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# SLEEPING YOUR WAY ACROSS EUROPE

o Munich, partly to enjoy the Englischer Garten in the spring sunshine but also to grab a last chance to ride a CityNightLine on the way home. First, though, a call at Nuremberg, home to the Deutsche Bahn museum and much else besides. One can stroll around the beautiful medieval city centre and enjoy Franconian asparagus in the old city hospital, now a restaurant. You can inspect the courthouse where the first ever war crimes trials were conducted in 1945-46, and pay a visit to the notorious 1930s rally grounds.

Unlike so much of German history from the country's dark era in the 20th century, the rally grounds have not been obliterated but instead left as a reminder to future generations. The Zeppelin field remains much as it was when the Hitler Youth and the rest of them assembled here eight decades ago, save for the swastika on the roof of the grandstand, blown up by the US Army in 1945. Tourists can now stand on the podium where the Führer took the Sieg Heil from the massed ranks although it is a sobering thought that the granite under your feet was hewn from the earth by slave labour that was starved to death.

It is all interpreted through an excellent Documentation Centre, where the Fascination and Terror exhibition explains how the mad ideas took hold and how difficult it was to stand up to them. Setting aside the horror and concentrating on the organisational aspects of the rallies, the logistics are fascinating. This Glastonbury for the Nazis saw the town's population of 400,000 swelling to over two million at rally time: transporting all those people and feeding them (not to speak of dealing with their sewage) was a real challenge.

But back to transport in 2016, where the CityNightLine beckoned. As our European correspondent Keith Fender reported in the February issue (p80), with sleeper services losing over €30 million on a turnover of €90 million. DB has decided to replace them with overnight ICE services from December. Thus you will still be able to travel on a train overnight, but sat up on a day seat - much the same as on the Autobahn coach competition.

The financial loss is not down to occupancy rates, if our train is anything to go by. Before we left, an on-train announcement let us know that every sleeper bed, couchette and seat on the train was reserved - so if you had no reservation, it was time to leave

the train. This on a 14-coach leviathan: the 'Pollux', destined for Amsterdam and with a portion for Hamburg Altona, comprised 10 couchettes and sleepers and four day coaches in the capable hands of a '101' leaving Munich.

We were travelling in style with a CityNightLine compartment featuring a stack of three bunk beds and a mini-bathroom with shower. Rather knocking off the shine off this was a water failure that meant our shower could not be used (although there was another in the common user toilet at the end of the corridor that was working). But this irritation could not detract from the romance of transiting Germany in the dead of night, with the topmost of our party lodged in an eyrie under the curve of the roof.

Clambering out in the bright morning sunshine at Amsterdam Centraal I was struck by the maker's plate on the coach steps: this CityNightLine vehicle was manufactured as recently as 2004 at Siemens' SGP unit in Austria. It was a reminder that it is not so long ago that DB, along with partner railways, was investing in night trains in an effort to stave off competition and keep them viable. But now sleepers are becoming an endangered species on

the Continent, with France deciding earlier this year to remove all but two of its night trains (p67, April).

The exception to this trend is of course the UK, where not only are we retaining sleepers but actively investing in them. The purchase of 75 new vehicles from CAF for the Caledonian Sleeper is nothing short of heroic, although in the light of the losses on this service one can't help but be reminded of Lord Cardigan at Balaclava. But politics always trumps economics where the sensitive issue of Scottish links with England is concerned: Chancellor George Osborne, for one, was certainly keen to see the sleeper continue.

Great Western Railway, too, is investing in its sleeper service to Penzance, with a refurbishment that the operator contests shows that you don't need to buy new vehicles to provide a competitive sleeping environment. So the UK's two sleeper operations look set to continue for many nights into the future. Sweet dreams (and

no nightmares about Nuremberg...).

James Abbott, Editor





7 Transforming the Tube

An update on modernisation plans for the Underground

Turning South London orange

Proposals to improve the suburban rail network

DLR's growth challenge

Capacity increase planned for east London's light railway

# **FEATURES**

The passenger voice

Transport Focus chief executive Anthony Smith describes the organisation's work

Southeastern at 180

How the operator is handling the rebuilding of London Bridge

72 The Railway Industry Innovation Awards 2016
A preview of the nominations for our June event

# **REGULARS**

Welcome
An introduction from the editor

Railtalk

Modern Railways' editorial view

Pan Up

More research proposals; Brexit implications debated

**Æ** Forum

Readers comment on topical issues around the railway today

**⚠** Blood and custard

Our diary column

84 Moving Wheels
Rolling stock news

n People

Recent appointments

• Trackwatch

Our monthly look at changes on the national network

In Business and small ads

Latest happenings in industry

94 Crossrail update
Station designs unveiled

96 Between the Lines
Bright prospects for the North

Alan Williams

Is the drive for safety becoming a burden?



## **NEWS**

News Front
ORR rules on

ORR rules on East Coast track access; EMU reshuffle prompts extra '387' order; PPM decline in 2015-16; Midland Metro extension opening date

18 Rail Freight

Fly ash to Longannet; West Midlands freight interchange proposal

20 Infrastructure News
Trans-Pennine alliance sought; Alstom for GW resignalling

22 Informed Sources
Traffic management

Traffic management travails; uncertainty in the rolling stock market; DfT hands over smart ticketing

**Europe View** 

Keith Fender presents a round-up of news from across the Channel

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## ON THE COVER

- 16 Midland Metro extension to New Street
- 51 London special
- 8 FirstGroup Edinburgh service approved
- 17 TfGM tears into Hendy review
- 15 Halton curve go-ahead
- 86 IC125 bonanza
- 46 Southeastern franchise
- 10 Low-cost Okehampton reopening proposed
- 28 New train tsunami





June 2016 Volume 73 Number 813

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The Editor is pleased to receive contributions to Modern Railways in the form of articles, news stories, letters and photographs (ideally by digital means). Material sent to the Editor, whether commissioned or freely submitted, is provided at the contributor's own risk; neither Key Publishing Ltd nor Transport Writing Services can be held responsible for loss or damage howsoever caused The opinions and views expressed by authors and contributors within Modern Railways are not necessarily those of the Editor or

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Having difficulty obtaining your copy of Modern Railways magazine? Please contact our subscriptions department using the details above.

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Modern Railways is published on the fourth Thursday of each month by Key Publishing Ltd. Registered Office: Units 1-4, Gwash Way Industrial Estate, Ryhall Road, Stamford, Lincolnshire PE9 1XP

#### **Origination and Printing**

Precision Colour Printing Ltd, Haldane, Halesfield 1, Telford, Shropshire. TF7 4QQ.

#### Distribution

Seymour Distribution Ltd., 2 Poultry Avenue, London. EC1A 9PP Enquiries line: +44 (0)20 7429 4000



Cover: 1973 stock on the Piccadilly Line at Stamford Brook, Paul Bigland

#### SEE PAGES 34-35 FOR OUR LATEST SUBSCRIPTIONS OFFER

# COOL HEADS NEED

emember flexible rostering and all that 1980s pain? The railway's customers may have been lulled into a false sense of security by the relative quiet of recent years, but the industry is now being wracked by industrial relations havoc once more. In May, Southern travellers were subject to disruption on account of two issues: the role of conductors on trains, plus ticket office closures. In Scotland, too, the subject of conductors was causing ructions.

The question of the place of the conventional ticket office in the days of the internet is perhaps an easier nut to crack, with London Underground having shown that it is feasible to operate busy stations without staff behind ticket windows. Granted, the main line railway is not quite so simple, with more help needed to guide the uninitiated through the ticketing maze, but the principle of taking the staff out from behind the glass windows and putting them

instead on platforms and in station foyers is a good one. Many regular travellers do not need assistance with the purchase of permission to travel and those that do can be guided in the use of ticket machines – and if need be the help can be delivered from a remote point with the technology available today.

The conductor question is more difficult. After a spat with drivers over the question of DOO on 12-car Class 387/2 trains on Gatwick Express (as opposed to the earlier 10-car Class 442 trains on which it was an accepted method of operation), Govia comprehensively addressed the role of on-train staff. It decided to remove guards on many Southern services and replace them with 'on-board supervisors' (OBS) on new terms and conditions, with drivers taking control of doors.

Southern insisted that 'there will be no compulsory redundancies from our plans to evolve the role

of the conductor on many of our services' but the RMT union insisted that as well as compromising safety, its members would lose income through reduced opportunities for overtime and through cuts to payments made for selling tickets on trains. Failure to reach agreement with RMT resulted in GTR informing the union that all conductors were to be dismissed and that they could then re-apply for the new OBS roles along with a few conductor posts retained on a handful of services.

Southern stated 'We have written to our staff to warn them that this is the only course open to us and to reassure them that if we issue notices of dismissal, offers of re-engagement will be made to every affected employee. There is an on-board supervisor role for everyone who wants one.'

We can be sure that behind this hard-line stance stand the Department for Transport and the Treasury. The advent of franchising saw a reduction in industrial relations disputes, because strikes seldom made sense for franchisees: a few days of revenue loss soon outweighed any financial advantage that might be had by toughing it out with the unions. While some might see this as allowing the staff to get away with it, this state of affairs avoided disruption to travellers and far-sighted operators used the cushion of rising revenues to reorganise terms and conditions to reflect the changing world.

But Southern/GTR is different.
This is a concession, where the
Government takes the revenue
risk. This option was chosen as the
DfT reckoned that a conventional
franchise would turn out expensive,
as potential franchisees would price
in the possibility of revenue loss as a
result of the London Bridge rebuilding
project not working out according to
plan. Instead, the concessionaire just
hands fare revenue to Government,



6

# ED IN DOO DEBATE

so it is the DfT that takes it on the chin if strikes occasion financial loss.

Thus we can see that the speech by DfT's Managing Director Passenger Services Peter Wilkinson in Croydon in February, in which he promised to 'break the power' of the unions (p13, April issue), was far from the ill-considered outburst that we assumed at the time. Mr Wilkinson was merely articulating official Government policy. DfT has plainly decided to take on the unions on Southern, where it rules the roost, no doubt hoping that new conditions implemented there will become more widespread and consequently cut the cost of franchising. Ominously for travellers, in mid May both sides were digging in and it seemed a long hot summer could be in prospect.

It appears to us that there are merits and demerits to both sides of the argument and the two sides should be less dogmatic.



The unions should be prepared to be flexible: we would still have wheeltappers and firemen without the recognition over the decades that a changed workplace requires a changed workforce.

The other side should treat railway employees with dignity: the fact that the railway is heavily unionised has contributed to some grades enjoying improved conditions in the privatised era, but there is nothing inherently wrong with that. No-one should want to go back to the position under British Rail, where railway staff were often at the bottom of the national heap.

#### FIRST PRINCIPLES

Urging calm, we suggest a look from scratch at the role of on-train staff. What do we want from them?

First and foremost, of course, we want safety. But the safety question doesn't necessarily endorse one side or the other. An inebriated passenger was dragged to her death by a train with a guard in Liverpool in 2011. At Hayes & Harlington in July last year, a train in which the driver was in control of the doors managed to depart with a passenger's hand trapped in the doors, dragging the victim along the platform.

The tragic death of a c2c driver from a heart attack on 25 April 2016 as his DOO train rolled into Barking station (where passengers were evacuated safely) has led to concerns about the possibility of passengers on a stranded train on a third rail section between stations deciding to leave the train and walk to a station being hit by other services or coming into contact with the live rail.

Technology can make a big difference to many of these issues. For instance, more sensitive door interlockings could prevent another Hayes-style incident – and as the Rail Accident Investigation Branch has pointed out, perhaps passengers need educating that train doors do not react like lift doors, which reopen when they encounter an obstruction. Wi-fi communication between control centre and train could ameliorate another Barking.

Which prompts us to ask where the safety bodies are in all this. What is the position of RAIB, the Rail Safety & Standards Board, the Office of Rail & Road and the rest of them as regards the role of on-train staff? We could do with more clarity.

The second thing we need after safety is operational robustness. So we don't want a train cancelled when a conductor is not available, if the driver is capable of operating it on his or her own.

And we don't want time wasted at stations, especially on busy commuter routes where the knock-on effects of over-long dwell times can be extensive. The driver knows when the train has come to a stand, so is surely best placed to know when it is safe to release the doors. Door closure is more of a moot point: it could be argued that the conductor is better placed to check what is happening on the platform and can help speed things up by closing the doors while the driver concentrates on the authority to move.

On a quiet paytrain route, it is daft that a conductor may be forced to interrupt taking fares in order to rush to the door controls when the driver is capable of operating the doors.

#### MISH-MASH

The tragedy is that it is seemingly impossible to view these issues objectively, with both sides often taking entrenched positions. The result is there is no rhyme nor reason as to why and where DOO has been introduced. Thus London Overground and Heathrow Express (to name two) have increased the application of DOO, while Southern has stumbled and South West Trains has not bothered.

Class 319s that were operated in DOO mode on the busy Thameslink route have been fitted with conductor door controls in their refurbishment for use on the quieter Northern Electric routes.

There is no discernible pattern in any of this. What is needed is some sense of direction so we get the right horse for the course: in some cases DOO is sensible, in other cases not.

The current mish-mash reflects the fragmented nature of the railway. Not only do the franchisees all have different policies, what is acceptable to a union branch in one part of the country can be out of the question elsewhere.

Some guidelines would be helpful. The safety bodies could opine on levels of staffing: is it acceptable, for example, to have a Thameslink train with 1,000 people on board in the hands of just one

member of staff? It seems to us that Thameslink is going to be so busy when the upgrade finishes in 2018 that there will be a need for plenty of staff around, on both trains and platforms, just to keep things moving (Automatic Train Operation in the core notwithstanding).

The valid concerns of the Southern conductors need addressing: what happens when a wheelchair ramp is needed, how are passenger alarms addressed, what happens when passengers decide to evacuate trains without authority to do so? Industry-wide agreed guidelines are needed on these issues.

What is the optimum method of door operation? Some time and motion studies to answer this question once and for all would be handy, but it seems there is too much anxiety about upsetting apple carts to commission such work.

The RAIB has identified a couple of key areas of concern following recent investigations into accidents on platforms:

- it has been discovered that some types of trains have door control systems that do not disable the opening of doors by passengers after the driver has initiated the closure sequence, so creating a risk of trapping (the Branch refers to a nasty case at West Wickham in March this year where a passenger was dragged along the platform and suffered life-changing injuries).
- there is a widespread misunderstanding about the sensitivity of train door control systems to the presence of trapped objects and this has led some staff to conclude that the presence of objects such as hands between the leaves of closed doors will always be detected. Since this is not the case for the majority of train door control systems, it is important for the industry to explain the importance of always carrying out a final safety check after the doors are detected as closed (the Hayes & Harlington case refers).

'Both of the above findings have led RAIB to issue urgent safety advice notices to industry' the RAIB says in its annual report. Clearly, these are not trifling issues and it is not only money that is at stake in the DOO debate. The RAIB should act as the conscience of the industry in this matter: there is more that could be done.

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# FIRSTGROUP'S LOW-COST EAS

#### VTEC PROPOSALS ALSO GET GREEN LIGHT, BUT GNER SERVICES REJECTED

he Office of Rail and Road has approved applications from Virgin Trains East Coast and FirstGroup to run new services on the East Coast main line (ECML), but proposals put forward by Alliance Rail Holdings under the name Great North Eastern Railway (GNER) have been rejected (Table 1).

The three operators submitted competing applications to run new services between London and Edinburgh, while GNER also proposed open access services between London and West Yorkshire/ Cleethorpes and VTEC planned new services to Bradford, Lincoln, Harrogate and Middlesbrough. However, the ORR has chosen to delay the granting of firm access rights for most additional services until May 2021, following advice from Network Rail that this is the date by which infrastructure improvements which will offer additional capacity on the ECML will be completed.

ORR has stated that it believes there will be capacity for broadly 7.5 long distance high speed paths per hour on the ECML from May 2021, compared to six paths at present. If all applications were approved, ORR says this would require more than eight paths per hour, for which there would be insufficient capacity.

Funding of infrastructure improvements on the ECML, part of Network Rail's East Coast Connectivity

Fund, appeared to be threatened by the Department for Transport in an adjunct to the consultation on NR chairman Sir Peter Hendy's updated Enhancements Delivery Plan, released in January. DfT stated that while the Transport Secretary'is minded to proceed with this enhancement, 'forthcoming decisions...regarding access rights for open access operators' mean that decision 'may need to be reconsidered'. In a hearing held by the ORR in March, Alliance chairman lan Yeowart said subsequent correspondence from DfT amounted to 'nothing more than blackmail of the independent regulator.

#### MODELLING

The regulator says all applications were considered operationally feasible in principle' and 'appeared broadly consistent with industry plans for the ECML's o CH2M was engaged to undertake modelling of the benefits of the proposals. ORR states that following a sifting of options all the applications were likely to meet its not primarily abstractive (NPA) test, indicating that they would generate at least 30p of new revenue for every £1 abstracted from incumbents; the regulator does not usually approve applications which do not meet this threshold. CH2M also modelled the net present value (NPV) benefits of each application (Table 2).

#### TILT KILLS ALLIANCE PROPOSAL

The principal basis for rejection of the proposed GNER Edinburgh service was the cost of investment in tilt capability. Alliance proposed the use of 140mph-capable tilting Pendolino trains which would achieve an end-to-end journey time of 3hr 43min, calling at Newcastle and, for early morning and late evening services only, at Stevenage.

ORR says GNER's estimate of the costs of investment in tilt capability was likely to be 'very low', and when the NPV of the benefits was adjusted for these costs it was 'likely the option would have a near-zero or negative NPV'. ORR also says that it considered other operators 'would be unlikely to make use of the tilt capability for the foreseeable future'. The GNER Edinburgh application was therefore rejected 'because its costs are likely to exceed its benefits and the benefits are likely to be low relative to the alternative uses of capacity proposed'.

#### BRADFORD SERVICE ABSTRACTIVE

ORR also turned down GNER's plan to run services to Bradford via Leeds and to Cleethorpes. While the NPV benefits of £185 million reflected the new direct service to Cleethorpes, ORR says it believed the service would result in 'significant absolute levels of revenue abstraction, modelled at £44 million per annum', which 'would

probably affect the Secretary of State's funds by several hundred million pounds in NPV terms.' ORR says these impacts would have been reduced if the application had focused on serving only the Cleethorpes line, which would offer new direct services to the capital from destinations which do not currently have them. However, ORR reports that GNER says this move would not be commercially viable, and while it says that reducing its West Yorkshire services to six trains per day would be viable, ORR believes this would 'still result in unacceptably high levels of abstraction'.

## ADDITIONAL EDINBURGH PATH DELAYED

ORR has approved VTEC's 'core' proposal of an additional path between London and Edinburgh, but will only grant firm access rights from May 2021, two years later than the date requested by the operator. The service and VTEC's overall timetable, which includes provision of an hourly fast service between London and Edinburgh, takes advantage of the delivery of the new Hitachi Inter-city Express Programme (IEP) trains, which are due to enter service from 2018.

