on the Internet, you must visit the LRTA's website. It's a treasure house of information!**

Light rail by air. The first of four Siemens five-section 30.5-m Combino 100% low-floor trams for Hiroshima in Japan was airlifted from Hahn in Hunsrück airport in Germany by Antonov heavy-lift transport plane on 11 March. **Siemens**


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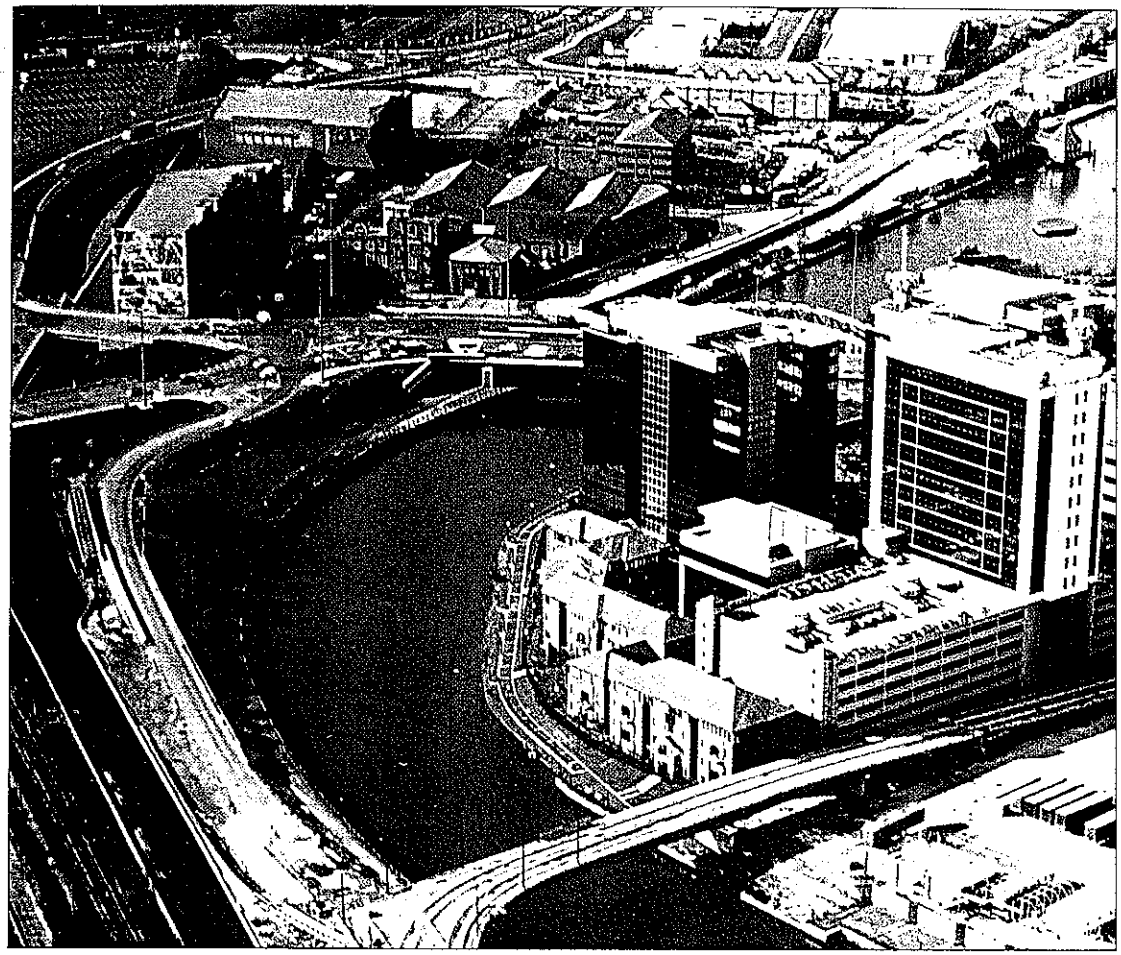
**It looks old, but it's brand new! New Orleans replica Perley Thomas tram 460, built in 1998, heads through the city centre on the non-revenue trackage that links the St Charles and Riverfront lines, passing the Customs House on Canal Street, once the site of a four-track tramway layout.** ***Jim Schantz***



**A bird's eye of the Manchester Ship Canal bridge which will carry the new Eccles extension through Pomona to the Exchange Quay office development en route to Salford Quays. The offices are seen to the left of the bridge.** ***GMPTE***

# Public transport use rising - official

The Department of Environment & The Regions has produced a new edition of its Transport Trends 1999 book which details major trends in UK transport.

Main drivers of cars will travel, on average, over 10 000 miles per year compared 2500 miles in households with no car. However, bus use appears to have stabilised at 4.3 million passenger journeys a year following several decades of decline. The year to 31 March 1998 showed a small 1.5% increase in passengers throughout the UK, although the increase in England only amounted to 1%.

Travel by rail, despite a poor press, is growing substantially with 6% extra passenger journeys on the national network and 8% more journeys on London Underground in 1997/98. The rise in passenger numbers on light rail and supertram systems amounted to 7% for the same year.

Despite various green initiatives, walking and cycling is still declining. The overall proportion of journeys made on foot fell from 34% to 28% and the distance walked fell by a fifth to 195 miles per person. In London cycling remains the fastest mode of transport with car journeys taking on average twice as long when starting or finishing in central London.

*Copies of Transport Trends can be obtained from the Transport Statistics Office of the DETR, price £29.50.*

**Parry People Movers' new electric/low petroleum gas hybrid Railcar 11 arrived at the Welsh Highland Railway at the beginning of the year for extensive trials. It will be in public service this summer. HM Railway Inspectorate has approved the vehicle's movement to different locations without the need for new permission every time.** ***PPM***

## Three infrastructure companies for Tube

London Transport has confirmed that the Underground network is to be split into three infrastructure concessions.

These will be awarded for a 25 to 30 year period with a review of charges every eight years. These concessions will be let as part of the Government's public-private partnership proposals, and a call for expressions of interest will be published shortly.

A pre-qualification process will take place over the summer and the probable five-month tender process itself will start in the autumn.

It is hoped that the concessions will become operative in 2001. The break-up timetable is running considerably later than the Government at first envisaged.

The Underground network will be split into three sections colloquially known as "Infracos".

The sub-surface Circle, District, Hammersmith & City, East London and Metropolitan lines will form one concession, while the tube lines will comprise Infraco BCV for the Bakerloo, Central, Victoria and Waterloo & City and Infraco JNP the Jubilee, Northern and Piccadilly lines.

LT is hoping that this arrangement will allow more companies to participate in improving the system with innovative ideas.

## New busway to the Millennium Dome

The first electronic guided busway is being funded by London Transport, English Partnerships and the New Millennium Experience Company.

It will occupy 1.3km of road through the Greenwich Millennium Village as part of a bus route serving the Dome from Charlton.

Installation of the guidance cable is being undertaken by Alstom in a reserved route busway which will be served by ten low-floor vehicles equipped with antennae which will follow the magnetic field generated by the cable.

This system was originally proposed for a route alongside the River Tyne in Newcastle, but not subsequently pursued.

It is the same system which is proposed for the reserved route sections of the Merseyside Rapid Transit trolleybus project which currently awaits a decision from its public inquiry.

A functioning system is in use in the service tunnel of the Channel Tunnel.

### Scottish funding for Edinburgh Crossrail scheme

The Government has allocated £8 million of the new Scottish Public Transport Fund towards developing the Edinburgh Crossrail project.

It will extend heavy rail services from West Lothian and Fife across the city centre to the East End, including a new park and ride facility at Kinnaird Park. The whole project is to be undertaken in a public-private partnership and the total funding will support the project for the next three years.

The £8 million funding allocation is the largest allocation from the £29 million fund. Other rail schemes include some £350 000 at Falkirk for improvements to the station access, and £3.5 million for an integrated bus, rail and Underground transport interchange at Partick, Glasgow which is £2 million less than originally sought.

### Airport Maglev to be a Peoplemover?

The former Maglev Peoplemover system which linked Birmingham International Station with Birmingham Airport is likely to be revived as a monorail.

New proposals which have been formulated by consultant Ove Arup. It will form the basis of an integrated transport interchange at the station and provide the means of travel to the airport.

Currently, this function is being carried out by minibuses following withdrawal of the Maglev service because spares were unavailable for continued reliable operation.

A planning application for the project is likely to be submitted to Solihull Council shortly.

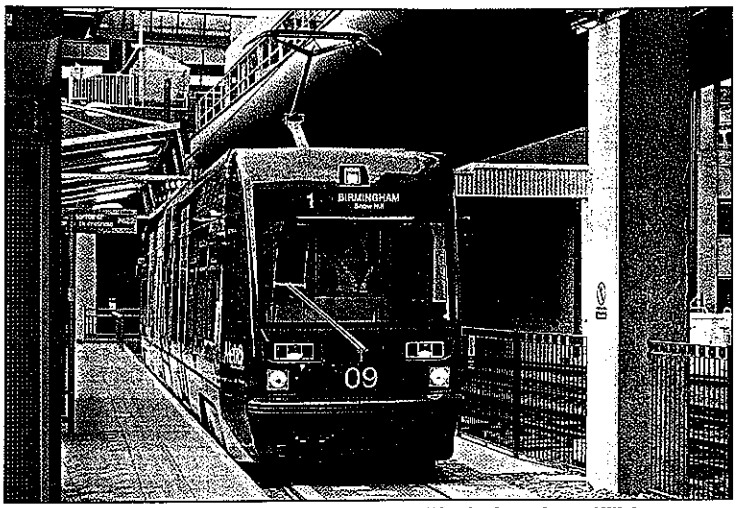
### Trafford Centre forgets the tram

The failure of the Trafford Centre developers to gain planning permission for further retail and leisure development appears to have eliminated all possibility of a new branch from the Manchester Metrolink system.

Consultant Allot and Lomax has now been engaged to investigate whether a 6-km monorail feeder to Metrolink might be a cheaper alternative.

It will be recalled that the Merry Hill Shopping Centre at Dudley has been served by a much shorter monorail installation which cost £22 million when new. It is not functioned in recent years.

# Now Metro talks of May opening




**Midland Metro trams will soon be working into Birmingham Snow Hill for proper - unlike this test run with unit 09 on 16 February.** *Mike Ballinger*

**Midland Metro Line One could open on Monday 24 May. Trial running commenced on 29 March and, all being well, the Railway Inspectorate's final inspection is likely to be on 13 May.**

**It is believed that solutions have been found for all the problems experienced with the trams, some of which - such as rain affecting the sanding equipment - seem to have been due to 're-inventing the wheel' technologies. Others, such as the adoption of a twin bladed windscreen wiper, have overcome original design short-comings.**

**Finishing touches, including the installation of ticket machines at stops are now under way. During the six-week trial running period - which is a contractual requirement with infrastructure owners Centro - a ten-minute frequency service is being run. If the Railway Inspector gives permission for the line to open to public service the initial frequency is likely to be ten minutes.**

**Meanwhile, concessionaire Altram has refused to explain the problems which have beset the system at a meeting of the Passenger Transport Authority held in public - the company has said it will only do so behind closed doors.**

**Councillor Richard Worrall, Chair of the West Midlands Passenger Transport Authority has written to the company asking it to reconsider and attend. With nearly all the cost of the £145 million having come from public funds an unwillingness by the concessionaire to account to the public is clearly stretching the patience of the PTA.**

**It is believed that Altram's attitude does not reflect the views of all the member companies of the ALTRAM consortium (John Laing, Ansaldo and Travel West Midlands). RJT.**

# Budget favours integration

The UK Budget measures announced in early March have given a slight edge towards public transport compared with private car travel.

Tax benefits have now been introduced to encourage large companies to institute green commuter plans which rely on public transport subsidy. Previously, subsidised transport was regarded as a tax benefit to the employee, and large sums have been claimed from companies such as Boots the Chemists which has already introduced such schemes.

Bus fuel duty rebate levels have been increased to allow the bus industry to maintain its competitiveness, while business has been encouraged to be more fuel efficient.

Extra funding has been allowed for rural transport in the next two years and, significantly, £170 million has been allocated to security measures at bus and rail stations and car parks.

Lord Whitty, Transport Minister, commented: "The measures in the budget are only a start. There is a lot more work for us all to do. Government will be providing the necessary legislation to make integrated transport possible. Local authorities will be involved in the creation of local transport plans and business, and individuals need to take a long hard look at our use of transport.

He added: "Britain desperately needs a transport system which is fair, sustainable and environmentally sensitive."

# Bristol scheme still on track

The Bristol and South Gloucestershire Rapid Transit scheme is still on course despite government indications that the Nottingham decision would mop up all available funding for light rail schemes for three to five years.

Bristol City Council says it has been assured by the Government that the Citylink scheme from Bradley Stoke to the city centre (Temple Meads) was exempt from that decision because the proposals were already being considered.

Plans, which are at an advanced stage, could be successful as a Private Finance Initiative together with private sector funding would meet more than 70% of the £105 million cost, with only a top-up required from state sources.

# Alliance aim is crime cut

**Nexus, the Tyne & Wear PTE, has signed an alliance with Northumbria Police in a bid to reduce violence on the system and increase passenger safety.**

**Although a special police unit has patrolled the system for the last nine years, there will now be an increased presence.**

**Last year, there were a total 80 reported assault cases and Director General Mike Parker recognises that fear of crime, particularly among women and the elderly, is still too high.**

**He said: "There are now more than 120 closed circuit television cameras at our stations, help points at all 46 stations and significantly better station lighting."**

**Elsewhere on Tyneside, Nexus and the local authorities are still investigating the possibility of operating street trams or 'electric buses' along the developing Quayside, probably crossing the Tyne via the Swing Bridge.**

**The route would link Grey's Monument and Central Station with the Gateshead Interchange.**

**Previous attempts to provide an Alstom-system electronic guided busway in the Quayside area came to nothing, but with considerable investment on both sides of the Tyne, it is hoped that a new joint approach to transport problems could be more successful.**

**Once a scheme has been prepared it is expected that the Government and the Regional Development Agency will be approached for funding.**

**Recently, tickets sold for Metro travel have featured an advertisement for Wimpey Homes, allowing a £250 discount on a new home purchase.**

### Croydon looks to city status

Croydon is likely to bid for the honour of becoming a city next year when the opportunity is available as part of the Millennium celebrations.

As part of its case it will be using Tramlink as the symbol which is currently transforming the borough.

Fifteen of the fleet of 24 trams had been delivered by the end of March and the first seven had been noted in test operation in the vicinity of Therapia Lane depot.

Work on completing the Wimbledon branch is making good progress with electrification extending to allow longer test runs. It is suggested that this section could be operational before the expected system opening in November.

### Metrolink fares up, day ticket launched

Manchester Metrolink fares were revised from 22 March with increases for many passengers travelling to the city centre, but with reductions for longer cross-centre return journeys.

A £3 MetroMax day ticket has been introduced "due to customer demand" available for the full network after 0930 on weekdays and all day at weekends and on Bank Holidays.

Previously, network travel was only available using the considerably more expensive Wayfarer or Integrated Travelcards which also offer full local rail and bus networks.

### Supertram accident

Stagecoach Supertram services over Sheffield's Meadowhall line were interrupted on the evening of 15 April when a tram collided with a car at the crossing with Staniforth Road between Woodburn Road and Attercliffe stops.

Outbound cars terminated at the depot and a tram isolated at the terminus maintained a Meadowhall to Arena shuttle. When the service is interrupted, First Mainline buses accept tram tickets.

### Blackburn plaques

A plaque to commemorate 100 years of the electrification of the Blackburn tramways was unveiled by the Mayor in the town centre on 19 March.

On 14 April, another Civic Society plaque was installed on the wall of the former Post Office in Darwen Street, now a Wetherspoon's pub. It marks the northern terminus of the steam tramway between Blackburn and Darwen which opened in 1881 by the Blackburn & Over Darwen Tramways.

# Docklands light rail meets the challenge

Operational changes including a new timetable have been introduced on London's Docklands Light Railway in advance of the opening of the Lewisham extension.

The timetable is needed because of the curtailment of the Island Gardens service to Crossharbour on 8 January. One less train (27 instead of 28) operates in the morning peak and three less in the evening peak (25 instead of 28). The released train sets have been used to reinforce the Beckton service on which two-unit trains now operate wherever possible. Off-peak services require 17 trains and evenings see 9 trains in service.

Two units (45/74) are in all-over advertisement livery for the London Knights hockey team. The batch of vehicles 50-69 is undergoing seating modification with the aim of creating more standing space. Instead of 66 seats plus four tip-ups, the modification produces a 46+4 arrangement and additional handrails have been installed. Unit 32 was altered in 1996 in an earlier trial and remains with its amended layout.

Station upgrading, including fitting new ticket machines, will be carried out at the older DLR installations including Limehouse, West Ferry, Crossharbour, Shadwell, Tower Gateway, All Saints, Devons Road, Bow Church and Stratford. Most external staircases will acquire canopies and at some stations stairs will be encased in full height glazing.

The first vehicles operated on the Lewisham section on 2 and 3 March for gauging purposes and it is expected that the first vehicle will operate through the tunnel section in April, also for gauging purposes. As most of the electrical work is in place and is in the course of local testing, it is expected that trial operations will commence shortly. Without too many problems, opening is possible in November, ahead of the contracted date of January 2000.

**David Quarmby took over as chairman of Docklands Light Railway Ltd on 1 April, succeeding Sir Anthony Gill. He is also chairman of the British Tourist Authority, and between 1988-96 was Joint Managing Director of supermarket giant J. Sainsbury.**

**Saarbrücken's Saarbahn Bombardier dual-vo the low-level 'luggage' platform as the car is**

# We're nearly there!

By GEOFF LUSHER
General Manager
Travel Midland Metro

Well, Midland Metro certainly grabbed the headlines in last month's issue of *Tramways and Urban Transit*, with extensions, opening delays and our 'race' with Croydon Tramlink.

Readers will have noticed I have studiously avoided the controversial area of opening dates in my column, and concentrated deliberately on the preparations of the operator. At last that can now change. I am delighted to record that the trial period for Midland Metro started on 29 March.

This key date marks the assumption of full responsibility for operation by Travel Midland Metro. Given the current availability of trams, we are currently running a trial service at ten-minute frequency each day, giving drivers experience in running to timetable, testing running time and ensuring duty managers and controllers develop their skills in monitoring and adjusting the service to ensure the highest quality.

The number of emergency exercises has also escalated during the trial period, and a number of these are being observed by HM Railway Inspectorate. Talking of exercises, what a great picture by Mick Mabbutt at The Hawthorns in the last issue, and good to see passengers on the system, albeit non fare-paying! Given satisfactory progress, we are well on target for the 14 June opening date announced by Altram, and current plans are to open early to the public at a ten-minute frequency.

The tram fleet was finally completed by the arrival of car 16 on 11 March, followed soon after by a team from Firema to complete and commission it. Representatives from TDI Advertising have been noted casting envious glances at 16, as it is destined (some would say condemned!) to receive all-over advertising livery.

What of the rest of the fleet? Reliability has been below expectations, with particular difficulty being caused by the failure of sanders in wet weather. Good progress has been made on the overall modification programme, and it is now intended to complete the handrail and wheelchair-space revisions before public opening.

Other requirements of the Rail Vehicle Accessibility Regulations have included new destination blinds with lower-case lettering and a revised colour of dark grey for the lower doors, repainted by the Walsall paint shop of Travel West Midlands.

Vandalism continues to give cause for serious concern, particularly with vending machines and information displays at stops. The Trinity Way stop in West Bromwich suffered a graffiti attack and four large glass panels were destroyed within days of fitting. We are determined to fight these mindless attacks, which include throwing stones at moving trams, and both police and public relations activity is being intensified.

■ **Next month, the waiting will nearly be over!**

# From 'work

UK Deputy Prime Minister John Prescott has launched probably the most important of the 'daughter documents' to his 1998 White Paper on Integrated Transport.

The bus, Mr Prescott said, accounts for two thirds of all public transport journeys in the UK - well over four billion bus journeys per year.

He said: "I want to see the bus as a dynamic force in towns, cities and rural areas providing high quality rapid and reliable services to meet passengers' needs at affordable fares - so this document describes our aspirations for modern, quality bus networks that will not only retain existing users but will attract new passengers."

Mr Prescott was speaking at a conference in London on 23 March called 'A New Deal for Bus Passengers' organised by Professor David Begg, Director of the Centre for Transport Policy, the Robert Gordon University, Aberdeen.

Mr Prescott's buses document is a consultation document (copies are available from the Department of Environment, Transport & The Regions) and views need to be submitted by 25 June.

He said: "If you add together the public support we give to buses through the fuel duty rebate, concessionary fares, support for socially desirable services and school buses, it is more than £1.4 billion a year - a similar amount to the support given to passenger railways."

New Local Transport Plans being produced this year for the first time by all local authorities "are the building block of our integrated transport system." The daughter document describes how local authorities' plans and strategies will encourage an integrated approach to developing local bus strategies, with clear objectives and targets, and in the wider context of local policies on planning, education, health and social services.

**LRV 1002 has made a visit to a main line station. Note that passengers had to board from gned for street operation. This picture at Kassel Hbf is dated 30 January.** *C.T. Wagner*

# lorse to thoroughbred'

The Government intends to legislate to introduce a minimum half fare concession for pensioners on buses. Low-floor, single-deck buses are being introduced now, and as from 2001 all new double-deckers must have disabled access. By 2017, all buses, single and double deck must be accessible.

Mr Prescott advocated voluntary Quality Partnerships between bus operators and local authorities wherever possible, but promised legislation as soon as possible to introduce legally backed quality partnerships where voluntary agreements could not be secured and exclusive bus quality contracts prohibiting competing operators will be empowered where these can be justified. It is proposed to give the traffic commissioners extra powers to penalise operators who do not run the services they have said they will.

Mr Prescott made special mention of the Greater Manchester Integration Project which is spearheading the wider integration initiatives - better connection with other modes, more integrated ticketing and better passenger information.

He also mentioned how, in the year 1997/98 total bus patronage had increased by 1% after many years of decline and singled out London, where the increase was 4% and the West Midlands where it was 5%. He concluded his speech to the conference by throwing out two challenges to the bus industry - to commit itself firstly to continual steady improvement in the average age of vehicles and secondly, to collect figures on the reliability of bus services - "so that we are measuring service quality - not just bus mileage." He proposed an annual 'buses summit'- the first to be held this autumn.

The conference was chaired by Professor Bill Bradshaw who said in his introduction that the bus is the only tool immediately available to policy makers. Veronica Palmer, the Director General of the Confederation of Passenger Transport (CPT) said that we are not going to get people to give up the comfort and convenience of the car if they are not going to get the reliability that priority measures give. This is a carrot which has to be in place before people can be expected to change their behaviour.

Graham Stevenson of the Transport & General Workers Union said that 20 studies has confirmed how stressful the role of the bus driver is in modern traffic conditions and that over the last ten years the basic pay of bus drivers had fallen from 7% above the average wage to 13% below so small wonder there was something of a morale and motivation problem.

Councillor Tony Page, representing the Local Government Association, said local authorities favoured voluntary quality partnerships but felt that reserve powers for compulsory Quality contracts were necessary in the wider interest.

He mentioned that public transport provision often hardly figured in Section 106 agreements (formal planning agreements made by local authorities with developers wanting to develop land and buildings) - this needed to change to ensure a corporate approach. Professor Begg's address is covered separately on page 184 of this issue.