Concerns were raised by existing open access operator Grand Central that VTEC's proposals could have 'a devastating effect on its business', but ORR believes it is 'unlikely' that Grand Central would be forced to withdraw

Blunt end to GNER's aspirations: FirstGroup and VTEC have triumped in the path allocation procedure. This is VTEC's 17.25 Newcastle to London King's Cross at Colton Junction on 4 May 2016. Failure of DVT No 82220 (paired up with No 91125 on the rear) at Leeds that morning meant that No 91105 was sent from Doncaster to assist. No 91105 worked to London blunt end first, then stayed on the diagram (covering 1N19, the 13.30 KGX-NCL and 1Y47, the 17.25 NCL-KGX). Ashley Brunt



# ST COAST SERVICE APPROVED

#### **TABLE 1: SUMMARY OF APPLICATIONS**

Applicant	Proposed start date	Services	Application approved?	Firm start date
Alliance/GNER	December 2016	London-Edinburgh – fast hourly service	No	N/A
Alliance/GNER	December 2017	London-Cleethorpes via Doncaster – four trains per day No		N/A
Alliance/GNER	December 2018	ondon-Bradford via Hambleton and Leeds – one train every two hours No		N/A
FirstGroup	December 2018	London-Edinburgh – five return services per day Yes		May 2021
VTEC	May 2019	Additional hourly Edinburgh service, providing overall frequency of 2tph London-Edinburgh and 3tph London-Newcastle		May 2021
VTEC	May 2019	2tph London-Leeds, 1tph London-Harrogate/Lincoln (alternating), extensions to Bradford, one peak hour extension to Huddersfield.  No additional paths compared to current service		May 2019
VTEC	May 2020	London-Middlesbrough – one train every two hours; Saturday and Sunday services enhanced Yes		May 2021

services 'to any significant extent'.

ORR has also dismissed concerns that a proportion of the costs of the IEP rolling stock would be 'economically sunk', saying that approval of the VTEC core services would render treatment of these costs as not relevant.

The firm approval of access rights to VTEC has been delayed because Network Rail says infrastructure improvements which will give additional capacity may not be ready until the May 2021 timetable. These include four-tracking at Woodwalton (between Huntingdon and Peterborough) and grade separation at Werrington Junction (north of Peterborough). However, ORR says it will grant VTEC contingent rights for the additional hourly path from May 2019, meaning the services could be introduced sooner than May 2021 if these projects are 'delivered early or found not to be needed after all'. VTEC's access rights will run until 2025.

## ADDITIONAL DESTINATIONS IN THE PIPELINE

VTEC's proposal for services to Bradford, Lincoln and Harrogate from May 2019 did not require any additional paths compared to the current timetable. The existing pattern of two trains per hour (tph) from London to Leeds is retained, with some services extended to Bradford. The Lincoln and Harrogate services are effectively extensions of the current hourly stopping service, which runs to York and Newark alternately, with the Harrogate services reaching Leeds via Hambleton Junction rather than via Wakefield.

ORR says there were no significant adverse impacts identified from these services, with the largest being an impact on Grand Central's revenues in the order of £0.5 million per annum. ORR says the application for these services has been approved on the basis of the clear evidence of net benefits from better serving these communities, and services can be introduced as planned from May 2019. VTEC had planned to stagger the introduction of these services as it received additional IEP trains, initially providing seven trains per day to each destination with the full all-day service following in 2020.

VTEC's proposal for a two-hourly Middlesbrough service from May 2020 has also been approved, but firm rights are only granted from May 2021. Again, the most significant impact stated was on Grand Central services, but ORR says GC is 'unlikely to be forced to withdraw services to any significant extent'. The modelling by CH2M indicated a positive NPV for the service, and while ORR says this was relatively low, VTEC and the Department for Transport stressed that the Middlesbrough services 'would support crowding relief on these and other services in the region,' which ORR says suggests the modelling 'potentially understated the benefits'.

## FIRSTGROUP SERVICE APPROVED

FirstGroup's proposal for an off-peak, single-class service of five trains per day between London and Edinburgh has been approved.
First says journey times will be around four hours, with an average fare of 'less than £25'.
Trains would call at Stevenage, Newcastle and Morpeth, with First stating that the service is intended to compete with airlines.

ORR noted that while the proposed service did not serve any new rail destinations, 'there were

aspects to the application which would give passengers more choice, citing the single-class low-cost offer. The regulator says the NPV was significant and comparable to other options, 'which was notable given off-peak paths are typically used for less valuable services'. DfT contended that the NPA ratio would be higher than that modelled, but ORR rejected this view and says it remains satisfied that 'the application was likely to pass the NPA test'.

ORR notes that there remain 'kev uncertainties' about delivery of the FirstGroup services relating to future access charges, possible future imposition of Government levies and successful completion of 'a number of infrastructure works'. To avoid a situation in which FirstGroup 'unduly delays' implementation of its services and blocks capacity that could otherwise be used, ORR is directing Network Rail to enter into an access contract 'including conditions requiring FirstGroup to secure appropriate rolling stock by a particular date and to demonstrate steady progress as it develops its services. The access contract will run for 10 years from 2021. m

#### TABLE 2: FINANCIAL MODELLING OF ECML APPLICATIONS

Applicant/service	Not primarily abstractive (NPA) ratio	Net present value (NPV) benefits	NPV per path	NPV per path excluding operating costs
GNER West Yorkshire & Cleethorpes	0.37	185.0	10.3	19.0
GNER Edinburgh (with tilt)	0.41	46.1	1.4	21.0
VTEC core (additional hourly Edinburgh service)	1.50	198.1	7.6	22.2
VTEC Bradford/Lincoln/Harrogate extensions	4.00	108.7	5.4	8.3
VTEC Middlesbrough service	38.0	3.3	0.3	4.6
VTEC full proposal	1.99	379.6	9.7	22.4
FirstGroup Edinburgh	0.42	77.4	7.7	20.3
VTEC core with GNER West Yorkshire & Cleethorpes service	0.89	408.3	9.3	21.4
Source: CH2M				

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# **GWR TO ORDER MORE'387s'**

# ADDITIONAL HITACHI BI-MODES ALSO A POSSIBILITY

**GOVIA THAMESLINK** Railway's fleet of 29 Class 387/1 EMUs is to be retained by the operator and will not be transferred to Great Western Railway, according to industry sources. Instead GWR is to receive 14 of the 20x4-car'387s' ordered by Porterbrook Leasing in November 2015, which will be supplemented by an order for 15 further units.

GTR is to use the '387s' on Great Northern services to Cambridge and King's Lynn. Their top speed of 110mph is higher than that of the 100mph Class 377s previously earmarked for these services, and this is expected to free up additional capacity on the East Coast main line over the two-track Welwyn viaduct, which is currently a major constraint.

As was predicted ('Moving Wheels', last month), c2c is to receive the first 6x4-car units from Porterbrook's order for 20 further '387s' in a bid to address overcrowding on its route. The operator says these will begin to enter service in October, with all six operational by the end of the year. They will be leased until 2019, at which point c2c is due to receive new trains as part of the deal agreed with the Department for Transport when it renewed the franchise. c2c says the formal procurement process

for these trains started in April, with the manufacturer expected to be appointed in the summer.

#### **NEW BUILDS FOR GWR**

The first '387s' to enter service with GWR will be the eight units which were part of the original order and are currently being built at Bombardier's Derby facility. Construction of these is expected to be completed in early August, with introduction into service following by the end of the year. It is understood that testing will be carried out on the Thameslink route before the units enter service with GWR, initially on a small number of services between Paddington and Hayes & Harlington. These sets will now be supplemented by 29 new-build units, comprising the remainder of the Porterbrook speculative order

and a further 15 sets which are also to be funded by Porterbrook.

Changes to crashworthiness regulations mean that the Class 387 design cannot be produced after the end of September 2016, so to enable the additional sets to be manufactured it is expected that Bombardier will ensure that all cabs for the additional order have been produced by 30 September.

Industry sources confirm that options for some of the GWR order to be produced as independently powered EMU (IPEMU) variants fitted with batteries for operation away from electrified routes are still being explored. This would enable GWR services to Gatwick Airport and on some of the Thames Valley branches to be worked by '387s' prior to electrification. Any decision to look seriously at this proposal will depend on final

electrification timescales being confirmed by Network Rail.

#### **MORE BI-MODES ON THE CARDS?**

There is now some uncertainty as to whether GWR is still to receive 21 Class 365 EMUs from GTR to supplement the '387s' on services in the Thames Valley, and it is understood that discussions between GWR and the Department for Transport continue over whether this move offers the best solution. Sources suggest that with electrification to Oxford not due to be completed until June 2019, GWR's preference is for a further order of Hitachi AT300 bi-modes instead of a transfer of '365s'. It is believed that reinstating DC third rail equipment to the '365s' would be 'very difficult', placing a question mark over their future use if they are not transferred to GWR.

#### **CLASS 387: CURRENT AND FUTURE ORDERS**

Number of four-car units	Operator
29	GTR Class 387/1 – to be retained for Cambridge/King's Lynn services
27	GTR Class 387/2 – Gatwick Express fleet
8	GWR – under construction (original order)
6	c2c – delivery in autumn 2016 (Porterbrook speculative order)
14	GWR (Porterbrook speculative order)
15	GWR (extra order anticipated)

# CHEAPER OKEHAMPTON ROUTE PROPOSED

**THE PENINSULA** Rail Task Force is advocating the reopening of the former Southern Railway route between Exeter and Plymouth via Okehampton as a secondary route rather than as a bypass for the existing line via Dawlish. The news comes in an updated summary of the task force's work, released alongside a draft 20-year plan for investment in the south west's rail network.

Following the storms which closed the line at Dawlish for eight weeks in 2014, Network Rail produced a report which identified five options for securing the resilience of the rail service to the south west peninsula. Option 3, the reconstruction of the Okehampton route, was costed at £875 million, based on a double-track high specification line.

The line between Exeter and Okehampton remains intact but is only served on summer Sundays at present, while at the Plymouth end of the route the rebuilt line would use the existing Tamar Valley route as far as Bere Alston, from where reopening to Tavistock is already planned. This would leave the section between Tavistock and Okehampton to be restored. The task force states its belief that a route built to a lower standard between Tavistock and Okehampton would cost £450 million, based on a simple cost per kilometre calculation, with the full Exeter to Plymouth upgrade costing £510 million.

The task force says the line's function would be to provide a modest service serving local stations and to offer diversionary capability in the event of disruption on the existing route, as at Dawlish in 2014. New stations would be provided at Tavistock, Lydford, Sourton Parkway, Okehampton East, North Tawton and Bow, in addition to the existing station at Okehampton.

It is predicted that there would be a 'significant shortfall' between revenue (£1.128 million per annum) and costs (£3.918 million per annum) for the new rail service. To overcome this, the task force advocates construction of 25,700 new dwellings between the settlements of Bow, Okehampton, Tavistock, Lydford and North Tawton, which would require a significant change in planning policy.'

#### **WIRING UNLIKELY**

The task force says that its Dawlish Additional Line (DAL) study into

routes between Exeter and Plymouth demonstrated that there is as yet'no justification for the construction of an additional railway alignment on capacity grounds alone. However, it says the case becomes stronger 'when capacity, journey time, and resilience benefits are considered together. Electrification west of Exeter is ruled out as it is unlikely that the benefits generated would offset the cost of the work, with procurement of additional, newer vehicles offering greater comfort and better performance recommended instead.

In its 20-year plan, the task force establishes priorities for faster journey times and upgraded diversionary routes. Ambitions include a saving of 26 minutes on journey times between London and Penzance and a two trains per hour service between



With the '387s' retained by GTR, 11 further Class 377 EMUs could transfer from GTR to Southeastern in addition to the 25 already provisionally planned to move; six Class 377s currently used on Thameslink services are expected to be retained by GTR for use on Southern routes. Southeastern has submitted a raft of six options to DfT for expanding its

fleet, ranging from Class 319s to various Electrostar options. It was expecting a verdict on its bid by mid-June, with the preferred plan an injection of 36x4-car Class 377s for the Tunbridge Wells stoppers and the Maidstone East line, allowing the Class 465s currently on these routes to be freed up to provide extra capacity on the Metro routes in South London.

Release of the Class 377s depends on progress with the Class 700 acceptance programme on the Thameslink route; driver training is ongoing, but in mid-May the first unit had yet to be accepted for passenger service. A year ago, Class 700s were expected to be carrying passengers by February 2016 (p18, May 2015 issue), but since then problems have surfaced with the doors and other

components (p70, last month). As we closed for press, GTR was planning a formal launch ceremony with the Class 700s on 24 May.

Meanwhile, construction of the fleet of 27 Class 387/2 units for the Gatwick Express service has been completed, with some of the fleet still undergoing testing or mileage accumulation. Tony Miles/James Abbott



Exeter and London Paddington including hourly calls at Westbury. Upgrading of the West of England line between Exeter and Yeovil would give more flexibility for use as a diversionary route and support an enhanced Devon Metro service, while journey time improvements of up to 36 minutes between Exeter and London Waterloo are forecast through a combination of linespeed improvements and trains calling only at Salisbury between Clapham Junction and Yeovil Junction.



Okerail: the unit forming the first Sunday working to Okehampton (pictured) of the 2016 season on 15 May, No 153377, was decorated with a celebratory bodyside panel. The 09.55 to Exeter on that day left full and standing with 108 passengers, including families with buckets and spades heading for Devon's beaches. The four return trips a day service will continue on each Sunday up to 11 September 2016. D. W.V. Hunt



New station for East London: unit No 317649 stands at Lea Bridge as Rail Minister Claire Perry (green jacket, back to camera) conducts media interviews. Antony Guppy

# LEA BRIDGE LIVES AGAIN

**THE NEW** station at Lea Bridge in east London has been officially opened by Rail Minister Claire Perry.

The previous station closed in 1985, and the reopening project has been led by Waltham Forest council. The council provided £5.3 million towards the £12 million cost, with £1.1 million coming from the Department for Transport's New Stations Fund

and £5.5 million from Section 106 contributions (managed by the Stratford Transport Implementation Group) from the Westfield shopping centre development at Stratford.

The station is on the line between Stratford and Tottenham Hale. It lies just north of the Queen Elizabeth Olympic Park, and is expected to be used by over 350,000 passengers a year by 2031. Network Rail managed the construction of the station, with work on the ground delivered by VolkerFitzpatrick as main contractor.

Train services are provided by Abellio Greater Anglia, and the station is served by a half-hourly Stratford to Bishop's Stortford service on Mondays to Saturdays and by Stratford to Hertford East services on Sundays.

### KEOLIS AND AMEY IN WELSH PARTNERSHIP

**KEOLIS HAS** teamed up with Amey to bid for the Wales & Borders franchise, which is expected to include the task of electrifying the Valley Lines in and around Cardiff.

Alistair Gordon, Keolis UK's chief executive, said Amey was already a Network Rail contractor in Wales, and a Keolis-Amey joint venture was successfully operating and maintaining the Docklands Light Railway. Commenting on the Valley Lines, he said: 'We think a tram or metro system would work far better than a heavy rail system'.

The Welsh Government will procure the new franchise and possibly a Valley Lines concession. It will invite bidders to propose technical options, rather than specifying at the outset. Arriva's current franchise ends in October 2018 and the government expects a concession to bypass delays in Network Rail's electrification programme.

Mr Gordon said the opportunity to award the Valley Lines work to the private sector and 'go to the front of the queue' was quite appealing. Whether the Wales & Borders franchisee would manage infrastructure maintenance outside the Valley Lines area would have to be worked out with the client over the coming year, he said.

Keolis is owned by SNCF, which has a 70% stake, and a Canadian pension fund. *Rhodri Clark* 

# FLYING SCOTSMAN SCANDAL ENGULFS NR

A NUMBER of special services in Scotland hauled by the newly restored steam locomotive Flying Scotsman were on the verge of cancellation on the weekend of 14 and 15 May after Network Rail failed to carry out gauge clearance checks. The announcement on the afternoon of Friday 13 May that the locomotive could not run led to a public outcry, and following direct intervention from ScotRail Alliance managing director Phil Verster it was confirmed the following afternoon that the train could operate as planned.

The locomotive was due to undertake a tour of Fife and a trip along the newly opened Borders Railway from Edinburgh to Tweedbank, but NR announced at 16.40 on 13 May that it had 'been unable to carry out the [gauging] work in time'.



Digits extracted, regulator opened: No 60103 leaves Fountainhall on the Borders Railway on 15 May. Stuart Fowler

Scottish Transport Minister Derek Mackay described this as 'appalling incompetence by Network Rail' and demanded a full investigation. It is understood that Mr Verster called NR chief executive Mark Carne and chairman Peter Hendy to make it clear that the issue needed to be resolved. This reportedly saw a rapid assessment of the situation involving dynamic modelling of the routes, including a review of other steam locomotives which had already traversed the Borders route since it opened and minor changes to tracks to be used by the train in the Edinburgh area.

Whilst the grant of approval for the service to run was seen as a positive outcome, Modern Railways understands that the Scottish Government intends to launch a full enquiry into the incident and also into any impact the initial cancellation may have had on local businesses before the services were reinstated. Industry sources confirm that the Milton Keynes-based team tasked with timing and clearing charter services to run has regularly stated that it is significantly under-resourced and is struggling to cope with its workload. Tony Miles

# NR ESTABLISHES PROPERTY BUSINESS

**NETWORK RAIL** has established its property business, Network Rail Property, as a separate company with its own board, which will approve investments in NR's estate and make decisions about the disposal of property assets.

The new structure and governance arrangements have been implemented in the light of the report by chairman Sir Peter Hendy re-planning NR's Control Period 5 (CP5, 2014-19) enhancements programme. This proposed the sale by NR of assets in order to generate £1.8 billion to help fund a shortfall in the programme, within which a number of projects have been subject to delays and cost overruns. It is expected that the majority of this money will come from the sale of property assets whose ownership by NR is not considered essential to running the railway. NR says the move will also provide 'greater focus on plans

to deliver land for housing, while continuing to generate income from Network Rail's other property assets to reinvest into the railway!

The new organisation went live on 1 April and is led by David Biggs as managing director. Network Rail Property's board will be chaired by Chris Gibb, the former Virgin Trains chief operating officer, who has been a non-executive director at NR since 2013. A search has begun to identify two further

non-executive directors 'with significant experience in the commercial and residential property market and in leading complex property disposal and acquisition transactions'.

NR says the creation of a property company with its own board means it can focus on its core business of running the railway while the property board can be given a clear mandate to accelerate the release of value from the property portfolio.

# STEADY PERFORMANCE DECLINE

#### **PERFORMANCE ACROSS**

passenger operators declined during the year 2015-16, according to statistics released by the Office of Rail and Road.

The national public performance measure (PPM) score was 89.1%, 0.7% down on the previous year and the lowest score since 2006-07. PPM measures the number of trains arriving at their destination within five minutes of their booked time, or within 10 minutes for long distance operators.

ORR says PPM has been declining steadily since the start of 2013-14. The drive of the change over the last year was a 1.2% fall for the London and South East sector, which at 87.8% recorded the lowest annual PPM score since 2004-05. Performance in the long distance sector improved slightly, with a small decline for regional services.

Only seven operators saw performance improve during the year, with the biggest increases in PPM on TfL Rail, Virgin Trains West Coast and East Midlands Trains. The top performing operator was c2c, followed by Merseyrail and Chiltern Railways.