With some 400 delegates, mainly from local authorities and bus operators, this must have been one of the largest transport conferences held in the UK for some time, indicating the importance attached to the Government's proposals for bus services.

There are few surprises in the detail, but ample evidence of the Government's belief that the bus can deliver the change in travel behaviour and reduction in car dependency that it is seeking. **RJT.**

# Guided buses the choice in Chester

Cheshire County Council has reached the public consultation phase in its Chester & Deeside Transport System proposals.

This would use part of a disused rail link in the north of the city and the preferred method of transport is now the guided bus.

The proposal would link a 1200 space park and ride car park at Hoole with the city centre and it is hoped that 560 000 passengers a year would be carried, saving 440 000 car journeys. Funding for the £7 million scheme would be included in a forthcoming Local Transport Plan.

## ... and also Leigh

Consultation is also being carried out for the proposed Greater Manchester PTE-sponsored guided busway proposal between Leigh and Manchester.

The 13km route has had initial consultation which raised a number of possible technical difficulties which the current amended proposals seek to address.

The guided busway would occupy a former rail alignment from Leigh to Ellenbrook and then continue to Manchester centre by a bus priority corridor occupying the existing highway network. The PTE believes the proposals have been well received.

# More traffic from revised DLR line

Further detailed appraisal of the proposed London City Airport extension of London's Docklands Light Railway has produced a new route which, although more costly to construct, is likely to bring a much higher potential passenger count.

The line would operate on viaduct to the west and south of Royal Victoria Dock to serve Silvertown and the new residential area of Britannia Village before reaching the Airport. Lord Whitty, Transport Minister, is understood to favour this routing. He has invited the private sector to come forward with proposals, presumably on a similar basis to that used for the construction of the Lewisham line (officially the City, Greenwich & Lewisham Railway).

The network is estimated to have carried 26 million passengers in 1998-99, more than double the 1994-95 total. Although the existing fleet will have to cope with the Lewisham extension, between 12 and 18 new units will be needed by 2002-03 to meet increased traffic and the opening of the City Airport link. This takes into account the likely loss of traffic on opening of the Jubilee Line Extension.

## Cliff lift back in service

The South Cliff lift at Scarborough was back in use for Easter following last September's accident when failure of the bank of resistors resulted in a fully loaded car hitting the buffers at the lower terminus.

Full Railway Inspectorate recommendations have been met with a complete appraisal of the resistors, and speed sensing controls. A dead man's handle and inching facilities have also been installed at a cost to the authority of £54 290. More bills are likely from engineering consultants and as a result of compensation claims.

## Derby Castle track reconstruction

The last phase of the refurbishment of Derby Castle depot and works on the Manx Electric Railway has been carried out. Due to its compact location on a steep gradient, track leading to the yard and fanning out to the shed roads is complex.

Only a basic track layout accompanied earlier replacement of the running sheds and full reconstruction started in February. As power in the depot area was turned off the winter service terminated at Onchan Head, the next live feeder point, with a bus shuttle connection to Derby Castle.

Contractors were expected to complete work by Easter to allow the 'shoulder' service to run over the full line. They were expected to move to Douglas station to re-align track for the construction of the new two-road carriage shed.

## Volks tram returns to Southend

Volks car 8 returned to Southend for display at the Pier Railway museum on 27 February.

A pair of 1899 built cars were originally purchased from the Southend Pier Tramway in 1949 and numbered 8 and 9 in Brighton. In recent years they have seen little use and 8 has a longer wheelbase which has difficulty in negotiating all the curves in the current track. As the small diesel locomotive occupies space at the Banjo Groyne car sheds, the car was offered to the Southend Pier Society for display in its home town in its centenary year.

Summer season operation was due to start at Easter with a Monday-Friday service (1100 to 1700) and weekend service between 1030 and 1800. Fares are £1.10 adult single, £2 adult return, 60p/£1 child; £5 family.

## Contributors

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Contributors this month include Duncan Anderson, Richard Buckley, John Downer, Graham Feakins, Alan James, David Lloyd-Jones, Brian Lomas, Martin Petch, John Richardson, N. Sharpe and R. Whittaker.

Acknowledgements are also due to the DETR, *Fylde Tramway Society, LURS, Seaton Tramway, Birmingham Post, Bristol Evening Post, Croydon Advertiser, Manchester Evening News, Newcastle Evening Chronicle, Newcastle Journal, Portsmouth News, Southampton Daily Echo, Southend Evening Echo, The Citizen (Milton Keynes)* and *Yorkshire Post.*

# This could be South Hampshire!

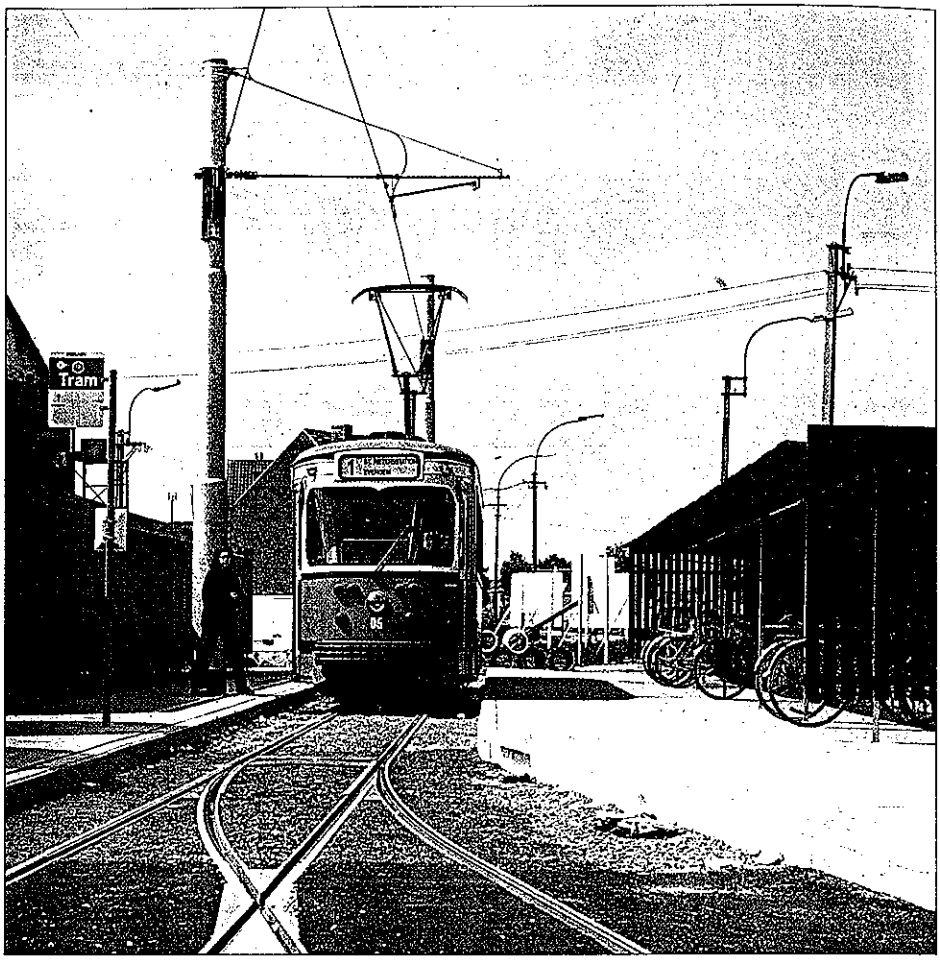
The public inquiry into the South Hampshire rapid transit line closed earlier than expected on 11 March, and a decision is currently awaited from Secretary of State, John Prescott.

This is unlikely to be before the end of the year as the Inspector, Walter Thrush, will have an extensive report to complete. Most of the heavyweight objection, from Railtrack, South West Trains and another 40 objectors was withdrawn following pre-inquiry agreement. The Gosport Borough Council objection also evaporated and the leader of the Council appeared at the Inquiry to support the line.

Perhaps the most significant objection was from the Portsmouth Harbour Ferry Company, operator of the frequent Portsmouth-Gosport ferry service. They proposed that the line terminated on either side of the harbour, connecting with ferries. This was ruled out as impractical by Portsmouth City Council which pointed out that depot and works facilities would only be available on the Gosport side.

Although there is a proposal to extend the line eventually to Southampton, that city has recently received a traffic report from consultant MVA which suggests that the city will be choked by traffic if methods are not introduced to encourage alternative means of travel. However, the report rules out trams as "unrealistic". The city will look instead at bus priority and quality corridor enhancements to make bus travel more attractive.

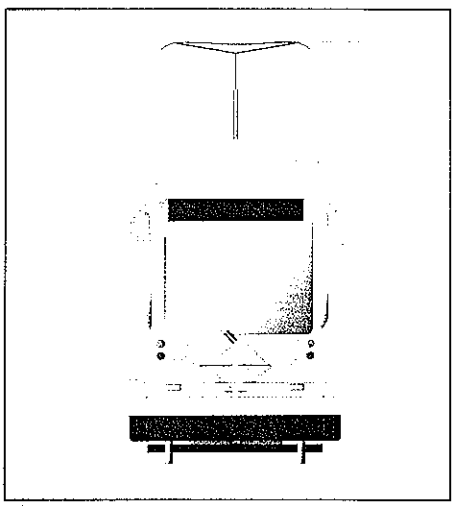
**Martin Petch, the LRTA's Area Officer for Hampshire, Dorset and the Isle of Wight, made his own representations at the inquiry, allaying fears over some of the more ambitious aspects of the scheme. They are reproduced on these two pages.**



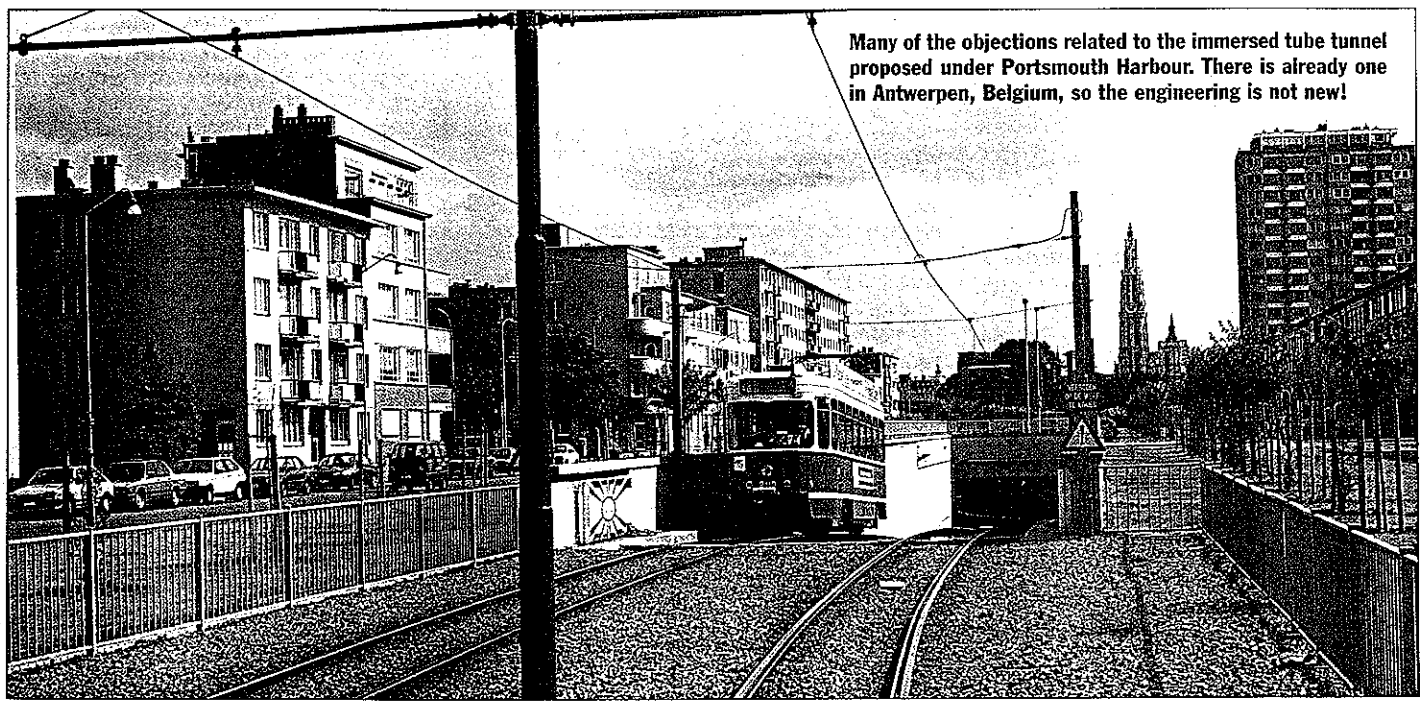

**Another point of concern over South Hampshire Rapid Transit is the provision of facilities for cyclists. Racks are routinely available at Gent suburban stops. Cycle carriage on trams is less common, but this is being considered in Orléans, France.**

**A view of a tunnel entrance in a suburb of Bruxelles, shown to the inquiry to allay the fears of Gosport residents.**

There was much discussion on the impact of new infrastructure on conservation areas. Trams merge into the historic heart of Gent, Belgium, among pedestrians and other traffic.



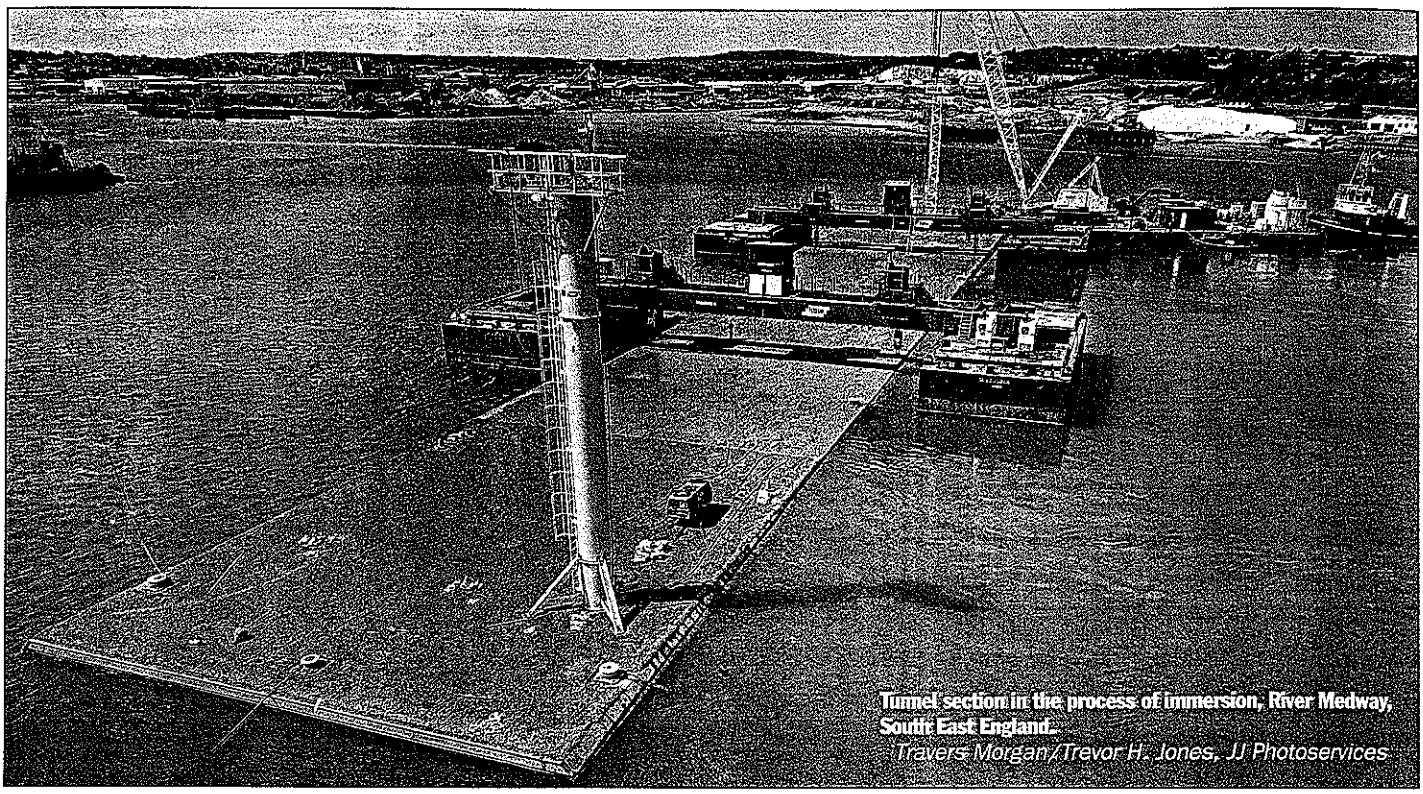
The Place Louise in Bruxelles amply illustrates something of the ambience which a well-designed tramway adds to an urban area. This isn't easy to quantify in the formal public inquiry room!



Many of the objections related to the immersed tube tunnel proposed under Portsmouth Harbour. There is already one in Antwerpen, Belgium, so the engineering is not new!

# Portsmouth Harbou

South Hampshire Rapid Transit could feature Britain's first immersed tube tunnel for a light rail line. **Piet Meeuwissen**, Managing Director of Dutch engineering firm **Delta Marine Consultants**, explains what is proposed.



Tunnel section in the process of immersion, River Medway, South East England.
*Travers Morgan/Trevor H. Jones, JJ Photoservices*

South East Hampshire in England includes the coastal area between Hayling Island and the River Hamble and its hinterland. Over 500 000 people live in the local area of Portsmouth, Gosport, Fareham and Havant.

The area's current transport problems are broadly similar to most other major urban areas. However, accessibility is influenced by the particular geographic characteristics. Growing number of car journeys entering and leaving the Fareham-Gosport corridor and Portsea Island have been concentrated on a limited number of traffic routes. Gosport is the largest town in the UK without a railway station.

To conquer the congested traffic routes, Hampshire County Council and Portsmouth City Council propose a rapid transit system between Fareham-Gosport and Portmouth. A key aspect is a tunnel under Portsmouth harbour. There are three options:

- A bored tunnel - cut through the ground by a tunnelling machine. The geology in the Portsmouth/Gosport area is poor and the tunnel would need to be very deep. Operationally, deep stations both sides of the harbour and long portals to arrive at street level, plus the cost, are not attractive.
- A 'cut and cover' tunnel - constructed within a drained cofferdam, which after construction can be removed. This requires a partial closure of the shipping channel of the harbour for one or more years. This disruption is not acceptable, so this method is not a practical solution.
- An immersed tube tunnel - individual sections are constructed in a dock are floated to the required location and then sunk in a controlled way within a dredged trench. For an immersed tube tunnel, a complete cessation of the harbour is only required during the immersion operation itself, generally only 24 hours per section. The cost of such a tunnel is in the order of 25% less than a comparable bored tunnel.

Considering all these aspects, the project office chose the immersed tube tunnel option. If these plans come to fruition, it will be the first immersed tube tunnel in the UK for either heavy or light rail. There are already two immersed tube tunnels for vehicular traffic, under the River Medway and estuary of the River Conwy in North Wales.

The Portsmouth Harbour tunnel will be 1 km long, although the immersed tube portion itself will be only approximately 670 m. There will be six tunnel elements or section, three on the Gosport side of 107 m length each, and three on the Portsmouth side of 116 m each. The crown of the immersed tube tunnel will need to be only 2 m below the over-dredging limit for the harbour bed (by contrast, a bored tunnel would need 9 m of cover above the tunnel crown). The likely minimum cross section of the tunnel elements is 11.5 m wide by 7.5 m high. These dimensions will allow sufficient space for two tubes within each section (one in each direction) each with space for the kinematic envelope of light rail vehicles (LRVs) up to 2.65 m wide and for the tunnel to act as a conduit for statutory undertakers' apparatus, which will provide revenue streams to assist in the financing the near-£40 million cost of the tunnel. Jet fans will be provided for smoke control in an emergency and evacuation of passengers through fire rated partitions, with escape doors at regular intervals. The horizontal alignment is determined by the constraints at the Gosport and the Portmouth side and minimum acceptable horizontal curves for LRT. The vertical alignment is defined by the minimum depth of the tunnel below the harbour bed, width of the existing shipping channel and maximum allowable slopes.

The cross section of the tunnel is first of all determined by the kinematic envelope of the proposed LRV and the minimum clearances above, below and to the sides of the vehicles for ventilation and walkways. There is also need to provide sufficient space for internal ballast. This concrete is required to replace the temporary water ballast which provides the tunnel sections with sufficient negative buoyancy.

After construction of the tunnel sections and dredging of the trench, immersion of sections can start. These sections, which already float by means of two bulkheads and are trimmed by means of water ballast tanks inside the section, will be fitted with immersion equipment.

An access and control tower installed on the roof of the tunnel is needed for access to the tunnel section after immersion, together with the survey tower positioned at the opposite end of the tunnel section. The towers are used for positioning the tunnel section when below the water.

On the tunnel sections, bollards and lifting points are installed for the control over the horizontal and vertical position of the section. Temporary supports are installed inside the sections. These are jacks through the tunnel bottom slab, making it is possible to adjust the vertical position of the rear end of the tunnel section. On the other side of the section a 'nose' is con-

structed for the section to find with its 'nose', a support on the adjoining, previously immersed, section. The actual immersion starts with a correct positioning of the tunnel section above its final position. Each section will be immersed by taking in water in the ballast tanks. The location of the section and its vertical stability (in this situation, the section has a negative buoyancy) are controlled by two immersion pontoons installed above the section being lowered and winches from pontoons to the lifting points of the roof.

The horizontal location is controlled by anchor lines connected to the immersion pontoon and the tunnel section. To achieve a watertight and flexible joint, each tunnel section has a rubber profile ('Gina') along the cross-section.

After the nose hits the previously immersed tunnel section, the section being lowered into place will be surveyed again and adjusted if necessary. Then the tunnel element will land with jacks on pre-installed concrete slabs on the bottom of the trench. After the element is positioned on its final location, the first compression of the Gina-profile will be reached by means of horizontal jacks connected to bollards on the two sections.

When the Gina is compressed over its full length the water between the bulkheads of the two elements can be pumped out. The water pressure on the other bulkheads of the immersed section will fully compress the Gina-profile. It is very important that the Gina seal is compressed during the total life of the tunnel, crucial for the water tightness of all joints between the elements. From the inside a second rubber sealing (the 'Omega' profile) will be installed to provide a second seal against leakage of water.

The next step of the immersion process is the installation of a sand foundation for the section. It will be pumped as a mixture of sand and water by means of pipes through the bottom slab and completely fill the gap between the element and the bottom of the dredged trench. The material can be pumped from the shore. After completion of the foundation the jacks of the temporary supports can be drawn in and sealed. Due to the flexibility of the joints (they rotate) the total tunnel is flexible in its longitudinal direction and able to absorb some settlement of its foundation.

The last task in completing the tunnel structure is to fill the gap between the last section immersed and face of the penultimately lowered section. A purpose-made steel shuttering is placed around the gap. To maintain the required compression force in the element, in view of the Gina-profile, struts have to be placed, water pumped out, and the joint made from the inside.