The biggest PPM decline was on the Caledonian Sleeper franchise, with Virgin Trains East Coast and Hull Trains also experiencing significant falls. Comfortably the worst overall score was for Govia Thameslink Railway. All three inter-city operators on the East Coast main line (VTEC, Hull Trains and Grand Central) saw PPM fall by over 5.5% during the fourth quarter of the year.

Cancellations and significant lateness (CaSL) in 2015-16 was 3.1%, 0.2% higher than the previous year and the worst performance since 2004-05. Again, the London and South East sector saw the biggest worsening of performance. By

operator the biggest improvement was recorded by CrossCountry (down 0.6%), with the largest increase for the Caledonian Sleeper franchise (up 3.3%), which was also the worst performing operator by a significant margin with a CaSL score of 10.4%. c2c, Chiltern Railways and Northern Rail were the best performing operators.

Freight performance as measured by the freight delivery metric (FDM)

experienced a small decline of 0.1%, with an annual score of 94.2%.

Meanwhile, Virgin Trains is now reporting performance on both its East and West Coast routes using the right time measure. This only classes a train as on time if it arrives at its destination within 59 seconds of its scheduled time and is therefore much stricter than PPM.

In a move which is clearly designed to increase pressure on

Network Rail and other operators, Virgin is also publishing charts which show where responsibility for delays lie. Talking to *Modern Railways*, a senior manager at Virgin noted 'We think that the 0-59 seconds initiative will help to focus Network Rail. We are now publishing graphs showing overall, and by route, performance figures. This is probably more data than anyone has shared before! *Philip Sherratt/Tony Miles* 

13

#### PERFORMANCE BY TRAIN OPERATING COMPANY, 2015-16

Operator	Public Performance Measure (PPM, %)	Change on 2014-15
c2c	96.7	-0.2
Merseyrail	95.3	-0.3
Chiltern Railways	94.4	-0.6
London Overground	94.4	-0.6
TfL Rail (MTR Crossrail)	94.0	+2.3
East Midlands Trains	92.8	+0.7
Arriva Trains Wales	92.2	-0.8
Heathrow Express	91.8	-0.8
Northern Rail	90.7	-0.2
ScotRail	90.6	+0.1
South West Trains	90.1	-0.1
Great Western Railway	89.5	+0.6
CrossCountry	89.5	+0.6
Abellio Greater Anglia	89.3	-0.6
National	89.1	-0.7
London Midland	88.1	+0.1
TransPennine Express	87.8	-0.8
Southeastern	86.9	-2.4
Grand Central	86.6	-1.6
Virgin Trains West Coast	86.0	+1.3
Caledonian Sleeper	86.0	-3.9
Hull Trains	85.3	-2.9
Virgin Trains East Coast	85.2	-3.4
Govia Thameslink Railway	81.5	-2.3

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## RISIA

#### Railway Study Association

Developing railway professionals

## RSA Thought Workshop: Stations of the Future – Dilemmas and Opportunities – Thursday 14 July

We're delighted to announce RSA's new Thought Workshops programme. These ground-breaking events will bring together the leaders, subject matter experts and bearers of fresh ideas to explore and rethink from different perspectives how we deliver the railway service for the future.

Drawing on the wealth of insight in the RSA membership, these multi-disciplinary events are aimed at everyone who works in rail with an appetite for driving improvement, including commercial managers, property managers, operations managers, lawyers, marketing employees, technologists and engineers.

Through these extended workshop sessions, we will put our heads together to create and explore new ideas and provide recommendations to the rail industry of new opportunities to explore. The first workshop will be at a City of London venue on Thursday 14 July 2016 between 16.30 and 19.00 and is free to RSA members and corporate members and only £10 for non-members. For further details, please e-mail info@railwaystudyassociation.org.

#### **Publications Officer Simon Feast writes:**

Neil Micklethwaite gave an interesting presentation in May to the last London sessional meeting of the 2015-16 season, talking about how East Midlands Trains uses social media and how this could be improved further in the future, which provoked some interesting questions and discussion afterwards. In line with this the RSA now has a LinkedIn page where members can connect with each other. We will be using the page to update followers about RSA business and share industry insight. Please follow our LinkedIn account at <a href="https://www.linkedin.com/company/railway-study-association">https://www.linkedin.com/company/railway-study-association</a>. If you wish to keep up to date with developments you can follow us on Twitter @railwaystudy and also on Facebook using the link on our website.

It is not long now until the annual RSA Celebration Evening and Dinner, which includes talks from London's Transport Commissioner Mike Brown MVO and Hitachi Rail Europe CEO Karen Boswell, as well as from Sabrina Ihaddaden, national chairwoman at Young Rail Professionals. The event takes place on 23 June at 18.30 at the Paddington Hilton Hotel. Details on how to book can be found on the RSA website.

We are also organising a Study Tour to Ireland on 21 and 22 July to visit several Irish Rail locations and also the Dublin Luas tram system. The itinerary is expected to include presentations on IE by CEO David Franks, on their Customer First Programme, and a visit to a Mechanical Engineering Depot, to include an overview on how they use Lean Management Control Rooms.

For further details on both these events, please e-mail info@railwaystudyassociation.org.

You can read a write-up of the talk by Antony Smith on page 44 of this issue and of the talk by David Statham on page 46 of this issue.

An application form to join the RSA can be downloaded from the website at www.railwaystudyassociation.org, and membership benefits include 12 issues of Modern Railways and a regular speaker programme.

You can contact the RSA by e-mail at secretary@ railwaystudyassociation.org or by post to RSA, Membership & Subscriptions, PO Box 375, Burgess Hill, RH15 5BX. Please enclose a stamped addressed envelope for a reply by letter mail.

Hear the speakers, ask the questions and then read all about it in *Modern Railways*!

www.railwaystudyassociation.org

# ATW EXTENDS TO MANCHESTER AIRPORT

ARRIVA TRAINS Wales began to operate regular trains from North Wales to Manchester Airport on 16 May, a year later than planned. The Office of Rail and Road said the services would improve performance at Manchester Piccadilly but awarded access rights only until December 2017, when additional Northern Rail and TransPennine Express services are proposed to commence.

ATW's standard pattern timetable of 2005 included almost an hour's layover at Manchester Piccadilly for its hourly Llandudno-Manchester workings, sufficient for a return trip to the airport. With a new fourth platform increasing capacity at the airport station, ATW sought to extend services in May 2015. However, Network Rail and the Department for Transport were in agreement that ATW's services would eventually have to be removed to enable an additional airport service from Leeds to operate after completion of the Ordsall Chord.

In October the access disputes committee found that Network Rail had acted beyond its powers in rejecting ATW's access proposal. ATW made a formal application to the ORR in January, following a consultation in which the outgoing Northern Rail and TPE franchises echoed Network Rail's concerns that the additional services would impair performance between Manchester Piccadilly and the airport. The ORR rejected the concerns on the grounds that ATW trains currently shunt from Piccadilly to the Mayfield goods loop for their layover.

'There will be no additional crossing movements in this area over

those undertaken by the existing terminating service' wrote Jonathan Rodgers of the ORR in the decision letter. 'Those that will still occur will do so at a higher speed, reducing the time during which confliction occurs. In addition, the proposals should result in any bottlenecks at Manchester Piccadilly being cleared immediately the Up Slow line is clear.'This contrasted with ATW's terminating trains having to wait until the route was clear across the Down Slow into the goods loop.

Performance risk further south was 'minimal' and would probably be balanced by the 'better performance to be expected from the removal of the shunt at Manchester Piccadilly'. Mr Rodgers also said that it would take only a relatively small shift from road to rail for the new services to generate new revenue to rail, although the new services would abstract some revenue from other operators.

The ORR did not have sufficient information to make a decision on the potential conflict with other proposed services from December 2017, and ATW had agreed to Network Rail's suggestion that the continuation of the airport access rights beyond the first year' should be subject to a performance review.

The ORR's decision letter was written two days before the May timetable change. The new airport services are therefore absent from printed timetables for the main summer holiday period, and the services' launch was not publicised in advance. Rhodri Clark

# ALSTOM WINS WIDNES APPROVAL

**ALSTOM HAS** been granted planning permission to acquire land for the construction of a new technology centre at Widnes.

The company says the facility forms part of ambitions to makes it UK operations more modern and efficient and support growth in the market. The strategically-placed site is intended to be a north west hub and offers good access to the West Coast main line. Ground-breaking at the 30-acre site will take place before the summer, with construction starting later in the year.

The site will house a training facility which will be named the

North West Transport Training Academy. Due to open in autumn 2017, Alstom says it will act as a UK centre for research and development, providing training in engineering, manufacturing, project management and other transport sector skills, upskilling the existing workforce and supporting apprentices and new graduates for the rail industry across the north west. The company will also use the centre to carry out essential maintenance work, saying it will provide the expertise needed for maintenance and modernisation of trains.

# GO-AHEAD FOR HALTON CURVE UPGRADE

**THE LIVERPOOL** City Combined Authority has approved the upgrade of the Halton Curve in Cheshire, which will enable through rail services to operate between Liverpool and Chester via Runcorn.

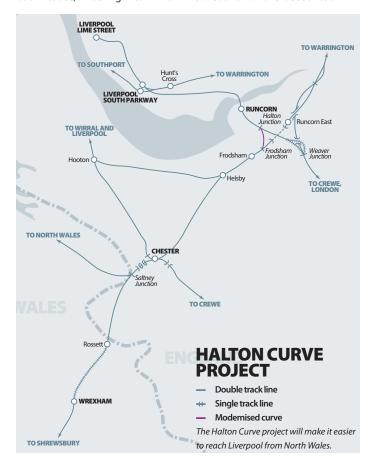
The curve, which links Runcorn and Frodsham, can only be used in one direction at present, and is served by a weekly passenger train during summer months only. Upgrades to the track and signalling across the length of the curve, along with new infrastructure at either end, will in future allow an hourly service to operate in each direction between Liverpool and Chester. Work is due to start on site in June 2017 and be completed by May 2018.

Discussions are taking place with the Welsh Government regarding the funding of the proposed service, which could later be extended into North Wales. It is expected that it will be incorporated into the new Wales and Borders franchise, which is due to begin in October 2018, with Liverpool's transport authority Merseytravel providing the revenue support for any operation prior to this time.

The authority has approved the full business case to bring the line back into use, unlocking £10.4 million

of funding allocated through the Government's local growth fund, which will be supplemented by a further £5.67 million from the city region's local growth fund. The additional funding will cover the full scope of works required, with the initial cost estimate by Network Rail having been shown to underestimate costs and omit a number of items. The report to the combined authority's meeting states that 'significant challenge' has been made by Merseytravel and other stakeholders to the cost estimate produced by Network Rail, but notes that Mersevtravel 'now has more confidence in the information now being provided by Network Rail due to a closer working relationship with Network Rail'. The scheme has a benefit-cost ratio of 1.9, based on the new estimate with a contingency added.

A £340 million package of rail upgrades for the Liverpool city region was recently announced, and as well as the Halton Curve project this covers major works at Lime Street station, upgrades to the underground section of the Merseyrail network and resignalling between Weaver Junction and Wavertree Junction.



#### **IRO WELCOMES 5000TH MEMBER**



#### IRO MEMBERSHIP TOTAL REACHES MILESTONE

Founded in 2000, the Institution of Railway Operators (IRO) was formed for its members and the rail industry, promoting best practice and representing the interests of railway operators at all levels. Membership has continued to grow each year and surpassed 5000 members at the beginning of April 2016.

Throughout March the excitement started to build as the total membership of the Institution grew nearer to 5000. The IRO was delighted when Lucy Garrad, Contact Centre Manager, Chiltern Railways, submitted her membership application and became the 5000th member.

Lucy was very pleased to learn she had become the Institution's 5000th member and told us more about her career in the industry so far and reasons for joining the IRO: "I joined the industry working as an Office Administrator with Chiltern Railways in January 2009. Since then I have undertaken various roles in the organisation such as Personal Assistant, Station Manager and currently I am the Contact Centre Manager."

"I decided to join the IRO after learning that I was eligible for free membership through Chiltern's Corporate Membership. I feel that the benefits of joining, such as the area events and online learning resources will help me broaden my understanding of the industry more widely. I think it is important to take an active role in your own professional development and look forward to doing this with the Institution."

The Institution is thrilled to have reached this milestone which symbolises that railway operators worldwide are committed to professional development and raising standards across the industry. The IRO could not exist without the support of its members, so we would like to thank them for their continued membership and involvement in the various and far-ranging benefits membership brings.

We would also like to take this opportunity to offer our thanks to all of the IRO Area Council Members who volunteer their time to organise and host a varied range of learning events and visits. Their efforts epitomise the Institution's mission to drive forward industry standards and lead the way as custodians of best practice in railway operations.



- If you would like to find out more about the benefits of IRO membership and how to join, visit: www.railwayoperators.co.uk/ membership
- The IRO will be celebrating this milestone at the upcoming Members' Lunch on 17th April in Leeds with David Brown, Chief Executive, Transport for the North, as Guest Speaker. For more information please visit: www.railwayoperators.co.uk/whats-on



www.railwayoperators.co.uk Or call 03333 440523

15

# MAY OPENING FOR METRO EXTENSION

**THE MIDLAND** Metro extension through the streets of Birmingham city centre to New Street station was due to open to passengers on 22 May. The announcement from West Midlands transport authority Centro followed completion of electrical safety checks and test runs in the early hours of Sunday 24 April.

The extension from Snow Hill into Birmingham city centre was originally planned to open by the end of 2015. The section as far as Bull Street began operating on 6 December, but Centro suspended the remaining works for eight weeks to minimise the effect to shoppers and businesses during the busy pre-Christmas period. Construction work subsequently restarted in the New Year. The £128 million project also included the acquisition of a new fleet of 21 CAF-built Urbos 3 trams, refurbishment of the depot at Wednesbury and provision of a new stop at Snow Hill station.



City centre test: the first tram to try out the line to Birmingham New Street, No 37, ran in the early hours of 24 April 2016, as Saturday night revellers partied close by. John Whitehouse

# **GLASGOW SUBWAY SHUTDOWN IN JULY**

#### STRATHCLYDE PARTNERSHIP

for Transport (SPT) has confirmed that Glasgow Subway services will be suspended for one month starting on 1 July to allow work as part of the system's £288 million upgrade.

Plans for the closure were first announced last August, after an independent review had concluded that it would not be possible to maintain a safe and reliable service while work was carried out to renew the turnouts and ramps linking the twin running tunnels with the system's Broomloan depot at Govan.

These ramp connections were installed during the last comprehensive modernisation

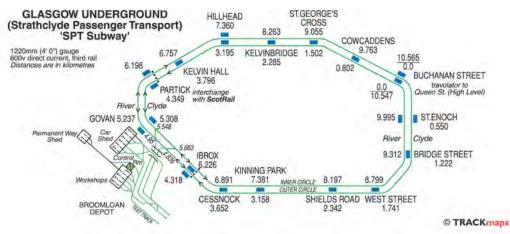
of the Subway in the late 1970s, ending the need to crane vehicles in and out of the running tunnels at the depot that had been a distinctive feature of the system since it opened in 1896. Two single track box tunnels, designated south and north respectively, lead out of the Outer (clockwise) running tunnel between Govan and Ibrox stations, forming a 'Y' connection into the depot layout via a transition cutting. Each leg of the 'Y' is linked from the Outer circle into the Inner circle by a crossover in the turnout chamber, and these crossovers provide the only connections between the tracks of the two circles.

The concrete slab track base in the ramps and in this section of the running tunnels is now life expired and requires complete replacement, together with the associated drainage, plain line track and pointwork. As part of the modernisation the opportunity will be taken to improve the alignment of the track and the switch and crossing geometry within the junction configuration where possible, and the cabling and live rail within the area will be replaced to reduce current loss. Existing signalling equipment will be relocated as required.

Tenders for these works were invited in June 2014 on a design

and build basis; design packages for track geometry improvements elsewhere on the system were also included, together with an option for additional re-railing work to assist SPT's in-house maintenance activities if required. In February 2015 the contract was awarded to Colas Rail, with a tendered cost of just over £5 million, exclusive of contingencies and the additional re-railing options

The closure begins a week after the school term ends, with subway patronage generally falling by around 10% during the summer period. SPT has contracted First Glasgow to operate dedicated replacement buses during the closure period at a total cost of almost £351,000. Despite the extended journey times, SPT clearly hopes to keep much of the Subway customer base during the shutdown, and will be charging low flat fares which will be significantly cheaper than usual Subway prices and will also undercut regular bus and suburban rail fares on parallel routes. SPT will retain the revenue that is collected on the replacement bus services, which have been contracted on a gross cost basis. No Subway stations will be opened during the period of service suspension, and ticket issue and validation will be undertaken by the bus drivers.



Glasgow Subway: track plan of the system, showing the access ramps to the depot. Courtesy TrackMaps

# **TFGM HITS OUT AT HENDY REVIEW**

#### REVISED ENHANCEMENTS PROGRAMME LACKS SPECIFIC TARGETS, SAYS AUTHORITY

#### **TRANSPORT FOR** Greater

Manchester has expressed concern about delays to Network Rail's enhancements programme and described the revised programme for delivery of enhancements as containing 'ambiguous language' and 'non-specific targets'.

Responding to the consultation on NR chair Sir Peter Hendy's updated Enhancements Delivery Plan (EDP), published in January, TfGM has called for 'firm dates' for delivery of schemes, which it says 'are essential for purposes of planning integrated infrastructure schemes, procurement of rolling stock (and cascades) and planned access to the railway and other infrastructure for construction. The removal of dates for some schemes 'raises serious concerns for us and our stakeholders, puts local investment plans at risk and does not promote confidence in the delivery plan, the authority adds.

Particular concern is expressed about the continuing delay to Great

Western electrification, amid fears that it could set back the cascade of diesel trains to both Northern Rail and ScotRail to meet planned service and capacity improvements. TfGM says the Hendy review raises concern 'about the overall ability of the national railway network to fulfil obligations and meet the expectations of our passengers'. Specifically, it notes that 'it is particularly unpalatable that the Enhancement Delivery Plan was released on the same day that Arriva Rail North publically agreed firm orders for new electric and diesel units which were predicated upon assumed electrification schemes and rolling stock cascades as specified by DfT in the franchise ITT (invitation to tender), which may now no longer be fulfilled as originally planned in the light of Sir Peter's rephrasing.

While welcoming the un-pausing of the Trans-Pennine route upgrade, which includes electrification and is now due to be completed in 2022, TfGM says it remains concerned about some of the delays within the

enhancements programme and has called on NR to 'accelerate some of the more critical works to achieve the original projected timescales' as well as to commit to joint clienting and local stakeholder involvement for all schemes across the north of England.

TfGM has also criticised a 'lack of transparency with regards to the underpinning methodology behind the revised dates' within the EDP. The authority has voiced a preference for giving clearer target dates with a list of accompanied project risks rather than indicative delivery dates, while also calling for 'a full breakdown of the programme with the causation of delays', providing greater clarity as to the reasons for delays to schemes in order to assist understanding among user groups, local politicians and leaders. While the review by Dame Colette Bowe provided 'overarching findings' as to reasons for delays to schemes, TfGM says these 'are not specific enough' for the authority to have confidence in the revised timings.