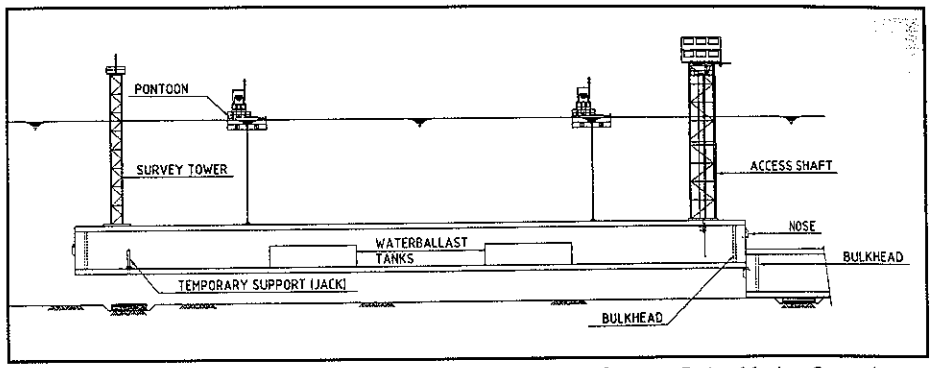
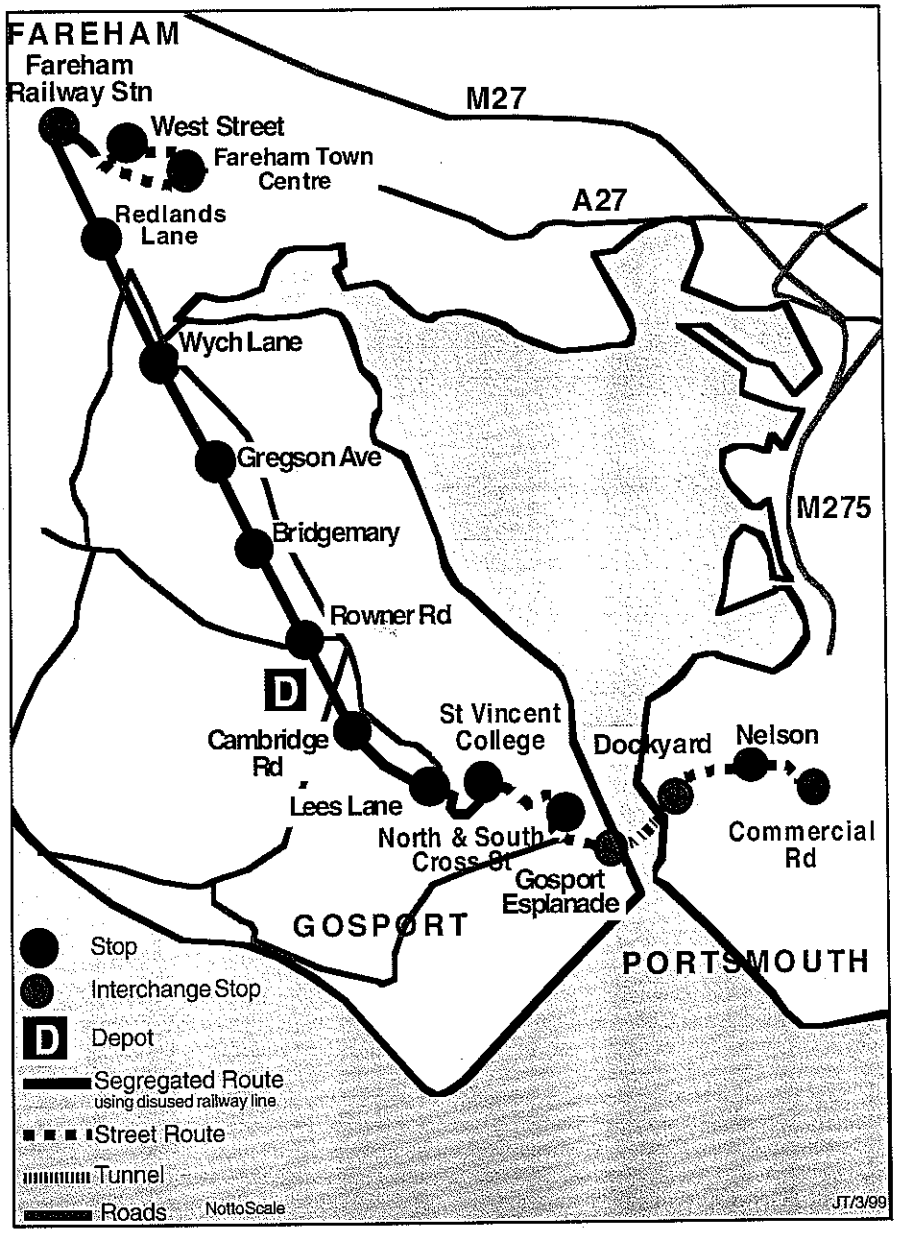
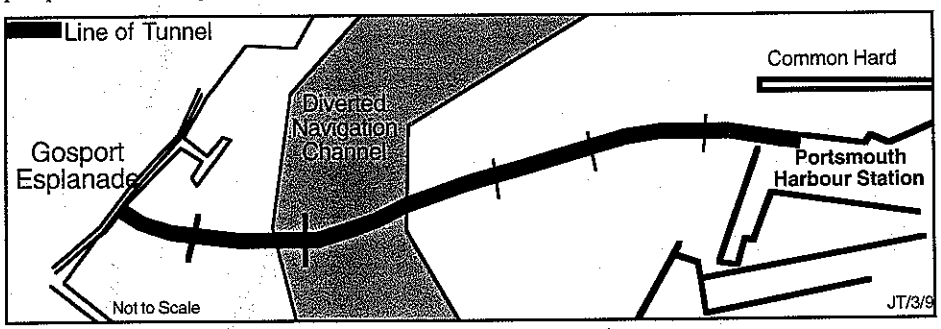



**Diagram showing longitudinal view of tunnel element being immersed.** *Delta Marine Consultants*

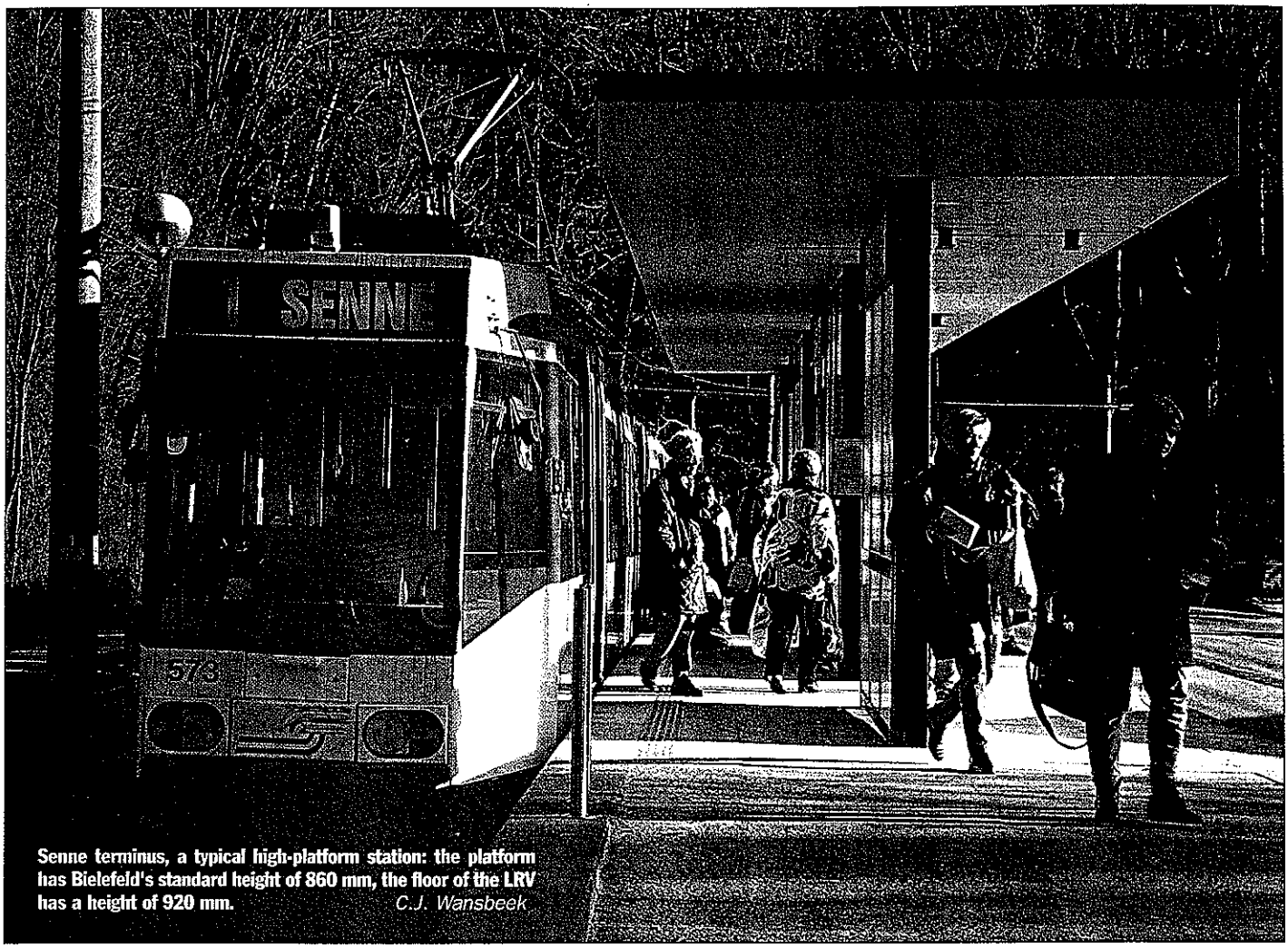



During construction of the tunnel in Portsmouth's harbour it is very important to reduce the impact on the harbour users as much as possible. During dredging, the present channel will be diverted and during the immersion operation itself there will be a short period when the harbour is completely closed. In the present stage of the design, six tunnel elements are foreseen, meaning six immersion operations. Detailed consultation has been undertaken with the harbour authorities and users to ensure minimum disruption.

The overall construction time for the tunnel will be about three years, but the immersion of the individual elements will only take about one day apiece. The significant economic and environmental benefits that light rail will bring to Portsmouth and the Fareham-Gosport peninsula will not be at the expense of any significant disruption to the economic or leisure activity of the harbour or, indeed, to the densely pack hinterland.



# Bielefeld Small city, b




**Senne terminus, a typical high-platform station: the platform has Bielefeld's standard height of 860 mm, the floor of the LRV has a height of 920 mm.** *C.J. Wansbeek*

## **C. J. Wansbeek** reports from a Germany city whose transport policy must be the envy of Coventry, a UK city of similar size.

Bielefeld in Germany and Coventry in the UK are remarkably similar in many ways, with the exception of public transport.

Each has 325 000 inhabitants, both are middle-sized. Both are centres of industry. Both got a university 30 years ago. Both have a modern inner city, rebuilt after the Second World War. The striking difference is in urban transport - Coventry relies on buses, with road lanes to provide priority. Bielefeld has, since 1945, steadily modernised its tram network, which dates back to 1900.

This network has now matured to reach full Stadtbahn status. The backbone of Bielefeld's urban transport consists of a 3-route Stadtbahn, with 55 light rail stations spread over the entire city. Ultra-modern LRVs move around fast over the smart, environmentally-friendly system. The three lines have a total length of 30.5 km. A fourth Stadtbahn line will be added in 2000, and further extensions will soon follow. Even in Germany, with its rich variety in rail networks, Bielefeld stands out. Firstly, no city so small in size boasts a fully independent Stadtbahn of its own with light rail in tunnels through the city centre, and laid on reservation in the outskirts of town. Most Germans would expect a Stadtbahn in a major city, but not in this corner of central Germany, where Bielefeld is spread out along the edge of the Teutoburger Wald. This forest is by the way, where in AD 9 the German tribes under Hermann routed a complete Roman army. In the 19th century the memory of this feat sparkled nationalist feelings.

The Bielefeld Stadtbahn is a high-platform system, with 860-mm high platforms at new stations. The LRV floors have a height of 920 mm, to facilitate easy boarding and alighting. Island platforms in Bielefeld have standard lengths of 75 metres, sufficient to accommodate coupled sets of two LRVs. Today, 37 out of 55 Stadtbahn stops have high platforms. So there still remain 16 low-floor stops, in streets with classic street-running, dating from Bielefeld's tramway era. Bielefeld's LRVs have adjustable folding steps, for both street-level and high-level platform service. The final aim is a 100% high platform.

Typically, the low-floor tram 'revolution' of the 1990s has failed to impress Bielefeld's engineers and policy makers alike. They feel that the elderly and the disabled are well off with the high-floor platforms, where entering and alighting from the LRVs is safe and comfortable. A nicety of the Bielefeld Stadtbahn is that it is permitted to take bicycles on board.

Equally remarkable is Bielefeld's faith in metre-gauge. In recent years, other cities regauged their lines to standard 1435 mm. Stuttgart, Essen, Chemnitz come to mind. Not so Bielefeld, where there is belief in the potential of metre-gauge techniques. Why say farewell to narrow-gauge if it proves so reliable? Look at the smooth and fast (100 km/h) metre-gauge vehicles of Rhätische Bahn of Switzerland, it is said at Bielefeld. Yet, at Bielefeld, by way of precaution, all Stadtbahn platforms and tracks are already designed with an eventual regauging in mind. Occasionally, there is some talk of a conversion to standard gauge. But no one sees it as a priority.

A further reason to stick to metre-gauge lies in the quality of the Betriebshof (depot and workshop) at Sieker, in east-central Bielefeld, with its spacious layout, including 5000 m of service tracks. The Sieker depot was inaugurated in 1977. All 76 city buses and 80 LRVs have Sieker as their home base. The depot is completely fenced in. It is under tight surveillance, so intruders are denied access. This explains why no graffiti is seen. The new LRVs for the future line 4

# ig success for light rail

**There is a total of 5 km of tram tracks for use by LRVs at the 1977-built central tram and bus depot at Sieker in east Bielefeld. Car 555 is an M8C, or standard Duewag *Stadtbahn*-M design.**

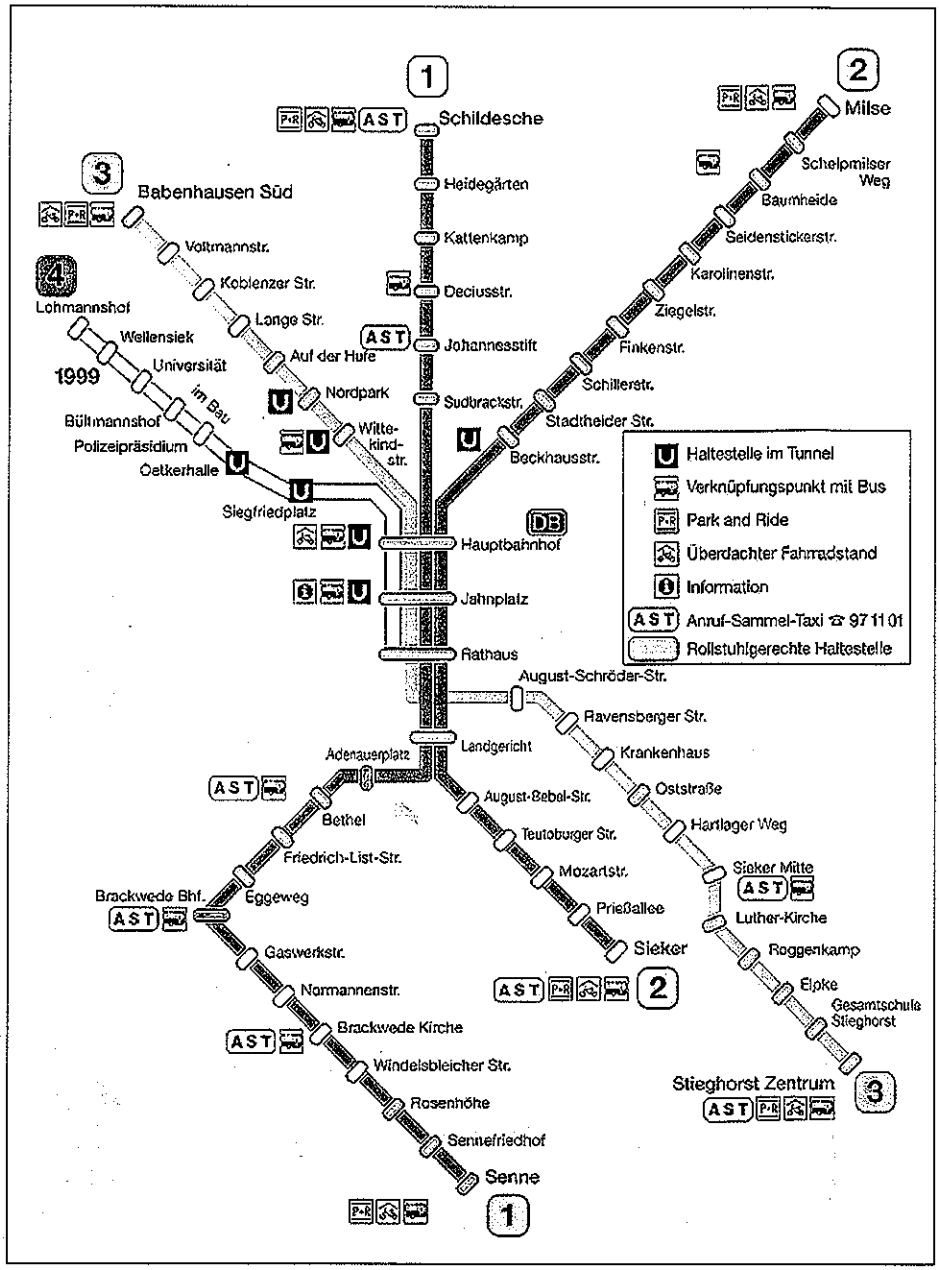
will also use Sieker as their home base, using some 3 km of connecting surface lines to reach the depot. If on the other hand line 4 had been standard-gauge, then the construction of a second depot would have been unavoidable. This was simply unaffordable.

In hindsight, the best service Bielefeld has rendered itself was simply not to do away with the tram. This required courage, as many in the 1950s spoke out against trams. However, as early as 1955, consultants advised that Bielefeld keep its trams, as they saw no alternative. The city council backed this view, and a policy of gradual upgrading was introduced. In the 1950s, new Düwag high-capacity trams were bought. Later came the sleek articulated GT8Z trams, also from Düwag. Meanwhile, long stretches of fast tram lines on private right-of-way were created.

As early as 1963, it was decided that a few interlocking inner city tram tunnels should be built, 60% of tunnel building costs to be borne by the German State, 30% by the Land Nordrhein-Westfalen, and 10% by Bielefeld. This key has worked well, the first short tunnel stretch opened in 1971. 20 years later, in 1991, the climax followed. At that time, a total of 4.5 km of lines had been laid in tunnel. New Siemens-Duewag LRVs were ready for delivery. In a single operation, all inner-city tracks were replaced by tunnel lines, and all GT8Z trams were withdrawn. In 1991 the system was renamed Stadtbahn. A huge festival marked the event. By 1991, Bielefeld had already invested DEM 500 million in light rail infrastructure, and it was generally felt that money had been well spent.

In 1995 construction started of line 4, which will run from central station (Hbf) to the north-west, to reach the university (22 000 students) and the new satellite town of Lomannshof (40 000 inhabitants). For obvious reasons, line 4 is dubbed 'Uni-Linie'. At the campus, a car park building will soon be demolished to make room for line 4. At the university, a wide loop is under construction, to satisfy scientists who feared that a tram in front of their laboratories might interfere with their sensitive measuring equipment. The campus area tracks will be the last bit of line 4 to be achieved, and most of the track-laying will take place in the course of 1999. Line 4 will have a total length of 4.5 km, with almost 2 km in tunnel. There will be nine stations, of which two will be underground. From Hbf to the university campus, total travel time on route 4 will be nine minutes. Headways will be 7.5 minutes during daytime. Also served by line 4 will be several cultural and business venues.

A fleet of 12 new Siemens Duewag-built




**Route map. The Sieker to Stieghorst extension was inaugurated in 1996. The boxed key shows underground stations, stations with feeder bus connections, park-and-ride sites, covered cycle racks, the location of the passenger information centre, locations where pre-ordered taxis will wait for passengers in the evenings and stocks which are fully-accessible to passengers in wheelchairs.**

2.3 m wide LRVs will run exclusively on line 4. For the time being, line 4 will remain an isolated operation, and through-going service over existing lines is excluded, as the Stadtbahn tunnels are already now used to full capacity. The construction of Line 4 cost some DEM 200 million. A tram line to west Bielefeld had been planned a century ago. The scheme was dropped following the outbreak of the First World War in 1914. Now, with Stadtbahn line 4, old plans come true.

Bielefeld's LRV fleet, comprising 80 units (as of February 1999), is extremely young. It consists of 44 **M8C**-class LRVs, double-ended and with doors on both sides; eight-axle double-articulated cars, of a standard design by Duewag, numbered 516-559, and delivered in batches between 1981 and 1987. The clue to the class name is easy. M denotes: metre-gauge. 8 means: 8-axles. C means: chopper control.

In 1994/5 a series of 20 **M8D**-class LRVs followed, numbered 560-579, closely resembling the M8C, but with one driving position, which leaves more room for passengers. It also means that they are, of necessity, used in back-to-back formation. Such a 54 m long two-car set, requiring only one driver, carries up to 294 passengers. Whereas all M8C cars are powered with two 150 kW dc motors, the advanced M8D cars are powered by four 95 kW asynchronous motors. The 'D' in the type name stands for Drehstrom.

The new M8D class vehicles proved a hit, so a repeat order for 16 more was placed, as rolling stock for the 'Uni-Linie', and numbered 580-595. Delivery started on 8 July 1998, and in February 1999, car number 595 was delivered, well in time for service on the 'Uni-Linie'. Until then, the new LRVs are in daily service on all three existing lines. The 'Uni-Bahn' had been devised for work-

ing by sets of two coupled **M8D** class LRVs. However, traffic forecasts for the future 'Uni-Linie' surpass all expectations. Without delay, Bielefeld also ordered an additional series of five unpowered four-axle intermediate bogie cars (trailers), of the **MB4** class, which, at both ends, can be coupled to a **M8D** car. Three-car double-ended sets can now shuttle between two stub termini (reversing points). The new trailers will be numbered 511-515. Three-car sets (M8D+ MB4+M8D) for line 4 will carry up to 389 With only one driver per set, and only an occasional roving ticket inspector, this is a superb performance in cost-saving.

Tunnel construction for line 4 is supervised by Herr Hans-Werner Neumann of the City Government. As he explains, construction proved inevitable, as the winding, narrow inner-city streets rules out a surface alignment for line 4. Only a tunnel would do. In fact, the Bielefeld solution consists of two parallel single-track tubes (with a combined length of 2 633 m). There is 151 m of double-track step-plate junctions and two stations in cut-and-cover. The overlay in the covered area measures between 5 and 16 m. It is not an easy job. Geological conditions that determine the tunnelling process change substantially along the line.

Beginning at the railway station, the tunnel is driven through layers of clay stone containing open seams, followed by stone marl. The tunnel is headed by means of the NATM (New Austrian Tunnelling Method), with shotcrete outer lining, girders and wiremesh. It crosses underneath ten DB main line tracks with an overlay of only 5 m. The maximum settlements are 10 mm. Approximately in the middle of the lot a soft gypsum marl can be found rising from the invert right until the end of the lot. In this part of the tunnel, the crown is partly driven through quartenary layers, where an alluvial groove consisting of saturated silty fine sand appears. This faulty area with a length of about 50 m is driven under a shelter of nitrogen freezing.