In addition, concern is raised about the lack of an assessment of the wider consequences of the revised programme, including its impact on planned developments, access to the railway and disruption to rail services and other transport systems during construction works, and the sequencing of rolling stock cascades. TfGM has called for an annex to be provided setting out 'the drivers for prioritising schemes, the identified potential impacts and risks generated as a result of delays and the mitigation plans in place to manage and deliver projects in an integrated, collaborative and cohesive manner.

Responding to a request to provide a list of schemes which should be considered as the highest priority for delivery, TfGM highlighted the Ordsall Chord, redevelopment of Manchester Oxford Road station, delivery of an additional through platform at Manchester Piccadilly, the trans-Pennine upgrade and Manchester-Sheffield capacity improvements.

# TWO MORE TRAMS FOR TRANSPORT FOR LONDON

**TRANSPORT FOR** London has ordered two additional Variobahn trams from Stadler to support further frequency increases on the Tramlink network. The 2016-17 TfL budget includes funding for the completion of design work for a second tram platform at Elmers End station and double tracking of the line from there towards Croydon.

All four Variobahn trams from TfL's second order are now in

service, and the budget foresees further new trams being delivered from March 2017. TfL confirmed to *Modern Railways* that it is to procure two additional vehicles at a cost of €7.372 million using options in the original contract, which included provisions for eight further vehicles to be ordered, and following the latest order six have now been taken up.

The four new trams delivered in 2015/16 plus the 'double-tracking'

of part of the Wimbledon route and a new platform at Wimbledon now allows a 12 trams per hour service to be operated on the Wimbledon to Croydon route. TfL is planning to increase the service frequency on the New Addington line from eight to 10 trams per hour by 2020.

TfL is continuing to evaluate options for extending tram services to Sutton to support housing growth

along the corridor between South Wimbledon and Sutton town centre. The organisation's business plan includes £100 million towards the cost of delivering the project if it goes ahead. The Sutton extension has been estimated to cost around £240 million, and funding from non-TfL sources (such as local boroughs and private developers) will be needed if the scheme is to come to reality. *Keith Fender* 

# TRAM-TRAIN SERVICE DELAYED AGAIN

#### **THE INTRODUCTION** of

tram-trains between Sheffield and Rotherham is set to be further delayed.

The £60 million UK pilot scheme will see vehicles run on main line rail tracks from Rotherham to Meadowhall and then over the Supertram network into the city of Sheffield. Services were originally proposed to begin in 2015, but following delays a revised timetable had given an anticipated start date of early 2017. South Yorkshire Passenger Transport Executive, one of the partners in the scheme, has told *Modern Railways* that this date will also not be met as Network Rail



'can no longer meet its timetable for delivering the infrastructure works required to allow the first Tram-Train service to commence as planned.' It is understood that a revised delivery programme for these works is currently being formulated.

The works include electrification of the heavy rail network between Meadowhall and Rotherham at 750V,

the building of new Tram-Train platforms at Rotherham Central and Parkgate, adaptations to the Supertram network to accommodate the wheel profile of Tram-Trains and construction of the Tinsley Chord to connect the Supertram and heavy rail networks.

The first of the seven Class 399 tram-train vehicles, built by Vossloh in Spain, reached the Supertram depot at Nunnery Square in December 2015, and the second vehicle left Vossloh's factory in early May. SYPTE says the vehicles are still due to be introduced onto the regular Supertram network this summer, where they will provide additional capacity.

June 2016 **Modern Railways** 17

# FLY ASH TO LONGANNET POWER STATION

LONGANNET POWER station was shut down at 15.00 on 24 March 2016, with the last train of coal from Hunterston on the Clyde to Longannet running on 18 March. This marked the end of an important destination for rail freight in Scotland.

It is interesting to note that two decades ago, Longannet was an originator as well as a recipient of freight. In 1997, Scottish Power came to an agreement with the then Blue Circle to send fly ash (a by-product of coal burning for power generation) from Longannet to Westbury for use in the production of lightweight breeze blocks for the construction industry.



Still hanging on: with the demise of Longannet power station, rail transport of coal in Scotland is now reduced to a few trains on the Glasgow & South Western route to English power stations with imported coal from Hunterston or from the Keir Mining loading site at Greenburn opencast mine near New Cumnock. Here GBRf's No 66708 *Jayne* moves a train along the loading platform at New Cumnock with what will form the 15.25 loaded coal working to West Burton power station on 18 March 2016. lan Lothian

This rail flow lasted until 2001, by which time a new plant to produce these building products had been built just to the east of the power station at Longannet. That ended the then rail flow to Westbury.

The recent closure of the power station removed the source of fly ash for the concrete product plant and now the raw material is coming in by rail, with Freightliner Heavy Haul securing the contract to deliver it. On 8 March the first train, comprising 30 loaded PCA wagons, left Aberthaw power station in South Wales and ran as far north as Carlisle Yard.

On 11 April, the train travelled from Carlisle to Longannet.



Rail Freight Group

# MANAGING FREIGHT IN A DEVOLVED NETWORK RAIL

t our annual Rail Freight Conference in April, there was much discussion around the best way to manage freight in a railway that is becoming more devolved both geographically and politically. Speakers on the day included Network Rail, the Office of Rail & Road and Nicola Shaw, who gave a summary overview of her report and the implications for freight of her recommendations. We also heard from Rail North and from Midlands Connect on how devolution could provide benefits for rail freight and for the regional economies that they represent.

Whilst it is clear from this that good progress is being made in defining how freight should be managed, a great deal of detail must yet be resolved on the details of the working arrangements with Network Rail and the alignment with the various regional transport bodies.

Of course, Network Rail already has some degree of devolution to its geographic Routes, and the Freight Team exists to provide a single point of contact and cross network co-ordination. This has worked fairly well, and across the wider industry there has been much support for this model. In her report Nicola Shaw therefore recommended building on this approach, to create a Virtual Freight Route 'which should be protected and enhanced from the current Freight Team, and not diluted'.

Part of the justification for this development is the scale of the change that is happening elsewhere. The geographic Routes are set to gain much greater authority and autonomy than today, becoming

standalone business units. Ms Shaw recommended the establishment of a Northern Route aligned to the new political geography of Transport for the North, which is presently under review. Further south, Transport for London is working with the Department for Transport on a new framework for managing London's railways, which will inevitably change the relationship TfL wishes to have with Network Rail. And the newly forming Midlands Connect will also be looking on with interest, and expecting a coherent response to its emerging needs.

18



# Mountsorrel renewal

railer puts finishing touches to the chord into the Severnside energy recovery centre on 28 April as a

Severn Beach service passes on the

adjacent branch. Brian Perryman

**DB CARGO** UK has signed a new five-year contract with long-standing customer Tarmac. The contract came into force on 1 April 2016 and will see DB Cargo UK continue to deliver aggregates by rail from Mountsorrel quarry in Leicestershire.

In January 2016, DB Cargo UK began two other five-year contracts with Tarmac to transport materials for Tarmac's aggregates businesses in the West of England and London.

# SEVERNSIDE PROGRESS

**AS REPORTED** in our January issue (p17), SITA UK is developing a brownfield site adjacent to the former Terra Nitrogen plant at Severnside, in South Gloucestershire, as an energy recovery centre. The centre will take in commercial and

industrial waste from the former Avon County Council region, along with household waste from West London that will be delivered to the facility by rail.

The centre is expected to process up to 400,000 tonnes of

non-recycled waste when it opens later this year, with the capacity to generate up to 32 megawatts of electricity – enough to power approximately 50,000 homes (equivalent to half the homes in South Gloucestershire).

# **WEST MIDLANDS SRFI PROPOSED**

**PLANS HAVE** been unveiled for a new strategic rail freight interchange (SRFI) located in the West Midlands next to the railway between Wolverhampton and Stafford.

The proposed location is a 250-hectare site west of junction 12 of the M6, near the village of Four Ashes. Developers say the area was identified in 2007 as one of the best locations in the region for an SRFI, due to its road and rail access that would allow 9ft 6in containers to come in by rail on conventional flatbed wagons. The site would include six to eight million square feet of warehousing and associated development, and developers say it could create between 6,500 and 8,500 new jobs. The development is being promoted

by Four Ashes Ltd, a consortium led by Kilbride Holdings in conjunction with property company Grosvenor Group, which is providing funding.

If it is to go ahead, the West Midlands Interchange will require a Development Consent Order from the Secretary of State for Transport, with 2020 the earliest a decision is likely on the project.

In this matrix, today's framework, which essentially relies on good working relationships between the Freight Director and Route Managing Directors, will find itself stretched to the limit; it seems unlikely to be sufficient alone. How will Routes, be they geographic or virtual, have authority over each other, in particular in facilitating decisions which are perhaps unpopular for some, or where the outputs span multiple Routes? Will there need to be contractual provisions – perhaps, if each geographic Route is essentially autonomous – or memoranda of understanding? Is there a process for arbitration in the event of non-agreement? This feels uncomfortable in a world where we have been trying to move towards greater collaboration, but what are the alternative models

that give sufficient comfort to investors and customers? This will be even more fraught when each Route has separate economic regulation with financial targets and regulated outputs to meet.

The System Operator role perhaps provides some part of the solution, and the urgent development of this function is critical, including clarification of the scope of its activities. This includes defining how the Routes interact with the System Operator, and the decision

criteria which will apply to areas such as the planning of engineering works, operational control and sale of access rights. For freight this is particularly critical for scheduling trains over multiple Routes, including at night, yet passenger operators will also need strong assurance – particularly if a Northern Route causes both the Virgin franchises to cross yet another Route boundary!

It is clear therefore that the establishment of a Virtual Freight Route requires a great deal of careful decision making. And with freight often lost in the wider debate, Network Rail would do well to ensure that some specific attention was given now to establishing the necessary parameters. A good place to start would be to reinvigorate the existing Freight Team and provide sufficient additional resource to develop this thinking with internal and external stakeholders now.

An opinion column of the Rail Freight Group, www.rfg.org.uk

#### **VIRTUAL FREIGHT ROUTE**

'A Virtual Freight Route, sharing some of the properties of the geographical Routes in terms of autonomy and local policy-setting, and subject to the same network-wide considerations, will ensure that the realities of rail freight transport are

recognised in the new arrangements. The nature of rail freight businesses means that trains will cross several Route boundaries, and these operators typically have lean management teams who need to understand the full national network

in order to deliver for their customers. The role of the Freight Route will therefore be outward facing and primarily tasked with managing the relationships between freight operators and the other Routes.' Shaw Report

www.modern-railways.com

June 2016 Modern Railways 19

# GBRF CONCLUDES LU CONTRACT

GB RAILFREIGHT has marked the completion of a 10-year track renewals contract with London Underground. Since 2006 the company has run between two and eight trains each weekend, bringing sleepers, rails, ballast and materials from Wellingborough and Ferme Park to the District or Metropolitan Lines, taking away spoil and life expired track panels.

Right: Nostalgic run: loco No 66718, seen here on the District Line near Barking, was adorned with a headboard to mark the end of haulage of supplies for the ballasted track renewal (BTR) works on the sub-surface line upgrade.



# **ALLIANCE SOUGHT FOR TRANS-PENNINE**

**NETWORK RAIL** is looking to form an alliance to deliver the upgrade of the trans-Pennine route between Leeds and Manchester.

A Notice in the Official Journal of the European Union (OJEU) seeks 'innovative solutions from multi-disciplinary suppliers' to deliver electrification, capacity improvements and journey time reductions on the route. The route west of Stalybridge to Manchester Victoria forms Phase 5 of the North West electrification, which is due to be delivered by December 2017 and is not part of the advertised tender.

The contract for the trans-Pennine upgrade would include design and execution of works comprising buildings, civils, track, signalling and communication, and is valued at between £800 million and £2 billion. Network Rail would be project 'owner' and a participant in the alliance. The

alliance would work as an integrated team and the organisations involved would share risk and reward, in a similar manner to the alliance delivering the Staffordshire Area Improvements and that chosen to deliver the next phase of the East West Rail scheme. The alliance will be formed after tenderers have completed GRIP2 (feasibility) works, with the project then moving forward to GRIP3 (option selection).

## **GWML RESIGNALLING FOR ALSTOM**

**NETWORK RAIL** has awarded a contract for the final stage of resignalling between Reading and London Paddington to Alstom's Signalling Solutions Ltd (SSL) division.

The £79 million deal covers the design, manufacture, supply, installation, testing and commissioning of a new train control system. Based on Alstom's Smartlock interlocking, it will allow Elizabeth Line trains to operate under European Train Control System (ETCS) on the Great Western main line. The work, which includes renewal of the existing interlocking

and some track remodelling, is due to be completed by the end of 2017. Elizabeth Line operator MTR Crossrail is set to take over the Heathrow Connect shuttle service between Paddington and the airport in May 2018, with services from Reading through the central London tunnels beginning in December 2019.

SSL was set up in 2007 as a joint venture between Alstom and Balfour Beatty. In May 2015 Alstom announced that it would acquire BB's share of the business, and as of 1 April 2016 SSL has been fully integrated into

Alstom. Alstom is Network Rail's primary signalling renewals and enhancements supplier in three out of eight geographical regions, including Great Western Inner and Great Western Outer. SSL is also responsible for resignalling works for the East Anglia section of Crossrail, again using Alstom's Smartlock technology.

A separate £11 million contract has been awarded to Amey for signalling power works between Paddington and Hayes & Harlington, including replacement of obsolete power supplies with fully resilient new supplies.

# ROCHDALE PLATFORM PROGRESS

**NETWORK RAIL** has completed the first phase of work to upgrade the western end of the Calder Valley line into Manchester.

A total of 1,200 metres of new track has been installed between Littleborough and Manchester Victoria and the new bay platform at Rochdale station has been connected to the network. The new platform will enable more trains to run through to the town and reduce the number of trains reversing at Manchester Victoria, freeing up capacity at that station for other services. Work to build the bay platform began in January, and will continue over the coming months as surfacing work is completed along with installation of lighting, passenger information screens and fencing.

The track alterations required a series of weekend closures on the line, and the next phase of work is due to begin in the summer, including strengthening of the main bridge into Rochdale station to handle the increased number of train movements and commissioning of the new platform.

# MAY DAY RECONTROL

**RECONTROL OF** signalling in South Yorkshire and south London was among the works completed by Network Rail over the May Day bank holiday weekend.

In South Yorkshire control of signalling in the Sheffield area has now transferred to the York Rail Operating Centre (ROC). In south London, replacement of signalling on the Brighton main line between Balham and Streatham in conjunction with contractor Atkins saw control transferred from Victoria to the Three Bridges ROC.

Other major projects included replacement of track on the Great Eastern main line between Harold Wood and Brentwood, electrification work on the Great Western main line and track replacement and simplification of the layout at Oxenholme in Cumbria.

#### ROCHESTER WORK PROGRESS

**WORK AT** Rochester station as part of the East Kent resignalling scheme continues. Demolition of the former signal box has now been completed, paving the way for completion of a new platform.

During the Easter bank holiday weekend the new platform 3 was commissioned – this is currently a London-facing bay of eight cars in length, but is later to become a loop on the Down side of the formation. The signal box stood at the country end of the platform, and its demolition paves the way for the commissioning of the loop, which is due to take place in October.

# HULL STATION UPGRADE PLANS

**TRANSPENNINE EXPRESS** plans a £1.4 million upgrade of Hull Paragon station, which it says will be completed ahead of the start of Hull UK City of Culture in 2017.

The operator says the work will deliver new waiting facilities and toilets, an enhanced booking office which is more open and accessible, new customer information boards and additional retail outlets. An application for listed building consent has been submitted to Hull City Council, and if approved work will commence early this summer and be completed by the end of November.

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# TRAFFIC MANAGEMEN

#### Cardiff up in the air, hesitant start for Romford - not much for £73 million

irst of all, apologies for committing a cardinal sin of technical writing – not making conventions clear. In this column Digital Railway, with capitalised initials, refers to Network Rail's Digital Railway programme, the £300 million boondoggle that will double the capacity of the busiest routes, eliminate delays and enable 150mph running on the East Coast main line (Watch it! We have limited space in the letters page – Ed).

To my embarrassment I did not make this convention clear when writing my open letter to Network Rail Chief Executive Mark Carne in the April column, begging him to stop promoting Digital Railway as some wonder solution. As a result, in last month's reply Mr Carne assumed I was referring specifically to the accelerated roll out of the European Train Control System (ETCS). My view on ETCS is that it is the mandated signalling system under the Interoperability regulations and will roll out when it is ready and affordable. So, apologies to Mark.

Which brings us to yet more scope for digital imprecision.
Traffic Management (TM) can

be provided by a number of proprietary signalling and control systems. Indeed, rather like the discovery of Monsieur Jourdain in Le Bourgeois gentilhomme, that he had 'been speaking prose all my life', Integrated Electronic Control Centres (IECCs) have been providing traffic management for a quarter of a century without the operators knowing it.

As reported at length in this column there is also NR's Traffic Management System (TMS) programme, again with capitalised initials, which is another product of the reign of error under which signalling has struggled since Railtrack neutron-bombed its infrastructure. So, if readers are happy, TMS refers to the NR procurement programme and its projects, while TM refers to the generic facility.

#### UNINFORMED

First a quick recap. After an 'uninformed customer' trawl of potential suppliers which identified over 50'possibles', this was reduced to a long list of 12 and then a shortlist of six. NR awarded framework contracts

#### TMS PRIMER

Under Network Rail's National Operating Strategy (NOS), the new Traffic Management System was intended to provide five facilities:

- management of rolling stock and crew changes in real time;
- Connected Driver Advisory System (C-DAS);
- customer information services;
- incident management; and
- plan/re-plan the ability to revise and implement timetables in real time in response to events.

These were known as 'The five pillars of NOS'.

Bidding for national TMS rollout called for only one of these facilities – plan/re-plan, specified at three levels:

to develop demonstration TMS offices, collectively worth £20 million, to Alstom, Hitachi and Thales.

Then Thales was awarded a £28.8 million contract to equip the Wales Rail Operating Centre (WROC) at Cardiff and the new Romford ROC with TM. These are known as the TMS first Deployment schemes.

- 'Isolated', where a controller can adjust the timetable in real time in the event of service perturbations and provide signallers with revised schedules which are shown on separate Signaller Advisory Displays (SAD). Also known as 'decision support tools'.
- 'Interfaced', has an interface with the existing control station, as well as providing decision support tools. It could provide inputs to Automatic Route Setting.
- Integrated, has interfaces with both the Operations & Planning and signallers work stations. It can be used to set routes and provides the full range of capabilities listed above.

Meanwhile, the three framework contract holders were invited to submit offers for a TMS rollout programme, which was then binned. TM is now an 'open market' according to NR.

Finally, there's Thameslink, where NR reckons that TM will be needed to assist running



# TWHY ARE WE WAITING?

24 trains per hour (tph) through the central core. To meet this need Hitachi was awarded a £24 million contract in July last year to supply TM, based at Three Bridges ROC.

Readers might wonder how Thales can supply two TM systems for Cardiff and Romford for £28.8 million, when Hitachi is getting £24 million for the Thameslink TM. You might wonder, but I couldn't possibly comment – yet.

Hitachi's 'isolated'TM (see the 'TMS primer' box) will provide signallers at West Hampstead, King's Cross and London Bridge 'boxes' with recommendations on rescheduling in the event of service perturbations. Routes will then be entered manually.

#### **SILENT DOG**

One of the attributes this column relies on is the ability to hear dogs that aren't barking. And one of these silent mutts made his presence known in a presentation by Martin Arter, NR's Programme Development Director, Digital Railway, to the All Party Parliamentary Rail Group in April.

On the subject of TMS, a screen included the line 'August – October 2016: Traffic Management at Rail Operating Centres in Romford and Three Bridges'. Gelert had gone missing.\*

What had changed? Well, by March it had become apparent that two signalling schemes, the late-running Cardiff Area Signalling Renewal (CASR) and the forthcoming Bristol Area Signalling Renewal & Enhancement (BASRE), would affect the installation of the first Deployment TMS at WROC. In addition to the TM depending on the design data from CASR, the possessions required for commissioning CASR Stage 5 in December this year, plus BASRE, meant that TMS would have to wait.

Note that when the Thales first Deployment contracts were let in May 2014, commissioning was scheduled for December 2015. But with CASR and BASRE pre-empting the TMS contract, itself already running late, NR is having to make some tough decisions on WROCTMS.

\*The faithful Gelert is the Welsh dog which comes immediately to mind. Other famous Welsh dogs are available.

#### **UPGRADE**

That is the official version. But why should connecting Thales' Aramis TM system to the existing Siemens Westcad workstations at WROC be such a palaver?

Well, it's complicated (We guessed – Ed). Both Thales' first Deployment TMS contracts are for a complete control system. In other words, in addition to its own kit Thales is also providing an upgraded version of Westcad, known as Westcad-E. In addition to Cardiff and Romford, the'E' version is also being installed in the Three Bridges ROC.

According to my chums at Siemens, Controlguide Westcad-E, to give it the full title, allows for true area of control movement between multiple workstations, as it includes all the ancillary functions such as signal post telephones, level crossing control and emergency alarms. The hardware and software includes workstation computers and server systems, as well as signalling, closed circuit television (CCTV) and voice remote interfaces (RIF). Automatic Route Setting is also provided.

Comparing these facilities with my article on the IECC at Marylebone ('Informed Sources', July 2015), the 'E' version of Westcad now matches the capabilities of the latest IECC Scalable. I hope to report on a hands-on session with the new Westcad-E next month.

#### **OPTIONS**

This need for a total control centre upgrade to support TMS explains the silent dog. It doesn't help that the full capability from Aramis won't be available until 2018.

As a result, NR has been looking at options for TMS at Cardiff, even including complete cancellation.
Slightly less drastic would be cancellation for now, while continuing with development work and procurement of hardware, such as workstation desks, to protect the long term value of the expenditure already incurred.

But note that this 'development work' would have included taking the TM to GRIP 4, including GRIP 3 Authorisation in Principle (AIP), in May 2016. Decode the abbreviations and GRIP 4 is Single Option Development. Hang on – wasn't commissioning due in December last year?

Given the reputational risk to a flagship Digital Railway scheme, a more politically acceptable solution

#### **TABLE 1: KEY FEATURES OF TMS**

Traffic Management is Network Rail's vision for the next generation of signalling control systems, migrating from the present tactical decision-making by the signaller based on train positions on track diagrams to strategic manipulation of the live timetable plan.

Kev features are

- greater integration of voice communications and level crossing CCTV with the signalling control system;
- flexible areas of control to facilitate better management of disruption;
- increased levels of automation;
- use of train graphs to allow forward planning and adjustment of the service in real time, predicting and eliminating conflicts and delays before they occur;
- significant Group Business Services involvement to define IT gateway (LINX) through which information can be shared between TM and other operational data driven systems; and
- the technology enables operational people and process change.

to the Cardiff conundrum would be an immediate pause, followed by commissioning TMS in August 2017 after CASR and BASRE have been completed. But even that is not as straightforward as it seems.

Remember that Thales' Cardiff contract includes total replacement of the existing Westcad equipment, even down to new desks. However, this could be avoided by limiting TM to 'Isolated', available from August next year. Whether Isolated justifies spending tens of millions is debatable.

Highlighting the chaotic situation was the suggestion that Thales could commission Westcad-E in August this year ahead of CASR Stage 5 in December. Further TMS deployment would then be put on hold, with commissioning after CASR was completed – nominally in May/August next year.

This approach would have increased the cost of TMS by

low single figure millions but was a complete non-starter. The associated scope changes to integrate the CASR signalling, being carried out by Atkins, with the entirely new Westcad-E would have pushed back the already-late CASR completion into 2017.

For me, this highlights the flaw in the TMS approach to Cardiff. TM should be a subset of signalling and control, not vice versa.

#### **VISION**

Which thought leads us on to Table 1, showing the official version of what TMS is about. Note that the first four items are already being used at Marylebone, or are available for the IECC Scalable platform and, now, Westcad-E. But note also the last, gnomic item in the table, which explains the rationale behind TMS.

Back in the mists of time, Network Rail's then Operations Director

#### TABLE 2: TMS FIRST DEPLOYMENT OBJECTIVES

The first Deployment objectives are to:

- assist the Business Change process within Network Rail with respect to the introduction of near to real time train planning (Dispatch Management);
- use the application of dispatch management (train graph driven route setting) within a mixed traffic area (freight / passenger / urban / rural areas);
- improve the visibility of Very Short Term Plans (VSTPs) such that disruption is minimised within the Traffic Management area;
- deploy automatic routing (everywhere subject to risk assessment) with manual route setting by exception;
- use other automated functions such as Conflict Detection and real-time timetabling and re-planning;
- quickly and proactively resolve disruption through improved decision support, reducing the potential operational safety issues, e.g. delegation of control;
- plan service delivery as a continuous process;
- support reconfiguration of control areas to suit current workload,
   e.g. during disruption or at periods of low demand; and
- improve the quality of information disseminated to the industry, customers, passengers and to other parts of Network Rail for post-event analysis.

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devised a new National Operating Strategy (NOS). Under this strategy there is more to consolidating signalling and control in the ROCs than savings through economies of scale. TMS would facilitate further streamlining through a radical redesign of NR's business processes.

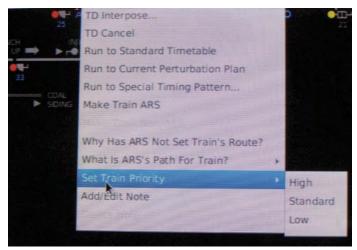
'Process change' is about removing layers. I described an example in the Marylebone IECC article.

Currently the interface between Network Rail and Chiltern on changes to the day's plan is paper-based. Why not eliminate this by giving Chiltern direct access to the Train Timetable Processor (TTP)? The operator would then be responsible for making any changes during the day, with the Enhanced ARS running the schedule.

So that's one example of an immediate benefit getting lost in a lofty aspiration.

'People change' refers to roles within signalling and control. For example, signalling, as in manual route setting, is replaced by Dispatch Management with what TMS calls Automatic Routing. Once again, this is nothing new.

What is interesting is that the demonstration of the Thales TMS suite I saw revealed that the system was being run by hard core signallers who were using its facilities to streamline



IECC Scalable at Marylebone: the drop down menu allows signallers to assign a value to a waiting train. Roger Ford

their usual operating practices, rather than as a new business process.

#### **ROMFORD**

Anyway, the proof of the pudding is now going to be at the new Romford ROC, which will take over control of what used to be called the London, Tilbury & Southend lines out of Fenchurch Street, currently controlled from the Upminster IECC and now known as Thameside. Commissioning is scheduled for 13 November. Significantly, control of the operationally demanding

North London line and the archaically named Tottenham & Hampstead line will remain at Upminster for the time being.

Interestingly, Liverpool Street, the pioneering IECC, is currently being upgraded to Scalable as part of Alstom's Great Eastern resignalling to support Crossrail. That could provide some interesting real world comparisons.

While the Thameside interlockings will remain at Upminster, control will be from new Westcad-E workstations in the ROC. This is a pretty radical

change for operator c2c, bearing in mind that Westcad-E is untried.

However, the TMS will not be introduced until after Romford has settled down. And, initially, the functionality of the Thales Aramis TM will be limited to that specified for the demonstration office.

NR expects that signallers will use the Aramis dispatch management screen, reverting to the Westcad-E workstation screens only for manual signal control. As NR puts it, route control for Thameside will be supported primarily by the new TMS 'with some aspects of conventional system functionality retained'.

Put another way, 'the present tactical decision-making by the signaller based on train positions on track diagrams [will migrate] to strategic manipulation of the live timetable plan.' Signallers in the readership can no doubt think of many routine operations that might be a tad difficult using a train graph. Setting a group of signals at danger for emergency repair work, for example.

In the Demonstration Offices, the signalling screens were the primary interface augmented by the TM displays. Given the near continuous telephone traffic, often linked to the signalling screens, I worry that we

25



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may be in danger of replicating the human factors issues with airline pilots whose dependence on the 'automatics' means that they can't fly the aircraft when things go wrong.

#### **NEEDED NOW**

Anyway, that's enough of what NR Chairman Sir Peter Hendy terms 'elderly, backward, white man' (EBW) stuff. Time to be dynamic and forward looking (but still white).

Were I c2c Managing Director
Julian Drury, I would not be looking
forward to the morning rush hour on
14 November. Yes, I know I mocked
Digital Railway for planning to pilot
integrated ETCS, C-DAS and TM on
the Wherry lines ('Forum', last month),
but there is a middle way between a
stroll in the park and attempting the
SAS course on the Brecon Beacons.

As readers will know, when it comes to technology I am an incrementalist by nature and the rush to TMS seems to me to be an action replay of InterCity rolling stock policy in the 1960s (I thought this was forward looking? Ed).

For TMS read the Advanced Passenger Train, with its all-new technologies aimed at transcending the limitations of the existing railway in a single bound. For HST, combining state-of-the-art equipment to produce a train greater than the sum of its parts, look to IECC Scalable.

Here's a list, in human-speak rather then Specification Boiler Plate English, of what TM will provide at Romford.

#### 1. Closer working with c2c

TM will be operated by a team led by the c2c'Train Service Manager TMS'. In effect, c2c will be signalling its own trains and implementing its own train regulation decisions. See the reference to Chiltern above.

## 2. The ability to work 30–60 minutes ahead

TM operators will work ahead of real time, giving c2c and NR time to decide in advance how conflicts will be resolved. This sounds a bit generous and subject to nothing else cropping up to disturb the new plan. Plan/re-plan, which IECC can provide, sounds more than sufficient for c2c.

#### 3. Stock and staff constraints

c2c has its own resource management system, supplied by Tracsis. This will interface with the Thales TM but will manage rolling stock and train crew constraints itself, for example by stepping up. So this is not strictly part of TM. I have seen this facility demonstrated on the IECC platform ('Informed Sources', April 2014) with an open system that will interface with proprietary systems.

#### 4. Customer information

A direct link to the Association of Train Operating Companies' Darwin real-time train running system is expected to free up existing staff, giving more time to maintain c2c's social media systems instead of the customer information screens.

So apart from the theoretical benefits of business change, an IECC Scalable is potentially TMS by another name, offering a full house of integrated facilities today, and for a lot less than the cost of an appliqué TM such as the Hitachi system for Three Bridges.

#### HST MODE

If the Digital Railway programme could switch from APT-mode it could make a heck of a difference to the here and now railway. Expediting the upgrade of Marylebone to reflect the original title behind the abbreviation – Integrated Electronic Control Centre – by integrating more TM facilities, such as plan/re-plan, platform occupation, possession planning, Connected Driver Advisory System (C-DAS) and stock and crew management, would cost low single figure millions.

And because the new features would be added to a working system, technical risk would be minimal – rather like the way Siemens overlaid the new Victoria Line Automatic Train Operation system on the existing interlockings so that the trains kept running during installation and commissioning.

Remembering that Great Western's Thames Valley Control Centre at Didcot is IECC Scalable city, a Marylebone pilot scheme could lead into TM as part of the current Great Western main line resignalling programme.

Yes, I know that IECC supplier DeltaRail blotted its copybook by challenging (possibly too robustly) its elimination (totally justified) from the original TMS shortlist. But that was over two years ago.

And it is worth adding that in the United States defence industry challenges to contract awards, let alone shortlisting, is standard operational procedure, with contract award halted for days while a challenge is heard, and sometimes even reversed. But you don't get the United States Air Force blanking Boeing or Lockheed because they had the temerity to protest a contract award.

On top of which there is PRISM, which NR uses to assess the performance of suppliers, and its own performance in enabling them to carry out their contract. Suppliers' PRISM scores are marked out of five and published every month; well, sort of.

Initially, there was a league table broken down into increments of 0.5 points. Band A was 4.5 to 5, Band B 4.0 to 4.5 and so on. This was a bit brutal for some firms and instead of leagues showing actual scores, the companies in each band are shown in alphabetical order, so there are no winners or losers – just like school sports days.

Table 3 shows the scores for signalling as at the end of 2015-16. With TMS first Deployment falling behind, you might have thought that Digital Railway would be keen to exploit the potential of IECC to bring many of the benefits it is promising quickly and affordably. What is the old saying about noses and faces?

There's more on Digital Railway and TMS in the evidence submitted to the House of Commons
Transport Committee's current inquiry into railway technology.
You can find all the submissions here: http://bit.ly/1Nj9Dpw

#### **TABLE 3: SIGNALLING SUPPLIERS RATED**

Average PRISM delivery score (Period 13, 2015-16)			
Band A: >4.5	Band B: >4.0 and ≤ 4.5	Band C: >3.5 and ≤ 4.0	Band D: >3.0 and ≤ 3.5
DeltaRail (1)	Atkins	Siemens Rail Automation	Signalling Solutions Ltd (2
	Telent	Thales	
lotes: 1 Actual score: 5			
2 Alstom from 1 April 2016			

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# ROLLING STOCK MARKET FACES UNCERTAIN TIMES

Cheaper trains, cheap finance, supportive government: what could possibly go wrong?

eptember 1995 was unseasonably hot. Walking through the City to an afternoon meeting on Wednesday the 27th I was carrying my jacket to avoid perspiring.

At the office we called 'the fridge' I needed my jacket to avoid shivering. On arrival in London, the San Francisco-based group I was advising had complained about the poor air conditioning in the temporary offices they had been allocated. The response had been the offer of what felt as though the air conditioning was next door and we got the full blast straight from the chiller. Hence 'the fridge'.

I was acting as independent rolling stock advisor to a company bidding to buy a ROSCO (rolling stock leasing company). My job was to assess the service life of each fleet for each ROSCO, compared with the sellers' forecasts. I recall that the Pacers were expected to remain on lease to 2015-16. Even in the optimistic case I knocked that back 10 years!

All the hard work had been done, the bids were due to go in on Friday, so we were literally chilling out when our bid leader came in with some bad news. At a board meeting that morning, the chairman of the bank partnering our bid had decided that the ROSCO business was too risky and withdrawn. When sportsmen say they are 'gutted' I know how they feel.

In the event our bank was not the only cautious one. Only four serious bids were submitted that Friday – three management buyouts plus one led by former InterCity Director John Prideaux.

I recount this anecdote as a counter to the received wisdom that the ROSCOs were sold off too cheaply. Hindsight shows that as confidence grew they were sold on at a profit several times, but at the time the view was that Hambros had done remarkably well to get the prices achieved.

#### **RISK FREE?**

Since then, the ROSCOs have come to be perceived as risk-free money machines. With continuous ridership growth outstripping capacity, pretty well everything on wheels has been in demand. Even the Pacers I condemned

to the scrapheap have justified investment and will run to 2020.

And today, as the table in the April 'Informed Sources' showed, between now and the end of the current Control Period 5 in March 2019, some 4,000 new passenger vehicles are due to be delivered. While 60% of these are state procured and funded – the Inter-city Express Programme (IEP), Thameslink and Crossrail fleets – 1,500 are being privately funded, around 1,000 of these by the ROSCOs.

Meanwhile, new train prices are falling, thanks to a combination of large production runs and operators going for lower specifications. Even better, with some banks offering negative interest rates, the cost of funding for new trains has been slashed.

So cheaper trains costing less to lease; what's not to like? As ever, the rolling stock market is not so straightforward as it seems.

#### **DEADLINE**

First of all, there is the 1 January 2020 deadline for all rolling stock to be

compliant with the accessibility regulations derived from the Passengers with Reduced Mobility – Technical Specification for Interoperability (PRM-TSI). That is just over 1,300 days away.

Already, ex-British Rail multiple-units are being made PRM-TSI compliant during C6 heavy overhauls. But that expenditure is taking the risk that operators will want to keep these trains in service after 2020.

To mitigate this risk, the ROSCOs are having to double up the bet by investing in upgrades to make the trains more attractive to both passengers and operators. Thus Eversholt is already upgrading the Class 321 fleet under the Renatus programme, to which will be added retractioning with three-phase drives.

Similarly with Porterbrook's retractioning of the refurbished Class 455 fleet. This will reduce maintenance and provide workshop capacity for Wimbledon to take on the new Class 707 Desiro City trains – avoiding the need for an expensive new depot.

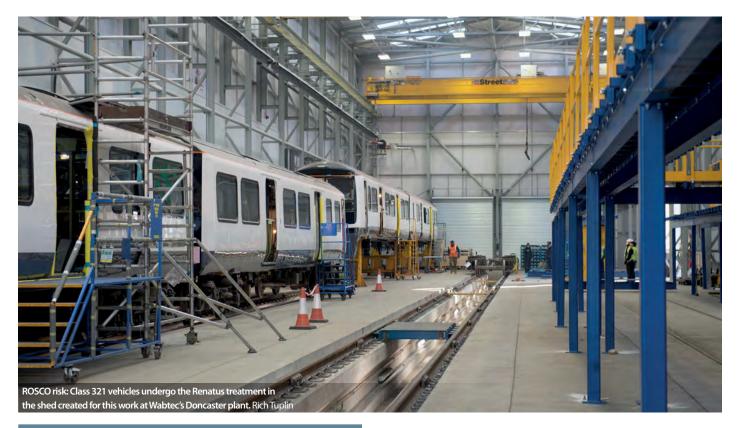




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#### YOU GET POINTS FOR NEW TRAINS

Douglas Carswell, UKIP, Clacton: To ask the Secretary of State for Transport, what plans his Department has to ensure that the next East Anglia franchise introduces new rolling stock on routes to Clacton-on-Sea and Walton-on-the-Naze.

Claire Perry Parliamentary Under-Secretary (Department for

This is all part of the Waterloo capacity expansion programme developed by South West Trains. But in a year's time FirstGroup could be running the replacement South Western franchise.

DfT's franchise bid evaluation now includes a weighting for quality and, in particular, new trains. Add in cheaper new trains at rock bottom lease rentals and it could be a winning move to replace the Class 455s.

#### RETROFIT

Then there's the eventual arrival of the European Train Control System (ETCS) and the growing demand for Connected Driver Advisory System (C-DAS). Compare the rental of a new train with factory fitted ETCS-L2 against the extra cost, time out of service and likely short term fall in reliability after traction and braking systems have been interfered with as ETCS-L2 is retrofitted. Once again, new build could be an attractive proposition.

Let's return to the Class 321 Renatus. As remarked previously, the Transport): The specification for the next franchise requires that bidders provide high quality rolling stock in their bids and 30% of the available quality points from the franchise evaluation (the highest level in any franchise) will be awarded for bidders' plans for rolling stock improvements. Hansard

replacement East Anglia franchise, due to be let in October, is seen by manufacturers as the 'El Gordo' of rolling stock opportunities.