Tunnel construction continues six days per week, in two shifts. A total of 43 Austrian miners are at work, at depths between 11 and 21 metres. The miners have removed a total of 180 000 cubic metres, roughly the payload of 12 500 lorries. This material was used as a protective layer, to cover a vast refuse tip at Galgenheide (Gallows Meadow). At the same time, to reinforce the tunnels, 45 000 cubic metres of reinforced concrete and 4500 tonnes of reinforcing steel has been brought underground.

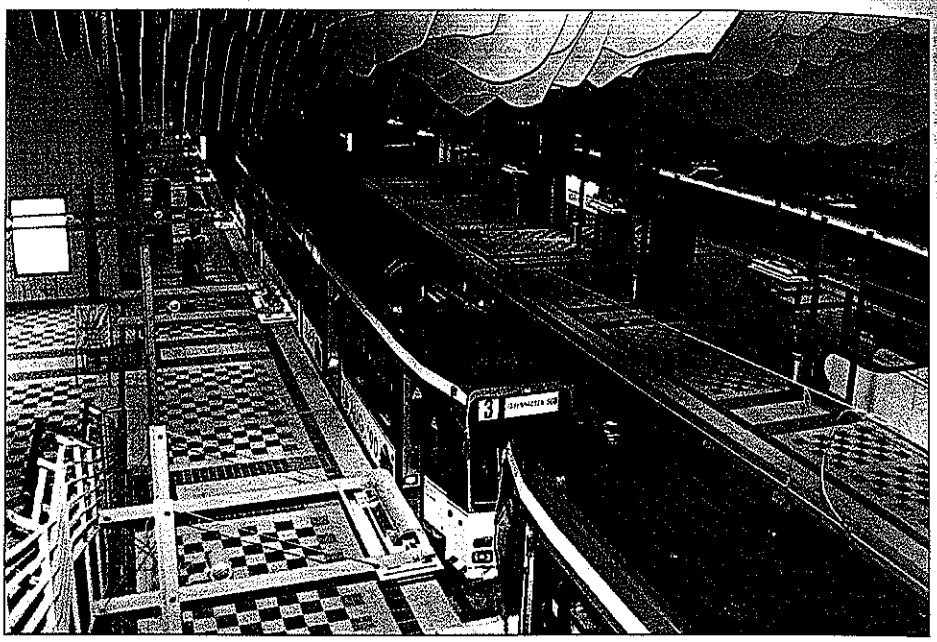
Public acceptance of the city tunnel system is high. Almost 60% of Bielefeld's public transportation is by Stadtbahn, buses accounting for the other 40%. Some 20 million passengers use the Stadtbahn every year, 50% more since it was opened in 1991. City buses saw an increase of 30% in the same period, clearly a spin-off of the Stadtbahn success. All bus lines have become feeder lines for the Stadtbahn. Buses and Stadtbahn all have basic ten minute headways, and the interchange is nearly perfect. Passengers switch from Stadtbahn to bus and vice-versa with great ease. Needless to say that Bielefeld LRV and bus drivers respect their services schedules, as befits a quality-orientated undertaking.

A further step ahead will come in 1 January 2000, with the introduction of a Verkehrsverbund between the transport undertaking of Bielefeld and the railways (DBAG), following the example of many other cities. This will bring unified tickets for local transport and the railways, based on a close co-ordination of timetables of both.

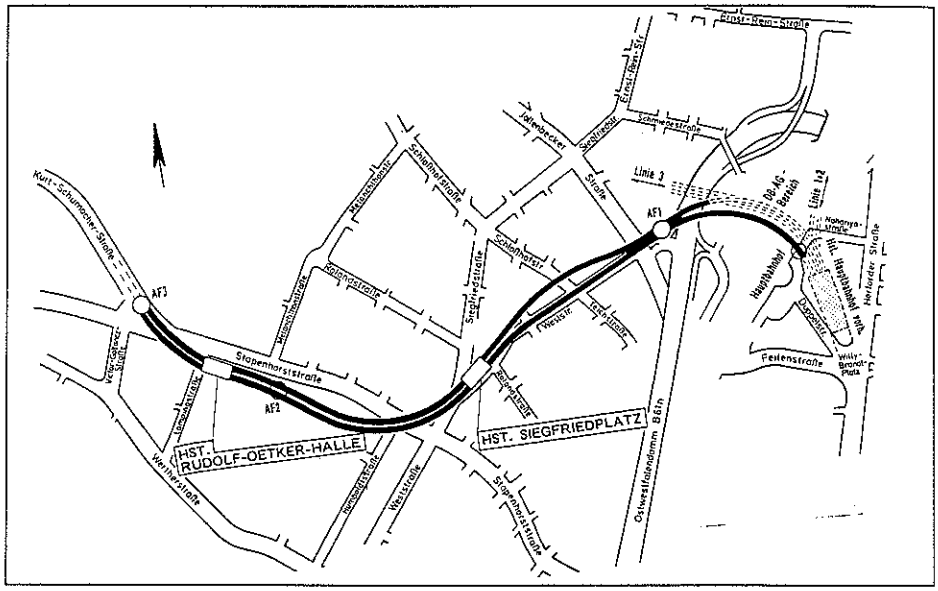
Fare-dodging at Bielefeld is estimated between three and four per cent. A total of 30 roving ticket inspectors do their best, but cannot avoid that an estimated DEM 1.5 million is lost each year as the result of fare-dodging. Much effort has been invested in the development of infra-red equipment to control the traffic lights at all road crossings. The technology was new in Germany, and Bielefeld had to go shopping for it in Zürich, Switzerland. In the past, priority for trams was given in the form of a rigid 'slot time', as part of the fixed programme of traffic lights which were all connected to a central computer programme. Say, 45 seconds for the tram every few minutes. In practice, trams lost valuable minutes waiting before red traffic lights. Recently, traffic lights have become self-selecting. At all times, these 'intelligent traffic lights' switch to green as soon as a LRV approaches at a distance of 400m. This is one of several devices to further improve the on-time performance of Bielefeld's impressive urban rail network.

Bielefeld's impressive performance has now been recognised by the Land of Nordrhein-Westfalen according it top-priority ratting for investment in a further 27.1 km of Stadtbahn, estimated to cost DEM 362 million. This includes the extension of route 3 from Babenhausen-Süd to Jöllenbeck, and the new line 4 further west to Grossdornberg, and across the city to the eastern suburb of Heepen. Route 1 may be extended into the centre of Senne, route 2 from Sieker to Kaserne and route 3 from Stieghorst to Hillegossen.

*The author would like to thank Dipl.-Ing. Hans-Werner Neumann of the Stadtbahn Construction Dept. of the City of Bielefeld for his kind co-operation with the preparation of this article.*



**Bielefeld Hauptbahnhof, where *Stadtbahn* tracks run at two different underground levels. Note the unusual design of the underground station.** *Stadtwerke Bielefeld*




**For line 4, two parallel single-track tunnels are under construction, starting from a stub terminus underneath the main station. The map shows clearly that the street pattern is very irregular, impossible to accommodate a surface line. So, a tunnel was the only way, despite the difficult ground conditions.**

**"Früher war ich auch dazwischen!" ("I used to be one of them too"). Cartoon from a brochure 'Stadtbahn Bielefeld', 1979.**

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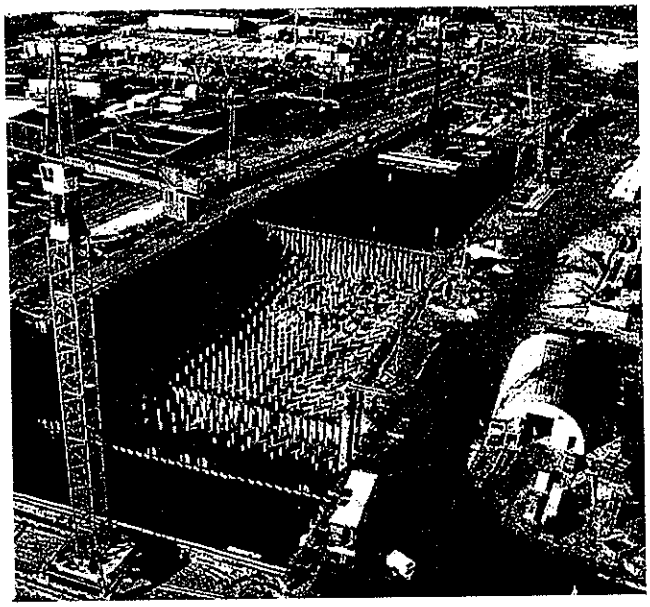

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**Unrebuilt one-man car 742 is one of the standard bodies that were mounted on 'hilly-route' trucks in 1983, and is seen returning to Santo Amaro depot from a peak working on route 28. Only a small number of such trams survive in service.** *Mike Tedstone*

# Lisboa and Sintra

## **Mike Tedstone** provides a personal update on Portugal's tramways.

I first visited Portugal in 1976, when things had quietened down a little after the 1974 revolution, in order to see the remaining narrow-gauge steam railways in the north of the country, and the trams. Until 1974 four tramway systems were operating: Coimbra, Lisboa, Porto and at Sintra; Braga had already disappeared. Going back in January 1999, some 25 years after the revolution, was largely prompted by the desire to see the revitalised Sintra-Atlântico system, which (to my great disappointment) had not re-opened for business in 1976.

The changes that have taken place to the historic Portuguese tramway systems over the years are considerable, with Porto reduced from a substantial system to a rump of just two lines, and Coimbra closed completely. The focus of my visit to Lisboa was thus the greatly slimmed-down Carris system, combined with the attraction of winter weekends-only operation at nearby Sintra, a 45-minute train journey from the Portuguese capital.

### Lisboa

The surviving Carris tram network is something of a paradox: a once vast system has substantially disappeared compared to when operating at its full extent in the 1950s, yet significant recent investment has taken place to secure the last handful of routes. A sizeable batch of two-axle 1930s standard vehicles has be remodelled for one-man operation on the hilly routes (but retaining their traditional appearance) and ten new articulated trams procured for use on route 15, quite comparable with modern European practice elsewhere (apart from the 900 mm gauge).

Lisboa tramway network cuts started in the 1960s, and the rate of shrinkage increased in the early 1970s. By the time of my first visit all of the long tram routes (Benfica, Carnide, Lumiar) had been cut back, giving way in some cases to the underground metro. However, the traditional tramway network was still substantial, with many different types of tram operating from three depots: Arco do Cego, Amoreiras and Santo Amaro.

Now the British ownership influence has gone completely, only five routes survive, and two out of three depots have gone. The metro is in expansionist mode again. First impressions of the city as one arrives on the Carris airport bus are a little confusing, as a number of routes lacking services still have rails and overhead intact, though whether they will re-open is very uncertain.

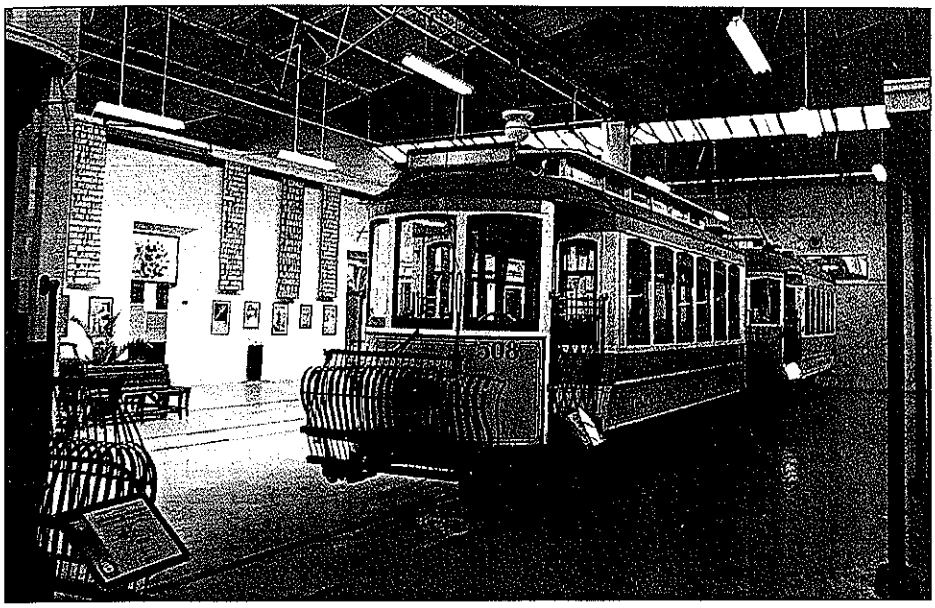
The LRTA publication *The Tramways of Portugal* is still a must for visitors, but the following list needs to be used to update the route map:

12, Praça da Figueira-Martim Moniz-São Tome-Praça da Figueira (clockwise circular);
15, Praça da Figueira-Cais do Sodré-Alcântara-Algés;
18, Alfândega-Cais do Sodré-Alcântara-Ajuda;
25, Alfândega-Lapa-Estrela-Prazeres;
28, Martim Moniz-Graça-São Tome-Chiado-Estrela-Prazeres.

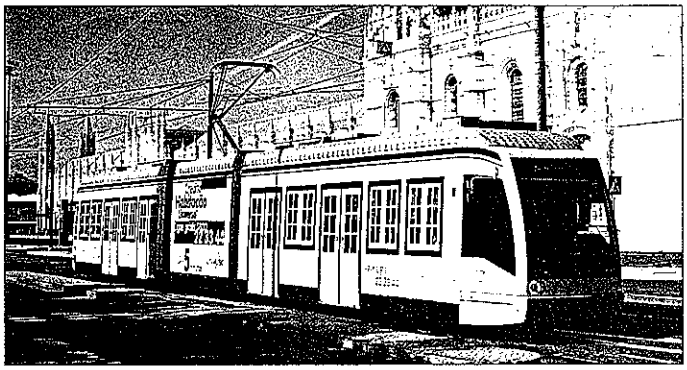
The articulated trams are confined to the long route 15 along the coast to Algés (a cut back from the former terminus at Cruz Quebrada), which features the only significant segregated section of track (albeit shared with buses and taxis), where a reasonable speed can be attained. These Duewag-design vehicles looked superb when delivered in the traditional yellow and white livery, but now all carry wrap-around advertising liveries (including passenger-unfriendly contra-vision over the windows), which range from the merely unpleasant to the truly hideous.

Elsewhere the huge increase in traffic during the last 20 years has brought ever-present traffic congestion, and many tram routes are characterised by the tendency of local car drivers to park within the swept path of the trams, causing delay and frustration, and much bell-ringing until the offender re-appears to grudgingly shift the offending vehicle. It is hardly surprising that the metro offers rather more predictable and faster journey times. I saw no evidence of any priority for trams, and tourist literature refers to the stoic nature of Lisboa tram drivers in their ability to put up with chaos on the roads.

A gradual policy of route closure has contin-



**Above: Inside the new transport museum at Santo Amaro in Lisboa, with restored trams 508 and 535 of the 1920s.** *I. F. Creswell*



**Right: Articulated car 503 is in total wrap-around advertising livery as it passes Belem heading towards Alges on route 15.** *Mike Tedstone*

# 25 years on

ued until very recently with route 17 (Martim Moniz-Alto de São João) the last casualty. What was supposed to be a temporary closure seems to have become permanent as special junction work on Avenida Almirante Reis has been lifted. The official Carris guidebook *Tram Tours of Lisbon* by Joseph Abdo (now in a second, 1996, bi-lingual edition) includes full descriptions of routes 17 and 24 (Corpo Santo-Estrela-Rato-Carmo), but admits that the latter would probably be the subject of disruption as a result of construction work along parts of the route. If this does re-open it might be between Cais do Sodré and Campolide.

Almost total fleet standardisation is now the order of the day, with the remodelados featuring on all routes, including short-workings of the 15 to Belem, apart from occasional appearances of unmodernised cars such as 733 and 742, which I noted on peak workings. Four tourist trams (1-4) exist, and ran on a scheduled tourist circuit (Electrico das Colinhas) from March to September 1998, as well as being available for private hire at other times. These are restored with the red-and-white livery, upholstered interiors and Providence lifeguards. The character of the remodelados is quite outstanding after their re-equipment, and every journey one makes on them is a delight.

With the exception of parts of the Graça (28) and São Tome (12) routes, virtually all sections

**Remodelados 553 squeezes around an interlaced-track curve on the Graça circle in Lisboa, a section controlled by traffic lights. The car parking problem is evident.** *Mike Tedstone*

of the surviving tramway are served by bus routes as well, albeit to different destinations. Two days should be allowed to explore the system fully, using the good value one-day tickets or other readily-available offers such as the Lisbon Card, which includes museum and art gallery entrances, plus the metro and all funiculars.

## The *Carris* Museum

Plans for a tram museum date back to at least 1981, and the second and third editions of *The Tramways of Portugal* both stated this would be created in part of the former Arco do Cego depot, in the north of the system, featuring a collection of trams built up from selected vehicles put on one side over the years. To my surprise, when visiting the Carris head office to acquire a system map, I discovered that the new museum had opened a few days previously (12 January 1999) and it was right there at Santo Amaro. This is eminently sensible, as the site of Arco do Cego is now cut off from the tramway, and the site has been sold for redevelopment.

Thus I became, unwittingly, the first English visitor to this excellent collection. In the old company offices are fascinating displays of old documents, photographs and other memorabilia. After browsing these one enters the depot yard to be carried on tourist tram 2 the short distance to part of the former workshops where there is a well presented display of 14 trams as well as some buses. I was told photography is not allowed inside, but others have found this not to be the case! Admission to the museum is PTE 350, and a smart new shop has been built next to the main ticket sales windows at which various books and souvenirs were on sale.

**Trams on display**

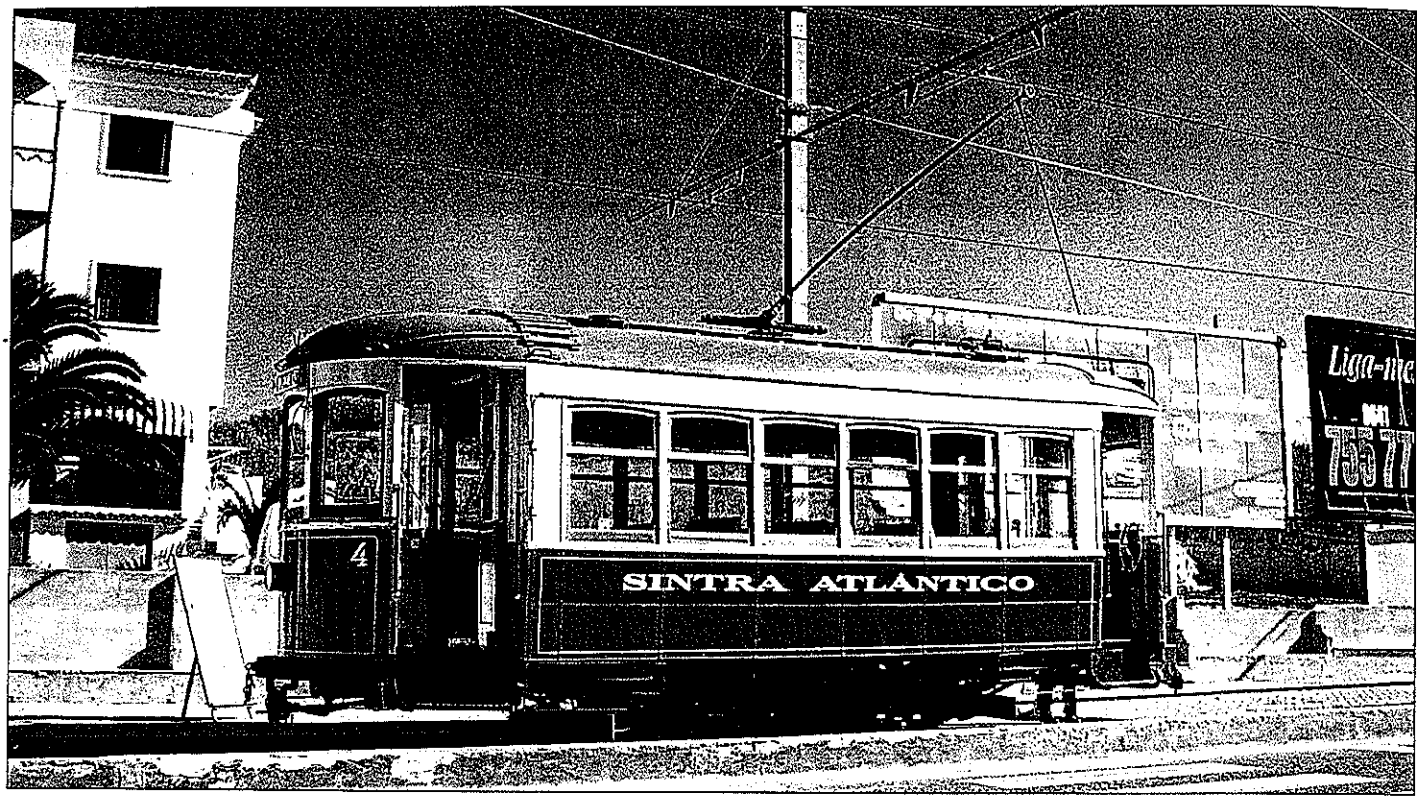
| | | |
|---|---|---|
| 1 | St Louis (ex-437) | 1901 |
| 260 | Brill small crossbench | 1901 |
| 283 | Brill large crossbench | 1902/3 |
| 329/30 | Brill bogie saloons | 1906 |
| 506 | Brill two-axle saloon | 1914 |
| 508 | CCFL two-axle saloon | 1924 |
| 535/49 | CCFL standard saloons | 1928 |
| 777 | CCFL one-man saloon | 1931 (83) |
| 802 | CCFL bogie saloon | 1939 |
| 741 | CCFL post-war saloon | 1947 |
| 904 | CCFL bogie saloon | 1947 |
| 101 | CCFL trailer | 1950 |

## Sintra-Atlântico

In 1976, having failed to ascertain any definitive timetable information from local sources, I first stood at Ribeira depot, only to discover no trams were running, and a few chickens the only sign of life. An excellent account of the renaissance of the Sintra tramway appeared in the November 1997 edition of *Light Rail & Modern Tramway*, at which point Stagecoach Portugal had started summer-only tram service over the short section of line from the sub-depot at Banzão to the seaside resort of Praia das Maçãs and the council of Sintra was rebuilding the track and overhead.

Arriving again after the short but steep walk from Sintra CP station, nothing much had changed at the upper depot level, and washing still hung out by the derelict tram tracks. However down at the roadside level the overhead clearly looked new, the rails were polished and the permanent way had been reballasted. A timetable was posted showing that during winter 1998/9 a Saturday and Sunday only service of four round trips was operated by Stagecoach Portugal between Ribeira and Praia das Maçãs. Shortly afterwards an immaculate saloon motor tram 4 arrived punctually off the first morning journey from Banzão.

Services ran again all the way from Ribeira to




**Rebodied motor tram 4 of the Sintra tramway at the Praia das Maçãs terminus after arriving from Ribeira on 30 January 1999.** *Mike Tedstone*

Praia das Maçãs from October 1997. A setback was experienced shortly afterwards when a bridge was washed out at Colares, but full services were re-instated in March 1998. Positive backing from Sintra Town Council has been a key feature in the progressive restoration of the historic tram service, combined with the willingness of Stagecoach to refurbish the rolling stock and develop the tram service alongside the local bus network, which acts as a feeder service, and offers integrated fares structures.