Like Northern and TransPennine Express this is, belatedly, a 'political' franchise, with the Chancellor supporting 'Norwich in 90'. An all-new fleet for Liverpool Street – inter-city and suburban – would do wonders for the quality weighting.

And with affordable lease rentals on new rolling stock, this could happen. Will the investment in Renatus be enough to make it irresistible to the replacement franchise owner?

#### **TURBULENCE**

By the end of 2019 all franchises will have been re-let under the new process introduced following the Inter-city West Coast débâcle. With eight to go, including East Anglia, and the 1,300 days to PRM-TSI compliance counting down, the risk goes beyond the ROSCOs.

Take reliability of new trains for the Government's 'big three'

mega-contracts. Of course, everyone expects Hitachi's IEP, the Siemens Class 700 and Bombardier's Class 345 to be Golden Spanner winners straight out of the box.

Sadly, real engineering life is not like that and the first contact with real customers can be technically traumatic. Add in complexity, like ETCS-L2 with Automatic Train Operation on Thameslink, and the risk to performance is obvious.

Similarly with Class 800 bi-modes. Diesel engines intended for brief excursions beyond the wires will be hammered with digital driving keeping to IC125 timetables on the main line.

Ah, yes, IC125. ScotRail is still on track to get its pocket rocket sets for the new Seven Cities services. Great Western is considering similar shortened formations on services such as Cardiff-Portsmouth. However, the current GWR Direct Award franchise is due to be re-let in November 2018. Should all those imaginative entrepreneurial bidders be curbed in their choice of rolling stock by a commitment

made by GWR to spend substantial sums on PRM-TSI modifications to 40-year old trains?

And as the 1,314 days pass, we also need to remember that even off a live production line it will be difficult to start delivery of a new order in less than two years. Late delivery of orders scheduled for completion in 2019 could see operators breaching the PRM-TSI deadline.

So while we should not feel sorry for the owners of the ROSCOs and other train funders – if they can't take a joke, they shouldn't have signed up – if fear and greed rule the market then fear will be in the ascendancy.

Ironically, while transport ministers insist that rolling stock procurement must be left to the private sector, within DfT civil servants are busily trying to allocate scarce resources. Without the 2020 PRM-TSI deadline, this clandestine Fat Controller operation would not be a problem. But in the real world DfT needs to come clean on future use, or face the risk of having to obtain PRM-TSI derogations to keep services running.

#### THE ANGLIA AXE: EMU FLEETS AT RISK?

	Delivered	Sets (four-car)	Owner
Class 317	1982-86	51	Angel Trains
Class 321	1990	94	Eversholt
Class 360/1	2003	21	Angel Trains
Class 379	2011	30	LloydsTSB

30



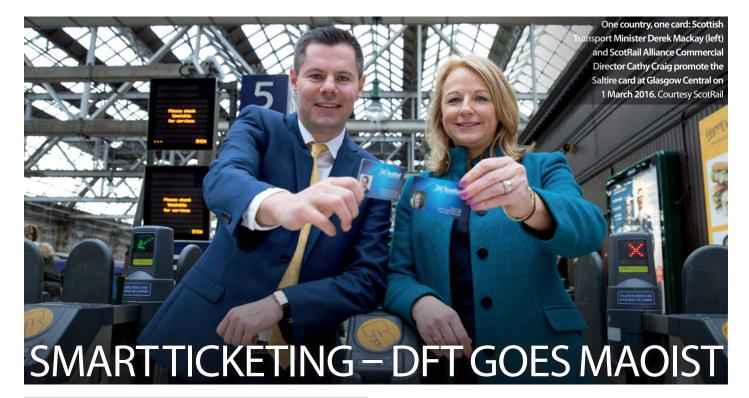
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#### Disaggregate! Disaggregate!

s reported in the March 2016 'Informed Sources', after spending £37 million on its flagship venture, the South East Flexible Ticketing Scheme (SEFT), the Department for Transport was handing over responsibility for the future development of smart ticketing to the private sector. On 31 March, the scale of the retreat was revealed in a letter to ITSO Chairman Mike Fuhr from Jenni Borg, Head of Transforming Ticketing, Payments & Mobility (TTP&M) at DfT.

According to Ms Borg, her unit had been 'disaggregated'. Actually, news of this disaggregation with extreme prejudice came at the very end of a letter extolling the achievements of TTP&M.

When the letter finally got round to the news that the parrot was indeed dead, she explained that 'there remain significant challenges around governance, commercial and regulatory requirements to support transformation and benefit realisation' from smart ticketing. This was why DfT had decided that 'now is the time to disaggregate the team so that our important work is more effectively mainstreamed with other bus and rail industry management'. A challenge ducked, then.

An organisation chart with the letter, showing the post disaggregation structure, confirmed that DfT has given up on any idea of what travellers really need – a national approach to transport smart cards. Instead, as Chairman Mao nearly said, the new policy is 'let a thousand smart cards bloom'.

Following disaggregation a number of gardeners will be involved within DfT. SEFT and the joint DfT/ Transport for London ITSO on Prestige (IoP) programme move to Rail Passenger Services (RPS), under Peter Wilkinson. Ditto Rail Smart and integrated ticketing policy plus the specification and oversight of delivery.

Reflecting devolution, Smart on rail in the North becomes the joint responsibility of RPS and Northern Transport Strategy (NTS), DfT's section that provides its interface with Transport for the North. Note that this is responsibility within the DfT organisationally, which is not the same as the DfT being responsible for something. For example, the unspent portion of the SEFT budget has been returned to the Treasury.

Thus multimodal integration, in the form of the 'Midlands Connect' and the similar 'Northern Strategy Smart Cities' programmes, is shared between the Local Transport section within the Department's Roads, Traffic & Local Group and NTS respectively. Local Transport also takes on TTP&M's previous responsibilities for the Transforming Bus programme. All this 'tranforming' suggests a variation on Hutber's Law, namely 'transformation means stasis'.

#### **CREDIT**

To give Jenni Borg credit, her one real achievement was the creation of the only ITSO-compliant smart

card back office 'that meets the latest rail standard and has the capability to support every train operator in the country'. In addition to current ticket types it can also handle new products such as carnets. Abellio Greater Anglia is already using this back office. c2c and Southeastern are being added later this year.

Ms Borg judges the most important contribution of TTP&M as 'changing the tenor of the debate: putting passengers at the heart of ticketing transformation and instilling a real ethos of collaboration with a focus on delivering passenger and industry benefits.' That's not how I saw it at the time, with the major franchise owning groups, such as Stagecoach and First, resolutely doing their own thing. Acknowledging this 'friction', she attributes some to commercial tension between competing rivals but also to 'cultural inertia'.

Of course, as remarked in the March column, the real tragedy is that the 'passenger benefits' are spread over a growing number of operator-specific, curiously-named ITSO compliant smart cards when, if you are serious about smart ticketing, the ideal remains a national card. The overwhelming drawback is that passengers don't know where their operator-specific smart card can be used outside its 'home' network.

In Scotland, the home of rational transport policy, there is the national Saltire travel card which is becoming increasingly multi-modal. In England, apart from the National Concessionary Travel Scheme, the bus pass smartcard which pensioners can use on local buses anywhere,

who can tell where Pop Card, Walrus, ThereUgo, Swift Card, the key or StagecoachSmart are valid?

For example, I found a card reader tucked away on Welwyn Garden City station the other day. Presumably it is a reader for Great Northern operator GTR's the key. But if I had a key card, could I use it for a day out in Brighton?

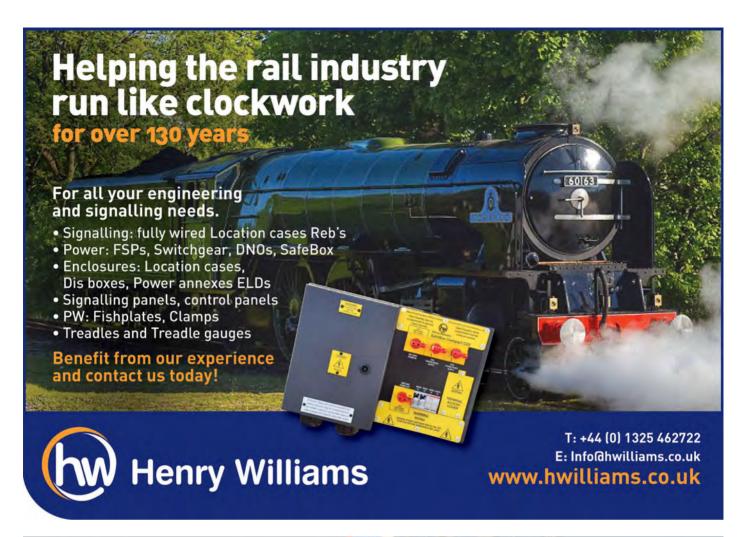
#### GENERIC

It's easy to mock smartcard names, but Oyster is a reminder that if the product on offer meets a need the name is irrelevant. The trouble is that Oyster has become a generic name like Hoover. Yet although it is starting to run out of scalability, Oyster in London offers facilities that ITSO compliant smartcards have yet to provide.

But because Oyster has become generic, regional politicians refer to 'Oyster-style' when describing their plans for smartcards. However, the penny is dropping, with an internal report for one authority referring to 'managing passengers' expectations' based on Oyster. And as my article in the March 2016 Modern Railways showed, Oyster is evolving, with contactless bank cards being used alongside it.

Meanwhile, new technology is overtaking the smartcard: for example mobile phones and bar codes. And I'm not the only one who thinks the printed ticket with magnetic stripe still has a lot going for it on practical grounds.

With DfT disaggregated it is hard to see who is going to bring order to this game of cards.





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# LOCK UP YOUR CALCULATORS

#### Future Railway is back in town

was about to write something about bogie design, and then all of a sudden Future Railway caught my eye. It must have felt like this for USAF pilots flying over the Basra road in 1991, so many targets, where do you start? I was going to leave research alone for a while, but as the only value us taxpayers get from rail research is this amusement, I'm afraid the 'bomb release' will be pressed again.

#### **AIR TRAIN**

Respected consultancy firm Arup is shortlisted in the 'tomorrow's train design today' competition with its new 'air train' idea. The concept, which we are told could be reality by 2018, uses longitudinal bench seats which deflate at busy times to make more room for standing.

Passengers are shown comfortably lounging in seats like inflatable armchairs, as if discussing the latest Jefferson Airplane release or perhaps who stole the show at Woodstock, then when it gets busy – poof! – the seats are gone and the carriage is transformed into a convivial open space.

#### **PUNCTURE PROOF**

This is a piece of genius as it ticks three boxes:

- safety it is a big airbag;
- capacity all standing in the peak; and
- innovation nobody has done it before.

Wonder why? Cynics might imagine that some oiks might think it funny to puncture the seat when it was full of unsuspecting commuters (and who can honestly say they wouldn't click on YouTube to see that?), but Arup says it has tested a puncture-proof material, possibly based on that found in the inner seals of tomato sauce bottles.

Also get your phones set to record when the Superannuated Anoraks sit down simultaneously next to a body





Switcheroo: Air Train in off-peak (left) and peak configuration. Courtesy Arup



Padded cell? Visual of the Air Train concept. Courtesy Arup

of significantly lower mass on the way home from the gym. Fortunately the ceiling is padded as well.

Arup has form on inflatable structures, proposing an inflatable Olympic venue that could be moved from the beach to the tundra as the show moves on. The archery and javelin events will be a treat. As for the rail application, this project offers the opportunity to achieve the flexibility of tip-up seats at only 100 times the cost.

## PARK YOUR CAR – BE A SUBSTATION

Sheffield University (good lads) has won £1.5 million for an innovative project on energy storage, picking

up an idea that has been kicking around the corridors of no power for at least two years. Never blame the ones doing it, by the way; just the ones too idle to do a half-page evaluation before they chuck your money away.

This one views your electric car in a station car park as an energy storage device, and drains it when it chooses to support the railway power supply. You might wonder if indeed there is a problem with the line voltage, and there is, but only near London on the third rail system. Out in the suburbs the line voltage is usually high, so high that you can't regenerate into it. These car parks full of electric cars are in the wrong place.

#### SOFT CELL

Let's not be hasty (as if?). Obviously a couple of Nissan Leafs won't be kick-starting a 25,000 Volt Pendolino, but let's imagine a future with 100 Leafs plugged in at a station which happens to suffer from low voltage on the third rail network. Each car would be on a 13 amp slow charger and could offer about 16kWh each. The whole setup could kick out about 300kW (limited by the current), which after losses is enough for one traction motor of the six or eight on a modern EMU. So for a top-up that is in the right area, the smart grid in action.

The power needs to be converted to the right voltage, which means electronic inverters and a transformer, and they need a safety case, just like a train does. It also has to have clever protection so it can't feed a dead section that has been isolated for some reason. The proposal also suggests using super-capacitors to store regenerated energy once all the cars are flat. Putting all that together the installation would cost £5 - £10 million, but being charitable I'll go for £5 million, or about £27,000 per month at lease rates.

#### HARD CELL

The benefit for the car driver is free car parking, but that costs the train operator revenue: it isn't really free. The loss depends on the car park, but call it £10.00 per day, 20 days per month for 100 cars and it makes £20,000; plus £27,000 for the capital cost write down, total £47,000. The available power is  $16kWh \times 20$  days  $\times 100$  cars = 32,000kWh. I wish I'd written about the bogies now, but whichever way I look at it I can't get it below £1.40 per kWh. This compares to about 8p down the rail, bomb gone.

You have to offer a good incentive, as the life of the car battery depends on the number of charge/discharge cycles it goes through and a new one is about £5,000. Now consider a cold

afternoon, load is up so Volts are down and every train is feeding off the car park. People come home to a flat car battery. Not so smart.

You can sign up for the Future Railway newsletter, but make sure you check your e-mail preferences to make sure it is detected as junk mail and goes direct to trash. I think it is now illegal to have any part of the industry without its own innovation budget, and some while ago the 'innovation in franchises' project was kicked off. Apparently the first innovation proposed is to find out what passengers are on the trains – why are they there? What are they doing? That might be useful actually, as long as they don't ask what they want.

### SHIFT2RAIL UPDATE

That's just a bit of fun; the real purpose is funding student projects, so we won't get too worked up about it. The big money is in the European Shift2Rail project, which is classic European cash disposal writ large. This lot is currently trying to hose €222 million into rail research and has progressed to breaking it down into five areas: trains, control, infrastructure, IT and freight. That line covers a few pages of Euro-speak calling these IT1 - 5.

Horizon, the EU research and innovation magazine, features an



Charge her up: Nissan Leaf connected to the electricity supply.

interview with our very own Andy Doherty (now vice-chairman of the European Rail Research Advisory Council) where the questions,

with increasing desperation, seek specific things which will improve for the eventual €920 million going in. Apart from good old weight

reduction, Mr Doherty goes for train convoys virtually coupled. One comment on the site, in French, says the money is not enough.

### LIGHTHOUSE KEEPERS

I like Shift2Rail website's opening line, which is: 'The design of rolling stock plays a key role for the attractiveness of rail transport. Passengers will only prefer to use rail transport over other modes if trains are comfortable, reliable, affordable and accessible.' Remember that first word, 'comfortable', because it doesn't get another mention.

The people behind Shift2Rail have set up four 'lighthouse projects', but I won't trouble you with them, as we all have better things to do. But I will just give you one glimpse into the future with innovative doors, or as they call them, 'access solutions'.

Here we imagine composite doors that would reduce dwell times, as they are (marginally) lighter than the aluminium honeycomb ones we have now. This would increase line capacity. Woo-hoo! Meanwhile, we have a man with a whistle and a flag wasting 30 seconds at every station...

Shift2Rail has been going for four years now – has it shifted anything but cash? Has it changed your journey? Well it's not as if we had anything else to do with the money, is it? I can't go on, close the access solution.







# EUROPEAN BEAUTY CONTEST

he Institution of Mechanical Engineers decided to debate Brexit on 9 May at its prestigious Birdcage Walk building. The illustrious lecture theatre has been revamped, with wooden panelling giving way to white plastic, but the tradition of unbiased debate remains.

### **SPEED-DATING**

The format was a bit like speed-dating with six 10-minute slots: if you didn't like one, swipe left and here's another one.

Robin Groth of the Department for Transport confessed to moonlighting for the European Rail Agency, and wore a badge to prove it. He lip-synched the words of Richard Lockett, Head of the Cross Acceptance unit at the ERA – or 'Mr Europe' according to his own profile. The stated objective is to improve clarity in interoperability, producing a clear process, which is nice after 19 years.

The UK is one of the 'Big 3', apparently, with France and Germany, although this could be because they are the only countries with technical staff to spare. The UK is often seen as 'honest broker'; Robin Groth thinks this is because our culture is a mixture of the other European cultures. I would suggest English being everyone's second language might also help. In short, we do a lot of work in Europe and protect our interests by doing so.

Swipe left to Tom Lee from the RSSB and 'what has EU membership ever done for us?'. Answer: market opening, cross-border operation, harmonised approvals and Technical Standards for Interoperability. Again, we 'punch above our weight' with our influence. A bewildering chart of all the committees brewing up regulations was shown; I have seen simpler schematics of traction packages.

### AVOIDANCE

Time's up. Next is John Dawes, Head of Engineering, Governance and Services for London Underground. LU's main objective is the avoidance of EU regulations that are irrelevant to moving as many Londoners about as possible. Self-contained metro systems can extract themselves from the tentacles of the EU, although they have to spend a lot of time and money doing this when they have overlaps like the Overground and Crossrail.

A question came up on the status of Crossrail 2, but the DfT thought this would be subject to regulation. Well, we'll see about that. You have to wonder about how useful these regulations are when the prime objective of the biggest people-mover in the country is staying out of them.

Bring on the academic, Professor Felix Schmid. He celebrated the diversity of his team, which now has an English member. His big win was the research project for Dyno Train, to run between Germany, France, Italy and Switzerland looking at track dynamics and aiming to allow'virtual acceptance' with much reduced testing. For the academic world money from research is life support, and the ability to bring in foreign talent without visas is brilliant. The prof bemoaned how difficult it was to bring in a Malaysian expert, as he needed a visa. Oh no, how awful.

### **ENJOYED DEROGATION**

Then came the clear winner of the speed-dating, the amiable Dick Fearn, formerly of the Irish Rail parish and now in pastoral retirement on the Bluebell. He noted that until recently Irish Rail had 'enjoyed a derogation' from the requirement to separate operations from infrastructure, but now the folk on t'other side of the Irish Sea are being good Europeans and separating the two, as we all know this is more efficient. This did remind me that the EU makes vertical integration illegal. Mr Fearn produced an edited version of his Modernisation Programme, which has been achieved thanks to EU money, which they were spending like sailors.

When it was my turn I asked who had said 'I believe that our renegotiation objectives have been substantially, though not completely, achieved'? The audience duly replied the Prime Minister, but not the right one as it was Harold Wilson in the 1975 referendum leaflet. In 1975

38

the priorities were food, money and jobs, in that order. We are really looking at jobs, and the predictions of the 1975 'No' campaign of a drift to the South have largely come true, although overall a lot of jobs have been created. We are clearly better off, witness the fact that the campaign leaflets are glossier and in colour.