That it is a success story is clearly apparent from the quality of the restored trams and total re-equipment of the line's electrical infrastructure. A prudent view of the future utilisation of the original rolling stock dating from 1904 (car 3 is perhaps the most exceptional, being an unrebuilt Brill car, with exquisite wooden panelling and marquetry work) has led to the acquisition of four 1930s two-axle trams from Lisboa, which it is hoped to restore and convert to metre gauge.

The journey, taking around 30 minutes, is a delight and the comparison of the glorious scenery around Sintra by the poet Southey in the last century with the North Devon resort of Lynmouth is not as bizarre as it might sound. The Colares region, through which the tram runs, is famed for its quality of wine, which with limited production is evidently not exported; there can be few tramway systems that were able to boast a winery private siding connection - this can still be seen today at Banzão.

One or two minor criticisms might be made. Visitors arriving by train at Sintra station finds no obvious signs to direct them how to reach the tramway, although free maps were readily available, as were tram and bus timetables at the tourist office. By Portuguese standards, tram fares are perceived to be high, with a single ticket priced at PTE 500 and no child concessions (an all-day ticket in Lisboa costs only PTE 430, including use of the Airport bus. I saw one family park their smart new car, get on the tram, and then get off again when told that their party of two adults and two children would pay PTE 4000. Personally I found the fare reasonable, given the special nature of the system and the investment that has been made, but this view is not what will make the business viable locally.

The future of the Sintra-Atlântico tramway looks good, as Sintra Town Council are evidently keen to see service restored beyond Ribeira to the station; indeed discussions were taking place on the subject on the day that I visited the system. Immense museum potential exists at the Ribeira site, as much historic power generation equipment remains, just waiting to be restored, together with the former workshops. Operations are currently based at the Banzão sub-depot, not unlike an interurban station, and it is here that the offices are located.

The 1998 full summer service required the use of three tram sets with two crossing loops used. No signalling exists, and services simply run to timetable order. More of the fleet of original vehicles, notably the toastrack trailers, await full restoration. There are abundant attractions in the region, and when combined with the local wine and gastronomy there can be little to touch the Sintra-Atlântico for character. This is indeed a serious restoration project, with high standards, yet one which fulfils an important local purpose. I like the comparison the late John Price made with the Manx Electric - but the weather in Portugal is perhaps a little kinder!

## Book reviews

**Tram tours of Lisbon** *by Joseph Abdo, price PTE 750, 1996 (second edition)*
**Lisboa - 125 Anos Sobre Carris** *by Joao de Azevedo, price PTE 2940, 1998*
**28: Cronica de um percurso** *by Jose-Augusto Franca, price PTE 4620, 1998*

The first of these three books, **Tram Tours of Lisbon**, is the only one which features any English translation. After a brief background outlining the tramway heritage in Lisbon, each of the then surviving tramways is succinctly described in terms of what sights can be seen while making the journey, from a stop by stop narrative. Brief details of tickets, interchange points and so on are provided and the quality of the illustrations is excellent. The publication of this handbook was sponsored by Carris, but it is slightly out of date in describing routes 17 and 24, not operating in 1999. In addition route 12 now operates a one-way circular, and not the hill shuttle as described. This compact and good value handbook is required reading for any visitor to Lisboa, especially first-timers.

**Lisboa - 125 Anos Sobre Carris** largely makes sense to a non-Portuguese speaker and is an attractive but compact history of the undertaking from its beginnings in 1873 with mule trams. The various phases of tramway development, and then system contraction, are outlined, and numerous photos provide atmospheric illustrations of a major tramway system. A major part of the book describes all the routes once operated and gives precise dates of events in the evolution of each route, all too often involving a closure date at the end. Surviving routes are described, then follows an outline fleet history, with a brief technical description of each type up to the articulated cars. No maps are included. This reviewer would have found helpful some kind of brief correlation between metro and tramway developments over the last 40 years. Nevertheless the book should be studied by anyone interested in tramway development generally and the splendid Lisboa system in particular. Good value at around £10.

**28: Cronica de um percurso** (no English text) is essentially a coffee table book devoted to the lengthy route 28 between Martim Moniz and Estrela via the tortuous Graça circle, skirting the Alfama, before proceeding across the city centre and then rising steeply through the west of the centre Baixa area. Just as many of the splendid black-and-white photographs portray the varied architecture and street scenes of Lisboa as illustrate the trams. Attractively produced on high-quality paper, this limp-covered book has a classy feel to it, but is a little expensive at around £24. However it is essential for Carris devotees.

All three books can be obtained from the Carris museum shop: Museo Carris Santa Amaro, rua Primeira de Maio 103, P-1399 LISBOA.

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| Juister Inselbahn | £16.95 | Fleetbook of Blackpool's Trams and Buses | £ 4.95 | Tramway London | £ 6.50 |
| Mainzer Strassenbahn (Video) | £20.00 | Heyday of Blackpool's Trams | £11.99 | Victoria & Lambeth Tramways | £12.95 |
| Munchener U-Bahn | £18.95 | Nostalgic Look at Blackpool's Trams | £12.99 | Waltham Cross & Edmonton Tramways | £12.95 |
| Nahverkehr in Berlin | £14.00 | Bournemouth & Poole Tramways | £12.95 | Walthamstow & Leyton Tramways | £12.95 |
| Ruinen, Trams unde Stadtverkehr (Video) | £20.00 | Brighton's Tramways | £12.95 | Wandsworth & Battersea Tramways | £12.95 |
| S-Bahnen in Deutchsland (Video) | £21.50 | Bristol's Tramways | £12.95 | | |
| Strassenbahn der Berliner Verkehrsbetribe | £14.50 | Burton & Ashby Light Railways (old pictures) | £ 2.95 | | |
| Strassenbahn in Eisenach | £18.50 | Cardiff's Electric Tramways | £ 8.95 | Tramways of Lytham St Annes | £ 8.95 |
| Strassenbahn in Munchengladbach | £17.50 | Tram Tracks & Trolleybooms (Chesterfield) | £ 6.95 | Maidstone & Chatham Tramways | £12.95 |
| Strassenbahn in Oberhausen | £19.95 | Dearne District Light Railways | £ 6.60 | North Kent (Bexley, Erith, Dartford etc) | £12.95 |
| Strassenbahn in Wupertal | £30.00 | Tramways of Dewsbury & Wakefield | £ 7.00 | Tramways of North Lancashire | £ 2.50 |
| Strassenbahn in Zwickau | £22.00 | Dover's Tramways | £12.95 | Nottinghamshire Tramways | £ 2.95 |
| Strassenbahn Zwichen Rostock und Gorlitz | £26.50 | Tramway Routes of Dover | £ 9.95 | Oldham Corporation Tramways | £13.95 |
| Strassenbahnfahrzeuge Bd 1 | £12.50 | Tramways of East Midlands | £ 2.00 | Portsmouth Tramways | £12.95 |
| Strassenbahnfahrzeuge Bd 2 - Niederflur - | | Nostalgic Look at Edinburgh Trams | £ 9.99 | Pwlheli & Llanbedrog Tramways | £14.95 |
| Stadtbahnwagen | £12.50 | Exeter & Taunton Tramways | £12.95 | Reading Tramways | £12.95 |
| Strassen- u Kleinebahn Pforzheim | £22.95 | Glasgow Tramcar | £16.95 | Tramways of Reading | £12.00 |
| Strasse- u Stadtbehnen in Deutchsland - Westfalen | £25.00 | Nostalgic Look at Glasgow's Trams | £ 9.99 | SHMD Joint Board (British Bus Tram & | |
| Tramways & Light Rail Atlas | £11.50 | Another Nostalgic Look at Glasgow's Trams | £12.99 | Trolleybus Systems No 12) | £14.50 |
| Wuppertaler Schewebebahn (Video) | £16.00 | Twilight Years of the Glasgow Tram (NEW) | £25.00 | Salford Tramways | £14.95 |
| ***IRELAND*** | | Glossop Tramways | £ 4.50 | Sourcebook of Literature Relating to | |
| Fintona Horse Tram | £5.95 | Gosport & Horndean Railways | £12.95 | Scottish Electric Tramways | £ 1.50 |
| Irish Trams (New) | £18.99 | Tramways of Grimsby Immingham & Cleethorpes | £ 6.00 | Seaton & Eastbourne Tramways | £12.95 |
| Trams to the Hill of Howth | £9.99 | Heaton Park & its Transport | £ 0.90 | Sheffield Trams in Colour since 1950 | £12.99 |
| ***LATIN AMERICA*** | | Huddersfield in the Tramway Era | £ 1.50 | Nostalgic Look at Sheffield Trams | £14.99 |
| Latin America by Streetcar | £30.00 | **Isle of Man** | | Tram to Supertram (Sheffield) | £ 4.95 |
| Peruvian Trams & Railways | £11.99 | Double-Century - Centenary Story of two Unique | | Southend of Sea Tramways | £12.95 |
| Tramways of Chile | £15.00 | Manx Tramways | £15.00 | Tramways of the South Midlands | £ 3.20 |
| ***NEW ZEALAND*** | | Isle of Man Tramways | £ 9.95 | Tramways of South Wales | £ 4.00 |
| End of the Penny Section | £24.95 | Manx Electric | £ 8.95 | Tramways of South-West England | £ 3.20 |
| ***NORTH AMERICA*** | | Keighley Corporation Transport (1964) | £ 7.50 | South Yorkshire Trams | £ 3.50 |
| World Gazetteer Part 4 | £14.50 | Tramways of Kent | £ 3.75 | Tramways In & Around Stockport | £ 6.95 |
| ***PORTUGAL*** | | Kidderminster & Stourport Electric Tramway | | Thanet's Tramways | £12.95 |
| Tramways of Portugal | £ 9.95 | Company Rules & Regulations (reprint) | £ 7.00 | Volks Railways Brighton | £ 4.95 |
| ***RUSSIA/UKRAINE ETC*** | | Leicester Trams | £ 3.50 | Tramways of Wigan | £ 7.80 |
| Tramway Atlas USSR | £22.50 | Liverpool Tramways 1 Eastern Routes | £12.95 | | |

BKSHP3

# More trams, and walking

UK trams off the endangered species list? Croydon seems to be getting what it's paid for - on time. If you get around without walking you must be levitating... or in a wheelchair.

So, let's take stock. On the one hand, we have grumpy Mr Prescott who, when he's not diving in the Maldives (all in the cause of the environment you know - it's your car exhaust which has killed the coral there), is telling us that the answer to car dependency is the bus and, no we can't have any more trams for a while 'cos the kitty's nearly empty.

On the other hand, we have Croydon Tramlink - forging ahead, confident of opening on 4 November 1999 and maybe part even before then.

Docklands Light Railway (DLR) - forging ahead with its Lewisham extension under the Thames. Manchester's Metrolink Eccles extension - forging ahead. Nottingham - getting ready to forge ahead on site later this year.

Tyne & Wear Metro extension to Sunderland - preparing to forge ahead on site. South Hants Rapid Transit - sailing through its Public Inquiry and decision now in the hands of (a) the Planning Inspector and (b) grumpy andparsimonious Mr Prescott.

On the slightly gloomier side we have Midland Metro, with Geoff Lusher and his guys and gals champing at the bit (at least they're on the final straight now) and Leeds - where liberal applications of cold water administered by Mr Prescott's equally grumpy second in command Dr John Reid may finally make them give up the ghost. So what, before I forget it, is the point I am trying to make? It is that, curiously and contrarily, just at the time when UK Government policy seems dead set against the tram - even to the extent of bringing in new taxes against it (see last month) - there's more happening on the ground in terms of new tramway and light rail systems than at any time since the LRTA was founded in 1937. Not that we would claim all the credit of course...

## Big poles, good system

Now we are all feeling much better, what about Croydon Tramlink and its overhead? Last month we gave them a bit of a drubbing. Since then I've been to see it and to interview the top men. Was it all a terrible mistake? Which - the overhead or our criticism of Tramtrack Croydon Limited?

First of all, what's it like in Croydon town centre? Well, inevitably it's what you might with understatement describe as 'slightly disrupted by works' at the moment, or to look at it another way, there's a hell of a lot going on. The good folk of Croydon will no doubt be pleased when it is finished and they can use it.

If it wasn't within the shadow of London, Croydon would be recognised for what it is, one of the major urban commercial and shopping centres of the UK and it has traffic congestion to match. It is also a residential dormitory town for its even bigger neighbour so it has especial problems at peak hours.

What's remarkable is to go to Croydon and not be amazed at another British city getting a modern light rail and street tramway system - what was phenomenal ten years ago is almost routine now. Posts, poles, masts, girders - call them what you will - for the overhead are up in profusion in the town centre, though not yet wired.

For a town which used Nantes as an example, one can't help feeling it is going to look just a teeny-weeny bit more conspicuous. It seems that the 1960s buildings in Croydon are even less solid than those in Dusseldorf, because the latter can manage to hold up an almost invisible skein of overhead wires while the former are just too tired. Fortunately they've got nice strong girders to lean on now.

## I'll catch the shoes

I've just covered the seminar on walking - my report will be in the June issue. What IS this all about, you may be saying? I don't spend my (or my employer's) hard-earned cash on *Tramways & Urban Transit* to read about walking!

Think again! Even in your second-best rosiest dreams what do you do before you get on your beloved tram? And what do you do afterwards? Walk - of course. (I know that in your rosiest dreams, the tram stop is right outside your front door and the destination stop is right outside your office/shop/theatre/hospital/ whatever but that's just an extreme fantasy, so snap out of it!)

One of the worst things about using public transport, in my view, is how you are made to feel a second-class citizen even before you get on it and once you've got off (the fact that too often you're made to feel like a third class citizen while you're actually on it is a different issue, to which I will return, no doubt).

Walking to a bus or tram stop or a local rail or underground station can, if not too far, blow out the cobwebs and set you up for the day. Unless, of course, you have to cross any busy roads on the way, get drenched by passing cars ploughing through standing water, or get chilled, soaked and/or wind-bedraggled by the time your trusty bus, tram or train arrives.

Similarly, at the other end of your journey, how easy is it to find your way to your destination - is there a map and clear signs? Are you forced down foul smelling and frightening subways or over long ramps and footbridges or other lengthy detours so that motor traffic can have a straight and easy course while you don't matter?

Is there a signalled crossing when you want to cross a road and how long - seconds, minutes, hours do you have to wait when you press the button? And what are you doing all this time as your blood boils or you switch into auto pilot? Walking, of course.

Mr Prescott, of diving skills and grumpy reputation, is, of course, the very gentleman who has identified walking as important in his Integrated Transport White Paper. Born cynics might say it's because walking is even cheaper for the Government than buses are, but I would not be so suspicious.

However, I can say that his wishes have not yet brought about a culture change - too often what is actually happening for both pedestrians and cyclists amounts to lip-service and not least is the wide-spread tendency to lump pedestrians and cyclists together, though the modes are frequently mutually incompatible. It seems to me that this is often done rather than taking some road space away from cars and lorries and re-allocating the total space available more sensibly and fairly between cars and lorries, buses and trams, cycles and pedestrians - all of whose needs and requirements are different.

All too frequently, cyclists and pedestrians are seen as third class citizens (after car and public transport users) and are given the dregs left over, thus making them both fourth class.

## Others are fourth class

Such a case exists, sad to say, here in my home city of Coventry, where a year on from first proposal only a quite short length of the Warwick University-City Centre cycle route has been achieved (the rest is still snarled up in local public inquiries) and that which has, has simply divided up former foot way between pedestrians and cyclists - with some parts insufficiently wide for a cycle to pass a pedestrian let alone pass a cyclist going in the opposite direction as well.

Folly of follies, the cycle route actually contra-runs a bus layby and at the most main road it crosses (the A45 - directly under the control of Mr Prescott's DETR/Highways Agency) there is still no phase of the traffic lights at all for pedestrians or cyclists to safely cross this extremely busy four-lane highway junction. Nor is there any sign that the foot way and cycle route has been cleaned or swept since last autumn's leaf-fall - though the adjoining highway is squeaky clean every day.

A little way to go then before the ideas of the White Paper are achieved on the ground?

*bobtarr@lrta.org*

**Bob Tarr,**
Secretary General

# Blackpool Coronation 304

## By Philip Higgs

There are quite a number of preserved trams in the UK which enthusiasts eagerly await to return to the rails, and among the most deserving is former Blackpool 'Coronation' car 304 owned by the Lancastrian Transport Trust. The car came from a batch of 25 cars delivered from June 1952 and fitted with the revolutionary VAMBAC (Variable Multinotch Braking and Acceleration Control) in stark contrast to the more typical series-parallel controllers common on most British tramcars.

Plagued by electrical and other problems, the requirement for a tram fleet reduction led to the start of withdrawals in 1968, though not before attempts were made to improve their reliability by retro-fitting English Electric Z-type controllers made available from Railcoaches scrapped earlier in the 1960s. While two of these 'Z-cars' still survive, including one retained by Blackpool Transport, 304 retained its Vambac equipment until withdrawal in October 1970. Initially passing to the Tramway Museum Society, the car later passed to the Merseyside Tramcar Preservation Society before acquisition by the organisation that has now become the Lancastrian Transport Trust.

Housed at the St. Helens Transport Museum, serious restoration work started in 1993 when the body was lifted off its trucks to allow the underframe to be steam cleaned, removing the accumulated dirt, grease and sand built up during its 18-year operational life at Blackpool. No. 304 was refitted to its trucks and all flooring was stripped out for a complete renewal and the saloons prepared for refurbishing.

An appeal for funds by the Fylde Tramway Society raised nearly £3000 towards the cost of a complete rewiring, and this project is still ongoing, being undertaken by Brian Pickup, who has built up considerable experience of the Vambac breed working on Leeds 602 at the National Tramway Museum. One important discovery was that the 36-volt batteries and charging circuit on car 304 had been removed by Blackpool Corporation during its life and replaced by a resistor in the circuit, which would draw a proportion of the 550v overhead supply to feed the low voltage Vambac system.

Unfortunately, it is possible that this innocent modification could be one of the causes of the well documented Vambac control failures. The Vambac system requires a constant supply of 36 volts and while the resistor fed circuit may supply 36 volts when the full line voltage is available, a drop in the line voltage would also reduce the proportion fed to the Vambac system, with the result that the controller would either become slower in operation or fail. If there was a power loss the driver would not be able to brake using the controller.

Another discovery was that the electro-magnetic track brake circuit was also wired through the Vambac system and so, in the unfortunate event of a service braking failure, the track brakes could not be activated either! The air brakes provided acted on separate drums rather than the wheel treads and were only effective below 4mph - the Coronations could be a braking nightmare! In the light of these discoveries, a number of modifications are to be incorporated into 304 to resolve safety issues.

**Its panels stripped off for bodywork attention, No. 304 demonstrates the soundness of its solid steel construction.** *Philip Higgs*

**No. 304 is raised up on jacks for underframe cleaning and painting.** *Philip Higgs*

Aside from actual restoration work is the consideration of how future work on car 304 can be funded and its future once restoration work has been completed. During 1998 the Trust approached the Millennium Experience Co. which is charged with the commissioning of exhibits for the 'dome' in 2000. In view of 304's traction equipment being exhibited at the last major exhibition in this country, the 1951 Festival of Britain, an approach was made for them to consider accepting 304 for the basis of a display. This would have allowed sponsorship to be sought for completing the car's restoration, but unfortunately our offer was declined because the company has been overwhelmed with exhibits.

Despite no agreed operational base for 304 yet forthcoming, the Trust's resolve to complete restoration is not diminished and it is still fortunate to have the support of the Fylde Tramway Society, which has pledged further funds towards the car's completion. The National Tramway Museum is an obvious choice as a future home for the tram, assuming it would fit with its collection policy, although who knows what schemes may develop in the future (a heritage tramway scheme developed in a tourist area as an answer to traffic congestion...?)

● **Any reader wanting further information about the tram, the Lancastrian Transport Trust or its support body TransSupport, is invited to write to Philip Higgs, Lancastrian Transport Trust, 1 Beverley Grove, South Shore, Blackpool, FY4 2BG (e-mail: *philip@higgsp.freeserve.co.uk*)**

## Pedestrians have the right of way

Ronald Gee asks who has right of way in the instance of a tram attempting to 'gong' pedestrians off a zebra crossing that it is approaching. Not surprisingly, it is the pedestrians.

This is not simply because they are using a pedestrian crossing. In pure law, a pedestrian has right of way over vehicles on all roads, whether at a pedestrian crossing or not. The reason is that if this were not the case, motorists (or tram drivers) would be allowed to mow down any pedestrian encroaching onto a road on the justification that it was the road user's right of way.

Even on a multi-lane motorway, any driver failing to avoid, or stop for if necessary, a pedestrian when it is possible to do so without causing danger to others, must do so. Our courts will come down very heavily on any driver, whether of a rubber-tyred vehicle or tram, who knocks down a pedestrian straying into their path if it were reasonably possible to avoid doing so.

Of course, any individual attempting to test the principle or enforce their right of way on a motorway would have to be either very foolish or tired of life. Being in the right but dead would be a very hollow victory indeed!

**Peter Carr**
*Sawbridgeworth, Herts*

## Lawsuits over stray return currents

Further to the letter from Ronald Gee, Cincinnati Traction Company (CTC) had twin trolley wires after a lawsuit OVER stray return currents affecting the quality of telephone service. The Cincinnati and Suburban Telephone Co. and CTC had common ownership. The goal of the lawsuit was to force the take over of over-capitalized streetcar companies at cheap prices to consolidate all service under the CTC.

Twin wires for streetcars were also used in Tokyo and Havana. A little known twin wire operation was at the Fond du Lac station of The Milwaukee (WI) Transport Co. When abandonments isolated the No. 10 Wells route, operator training continued to be required. A trackwork complex was used at Fond du Lac for that training. Because of concerns of electrolysis, a second contact wire was suspended.

**Herbert Pence**
*Manchester, USA*

## Modern tram design shows little thought

I agree with Christopher Wiseman (*T&UT*, March), about the ugliness of modern European trams. There seems to be no attempt to put styling into low floor bodies, so their square corners combined with upright ends, running on very small wheels, makes them look like boxes floating on rails.

The Strasbourg design does not come under this category, but has the most non-tramlike front end I have ever seen. It is a disappointment to me that my home town of Nottingham has opted for the Adtranz design.

I find the design of most modern English buses far more attractive than modern European trams. As one of our older members recently remarked to me: "At least they look like buses!"