#### **HOPELESS**

As for me, I summarised 'Last Train from Brussels' ('Pan Up,' April 2016 issue), which basically said we are stuck with the regulations whether we are in or out. As an example of EU waste I noted the hopeless performance of the EU's 'Shift2Rail' research programme, but noted the UK's equally hopeless 'Future Railway' version, so again it makes no difference.

Although most speakers were on the 'remain' side, I started wondering why. For the Europhile technocrats they are having a great time being paid by the UK taxpayer to write and edit standards for Europe, which we then pay more technocrats to either avoid or demonstrate compliance to. The myriad of committees was meant to show how thorough the process is, but the cost must be immense, and for what output?

Of course academia likes the EU, but is it good for the UK to train and then export graduates while bringing in foreign students who pay better for their courses? In 1975 exporting graduates was called the 'brain drain'. The technical mugging of research spending makes a lovely income stream.

Then there is Irish Rail, which celebrates EU funding without for one moment thinking that the same funding could have upgraded railways in the UK with many times the traffic the Irish lines have. The Irish didn't even have the grace to buy from the UK; their new trains came from Korea and Spain.

### **NEVER HAD IT SO GOOD**

So with all the influence and expensive input to these processes we are expected to be proud. Some say that certain engine manufacturers have a heavy influence on European committees setting emissions standards, and that making them different to American standards could bring a competitive advantage. True or not, those folks end up selling a lot of engines. As for the effort we put in to opening up markets, what we are actually doing is opening up our own market. In 1975 importing trains was very rare, but now it has become the default path.

The EU has created jobs in the UK, many filled by workers from outside the UK, and domestically most new jobs are for what would have been called 'white collar workers'. Graduates trained in the UK have never had it so good, cruising Europe on expenses,

mediating and administering this great rudderless leviathan in no particular direction other than the ill-defined harmonisation in 2040.

As for the 'blue collar workers', they have had a rotten time of it with EU labour depressing wages and losing their business to European companies. When you get down to it UK railways are, and always will be, different. Our loading gauge and platforms see to that. So much of our effort goes into the relatively few vehicles that travel across European borders.

If we build a wagon to work from a quarry to a development site, why does it need to be tested against noise standards set by the Rhine Valley? On an average wagon build 10% of the cost is for testing for things it will never do.

But celebrate the open market and the freedom to export trains to continental Europe. Here's a list so far:

mr

# SYDNEY GETS A MAKEOVER

he listed bit of railway through Sydney Gardens, Bath, will soon need to be electrified, but do not be alarmed, it is not getting the Great Western standard, shall we say, hefty kit. There are actually four designs to choose from but I am only in a position to share one, which has appeared on Twitter. Apologies for the quality of the pic – we couldn't get a better one.

This Atkins Global design sweeps up the wall profile in a graceful arc, supporting the standard Furrer + Frey single insulator registration arms, centrally mounted between the tracks. The illustrations also show new metal railings in front of the low-level stone walls, which are currently a few feet behind some roll-out wooden fencing.

Choosing the final design is a sensitive matter, and as with any



aesthetic issue put to heritage groups a quick and clear answer is unlikely – but a decision must be made by the end of the year. I must advise that the design is nothing to do with the Future Railway research competition to design aesthetic masts, so that organisation keeps a clean sheet on applications on the real railway.

As described previously, the demands of Great Western electrification mean large forces are at work, and the aversion to span wires and cantilevers needing two insulators makes this a real engineering challenge. Atkins Global has done a lot of work reducing the visual intrusion of light rail catenary systems and has applied that experience here. The proposed arrangement looks pretty good to me and I look forward to seeing the finished product (and getting rid of that wooden fence). By the way, don't ask why we can't have these everywhere – they are expensive and don't fit the High Output Plant System concept. Pan down.



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### RAIL TRANSFORMATION IN THE NORTH

Your supplement in the May issue was a very informative and uplifting read, and we should have a lot to look forward to. Readers will expect transformation to be wholly positive; however, I have to report that as it stands the opposite will be true for users of services between Southport and Manchester.

From December 2017 the plan is to withdraw direct services to Piccadilly and the airport and route all trains to and through Manchester Victoria. What happened to 'putting passengers first' and 'connectivity is key'? It is probably not reasonable or realistic to expect even the

winning franchise bid to get it 100% right, and how else would you explain this proposition?

I believe, however, the clear need to put this right will be an early, real test of leadership for Rail North and for Arriva Rail North's mettle as an operator, where we must see 'working together' in action.

Every morning 1,000 commuters take the train from a station to the west of Wigan towards Manchester; over 60% of those going into Manchester work on the south side of the city centre served by Deansgate, Oxford Road and Piccadilly stations. The pattern is repeated throughout the day, and in both directions, for business,

education and leisure purposes, including access to the airport. With passengers from Wigan and north west Manchester also reliant on this service, there will be a severe, adverse impact on a huge number of households. Moreover, not only will Piccadilly remain the only true main line station (for example, offering services to London), as your article explains it will become the hub for high speed services.

Unsurprisingly, there has already been a very strong outcry and objection to these plans by rail users, local authorities and MPs given the real life and economic impact in so many communities. Referring to the objective and discussion of enabling the Northern Powerhouse, there is another crucial issue here. Research shows that those using the Piccadilly service are fulfilling highly skilled and professional roles across the range of growth sectors; how can it be the right decision to cut off Manchester's businesses from its existing skill base?

I will close with David Brown's apposite statement: 'you can't just have a transport strategy that only includes the six big cities'.

### **ALAN FANTOM**

Chair, Ormskirk Preston & Southport Travellers' Association Southport

### VALLEYS METRO

lan Walmsley makes some good points about the Valley Lines ('Pan Up', last month). I prepared the original, pre-GRIP estimates for Network Rail and the Department for Transport in late 2010 and was given food for thought by his arguments.

He suggests either street-capable trams or a clone of the Tyne & Wear Metro. Both are a little lower than heavy rail, and the lower power voltage needs smaller clearances – I found about 150 bridges with less than 500mm clearance that would need alterations for 25kV electrification, costing around £50 million; I 'guesstimate' that most of these would be OK for a Tyne & Wear type system.

Anglo-Scottish tilt: Pendolino No 390129 approaches Auchengray on 19 March 2016 working the 16.52 Edinburgh - Euston service. lan Lothian



Modern Railways June 2016 www.modern-railways.com

After discussion with signalling experts we estimated that signalling immunisation works away from the Great Western main line would cost around £9 million - with drive-on-sight this would near enough disappear. The congested areas near the main line would have to be immunised anyway for Great Western electrification.

25kV power supply was guessed at £30 million. A 1,500V DC system such as Tyne & Wear would be noticeably cheaper - the overhead line equipment would cost about the same, insulators would be cheaper, but DC switches tend to be dearer.

If we went for Tyne & Wear cars rather than trams then we don't need to alter the station platforms, as they're about the same level; the usual low-floor trams would need lowered platforms, which would not be cheap.

Now the snags! There would have to be total segregation wherever trams need to share main line stations – this could be very expensive. An alternative would be to have dual 25kV/1,500V DC

trams (they have similar systems in Germany) and transition areas. For main line DC to AC transitions I had previously estimated a cost for the Reading area of at least £1 million per single track kilometre.

Track voltage drops up the Valleys would be problematic, and it might be necessary to add hefty aluminium cables linked to the rails at intervals even if we used 1,500V DC. As for 600V DC, as used by street-running trams – that would be difficult on the longer runs.

DC traction track needs to be effectively insulated from earth to minimise electrolytic problems in trackside metal, but I've no idea of the costs of checking this (25kV track is earthed).

I don't know much about the vehicles but it seems to me that the articulated Tyne & Wear trains are far less complicated than multi-segment street trams and noticeably simpler than standard EMUs.

The numbers above were based on a different, smaller scope than the current proposals and at late 2008 prices, and don't include project management or Treasury cynicism, so probably double them for today's cost! **EUR ING ANTHONY J FOSTER** BSC (HON) DIP COMP CENG CITP MBCS MINUCE MCIM FIAP MPWI Peterlee, County Durham

We understand DfT thinking still favours cascaded Class 315s from the London area for the Valley Lines on the basis that the best (trams) could be the enemy of the better (EMUs instead of Pacers). There are fears that with the pressures of franchise renewal in October 2018 and the need to meet disability regulations by the end of 2019, a light rail solution would struggle to meet the required timescales - Ed.

### **HS2 AND THE NORTH**

The HS2 report on broad options for upgraded and high speed railways to the north of England and Scotland (p11, last month) is to be welcomed. However, the initial predicted journey times from London to either Glasgow or Edinburgh after HS2 Phase 2 are

very disappointing at 3hr 38min and 3hr 39min respectively. This is little better than the best times achieved today of 4hr 8min and 4hr exactly. The problem is that much of the time gained on HS2 by comparison with today before joining the West Coast main line (WCML) at Golborne is lost on the 220 miles or so of 'classic' railway on to the Scottish cities.

The report details a number of 'interventions' that would provide projected journey time improvements of 40 minutes at a cost of just under £20 billion. The total length of new bypasses is 220.6km, or about 137 miles. Almost two-thirds of the route would be new and many important centres would be bypassed.

However, up to half of that 40 minutes might be gained by the use of tilting trains running on the existing route, dependent on train performance and stops. This would have dual benefits of not only reducing the cost and intrusiveness of the upgrade works but also removing the need to bypass important centres such as Wigan, Preston, Lancaster and Carlisle. The proposed use of conventional trains immediately imposes a time penalty by comparison with today, and that penalty appears to me unnecessary.

Tilting train technology has moved on since the Pendolinos were designed. Very high speed operation and tilt should not be considered as mutually exclusive or inordinately expensive. As the report correctly identifies, the terrain to be crossed at the northern end of the WCML is challenging and very sensitive from an environmental viewpoint. A straight high speed line is not possible unless it is entirely in tunnel. Anything that can lessen the complexity, extent, cost and impact of the works should be considered seriously.

Tilt has transformed the WCML. Why does its continued use appear to have been ruled out without any visible consideration of its benefits? **DAVID HOLMES** 

Shrewsbury

We understand that the thinking behind the proposal to use non-tilting trains is that 360km/h trains are needed to maximise capacity on the high speed line, while manufacturers have advised that the maximum speed for a tilting train is 300km/h. The idea is that easing of speed restrictions and pushing cant deviation to the limit on the northern stretch of the West Coast main line, combined with fast running on the new infrastructure, will allow non-tilting high speed trains to cut Anglo-Scottish journey times – Ed.



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Costume drama: unveiling of the memorial at Manchester Piccadilly was accompanied by a display of period uniforms. Tony Miles

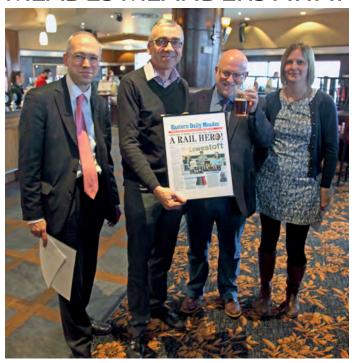
# LNWR PATRIOTS COMMEMORATED

A MEMORIAL to 87 railwaymen who lost their lives in the Great War (1914-18) was unveiled at Manchester Piccadilly station on 4 May in a ceremony attended by family members of many men commemorated on the memorial. The unveiling itself was carried out by broadcaster and former Transport Minster Michael Portillo, during a journey which will form part of a future episode of his TV Series Great British Railway Journeys.

The men commemorated on the new memorial, which is located just inside the entrance to platforms 10 and 11, all worked for the London & North Western Railway in the station's goods depot and were originally honoured on a

bronze memorial that disappeared during the redevelopment of the area in the 1960s. Eager to restore their memory, two of Virgin's Train Managers, Andy Partington and Wayne McDonald, took it upon themselves to have a new memorial erected centre stage at Piccadilly station, to act as a focal point for future remembrance events during the 100-year anniversary of World War 1 and subsequent occasions. Funding was provided by Virgin Trains and the Railway Heritage Trust. Five years of hard work, involving numerous trips to France and searching various war archives, came to fruition at the emotional unveiling, which was attended by around 100 guests. Tony Miles

### **MEADES MEANDERS AWAY**



Farewell: longstanding Great Eastern PR man Peter Meades (second from left) retired in April, and chums from Abellio Greater Anglia toasted his future with a spoof front page of the local newspaper at a pub in Norwich. Antony Guppy

### **SECURITY CONSCIOUS**



Useful padlock? The purpose of this locked gate at the end of platform 2 at Narborough seems a mystery. Malcolm Taylor

New Street Station has low energy LED lighting and controls systems that can save up to 50% less energy then the previous lighting system

### **PROOF READER REQUIRED**

Shouldn't that be 'use', not 'save'? Perhaps with all the money it is saving on electricity at New Street, NR could get someone to proof read the signs there and get the spelling right as well as the meaning. David Ventry

42

# Fixed Track Forms for High Speed Lines

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# THE PASSENGER

In a presentation to the Railway Study Association, Transport Focus chief executive **ANTHONY SMITH** compared the needs of road and rail users

n March 2015 Passenger Focus was renamed to reflect its new wider responsibilities covering the English strategic road network (SRN, which comprises motorways and certain 'A' roads). Transport Focus retains its role as consumer watchdog for the UK rail network as well as for users of England's buses, coaches and trams outside London.

The change is a sensible one – Highways England, the organisation responsible for the SRN, is an independent company with a five-year investment plan for which it is allocated a specific budget, so there are similarities to the situation on the railways. But in the past there has been no coherent long term plan for the road network, whose budget was often raided to pay for rail upgrades. The needs of road and rail users have much in common, so it is a good idea to have one body representing them all.

Transport in the UK is in an interesting phase. In 2015 new car registrations were at an all-time high, but car usage itself is declining. Bus use is also falling – if it continues at current rates in Wales there will be no buses left by

2032. This is likely down to growing congestion, which creates challenging circumstances for bus operators. Contrary to these trends, rail usage is going through the roof, and rail has been an immense success story. But dealing with this growth represents a major challenge.

#### CIIDVEV

Our aim as an organisation is to be useful, by providing measured feedback which leads to change. We do this by producing evidence for policymakers, and probably the best known example is the twice-yearly National Rail Passenger Survey (NRPS).

NRPS involves 65,000 passengers per year, and one in three of the paper surveys we hand out is returned to us, showing that the issues it covers do matter to passengers. A similar bus passenger survey reaches around 50,000 users per year, while that for trams involves around 5,000 users; we are developing a road user survey based on a similar model.

The great value of the NRPS is that it provides benchmarking, enabling comparisons to be made between train operators and

Network Rail Routes, from which powerful and useful conclusions can be drawn.

#### **REPRESENTATIVE**

The NRPS seeks to gather a representative sample of the body of rail users. While it may seem archaic nowadays, a paper survey has shown to be the best way to achieve such a sample. We ask passengers about emotional aspects – how do they feel about their journey?

This will be keenly influenced by whether they get a seat and their perception of how crowded the train is – the design of some trains means they feel more crowded, and there are lessons to be learned here for operators and designers of rolling stock. While the theory that passengers travelling for longer than 20 minutes should get a seat is a nice expectation, we need to be more flexible as we go forward, and should be specifying the number of people to be carried rather than the number of seats.

Transport Focus does not claim a monopoly on the passenger voice, but the distinctive feature of the NRPS is that it takes a representative sample and asks passengers for an immediate response



# **VOICE**

following a specific journey, which gives weight and validity to the findings. Similar surveys by Which take an unrepresentative, self-selected sample and ask for a general view of railway journeys over a period of time, so the findings lack detail and nuance. Data from social media is less informative still – it is akin to asking a group of angry people how angry they are.

### **EXPECTATIONS**

All transport users, whether of rail, bus or car, are seeking the same thing – predictability. It is what these systems live and die on – if you take the train you want it to turn up when the timetable says it will and take you to your destination punctually. Similarly, road users desire that the actual journey time should be roughly what their journey planner says it will be.

The key issue in all this is how you deal with disruption, and in spite of the occasional negative press the railways have a good story to tell. Compared to roads, they are light years ahead in terms of information provision – following a traffic incident cars will blindly join the back of a lengthening queue with no idea of the consequent delay that they are likely to suffer. Yet there is still room for improvement – the key driver of dissatisfaction on the railways remains how delays are dealt with.



### **CHALLENGES**

The latest NRPS results, released in January 2016, showed a slight rise in overall satisfaction levels among rail passengers. Long distance and regional passengers are generally fairly content with their journeys, but users in London and the South East are less satisfied. Indeed, commuters are generally not so happy with their journeys as leisure travellers, a function of the fact that they are travelling for work rather than pleasure and that the annual January fare increase hits them at the worst possible time!

The railways have become a victim of their own success. Rising passenger numbers mean that the railway is increasingly less resilient to disruption and delays. A busier railway means longer dwell times at stations, which inhibits attempts to increase capacity by running more trains. Major infrastructure projects to increase capacity mean substantial programmes of engineering works, which themselves also cause disruption.

This is most clearly demonstrated by the Thameslink works at London Bridge, where the passenger experience has been well below the expected standard. The railway has got to do better – and there are plenty of examples where it has, such as the major blockades on the Great Western route during the current electrification programme. The key is to encourage sharing of good practice within the industry, and there should be a strong partnership between Network Rail and the train operating companies.

But the problem is not exclusive to the railways. There is a clear feeling among users of the SRN that roadworks have got to be managed better. A major problem is the inability of the authorities to explain what is being done, particularly where long stretches of roadworks are undertaken on motorways. With 60% of the SRN set to be resurfaced over the next five years, the issue is a very real one.

### SAFETY

Another area in which the railways are ahead of the roads is safety, and the contrast in attitudes is striking. The railway should be proud of its safety record – the biggest hazards now are level crossings and incidents involving slips, trips and falls by passengers at stations. Any safety critical incident on the railways generates intense scrutiny, both from the media and from the regulatory bodies.

By contrast, scores of people are killed and injured on the roads each week, and there is a much less forensic approach to accident investigation. Safety on the roads is heading in the wrong direction, while on the railways it is improving.

### STRATEGY

The similarities between the investment models and user priorities for rail and road have already been alluded to. Yet there is no joint plan or strategy covering their development – policy is formulated in isolation. The UK is a small island with a dense transport network, and we need to see a much greater degree of joint planning between different transport modes.

The catalyst for this could be HS2 – the West Midlands station at Birmingham Interchange will be a giant park and ride, and should bring people off the SRN and onto the railways. And of course there is the vexed question of airport

capacity – whatever decision the Government eventually takes, there will be enormous consequences for both road and rail.

### **PLANNING**

Within the rail industry, devolution is all the rage, and the recent report by Nicola Shaw into the future shape and financing of Network Rail has heightened this trend. Many will remember that Network Rail Routes used to be devolved, but were then centralised – now the move is being reversed again.

Our aim as an organisation is to help guide the industry through the long term planning process by bringing a user focus. There is an incredibly ambitious programme of enhancements, with a heroic shopping list of schemes, few of which are funded. Transport for the North is championing devolution and wants to take greater responsibility for local decisions, but it will have to pay for the schemes it is promoting and will face difficult decisions in this area as it moves forward.