**Peter Jackson**
*Liverpool*

# Why rip up old permanent way when LRT could use it?

**I heard this week that Giles Fearnley, in his twin role as Chief Executive of Prism Rail and Chairman of the Blazefield Bus group, has suggested that loss-making rail routes be replaced by bus services.**

**I am old enough to remember the last time that happened - for a brief period 'Rail Replacement Services' appeared in bus timetables across the country, only to fade away in the decline of rural transport during the 1970s and 1980s. This time, I understand the proposal is not to replace railways by buses meandering through country lanes trying to divert to serve every former station, but convert existing trackbeds to guided busways.**

**As a loyal LRTA member, my initial reaction is - if there is already an existing permanent way, why rip it up and replace it with another? Could light or ultra-light rail provide a cost-effective solution?**

**One of the key issues is motive power. It would clearly not be cost-effective to electrify every lightly used rural rail line, so on-board power source is required. I understand that one of the Parry People Mover designs is aimed at rural branch lines and I look forward to the Stourbridge trials which are to take place this summer. Alternatively, would it be possible to install a diesel (or preferably a CNG or LPG) engine, coupled to a generator, on a light rail vehicle such as the Roadliner?**

**If such a vehicle were built to a low floor design then it would be relatively easy and cheap to provide additional stations along the route, and it may also be cost-effective to construct short extensions to serve more recent housing or business developments, or to link rail stations with their town centres where they are some distance apart.**

**Having said all that, one ought not to dismiss the guided bus option so long as passenger comfort and attractiveness can be maintained. A guided bus would offer more flexibility to serve wider catchment areas not immediately adjacent to existing rail lines, switch to the old rail trackbed to speed to the main junction station, then back onto the road to serve the town centre, shops, hospitals and bus station etc.**

**I believe this raises some interesting issues and no options ought to be dismissed out of hand. The key is to find cost-effective and pragmatic solutions which will attract the maximum number of passengers, existing and potential.**

**Geoff Stephenson**
*Harefield, Middlesex*

# Tramway success can also boost bus travel

C.R. Baldwin asserts that rail schemes are too costly in comparison with buses: "(Trams) were, are and always will be more costly and less flexible than rubber-tyred vehicles."

In the USA, approximate costs are USD 100 000 for a lightweight 10m bus, USD 250 000 for an air-conditioned 12m city bus, USD 500 000 for a similar trolleybus, and over USD 2 000 000 for a 28m LRV.

Buses can handle very large volumes of people. In the Lincoln Tunnel under the Hudson River between New Jersey and New York City, an inbound lane is reserved for buses in the morning peak hours. Operating on less than a 20-second average headway, buses carry about 10 000 people per hour in a single lane. This is the volume handled on one track of an intensely served underground line.

So buses are better and cheaper than rail? Horses make courses. In about 15 years the USD 250 000 bus is more expensive to maintain than the annualised cost of a new one. The USD 2.5 million LRV carries the load of two and a half buses and lasts twice as long. Two hundred buses in the Lincoln Tunnel need 200 drivers, but 30 underground trains can be operated by 30 drivers. Safety in the tunnel depends absolutely on steering in narrow lanes and stopping in time if the bus ahead stops short. Recently, in Seattle, a passenger shot the bus driver while crossing a bridge. The bus fell 50 feet, killing a passenger and seriously injuring 30 riders. A rail vehicle in similar circumstances would simply have come to a stop.

In the mid-1930s, Public Service Co-ordinated Transport of New Jersey replaced most trams with 600 dual-power 'All-Service Vehicles'. 400 new gasoline-electric buses with trolley poles were bought at USD 16 000 each, and 200 older gas-electric buses converted to dual power. All were 32-feet long and could carry perhaps 50 people with standees. On the petrol engine the bus was seriously under-powered. By 1948 they were all junk. PCC trams could be had for the same price: a 45-foot vehicle that can easily carry 90 people, that has excellent performance and comfort, and that can last 45 years! New Jersey Transit, Public Service's successor, today operates 24 PCCs, purchased used in 1953, in the Newark City Subway. As time went on, the volume of tram manufacture declined. By 1950 a PCC car cost twice the price of a diesel bus.

Rail systems certainly have a high investment cost. They don't make sense without really large numbers of riders. Where the potential is only a few thousand a day, the bus sharing public roads is the only real choice. In several cities across the US, notably Sacramento, St Louis and Portland, not only has light rail been a success, but bus ridership is way up as well.

**John Aurelius**
*South Orange, NJ USA*

# Deregulation has not resulted in nationwide bus decline

In the article on traffic charging, (March), there is attribution to Richard Knowles of the University of Salford of a statement that "in London bus passenger numbers have dropped by 29% since deregulation in 1986". There must be some confusion in what is quoted.

Deregulation took place outside London in 1986. London Transport's figures show an increase of 8% in bus usage from 1985/86 to 1996/97, contrasting with declines elsewhere - 23% down in Great Britain as a whole, and 40% down in English metropolitan authorities. The result is that in 1996/97, 28.5% of bus journeys in Britain were made in London against 20.4% in 1985/86 - an eloquent verdict on deregulation.

Experience on the continent may lend support to Richard Knowles' analysis: Carmen Hass-Klau and Graham Crampton, in the same issue, did not say there had been no switch from cars to light rail. How far this has been achieved with park-and-ride or otherwise may need examination. Moreover, continuing rise in car traffic on the periphery of towns should not obscure achievements for travel to the city centre.

**John S Wilson**
*Glasgow*

# Croydon overhead explained

The use of H-section columns to support Croydon's overhead may be functional, rather than elegant, when compared to the traditional tubular poles.

However, tubular poles cost significantly more than commercially available rolled steel sections, a factor which had to be recognised in bringing the cost of the Tramlink system down to a level which the Government was willing to afford. In such circumstances, it is unarguably better that the tramway is actually built, even if a degree of elegance has had to be sacrificed in doing so.

That said, the articles in the April issue of *Tramways & Urban Transit* have failed to appreciate what is actually being erected by way of overhead line equipment in central Croydon , as well as demonstrating a degree of ignorance in regard to the design issues involved in overhead line construction.

Most of the poles in Croydon are relatively slim, with short bracket arms supporting the contact wire for a single track. There are areas where long bracket arms are used to support double track overhead from single side poles - these poles are, of necessity larger and taller in order to support the additional weight. They also need significantly larger foundations and are not used without good reason.

The quantity of statutory undertakers' plant in the pavements of Croydon is considerable and there are many instances where planting pairs of single-track poles would be impractically expensive in terms of the Utilities diversions which would be required.

Much criticism has been levelled at the existence of a number (actually quite small) of heavy poles. It is the desire of all concerned with the promotion and construction of the Tramlink system to avoid the multiplicity of poles for which the Metrolink was, rightly, criticised and the OHLE designers have, by the use of backbone wiring and pull-offs, managed to engineer a design which avoids an excessive number of poles.

However, the strain which is imposed on the few remaining poles at a location such as the junction of Station Road with Wellesley Road, where the track turns through almost 120 degrees, is high, hence the 34 x 34 cm pole to which Graham Feakins refers.

Each of the twin contact wires, necessary to achieve the current rating required to avoid the use of parallel feeder cables, is under considerable strain - which, when applied via the pull-offs to the top of the pole, results in a very considerable force trying to both bend the pole as well as overturn its foundations.

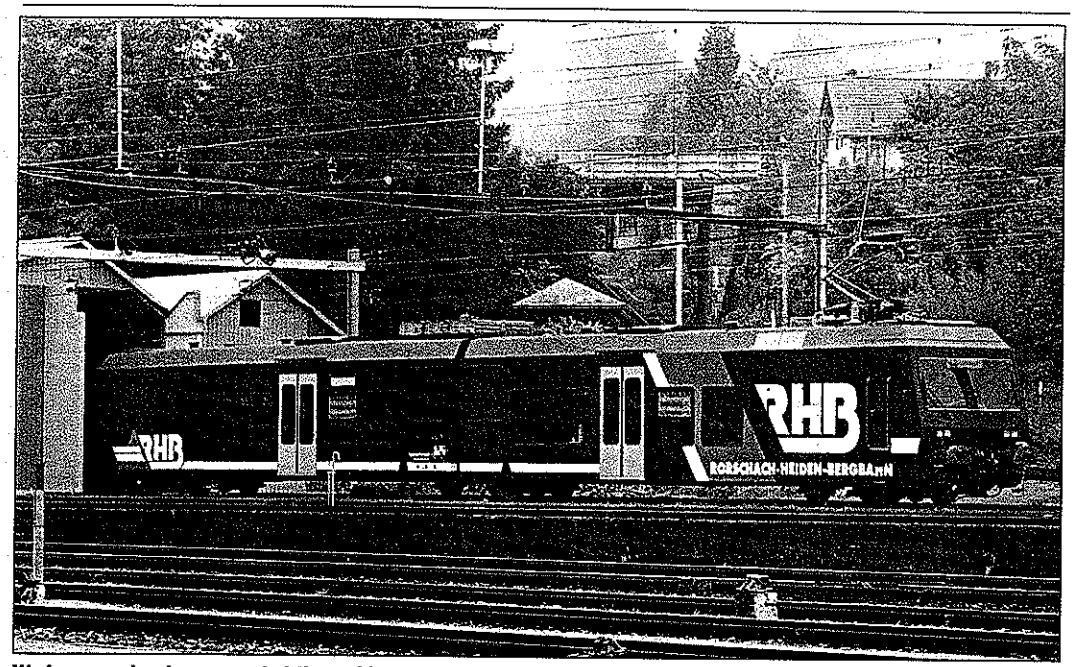
The use of such high wire tensions is not dictated by tram speed, which will typically be in the order of 40-50 km/h in street, but by the need for the wire to be kept above the 5.2m minimum height required by statute in the event of any one support failing. The traction poles are typically about 25m apart in the street sections, so that the design has to be such that the sag in a double span, ie 50m, is kept within the required limits.

The option of using shorter spans would have required even more diversion of Utilities' plant than the already considerable amount required to build the system as it now is, and as such would undoubtedly have further increased the costs without any corresponding benefit in terms of value for money.

The Tramlink system is not without building fixings - there is only one pole in the entire length of the western half of George Street. However, there are many other streets where the use of building fixings is impractical - few buildings in the Church Street/ Tamworth Road/Station Road sections of the system are both tall enough and strong enough to support such fixings and in the right place relative to the span lengths required.

Even where a building is physically capable of holding a building fixing, its permanence has to be considered; there are parts of the town centre where redevelopment is a real possibility and the question of how the overhead is held up once the building supporting it has been demolished has to be considered.

**James R Snowdon,**
*Technical Manager*
*Tramtrack Croydon*




**We have previously commented that vehicle bodies are now swamped with advertising - but system logos also seem to be increasing in size as well. This is demonstrated on new Stadler/ADtranz-built BDeh3/6 rack railcar for Switzerland's Rorschach-Heiden-Bahn, which was delivered last September. The three rack-driven wheels are on the lower end of each truck.**
*C.T. Wagner*

## We have to recognise the value of the bus

Ken Glazier (March issue) is right, the common enemy of all public transport is the car, and it is going to prove nearly impossible to get the motorist to leave his car at home and to use any form of public transport.

We have got to recognise the value of the bus. One of the biggest improvements in this area in recent times has been the introduction of bus services last November to help encourage motorists to leave their cars at home.

Not even the most ardent tram supporter would suggest extending the Seaton tramway to such places as Taunton, Exeter and Dorchester which are the destinations that have been opened up by the introduction of these new bus services.

However, I would most emphatically disagree with Mr Glazier in saying that the bus has no longer to be dreaded in certain aspects. There are too many people such as Britain's Deputy Prime Minister John Prescott who still regard the bus as an efficient and cheaper substitute for modern tramway systems, and we should not hesitate to expose the shortcomings of this form of transport whenever applicable.

The bus is acceptable in its place, but not as the backbone of a major transport system and as long as the bus is regarded as the major form of transport, you will never get people out of their cars.

**John Barrie**
*Seaton, Devon*

## Narrow escape – why was no-one bothered?

I found the article on the Monte Generose line most interesting. Last August I was on holiday in Lugano, and I decided to go on the trip.

I went by boat to Capolago Lago where I boarded the train, which was very full. As we climbed the mountain, I think it was after the second passing loop, we entered a tunnel on a curve.

On leaving the tunnel we came face to face with a train coming down the mountain. Quick breaking soon brought us to a stand. Our driver proceeded back to the loop with the other train following where we passed the other train. The most amazing thing was that no-one seemed to be at all worried about it.

If we had met in the tunnel the result could have been a serious accident, even at a low speed. As an admirer of all Swiss railways I was quite surprised that something like this could happen. Most mountain railways are run on a train order system where trains are given orders where to pass other trains, so someone was at fault.

I wonder if Sig. Sergio Baranco would like to comment? .

**D.E. Grant**
*Chesham, Bucks*

*Letters may be faxed to 01487 832001 (International +44 1487 832001), or sent by e-mail to hj@howardj.demon.co.uk.*

*They should be clearly typed, and preferably not handwritten.*

**Please write - but please be brief!**

# Begg criticises 'less enlightened'

Deputy Prime Minister John Prescott is leading a transport revolution, his close advisor Professor David Begg told the audience at the launch in London of a 'daughter document' of the Government's White Paper on Integrated Transport.

Professor Begg, Convenor of Transportation on the City of Edinburgh Council and transport spokesperson for the Convention of Scottish Local Authorities, was speaking at the conference at which Mr Prescott launched his buses paper.

He said: "Sustainable transport policies are now being pursued, not just for environmental reasons but also because the Government believes that this agenda is crucial if social exclusion is to be reduced and the economy is not to be strangled by intolerable traffic congestion."

"The bus", he said, "will have to play a critical role in this transport revolution. The bus may not be as sexy as rail, or attract as much media coverage, but it plays a far bigger part in moving people. Each year, five times as many bus trips are made in the UK as rail trips."

He said we only need relatively small increases in bus patronage to transform the economics of the industry. Car trips account for 87% of land passenger kilometres travelled in the UK each year. If this was to reduce by just 1% and these kilometres were to switch to bus, bus passenger kilometres would grow by almost 17%. If we were to get an extra two passengers on every bus, the industry's revenue would increase by £400 million per annum.

Too much emphasis had been put on bus deregulation and privatisation in the debate on why the bus industry had been losing passengers, he said. The main reason for the decline of patronage has been the relentless growth in car ownership - for every extra car owned in the UK there are 350 fewer bus trips made each year. We need, he said, to emulate Germany where car ownership is higher but car use is lower.

The other crucial factor has been the economic decline of town and city centres and the drift to car-based out-of-town retail and business parks. In Edinburgh 60% of shoppers in the city centre arrive by bus, whilst at the city's out-of-town centres only 5% do so.

He held up as an example of what fully integrated transport and planning can achieve the Brazilian city of Curitiba where 15 years ago a visionary Mayor, who also happened to be a town planner, accommodated significant growth in the size of the city by permitting development only along high frequency bus corridors. He said the outcome is impressive with one of the most sustainable cities in South America.

He claimed evidence of the importance of good planning policies can also be found in Edinburgh which he said has the highest bus modal split in the UK with 32% of trips to work made by bus. The city, he said, was ideal bus territory, with a strong city centre and large numbers of residents living in close proximity to high frequency bus corridors. He said it is also much more European in character, with large numbers of people living in the city centre.

Professor Begg said the most inefficient use we are making is that of road-space. On five of the main routes into the city Edinburgh has implemented greenways, taking space away from cars and reallocating it to buses.

Greenways have been a remarkable success he said. "After 40 years of continual decline in bus patronage the market is now growing again. There are now 750 000 extra bus journeys being made on greenways corridors, and we have witnessed an improvement of bus speed of up to 50%. The improved reliability of the bus operation, the reduction in operating costs and the growth in patronage means that the bus revolution has already started in Edinburgh."

He said he was "fed up with the tram versus bus debate. Edinburgh has been pursuing a very radical bus-based strategy. It is a strategy that has met with opposition, not just from motorists but also from the less enlightened members of the train and tram lobby who are disparaging of any improvements to public transport unless it is steel wheels on steel rails. They argue that the bus will not succeed in getting motorists out of their cars. From what we have been doing in Edinburgh, I can tell them with certainty that they are wrong!

"The tender for the City of Edinburgh Rapid Transit (CERT), a guided bus system operating on six miles of segregated track, will be awarded later this month. State of the art modern buses - which look like the most advanced tram system - will provide a high frequency service from Edinburgh Airport and park-and-ride sites on the west of the city to the city centre.

"We are predicting that 30 000 passengers a day will be attracted by a journey time of 15 minutes to use the services. Real-time information, integrated ticketing and excellent customer care will be the hallmarks of the new system."

Professor Begg said that the guided bus scheme would cost £50 million whilst the two light rail lines being urged on him would cost £500 million. He said he would love to get trams running in Edinburgh but didn't want to be criticised "for doing the best we can."

He said that the two light rail lines would take all of the revenues from the proposed road pricing system for ten years leaving nothing for other improvements. He added: "We need to re-brand the product and transform the image of the bus. We can do it and it is already happening in numerous places in the UK.

"When I was a boy you only ever saw Lucozade in the house when someone was ill or when my grandmother visited! Now it is fashionable to drink the product amongst the younger age group.

"The product is the same, but it has been repackaged and the marketing has been transformed. When we achieve the high quality bus product we are working towards then the marketing has to be as slick as the Lucozade example." **Bob Tarr**

## Appointed head of integrated transport commission

**Professor David Begg has since been named as the Chairman of new Commission for Integrated Transport. He is currently Convenor of Transportation on the City of Edinburgh Council, and is Transport Spokesperson for the Convention of Scottish Local Authorities.**

**Under his Convenorship, the City of Edinburgh has gained a reputation as one of the most radical and pioneering local authorities in the UK. The Council's *moving* FORWARD transport strategy has set ambitious targets to halt the growth in car commuting by 2000 and reduce levels by 2010.**

**During his five years in charge of the transport brief, a series of radical and innovative measures have been delivered. The Royal Mile, in Edinburgh's medieval Old Town has been redesigned to create more space for people.**

**This has created a better environment and has added £25 million of extra spend per annum. Cars have been removed from the north side of the city's premier shopping street, Princes Street, and plans are being progressed to make the street comnpletely car-free.**

**The Scottish Office has just given the go-ahead to the Edinburgh Crossrail project that will extend passenger rail services across the city, serving new stations in the south east of the city. Work will also begin shortly on the City of Edinburgh Rapid Transit (CERT). This guided busway project will also include a new railway station at Edinburgh Park, a major business on the west side of the city. There will be two park -and-ride sites with car parking space for 1400 vehicles.**

**Professor Begg said: "This new post will be my greatest challenge yet. The Commission will be much more than a talking shop. We will start by completing the process begun by the White Paper - winning hearts and minds to the aim of more sustainable travel. We will make sure the Government achieves what it has said it will do.**

**"That doesn't mean we are against car ownership. We are aiming for responsible use of the car and want to see a reduction in traffic in those places and streets where environmental damage is worst.**

**"Edinburgh has introduced some radical and innovative measures including Greenway bus priority corridors and the UK's first City Car Club, but what is right for a historical city like Edinburgh is not necessarily the best way forward in other cities or rural areas. The best approach will be determined at local level; we need to see transport plans working in tandem with development plans to tackle congestion wherever it occurs."**

**Professor Begg is Chair in Transport at The Robert Gordon University Aberdeen, where he heads a team of researchers at the Centre for Transport Policy. He was a member of the panel of experts appointed to advise on last year's Transport White Paper.**

**He is also a member of the Scottish Office's National Transport Forum and a Non-executive Director of the British Railways Board, and a director of the Centre for the Management of Traffic and the Environment (CMTE).**

**Sir Trevor Chinn has been appointed vice-chairman of the Commission.**

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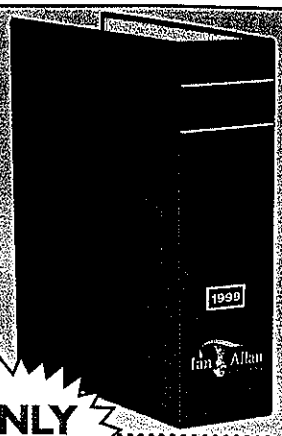


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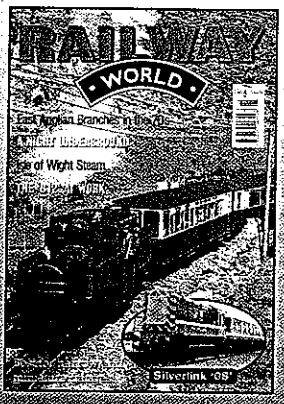


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# WORLDWIDE REVIEW

## AUSTRALIA

**ADELAIDE.** The SA Government has approved funding for the refurbishment of another six H-class trams, to join the 11 already completed (357/8, 361 (ex-363), 364/5/8/9/71-3 and restaurant tram 378). The choice of the six will be made from the 10 unrefurbished cars 351, 363 (ex-361), 367/70/4-7/9/80. Tram 360 from the St Kilda museum is to be restored to 1929 appearance with the help of state funding, in readiness for the 70th anniversary of the line in December. *(TW*

**BENDIGO.** Work is in progress on the conversion of ex-Melbourne 976 into a restaurant tram. *(TW*

## AUSTRIA

**STERN & HAFFERL.** The first of the ex-WSB Swiss railcars, ET 23 111 (ex-WSB 7) is in service on the Gmunden–Vorchdorf line, and will soon be joined by ET 23 112 (ex-WSB 8), displacing ET23 109/10 to Vöcklamarkt–Attersee. *(SM*

**WIEN (VIENNA).** ULF class **B** trams made an appearance in passenger traffic on route 6 from 30 January. *(EB*

## BELGIUM

**BRUSSEL/BRUXELLES.** Increasing concern by tram and bus drivers over assaults on staff led to no fares being collected on 2/3 March. On 3 March MIVB/STIB decided to deploy 20 squads of two or three security personnel, and recruit more inspectors. After completion of work on the conversion of PCC 7042 to a double-ended driver-training tram, Cureghem works will now convert 7052 in the same way. The first of the new series of metro cars, 231+232, has been delivered by Bombardier; there will be 5 two-car and five three-car sets. *(HOV, T-2000*

**DE LIJN (VVM).** It is proposed to order 43 more low-floor trams, in addition to the 45 already ordered/optioned. 29 would be allocated to Antwerpen and the remainder to Gent. For the Siemens trams already under construction, Antwerpen will receive the first on 4 June, followed by the first for Gent on 27 July. *(HOV*

## CANADA

**CALGARY.** The 16 March meeting of the city council approved the CAD 183.5 million plan to expand the light rail network, dependent upon a funding commitment from the province and appointment of a private sector partner. *(City of Calgary*

**VANCOUVER.** The new Greater Vancouver Transportation Authority, TransLink, replaced BC Transit within the Vancouver area from 1 April. It will be overseen by another agency, the long-existing Greater Vancouver Regional District, which also manages the region's water/sewerage systems. In addition to mass transit, TransLink has authority over certain roads and bridges. It was created to give local people more control over transportation planning and funding, since British Columbia province has long be criticised for ignoring or overriding local wishes. SkyTrain and the West Coast Express are separate divisions within TransLink, while the division covering buses and the SeaBus ferry has been named Coast Mountain BusLink; its new general manager is David Stumpo, previously General Manager of San Francisco's Muni. *(S. J. Morgan*

**The city of Lodz in Poland has a large metre-gauge tramway system, mostly worked by Konstal 105N trams, such as 1709 at Plac Wolnosci, also demonstrating the latest livery of maroon and yellow.** *A. P. H. Velthoen*

## CHINA

**HONG KONG.** Rolling stock for the KCRC West Rail project is to be supplied by Kinki Sharyo/Kawasaki of Japan, and will also be used to boost the existing fleet on the Lo Wu–Hung Hom line. 96 cars are earmarked for the latter (in 2001) and 154 for West Rail (in 2002). The contract for signalling and train control has been awarded to Alcatel. Public service on the Kowloon–Tuen Mun line is scheduled for the second half of 2003. *(RGI*

## CZECH REPUBLIC

**OLOMOUC.** *Astra* low-floor trams 201/2 have joined the fleet. 201 carries a new white, red and blue livery, while 202 is in all-over advertising. *(BS*

**PLZEN.** The two 1997-built *Astra* trams have been acquired as 300/1; 300 was first tested in Ostrava as their 1201. Two additional *Astra* trams (302/3) have been built new by Skoda. *(BS*

## DENMARK

**KØBENHAVN.** DKK 924 million is to be invested in a scheme to divert Hellerup–Vanløse *S-tog* trains away from Vanløse over 5-km of new tracks to Sjaelør. East of Vanløse a new interchange station will be created at Flintholm, while the new terminus at Sjaelør will permit interchange with the Køge and airport lines. Vivendi subsidiary Linjebuss has placed an ECU 7.5 million order with DAF/Berkhof-Jonckheere for 34 LPG-fuelled buses for use on local services in the Danish capital. *('Ligeud', TP*

## EGYPT

**EL QAHIRA (CAIRO).** The urban tram system has been reduced to just three routes in the north (8. 9 and 12) served by about 15 operating trams. *(J. J. Carels*

## ESTONIA

**TALLIN.** ADtranz has put proposals to the city council for private sector partnership in the construction and operation of two light rail lines to supplement the existing tram network within five years. *('New Europe'*

## FRANCE

**BORDEAUX.** The council of the urban community is inviting a package bid for the supply of 38 low-floor trams to its own design, 22-km of double-track tramway and associated electrification, with the option of a new system not using overhead wire, plus maintenance of vehicles and infrastructure. There will also be an option for 32 more trams. *(TP*

**CLERMONT-FERRAND.** The city has been awarded a grant of FRF 3,6 million from the national research programme to act as the testbed for the optically-guided trolleybus system *Civis* promoted by Matra-Renault (though a competitive tender process will permit other consortia to bid using similar technology). *Civis* uses a new design of combined wheel and motor which in turn uses a new design of Michelin 'super single' rubber tyre. The headquarters of Michelin is located in Clermont-Ferrand. It is hoped to start work by the autumn of 2000 on a reserved alignment linking Place du 1 Mai and Place Allort a Royal via Gare SNCF. *(TP*

**LILLE.** The inauguration of the 12.7-km VAL metro extension from Fort de Mons to Tourcoing has been delayed until late summer to allow more time fore testing the new rolling stock (60 VAL 208 sets). *(T-2000*

**LYON.** A full-scale mock-up of the new 100% low-floor Citadis tram design was displayed at the Lyon Fair from 19-23 March. The prototype of the 43 on order is due for delivery around the turn of the year. *(T-2000*

**STRASBOURG.** A new ticket is a Family Pass, costing FRF 25 for one days unlimited travel for two adults and two children. Also new is the EUROpass, valid in both Strasbourg and public transport in the German Ortenaukreis Verkehrsverbund, including SNCF and DBAG trains. *(T. J. M. Vis*

## GERMANY

**DARMSTADT.** Steam tram operation this year will be on Saturdays from 22 May to 20 June between Schloss and Eberstadt, and on Sundays between Eberstadt and Alsbach. *(SM*

**FRANKFURT/MAIN.** The 600-m extension of the *Stadtbahn* subway from Zoo to Ostbahnhof will be opened for use by line U6 from 29 May. The subway platforms at Ostbhf are presently limited to 70 m, but

agreement has been reached with DBAG to extend them to 102 m by tunnelling under the rail station. *(SV*

**HAMBURG.**The city council has decided that a 3.8-km *S-Bahn* extension should be built from Ohlsdorf to Flughafen. *(F. Muth*

**HANNOVER.** The Wettbergen extension and the Legionsbrücke subway section will be opened from 30 May, when a new route 17 is introduced: Wallensteinstr–Schwarzer Baer–Steintor– Aegidientorplatz. The tramway network during EXPO 2000 will include the following changes:

1, Langenhagen–Sarstedt;
2, Alte Heide–Rethen/Laatzen (alternate cars);
6, Expo-Ost–Nordhafen/ Haltenhoffstr (dividing trains);
9, Empelde–Buchholz/Lahe;
11, Zoo–Freundallee (Expo-Ost at peaks);
14, Misburger Strasse–Expo-Ost;
16, Königsworther Platz–Expo-Ost;
18, Hbf-Messe (express service E at peaks).

Routes 3, 4, 5, 10 and 17 will be unchanged. Route 8 will be withdrawn. Ticket sales on trams will cease in December. *(F. Muth*

**HEIDELBERG.** The city council has voted in favour of the Kirchheim–Römerkreis tramway. From 30 May route 1 will be cut back from Schriesheim to Bismarckplatz, and replaced by an OEG 10-minute service to Schriesheim. *(F. Muth*

**KASSEL.** The first new low-floor tram, 601, arrived on 19 March. *C. T. Wagner*

**MAINZ.**Five more low-floor trams are to be ordered, four to replace ex-Bielefeld *Stadtbahn-M* cars 277-80, and one for the extension of route 8. *(SM*

**MÜLHEIM/RUHR.** Six 1976 *Stadtbahn-M* eight-axle trams are being overhauled with new electrical equipment by Mittenwalder Gerätebau. The company is building 11 low-floor centre sections to extend six-axle *Stadtbahn-M* trams. *(SV*

**NAUMBURG.** The tramway operates on 29 and 30 May, 14.00 to 18.00. *(SM*

## GREECE

**ATHENAI.** With deliveries of 192 new trolleybuses due before the Olympic Games in 2004, prototypes have been produced and are being tested on other European systems. The Alstom/Van Hool vehicle has been on trial in Gent (BE), while the Kiepe/Neoplan vehicle has appeared in Solingen (DE). *(T-2000, SV*

**THESSALONIKI.** The 9.4-km metro with 14 stations will cost ECU 533.5 million to build. Via GTI has been awarded a 20-year contract to operate and maintain the system from its opening in 2004. *(TP*

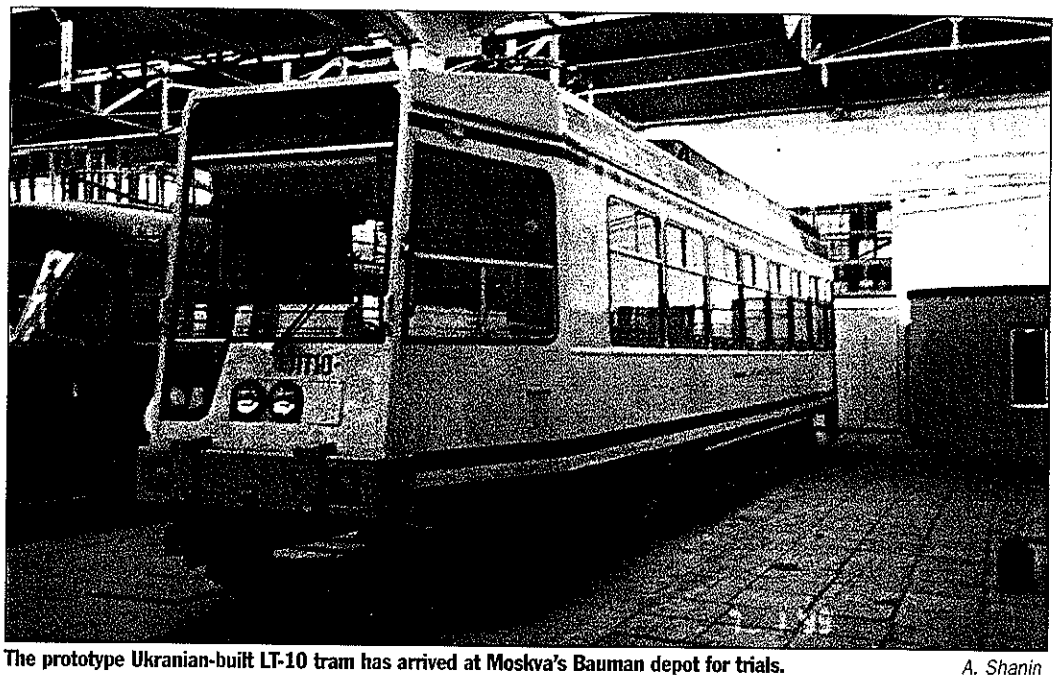
## HUNGARY

**BUDAPEST.** A row between the state and city authorities (following a change in political control on the city council) has led to state funding for metro line 4 being cancelled. HUF 1800 million has already been spent on the project. The city council is trying to collect 1.5 million signatures on a petition for the state to reinstate its 60% funding. *(EB*

## ITALY

**FIRENZE (FLORENCE).** Finance has now been agreed for the second new tram line, 10 km from Peretola airport to Piazza Beccaria, estimated to cost ITL 260 000 million. *(SV*

**MILANO.** Metro line 1 is to be extended from San Giovanni to Monza. The one day (ITL 5000) and two-day (ITL 9000) passes cover all types of public transport which are within the city boundary, including the FNM/FS *Passante* regional metro. The opening of the Malpensa Express airport link service is being brought forward to 30 May. FNM will provide a half-hourly service taking 39 minutes from airport to the city centre. It is planned to increase the service to every 15 minutes, and reduce the journey time to just 30 minutes, by 2002. *(RGI, T. J. M. Vis*



**The prototype Ukranian-built LT-10 tram has arrived at Moskva's Bauman depot for trials.** *A. Shanin*

# Barcelona signals a return to tramways

**The powerful term 'light rail' (no one outside the UK seems to understand the strong symbolic value represented by the term 'light rail', a foreign-language term 'English ' used by many outside the Anglo-Saxon orbit to convey a message) in its untranslated English-language original form is now entering the Catalan and Spanish vocabularies. So what is being prepared at Barcelona should be called 'light rail', or, alternatively, as its promoters say, the Trambaix'.**

**According to the latest studies, there will be a three-route tramway system between Barcelona and the suburbs of Esplugues, Sant Just Desvern, Sant Joan Despí, Cornellá and Sant Feliu. All tram lines will have their city terminus at Francesc Macia Square, within walking distance from city centre, from where they will in a southern direction follow the Diagonal Avenue until Hospitalet, from where there will be several branches.**

**Backbone will be tramline T-1, with 7.5-minute headways, from Francesc Macia to Esplugues and Cornellá, a total length of 8.0 km. Tramline T-2, with 15-minute headways, from Francesc Macia to Esplugues and Sant Joan Despí will have a length of 9.0 km. Tramline T-3, with 15-minute headways, from Francesc Macia to Sant Just and Sant Feliu will have a length of 8.8 km. There are partial overlaps between the lines. Total trackage length will be 13.6, of which, surprisingly, 1.0 km single-track, in particular to cope with Cornellá's narrow historic streets. Total construction costs including rolling stock estimated at PTE 23 800 million.**

**Under study is a cross-town extension in a northern direction from Francesc Macia to Diagonal Mar. There is also serious talk of extending line T-1 from Cornellá to Castelldefels, a coastal resort town. The Barcelona planners are under instruction to keep tramway construction costs to a minimum, avoiding expensive tunnels. So the tram will ride on reservation on the median strip or on a lateral strip of the wide avenues.**

**At several points, a solution must be found for crossing very busy roads, railways and metro lines. At Esplugues, an underpass underneath motorway A2 must be built. At Cornellá, the tram line must cross a very busy highway junction, which is further complicated because of the nearness of metro and rail lines there.**

**The tram terminus at Cornellá will be integrated to form a three-level rail interchange, at the street level the tram line T-1, at underground level in tunnel metro line 5, and on top of it all RENFE's mainline station. Once tramline T-1 will have been extended beyond the Cornellá terminus, it will go to Castelldefels. Alternatively, the extension of T-1 may not reach Castelldefels, but make a wide loop instead, and link up with the FGV metre-gauge suburban network. The future tramway depot and repair works will be located at Sant Joan Despí.**

**Barcelona seeks a fleet of 17 LRVs, in the form of 30-meter long bi-directional trams of a modular design, meaning that the vehicles should be extendible to 40 m length, with doors on both sides, standard-gauge. Life cycle must be no less than 40 years. There is talk of installing 1200 V overhead tension for the tram, which would facilitate a 'Dual-system' solution, as the 1200 V tension is also used by several Barcelona metro lines.**

**The metro of Barcelona now has a length of 76 km, and new metro construction is seen as almost unaffordable. One new km of metro costs at least PTE 5000 million. One km of tramline can be had at a minimum of PTE 1000 million. So at Barcelona, a metro is five times more expensive to build than a light rail line.** *(C. J. Wansbeek*

## JAPAN

**FUKUI.** Fukui Railway car 607 is a rebuild of Nagoya metro Meijō line car 1111, but employing 1067-mm gauge bogies, pantographs and other equipment which has been salvaged from a scrapped Toyohashi Railway 1900-series car. It is planned to create a car 602 in similar fashion. *(L. W. Demery*

**HIROSHIMA.** The Siemens *Combino* was flown in on 13 March, one week earlier than expected. *(Y. Nogi*

**NAGOYA.** Nagoya Railway has proposed closure of six branch line segments:

Kurono–Hon-Ibi (5.6 km), Ibi line;
11.2-km Tanigumi line, Kurono–Tanigumi;
7.3-km Yaotsu line, Akechi–Yaotsu;
Sanage–Nishi-Nakagane (8.5 km) on the Mikawa line;
Heki-nan–Kira-Yoshida (16.4 km) on the Mikawa line;
Egira–Ôsu (6.7 km) on the Takehana line. *(L. W. Demery*

## MALAYSIA

**KUALA LUMPUR.** For the record, the PUTRA automated light metro Kelana Jaya–Pasar Seni was opened for free rides from 15 August 1998, and for revenue service from 1 September, but the interchange station KTM-sentral is not yet complete, and

**The ex-Lisboa enclosed trams can now be seen in service on the Sollér tramway on the Spanish island of Mallorca. Car 20 is seen at Pl Constitucio.** *C. Stannard*

trains do not stop. Fares range from MYR 0.90 to MYR 3.50, using magnetic tickets. Fares on the STAR light metro range from MYR 0.80 to MYR 2.50, and have a maximum validity of two hours. Patronage is lower than predicted. *(T. J. M. Vis*

## NETHERLANDS

**AMSTERDAM.** Following the *Combino* visit, Alstom were given the opportunity to demonstrate Magdeburg low-floor tram 1314 in Amsterdam during the second half of March. Recent filming involving tram 602 also saw the film company create a replica 602 to run on rubber tyres off the track using the front and rear sections of withdrawn 617, and the centre section of 612. The city is promoting a short tramway extension from Stadionplein to De Boelslaan to serve the VU hospital. Plans are also being worked on to use the tracks laid along Haarlemmer Houttuinen in 1990, but never used; route 3 would be extended to Centraal Station. *(HOV*
**DEN HAAG.** The new route 17 was carrying 9000 passengers/day after five weeks of operation; its extension to Lage Veld is scheduled for 23 August. The latest estimate for the completion of the tram subway under Grote Marktstraat in mid-2001. *(HOV*
**ROTTERDAM.** Permission has been given to invite tenders for 60 low-floor trams for delivery over five years from 2001. Passenger traffic on route 20 continues to grow, and in the evening peak trams now run every four minutes. ADtranz has been awarded a contract to overhaul the metro cars of series 5201-71; the work will be carried out in Berlin from May 1999 to December 2000. *(HOV, OR*

## POLAND

**WARSZAWA.** All major stops have been equipped with machines which sell the full range of tickets: single PLZ 1.40 (PLZ 2.80 suburban) day pass PLZ 4 (PLZ 8). A family day pass for two adults and up to three children costs PLZ 8, or PLZ 14 for a weekend. *(T. J. M. Vis*

## PORTUGAL

**PORTO.** Construction work for the light rail subways under the city centre started on 15 February, involving sinking a shaft outside Campanha station to permit a boring machine to work from there to Trinidade. Work also started at Senhora da Hora on the link to Matosinhos.
**SINTRA.** Ex-Lisboa trams 615, 703/9/37 are stored in the lower depot at Ribeira. *(I. F. Cresswell*

## ROMANIA

**BUCURESTI.** Routes 5 and 33 have been combined as route 5, and routes 16 and 40 as 16, reintroducing through operation across the city centre. The isolated shuttle services 28 and 29 were withdrawn at least two years ago. New tracks have been laid on Str Expozisie with an intermediate loop at the exhibition, and are served by route 42 from the east and new route 6 (Expo–V. Pirvan). *(T. J. M. Vis*

## RUSSIA

**MOSKVA.** One of the two new **KTM-19** bogie trams was displayed for the first time at the PROMOTRANS-99 exhibition on 2-5 March. The rebuilt Tatra pictured in our last issue made its first trials on route 11 on 7 February. The city council has invited bids for light rail lines from residential areas feeding metro stations: Krematorium–Novokosino –Metro Novogireevo; Zhulebino–Metro Vikhino; Mitino–Metro Skhodnenskaya or Planernaya; Butovo–various metro stations. Bauman depot is hoping to restore a **KTM+KTP** two-axle tram set from Tula and an **RVZ-6** from Kolomna in time for the centenary of tramway operation, planned to be marked on 4/5 September. The new unlimited travel tram/bus/trolleybus tickets went on sale from 1 April, priced at RUR 5/25/45 for 1/5/10 days. Metro tickets for 1/2/5/10/20/60 rides cost RUR 4/8/15/30/60/120, or there are smartcards for 3/12 months for RUR 340/1600 (plus RUR 30 deposit). Calendar month tickets cost RUR 120 for the metro or RUR 240 for bus/tram/trolleybus. *(N. Semyonov*
**NOGINSK.** The 75th anniversary of tramway operation was celebrated on 2 March by a parade between Domozhirovo and Zakharovo, featuring **RVZ-6** 7, **KTM-8** 1, 4-6 and the snowbroom. Roving conductresses sold tickets for RUR 2, using a batch of three-kopeck tickets dating from 1980. The newest **KTM-8** is car 11, while car 3 is a similar design acquired from Kolomna. *(N. Semyonov*
**SANKT PETERBURG.** Correcting our March report, metro line 4 was extended from Tchkalovskaya to Staraya Derevnya from 14 January. An intermediate station at Krestovskiy Ostrov will be opened later. A tramway feeder route has been introduced to the new terminus from Prospekt Ispitateley via Torfyanaya Dorogo, but at the same time trams in Ulitsa Savushkin and part of Kamenoostrovskiy Prospekt were abandoned.

## SPAIN

**ALICANTE.** Six weeks of trials with the Siemens *Combino* between Plaza de Mar and Albufereta started on 24 March, using a newly-laid demonstration track and part of the Alicante–Denia FGV line. *(M. Abbott*
**BARCELONA (FGC).** Electrification from Martorell to Igualada was completed to co-incide with the introduction of the eight new class **213** CAF/Alstom low-floor EMUs from 1 February. Another 12 sets are on order *.(SV*
**BILBO (BILBAO).** 10 metro train sets have been ordered from CAF/ADtranz for the new metro line 2. *(RGI*
**BILBO–LEÓN (FEVE).**
The year 2001 will see the return of passenger trains over this metre-gauge line under administration of FEVE. This is one of Europe's most exciting rail lines, through an appealing area with a high touristic and cultural interest. The stretch between Matrallana and Bercedo-Montija was closed in December 1991, due to its poor state of maintenance. This meant that an isolated part remained in service at León, which became a metre-gauge island Two years later, in November 1993, the short segment between Cistierna and Guardo re-opened, extending the metre-gauge 'island'. But there still remained a very long missing link between Guardo and Valmaseda near Bilbo. In July 1998, a formal agreement was signed between FEVE and the Regional Government, the *Junta* de Castilla y León. The cost of PTE 7000 million to bring back Bilbo to León passenger trains over metre-gauge track will be split equally. The thrust of the agreement is to reinstate passenger traffic over the 200-km stretch between Bilbo and León. The route is as follows: León - Matallana - Cistierna - Guardo - Arija -Barcedo-Monitja - Valmaseda - Bilbo. The upgrading and overhaul under the new agreement concerns the long stretch between León and Valmaseda and covers several important activities: renewal of tracks between two stretches: (1) Guardo and Mataporquera at a cost of PTE 1700 million, and Ercina-Guardo at a cost of PTE 1500 million.
At the moment, work on upgrading both these stretches is in progress and contracts have been awarded; track renewal as well as renewal of stations between Arija and Valmasedas at a package cost of PTE 1200 million. At Matallana, there is a short branch line going west, which will also be upgraded, at a cost of PTE 300 million. Another PTE 300 million will be spent on upgrading tracks near Matallana; works are undertaken with a view to constructing a future new suburban line, which will connect the inner city of León with the university campus, most of it over existing (dormant, but soon to be reused) tracks. This latter concerns the stretch between León and León-Hospitales, near the university, where the expected frequent suburban-style services demand heavier track, welded rails of 54 kg/m will replace existing 35 kg/m tracks. *(C. J. Wansbeek*
**MADRID.** 3 March saw the inauguration of the 2.8-km metro extension of line 1 from Miguel Hernández to Congosto, built at a cost of ESP 8900 million. *(RGI*
**OVIEDO (FEVE).** 4 February saw the inauguration of a cross-city link for metre-gauge trains, also providing interchange with the RENFE station. FEVE has taken over and regauged the RENFE line to Trubia and the 1500 V dc electrification from Gijón is being extended from El Berrón to Oviedo and Trubia. The old metre-gauge alignment from Oviedo to Fuso de la Reina has been closed. Total cost of the project is ESP 7000 million (including ESP 5200 million

from EU funds). *(RGI*

## SWEDEN

**NORRKÖPING.** The current fare is SEK 14 off-peak, SEK 18 at peaks, or a four-hour MAX-billet for SEK 70 (from machines for smart card holders). The 24-hour ticket costs SEK 100. *(T. J. M. Vis*

**STOCKHOLM.** The first of the 12 new Bombardier/ADtranz **A32** articulated trams for the Alvik–Gullmarsplan light rail line, 401, was unveiled at ADtranz in Västerås on 25 February and delivered to SL's provisional depot at Lilleholmen on 23 March. The 30.4-m six-axle car is 2.65 m wide, accommodates 211 passengers (78 seated), weighs 37.5 t and features a 350 mm floor height at the doors, 400 mm throughout 72% of the car, and 580 mm over the motor bogies. The first part of the new line was electrified from 27 January and initial tests were carried out using **A30** tram 303 transferred from the Alvik–Nockeby route 12. Passenger service should start on 16 August. The Arlanda Express dedicated airport rail service from T-Centralen is due to be inaugurated on 20 August. *(Tåg*

## SWITZERLAND

**ARTH-GOLDAU–RIGI (RB).** CHF 30 million is to be invested in the rack railway over the next 15 years. The present Arth-Goldau terminus above the SBB station will be replaced by a facility parallel to the main line tracks. *(EA*

**BASEL.**34 diesel buses using the latest environmental technology have been ordered from MAN to replace trolleybuses on route 34, by merging it with bus route 37. *(SV*

**MEIRINGEN–INNERTKIRCHEN (MIB).** Ex-OEG railcar 6 has had a large diesel engine installed in the former passenger compartment and now fulfils shunting duties as a full diesel 'locomotive' Bm4/4. *(EA*

**YVERDON–STE-CROIX (YSC).** Two Be2/6 low-floor articulated cars have been ordered from Stadler/ADtranz at a cost of CHF 9 million. *(RGI*

## THAILAND

**BANGKOK.** It is hoped to open the first elevated section of the BTS rapid transit line on 5 December. Construction of the underground section, including the interchange at the railway station, is in full swing. *(T. J. M. Vis*

## TURKEY

**ANTALYA.** It is understood that the tramway along the waterfront was opened on 27 March. The city is now inviting bids for a 35-km light rail line. *(C. J. Wansbeek*

## USA

**ALBUQUERQUE, NM.** An eight-month, USD 500 000 mass transit feasibility study is underway inAlbuquerque that could lead to construction of a light rail system. Although consultants Parsons, Brinkerhoff, Quade & Douglas Inc. will look at everything from improved bus service to LRT, local officials have made no secret of their support for rail. Already suggested as the first line is a connection between the central area and suburban Rio Rancho. There is already up to USD 90 million in federal transportation funds allocated to Albuquerque, with the possibility of another USD 200 million if an LRT project is approved. However, the city would have to come up with its share – about USD 90 million — plus the operating costs. Part of that money could come from a transportation tax that is scheduled for a mail-in vote on 1 April. *(J. Wolinsky*

**ATLANTA, GA.** The Georgia legislature has restored USD 2 million to the state budget that was earmarked for a feasibility study into a proposed light rail line linking Lawrenceville with Marietta. Three local counties have also pledged up to USD 75 000 each to get the work started. The proposal includes the use of existing east-west rail routes on the north side of metropolitan Atlanta. Moves are in progress to create a state transportation authority which would subsume MARTA .*(J. Wolinsky, C. Lietweiler*

**AUSTIN, TX.** A recently-completed Texas Department of Transportation feasibility study shows a proposed 137-km commuter rail line connecting San Antonio with Austin would cost an estimated USD 475 million and could be financed by a combination of federal, state and local funds. Half the construction costs and the USD 24.3 million in annual operating subsidy would be generated from a sales tax increase in the five countries to be served by the line. Trains would operate from 0600 to 2200 weekdays, providing a 30-minute peak and 90-minute off-peak service. There would also be limited weekend runs. The maximum one-way fare would be USD 9 and weekday ridership was estimated at between 8000 and 11 000. However, the study predicts it will take about nine years to get the system built, in part because a third track would have to added to the already crowded railway route to Mexico that the passenger trains would use. *(J. Wolinsky*

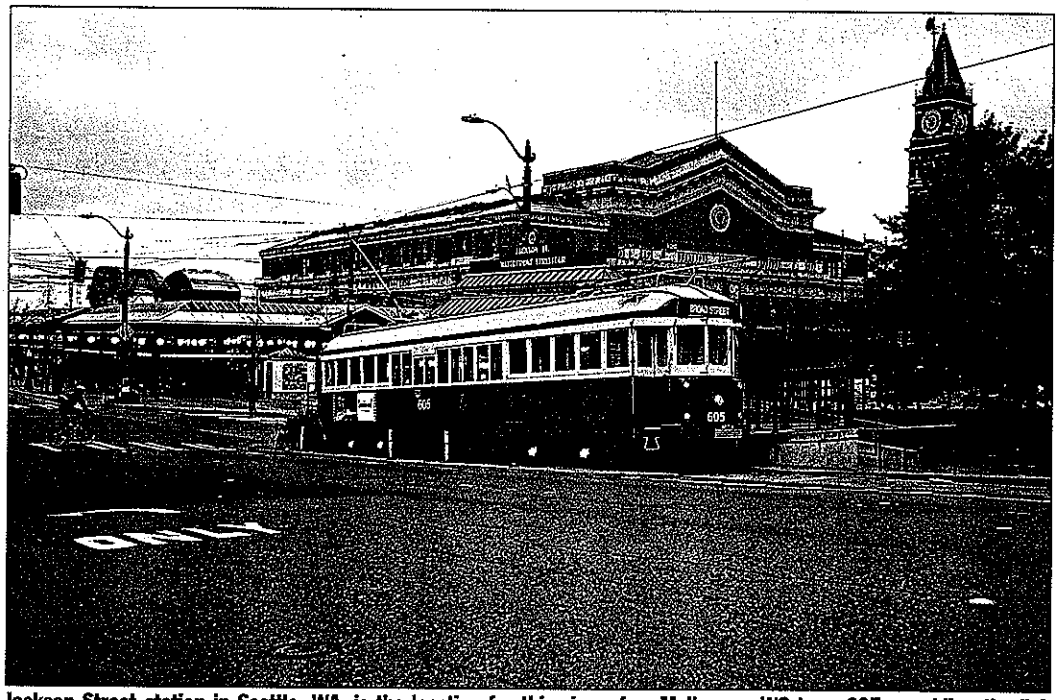
**BOSTON, MA.** The first of 100 low-floor trams entered Green Line service on 24 March. The two-car train ran from the system's hub at Park Street to Riverside station. Built by Breda of Italy, the **Type 8** cars cost USD 250 million and will make the Green Line fully accessible. They have the ability to trainline with the decade-old fleet of **Type 7**s built by Japan's Kinki Sharyo, thus making certain that every train will have at least one low-floor car once the entire fleet is delivered next year. Their debut was delayed by about three months due to a few teething troubles but now between four and six cars will enter service each month. The 117 active **Type 7**s are being upgraded with automated announcement systems and electronic destination signs. Much to the delight of traction enthusiasts and local riders, the MBTA has decided to give the 11 PCCs assigned to the 4.1-km Mattapan-Ashmont High Speed Line a new lease on life. Instead of bringing in modern LRVs or turning the line into a busway, two of the alternatives that had been proposed, the MBTA will spend up to USD 400 000 per car on a complete overhaul. Nearly the entire car except the frame is being replaced. Many of the mechanical and electrical parts will have to be fabricated but that's not considered to be a problem. However, passengers will still have to suffer hot Boston summers, since the trams will not be retrofitted with air conditioning. The exterior colour is still to be decided. Among the possibilities are red, because the High Speed Line is an extension of the Red Line; Green because the PCCs first ran on the Green Line; and Orange, their original hue from the old Metropolitan Transportation Authority. The first car to be completed, expected to be 3265, is due sometime this summer. The 1999 Massachusetts bond bill sets aside USD 1900 million for the MBTA. Among the projects to be funded by the borrowing measure are:

New commuter rail service to Fall River and New Bedford (USD 269 million);

The long-delayed Greenbush branch of the Old Colony commuter line to Hingham (USD 40 million); completion of stations and infrastructure on the commuter line to Worcester (USD 15 million).

In addition, the agency would receive USD 260 million for new cars and locomotives, USD 197.7 million for assorted infrastructure improvements, USD 180 million for station reconstruction and USD 100 million for purchase of automated fare collection equipment. The bond bill also provides the MBTA with USD 800 million in bridge funding that will allow it to switch to a new system of financing. Currently, the agency can spend whatever it needs each year and it then sends the bill to the state. Henceforth, it will receive a fixed annual appropriation and must stay within that limitation. *(J. Wolinsky*

**CINCINNATI, OH.** A light rail system for the Cincinnati area made progress in early March when the region's two largest transit providers voted to establish a joint agency that could run the trains. At the same time, the Ohio-Kentucky-Indiana Regional Council of Governments created a committee to investigate taxing sources that would pay for the system and to evaluate how best to manage it. But the Southwest Ohio Regional Transit Authority (SORTA) and the Transit Authority of Northern Kentucky (TANK) appear to have already decided the operations issue by proposing a new organisation whose narrow focus would be to run the proposed bi-state network. The initial line would connect 12th Street in Covington to Pfeiffer Road in Blue Ash along the congested Interstate 71 corridor. The line would eventually




**Jackson Street station in Seattle, WA, is the location for this view of ex-Melbourne W2 tram 605, providing the link between the railway station and the waterfront.** *M. Vleugels*

extend from the airport to King island. Preliminary engineering is underway and should be completed by the end of next year or early in 2001, after which a decision will be made on whether to start construction. *(J. Wolinsky*

**COLUMBUS, OH.** Commuter rail has taken a concrete step forward in Columbus following approval by the Central Ohio Transit Authority (COTA) for the double tracking of a railroad bridge, giving it the capacity to handle passenger trains. The USD 3.3 million bridge is a replacement for an existing structure over Neil Avenue, which is being widened in connection with construction of a new sports arena. To add a second track will cost only USD 300 000, two-thirds of which will be provided by COTA and the rest by the city. The bridge would be a key part of a proposed route parallel to Highway 315 utilising an existing freight line. Only a short section of additional track would be needed to connect it to a planned city centre multi-modal transportation centre. The region's long-range transit plan includes four commuter rail routes to the north and east of Columbus. It has been estimated that commuter rail would cost USD 3.1 million to USD 6.2 million per kilometre compared with USD 12.4 million per kilometre for light rail. *(J. Wolinsky*

**DALLAS-FORT WORTH, TX.** Contracts for the signal and power systems on two DART light rail extensions have been awarded. Powell Power Electronics Co. will supply 18 traction power substations and be the prime contractor for their installation and the erection of the catenary on the lines to Plano and Garland. The work is scheduled to be completed in 2002. Meanwhile, Union Switch and Signal Inc. has won a USD 45 million contract for the design, manufacture and installation of signalling equipment on the same segments. In addition, US&S will upgrade signals on a portion of the existing Red Line between the Mockingbird Lane and Park Lane stations. *(J. Wolinsky*

**DENVER, CO.** The RTD board of directors on 23 March approved USD 7 million for design and construction of the 3-km Central Platte Valley LRT spur. Combined with USD 2 million approved earlier this year, this completes the agency's share of the USD 40 million project, which will branch off the existing line at the Auraria Station. Scheduled for revenue service late next year, it will serve the Denver area's primary entertainment area including an amusement park, two sports venues and an aquarium. *(J. Wolinsky*

**LOS ANGELES, CA.** The newly formed Pasadena Metro Blue Line Construction Authority on 12 March released a financial plan that claims the project can be completed for USD 683.7 million. However, the budget is uncertain at best since it depends on income from two problematic sources: the leasing of the ROW for fiber optic communications lines and property development at several stations. But, by completing the financing proposal prior to the 1 April deadline, the Authority has opened the way to obtaining approximately USD 370 million in state and local funding. The agency plans to use a fixed-price design-build approach to keeps costs down and open the 22-km route between Union Station and eastern Pasadena by June 2003. However, this will still be the most expensive U.S. LRT line ever built on a per-km basis since the Los Angeles County MTA has already purchased new LRVs, paid the land acquisition costs and completed the design and 12 percent of construction. A major hurdle still facing the authority will be an expected challenge from the Bus Riders Union, an advocacy group for low income and minority transit users. The BRU, which has won a federal court order requiring the MTA to vastly improve bus service, is demanding that the USD 370 million be used to buy more buses instead for rail construction. 12 June has been set for the opening of the five-station Hollywood leg of the Red Line metro, one day after a planned show-biz style dedication ceremony. The 7.4-km line runs north under Vermont Avenue from a junction with the existing Wilshire Boulevard route, then turns west at Hollywood Boulevard to a temporary terminal at Vine St. It had been due to enter revenue service in late May. The final segment, to Lankershim Boulevard in North Hollywood, is scheduled to be completed in mid-2000. *(A. Quayle, J. Wolinsky*

**MILWAUKEE, WI.** After more than 15 years of indecision and lukewarm support, it now appears that light rail transit just may have a chance to become reality in Milwaukee. The agency that runs the city's convention centre, the Wisconsin Center District Board, has voted unanimously to seek federal funding that would study transit options for a circulator linking Miller Park and the lakefront with numerous central area attractions. Previous studies have focused on routes that would bring commuters into town from the suburbs but stiff opposition from the state legislature and suburban governments vetoed those plans. The most recent proposal, a 23-km, USD 444-million light rail project, was killed two years ago. Several board members made it clear they were not voting for light rail, at least at present, but agreed that research was needed into some form of transit in the city centre. *(J. Wolinsky*

**Hakodate (Japan) 3002 is an air-conditioned articulated tram built by Alna Koki in 1994, but also has to cope with the other extreme of temperature, as shown in this February 1999 depot view.** *Colin Brown*

**MINNEAPOLIS-ST. PAUL, MN.** Following the lead of cross-river neighbour Minneapolis, officials of the Regional Railroad Authority in St. Paul's Ramsey County have agreed to seek federal and state funding for three proposed rail routes. These include:

the Riverview Corridor, 13.5 km from the city's East Side, through downtown to the airport and terminating at the Mall of America, also the last stop of the Hiawatha Corridor in Minneapolis;

the Central Corridor, 15.1 km between downtown St. Paul and downtown Minneapolis;

the Hennepin County-Ramsey County Connector, 16.7 km between St. Cloud and Hastings.

The first two are being promoted as light rail, although busways would also be studied, and the latter would follow an existing railway that would form part of a commuter line. LRT construction costs for Riverview have been estimated at USD 278 million while the slightly longer Central line would cost USD 400 million. The Connector would be a bargain at USD 57 million, in part because it would not be electrified and the right-of-way is almost ready for service. *(J. Wolinsky*

**NEW JERSEY, NJ.** The first public ride on the Hudson-Bergen light rail line took place on 22 March on a 4-km section of test track through Jersey City. The 10-minute trip, using one of the system's new low floor cars manufactured by Kinki Sharyo, started at the new maintenance building on Caven Point Avenue and travelled through the future stations at Richard and Danforth streets. Only invited guests were aboard, including reporters, politicians and transit officials. The 15.3-km initial segment along the Hudson River waterfront is scheduled to begin revenue service in March 2000. Several extensions totalling 17.7 km are planned for completion in 2003, with the total cost exceeding USD 1000 million. However, average weekday ridership is expected to hit 100,000. The project is being built under a design-build-operate-maintain contract with a private sector consortium led by Raytheon. Faced with soaring ridership and overcrowding, New Jersey Transit plans to spend about USD 1300 million during the next few years on new commuter rail cars, including the agency's first double-deckers. Once all of the new coaches are delivered, the fleet would increase from 484 units to 714 and seating capacity from 64 000 to 93 000, providing sufficient room to handle the rush of new riders expected in the next five years following completion of the Secaucus Transfer and Montclair Connection projects. The trains now carry about 2600 standees on an average weekday, a number that could jump to nearly 13 000 by 2005 if the fleet is not expanded. NJT plans to purchase 200 single-deck cars and 40 new locomotives by 2002 at an estimated cost of USD 525 million. Another USD 505 million would be spent on 200 double-deckers and 17 locos (two electric and 15 diesel) by 2004. NJT anticipates advertising a design contract for the first of the new cars this summer with construction to start in about two

years. In addition, USD 266 million would be spent on upgrading yards and maintenance facilities to handle the expansion. *(J. Wolinsky*

**NEW ORLEANS, LA.** A controversial USD 0.25 fare increase proposed for 1 April was delayed for at least 90 days pending an independent audit of the Regional Transit Authority. The agency said it needed the fare hike to prevent service cutbacks and to help provide the local share for construction of the proposed Canal Street tram line. Without the local match, there will be no federal funding. But stiff opposition from the city council, combined with a USD 50 million debt, convinced the RTA board to hire a major accounting firm to analyse its financial situation. It will be asked to recommend a five year programme to reduce the debt and clear the way for council approval of the higher fare beginning 4 July. There are also plans to slash operating costs, in part through reduced overtime, redundancies and elimination of lightly-used bus runs. *(J. Wolinsky*

**NEW YORK, NY.** Fare discounts, a booming economy and better security are being credited for a huge increase in subway ridership. Transit Authority figures show that 6.2 million people are riding the trains every weekday, one million more than two years ago. The introduction of the stored value MetroCard along with free subway-bus transfers and unlimited ride passes has led to much of the ridership growth. Tackling a job that pundits claim may be impossible, MTA is planning a long-term courtesy campaign to make the metro more civilised. The main targets are passengers who hold doors open, litter cars and stations and take up more than one seat. Pointing just to the delays caused by holding doors, officials said a successful crusade could help the system better maintain its schedules. A recent internal survey showed that trains are dirtier and running later than a year ago. There has been a dramatic drop in subway fare evasion since the MetroCard and more secure turnstiles were introduced. The estimated number of passengers entering the system each week without paying is now three-quarters of one percent – 28 000 out of 20 million — down from 7% in 1990. When fare avoidance reached the one percent mark, MTA said it was collecting an additional USD 90 million annually in revenue. *(J. Wolinsky*

**NORFOLK, VA.** The federal government has awarded a USD 1.9 million grant to Norfolk's Tidewater Regional Transit for continued planning on a long delayed 29-km light rail line between central Norfolk and Virginia Beach. The money will complete preliminary engineering and an environmental impact statement for the project, underway for over 10 years. Although more than USD 6 million of the USD 32 million needed to prepare the east-west line for construction has already been spent, there is still not a local consensus that it should be built. The major holdout is the city of Virginia Beach, which has scheduled an advisory ballot measure in November on whether or not to continue supporting the proposal. *(J. Wolinsky*

**PITTSBURGH, PA.** 12 April marked the start of rehabilitation work along Broadway on the Beechview segment of the Port Authority's light rail line. LRVs will be restricted to single line running for much of the construction season. In an effort to speed up the effort, the transit agency is hoping to convince residents that allowing double or even triple work shifts will reduce the length of disruptions and get the work completed by 1 August, possibly even sooner. The line was built in the mid-1980s but constant pounding by LRVs has loosened the track fasteners in their concrete footings and also damaged the adjacent pavement and decorative bricks. The total cost of the project is USD 6.2 million. *(J. Wolinsky*

**PORTLAND, OR.** Although no new official plan has emerged to replace the proposed South/North light rail line, narrowly defeated by voters last November, a group of local businessmen has presented Tri-Met with their ideas for a pared-down 11.4-km line from SW 11th Ave in the centre over existing tracks to Rose Quarter, then run north on 9-km of new alignment along Interstate Avenue to the Expo Center. This is estimated to cost USD 350 million and, with federal support of USD 240 million, could be funded without the need for a vote. The federal support would involve packaging the new line with the Airport branch. Preliminary work on the latter started on 15 March, although the final FAA decision on use of passenger ticket surcharges to provide funding is not due until June. *(S. J. Morgan*

**SALT LAKE CITY, UT.** The 24-km TRAX light rail line between downtown Salt Lake City and Sandy could be ready for revenue service by November, four months ahead of schedule and in time for the Christmas shopping season. However, wiring and track installation would have to be significantly speeded up and the Utah Transit Authority board of directors is waiting to see how much it will cost before making a decision. Contractors are already ahead of schedule and the USD 312-million project is well under budget, so the early opening appears to be feasible. Catenary work began at the end of February and is now scheduled to be completed in November while track laying is due to be finished by June. Members of the Utah legislature spent the final hours of this year's session on 3 March cobbling together a compromise proposal that will provide operating assistance to the proposed west-east light rail line in Salt Lake City. The 10-year, USD 50 million commitment clears the way for the UTA to receive 100% federal funding (USD 480 million) for the 17.5-km project and have it finished prior to the 2002 Winter Olympic Games. The line will link the University of Utah campus with the airport, connecting with the north south line in the city centre. The FTA required a secure source of dedicated operating funds for at least five years before it would sign a full funding grant agreement. Pulling together support for the subsidy was politically difficult but in the end, the lure of that USD 480 million from Washington was too much to turn down and, even for opponents of LRT, pragmatism won out over principal. However, the legislature's action was not as generous as it appears. The state will only supply the required USD 5 million annually only if UTA, the city and the county cannot come up with the cash from other sources. *(J. Wolinsky*

**SAN DIEGO, CA.** The city centre American Plaza tram station was closed for about a month beginning 1 March to renew a segment of curving rail and its sub-base. South and East line trains reversed at a temporary station just east of American Plaza at the crossover on C Street where the line formerly terminated prior to the opening of the Bayside extension. An interim Green Line was established, with trains from the Mission Valley line and Old Town working directly through to (and terminating at) the 12th and Imperial station using the non-revenue connection with the Bayside Line just south of the railway station. All passenger transfers were made at 12th and Imperial except for those heading downtown from the north – they had to walk a short distance from the railway station to the original terminus. Patronage on the Coaster, the commuter rail line connecting Oceanside with downtown, jumped 20% in 1998. As a result, a fifth car has been added to the 06.44 inbound and 16.50 outbound schedules, the system's two most popular trains. Total boardings last year totalled 1.1 million compared with approximately 950 000 in 1997. *(J. Wolinsky*

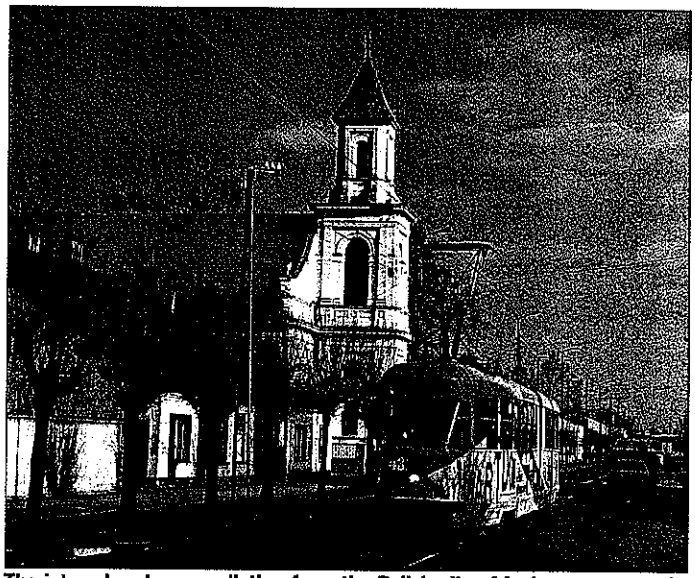
**SAN FRANCISCO, CA (BART).** The Metropolitan Transit Commission has approved BART's request for funds to permit work on the Airport extension to continue. *(T. C. Swinney*

**SAN FRANCISCO, CA (MUNI).** The new General Manager is Michael T. Burns, until recently Chief Operating Officer of SEPTA, Philadelphia. Proof of payment fare collection was extended to route M from 3 April. *(T. C. Swinney*

**SAN JOSE, CA.** Construction on the Santa Clara Valley Transportation Authority's newest light rail project, the 8-km Tasman East line, is now well underway. Starting at a junction with the existing route near First Street and Tasman Drive, it will cut through Milpitas and terminate near Hostetter Road in San Jose. However, it will be built in three relatively short stages. The first, the Baypointe segment (named after the single station on this section), is scheduled for completion late this year, ahead of the Tasman West line which is set to open next spring. Preliminary work on Baypointe has already been finished; trackwork and erection of the catenary should be underway shortly. Phase two will have two stations and construction should be underway in June and completed early in 2001. Phase three is still in final design. *(J. Wolinsky*

**SEATTLE, WA.** The Federal Transit Administration has awarded a grant of USD 9 million to assist with the purchase of three commuter rail cars and two locomotives for the Sounder system. The Central Puget Sound Regional Transit Authority (Sound Transit) plans to open its initial 64 km segment between Seattle and Tacoma in December.

Letters seeking expressions of interest from the private sector in building a monorail mass transit system in Seattle were issued at the end of February. The Elevated Transportation Company (ETC), a quasi-government agency entrusted with carrying out the terms of a ballot measure approved by voters in November 1997, is looking for a firm that will build, operate and maintain the proposed network. Responses are due by 15 April. Whether it would be an extension of the 1.6-km line connecting the city centre with Seattle Center, site of the 1962 World's Fair, is still unclear. The operating firm has not indicated whether it has any interest in the proposal. However the chairwoman of ETC is optimistic about finding a partner. Among companies mentioned as possible suppliers are Hitachi, which has monorails running in Japan, and Bombardier, which built the Disney World, and Jacksonville, Florida lines. ETC still must choose



**The interurban trams radiating from the Polish city of Lodz are now run by private companies, which have taken-over the Konstal articulated trams from the city fleet. Tram 2 of Tramwaje Podmiejskie is seen in the village of Konstantynów.** *A. P. H. Velthoen*