There is a recognition that Network Rail must no longer see the regulator as its customer, and this is certainly a good thing. The current regulatory structure is not fit for purpose – there are too many (often contradictory) targets. Network Rail should not see the train operating company as a perfect proxy for the customer – ultimately it should be the passenger.

#### **FRANCHISING**

Franchise replacement has become more user-focused since it was relaunched after the failed West Coast deal in 2012, and we are pleased to see the passenger experience taking far greater prominence in the process. But it is not perfect; the Govia Thameslink Railway franchise is simply too big and tries to incorporate too much change – while the scale of ambition is right, the pace of change is ridiculous. That is not to dismiss out of hand a model where the franchising authority takes the revenue risk – it seems to work well for the concessions which are let by Transport for London.

### THE FUTURE

Much has been said in recent months about the death of mag-stripe tickets and the move to smart ticketing. I don't believe for a minute that paper tickets will be eradicated – the railway has no history of shedding technology. HS2 will help drive change in this area, and it has said that when it opens there will be no paper tickets.

We are providing advice to HS2 in a number of areas. These include designing a franchise for the operation of services on the line, the design of the rolling stock that will be used and the impending rebuild of Euston station, which will be even bigger and potentially more disruptive than that currently taking place at London Bridge.



Developing railway professionals

Details of Association Membership can be found on page 14. Hear the speakers, ask the questions and then read all about it in *Modern Railways* 

# SOUTHEASTERN AT 180

# **DAVID STATHAM**, Managing Director of Southeastern, updated the Railway Study Association on developments on the London & Greenwich Railway

he first train on the London to Greenwich Railway ran on 8 February 1836 at 08.00, travelling the 2½ miles between Deptford and Spa Road. Thus it was that in early 2016 Southeastern celebrated its 180th anniversary, making it the oldest commuter railway in London, the first elevated railway in the world and one of the longest serving railway operations anywhere.

### **PRIVATISATION**

Southeastern's long history has included a period as part of the Southern Railway and later the Southern Region of British Rail.

Privatisation took place following the Railways Act 1993. The first train operating company to win the franchise was Connex South Eastern. Connex ran the franchise from October 1996 until November 2003, when it was taken over by South Eastern Trains, under government ownership. Michael Holden became the managing director of the public sector company and ran it extremely successfully until refranchising in 2006.

The franchise was then awarded to GoVia, which I believe has much of which to be proud in the succeeding 10 years. Since 2006 we've worked hard to address the growth in passenger numbers which is a sign of the renewed success of our industry. We run 200 more services and carry a third more people than we did when we started. Southeastern now oversees over 170 million passenger journeys a year.

We introduced the UK's only domestic high speed service in 2009, six months ahead of

schedule. It has been an incredible success; passenger numbers on high speed have grown by 43% since then and the service now boasts industry leading passenger satisfaction rates (the third highest in the country as a standalone business).

Back in the summer of 2012, we delivered a seamless travel experience for the Olympics, carrying 20% more people, delivering record levels of reliability and receiving widespread praise in the process.

### **LONDON BRIDGE**

Bradshaw's Guide observed in the 1870s that since London Bridge was opened in 1836 there appeared to have been continuous rebuilding. Regeneration continues! The £6.5 billion government sponsored Thameslink Programme is one of the biggest railway investment projects ever seen and its impact is nowhere greater than at London Bridge.

London Bridge serves some 93,000 Southeastern passengers every day; the old platform 6 for our trains to Charing Cross was the busiest single platform in Europe. It is currently closed to facilitate the construction works.

Closing the whole station to allow works to proceed unhindered by passengers was not an option, as there was nowhere else to divert the number of passengers involved. But keeping the station open whilst works take place is the engineering equivalent of open heart surgery.

Work on the Southeastern side of London Bridge started in 2015 and is taking place in several phases, each of which is having a distinct but different impact on services. Currently, Charing Cross services are unable to call at the station whilst new platforms are being constructed. From August 2016, Cannon Street services will be unable to call whilst new platforms are built for them.

Keeping people informed of the major timetable changes involved in rebuilding the station is a particularly massive effort. By way of example, the timetable change in January 2015 when the 'Charing Cross run through' started saw us issue over a million leaflets to passengers and employ 170 temporary staff to help passengers find their way. I can only thank our staff for responding to a massive challenge (even when viewed in the context of all our railway has achieved in the past 180 years) and our passengers for bearing with us.

### A NEW ERA

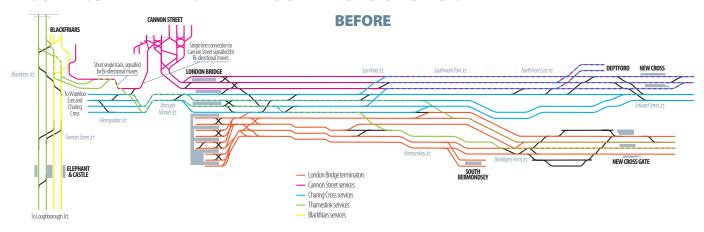
There is light on the horizon. When completed in 2018, the new station and track layout will give passengers new trains running every two to three minutes in the peak through central London, serving more destinations on an expanded Thameslink network, and a completely rebuilt London Bridge station. The Thameslink project is about far more than just London Bridge, with extensive work untangling the tracks through central London.

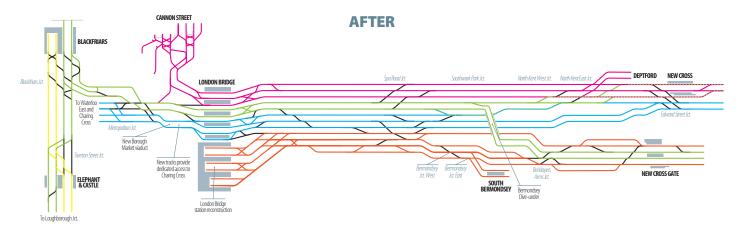
Figure 1 (overleaf) shows how desperately this work is needed. The various different services all cross over each other on the approaches to London





### FIGURE 1: SIMPLIFYING THE LAYOUT AT LONDON BRIDGE





Bridge, from both the east and the west. Following completion of the work the layout will be greatly simplified, with Thameslink services diving under Southern services at Bermondsey, accessing their own platforms at London Bridge and taking advantage of new viaducts and the double tracking of Metropolitan Junction on their way to Blackfriars. This will make services much more resilient, as well as adding very significant amounts of capacity.

### **DEMAND GROWTH**

Southeastern has sought to keep pace with demand growth. Besides additional services, we have also made better use of our rolling stock. Smarter engineering practices enabled us to squeeze availability and put three more metro trains and one more high speed train into traffic in January 2016.

We have also studied passenger loadings closely. Modelling is fine, but it is particularly important to calibrate one's plans using actual demand. We moved some 13 units around across our service groups in May 2015 to ensure that capacity was where passengers needed it most.

We are also publishing train by train loadings. Few people can change their journey patterns during the peak, but if we can influence just a small percentage to travel earlier or later by clearer information on which trains are busy and which are less so, then it'll make for a better journey for everyone. To borrow a phrase from the supermarket business, 'every little bit helps'.

But there's a limit to what engineering ingenuity and better communications can do. Our network hasn't seen any additional rolling stock since the high speed trains were introduced back in 2009. We are working very closely with the Department for Transport on how this might be achieved.

### **PERFORMANCE**

Performance has been a challenge for the railway as long as it has existed. In 1888 the South Eastern Railway was described as 'audaciously unpunctual', with 67% of trains arriving within the Victorian version of public performance measure (PPM), and the London, Chatham and Dover Railway delivered just 58%. Happily, we are doing slightly better 130 years later, and there's a huge investment in infrastructure to make a difference in the future.

But this brings its own challenges. Southeastern operates on four of the seven approach roads to London Bridge, and we have lost three of the six platforms at the station. We have to find ways of keeping our 93,000 daily station users moving.

In performance terms, the London Bridge corridor is absolutely critical. In infrastructure terms, some 42% of all delays are caused on the eight miles from Cannon Street/Charing Cross to Lewisham. It's therefore essential that this infrastructure is as reliable as it possibly can be. That's why Network Rail is replacing over 1,000 track circuits in this corridor over the next 18 months.

Our network is also more intensively used and less resilient than before. By way of example, a two-minute delay between London Bridge and Cannon Street in mid-March caused 168 minutes of total delay throughout the system. That's why we need to ensure we are doing all we can to minimise the delays within our gift and the knock-on impact.

For Southeastern, we have:

- more people undertaking 24-7 remote condition monitoring of the train fleet, so that we can intervene before breakdowns occur;
- more standby crews at London termini; and

■ the recruitment of seven more resource managers for the Kent Integrated Control Centre (KICC) and additional roster clerks to improve the robustness of train planning.

### THE STAFF

I must make mention of the fantastic people who work for our industry. From the Victorians who built our network, to the pioneers of electrification and to those who introduced the UK's first high speed service, Southeastern's people have been at the forefront of change for the past 180 years. Many companies say their people are their greatest asset, but for a train operating company that's more than a truism. We don't own the trains, the track, the signalling or the stations.

All we are is a collection of the skills, expertise and commitment of 4,400 people. From the 700 passengers on our first day of operation to the 600,000 we carry today, it's the people on the railway who have driven our industry forward into the future and made the day to day difference. I offer a heartfelt thank you to them all.

### **TIMETABLE PLANNING**

When there is going to be a big change to the timetable, you need to make use of all possible moves and options. You also need to get the right balance of keeping people moving but also running a reliable service.

People buy houses on the basis of choice of location, but you do need to simplify the operational railway wherever you can. To what extent can higher service frequency compensate for a more restricted choice of destinations? The proposal to terminate the Thameslink St Helier loop services at Blackfriars resulted in the DfT receiving over 2,000 objections (out of a total of 3,000

responses), with the result that they will now run through to Luton over the flat junction at Blackfriars.

Where passengers use one platform for a variety of destinations, not all will join the first train, which in itself makes the platform more crowded than it would otherwise be. At intermediate stations, and that includes most of London Bridge, you also have to allow time for those alighting.

The basic timetable promise is that of performance, punctuality and information. And while the peak is of prime importance, services in the contra-peak direction also have to work well.

#### **SERVICE PROVISION**

How should the balance be struck between running more short distance or more long distance services? Essentially this is set out in the terms of the franchise agreement; consultation takes place at that stage. The railway has got to meet the needs of different communities as best it can.

Small delays can easily cause overcrowding. At the really busy stations, overtime can be a real problem. What is the best way to get it all to work? The right time railway needs to be more than just an aspiration.

The speed permissible through turnouts, if 20mph or thereabouts, can be a real constraint, especially if an extra-cautious driver takes them at 15mph.

Can inner suburban services be speeded up? Should you remove stops in the inner areas when trains are regularly full up on arrival? Or do you put in more stops on a greater number of trains? These services offer the biggest performance challenge, but they are also the most difficult with which to deal.

### **THE FUTURE**

The future focus needs to be on how to cope with 30-40% more passengers as time progresses.

The capacity of the railway is very constrained; one remedy is to lengthen trains, the 12-car project. For this, more vehicles are needed. Do you build



Busy: unit No 465034 calls at the former platform 6 at the old London Bridge high level station – prior to the rebuilding work this platform was the busiest in Europe. Paul Bigland

more of the same, or do you look for a different balance of seats and standing space? Some journeys are very short, but you are also catering for long distance passengers, to Hastings for instance.

What needs to be the next move on Southeastern high speed services, which can now have passengers standing as far as Folkestone? More infrastructure will result in a step change in costs. Or does one rely on the introduction of European Train Control System (ETCS) to allow more intensive use of the railway?

How will the specification and governance of inner suburban services as set out in the Transport for London and DfT prospectus be arranged after the franchise change in 2018? This is ultimately the Secretary of State's decision. However, Southeastern is an integrated network and the fleet and the train drivers alike are used

throughout the network. In itself, the London boundary has little operational relevance.

For Southeastern, a fresh chapter will open with the beginning of a new franchise in June 2018. The new era will be marked with the introduction of a timetable recast in January 2018 to take advantage of the London Bridge remodelling and the extra capacity it offers to the franchise. John Glover

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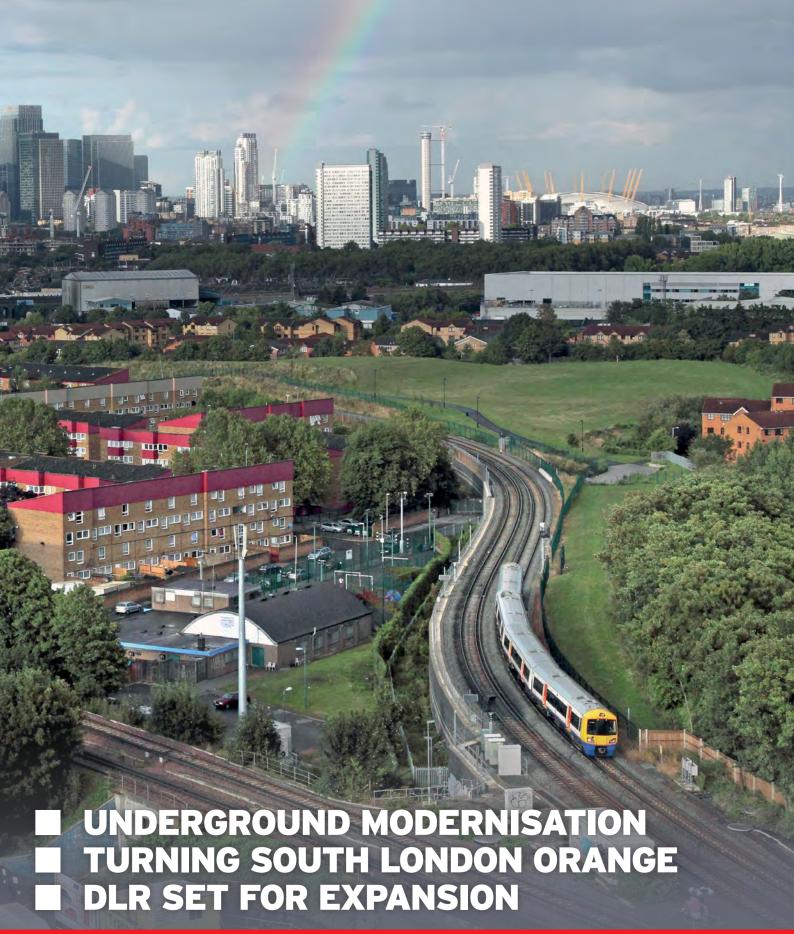
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A Modern Railways special report







# TRANSFORMING THE TUBE

PHILIP SHERRATT EXAMINES PROGRESS WITH LONDON UNDERGROUND'S NETWORK-WIDE MODERNISATION PLANS

ondon's transport system is bursting at the seams. The London Underground is busier than it has ever been, and 2015 included 18 of the top 20 busiest days ever recorded on the Tube. Transport for London says the number of passenger journeys on the Underground has risen by a third since 2001, reaching nearly 1.35 billion in 2015-16. This growth has increased in the last five years, and a further rise of over 10% is forecast by 2020-21.

TfL is battling to keep pace with this growth while also

managing the ageing assets and rolling stock on the Underground, and stations often have to be shut for safety reasons at peak times because of the sheer volume of people using them.

A comprehensive modernisation programme is

underway, with LU progressively upgrading lines with better signalling control systems and in many cases new trains.

### **VICTORIA LINE**

The Victoria Line is the most intensively used on the Tube, and



automatic train operation (ATO) was adopted from its opening in 1968. The modernisation programme began in 2006, and in 2012 a new Siemens communications based train control (CBTC) system was commissioned, enabling a frequency of 34 trains per hour (tph) to be provided. New 2009 stock trains, built by Bombardier, were introduced concurrent with this upgrade.

A major hindrance to provision of a frequent service across the whole line was the crossover outside Walthamstow Central station, which limited the train service north of Seven Sisters to 24tph. This was remedied in August 2015, when a three-week blockade allowed the crossover to be rebuilt. A new timetable from 15 May 2016 introduced end-to-end running across the whole length of





the line all day, with no trains terminating at Seven Sisters save for those accessing the depot at Northumberland Park. The current peak service of 34tph across the whole line is due to be ramped up to 36tph by the end of 2016.

### **JUBILEE LINE**

Resignalling on the Jubilee Line was completed in 2012 using the Thales transmission based train control (TBTC) system, with ATO introduced. This enabled the peak frequency to be raised from 24tph to 30tph on the central section of the line. However, overcrowding persists, and while the signalling can support a more frequent service the line is constrained by the number of trains available and by the infrastructure.

In 2013, Jubilee Line Upgrade 2 (JLU2) was initiated to deliver a more frequent service on the line, and the project includes a range of power upgrades and depot works as well as renewal and upgrading of the crossover at West Hampstead, enabling passenger trains to reverse here.

Ten new trains will be procured as part of the Jubilee & Northern Line Additional Trains (JNAT) Project, and an invitation to negotiate was released by TfL in April. There is the potential for early benefits to be exploited with the introduction of a 32tph service in April 2018, with a full 36tph peak service following two years later.

### **NORTHERN LINE**

A similar situation exists on the Northern Line. Following on from the Jubilee, it was upgraded using the Thales TBTC system in 2014, enabling peak services to be increased to 24tph north of Kennington and to 30tph between Kennington and Morden. Again, the number of trains and the infrastructure constrain the frequency of service than can be operated, so Northern Line Upgrade 2 (NLU2) was initiated in 2014 and includes provision of additional stabling, a new heavy maintenance depot at Highgate, power upgrades and development of new track layouts, as well as the addition of 17 trains through the JNAT project.

A range of options has been considered for enhanced service levels of between 30 and 36tph, and TfL has concluded that the optimal provision would be for 36tph to run on the Bank and Morden branches and 32tph on the Charing Cross branch. However, only a 30tph scheme is affordable at present, so TfL is pursuing this option but with scope to accommodate a more intensive service if affordability allows. The aim is to enter detailed design in 2017, with the more frequent service introduced in 2022.

### **BATTERSEA EXTENSION**

Construction work on the extension of the Northern Line from Kennington to Nine Elms and



### LINE MODERNISATION



Battersea Power Station began in November 2015. Its primary aim is to support regeneration in the Vauxhall Nine Elms Battersea Opportunity Area, where TfL says there is the potential to create up to 18,000 homes and 24,000 jobs. The £1 billion project is being funded entirely by the private sector through a package agreed between Battersea Power Station, Wandsworth Council, Lambeth Council, the Mayor of London and Government, which includes the creation of an Enterprise Zone from 2016 for a period of 25 years. These contributions will be used to repay a £480 million loan from the European Investment Bank, which is covering nearly half the

cost. However, significant changes to the proposed development above the station at Battersea mean a revised station design will be needed, leading to an increase in cost which TfL is seeking to recover from the developer.

Excavation of the two station boxes is now underway, and two 650-tonne tunnel boring machines (TBMs) have been manufactured by NFM Technologies in Le Creusot in France ahead of the start of tunnelling, planned for early 2017. The extension is being built by Ferrovial Agroman Laing O'Rourke and is due to be completed in 2020. The requirement for five additional

Imperial Wharf ð Vauxhal phant & Castle 🔫 Battersea Power Station 3 **BATTERSEA EXTENSION** 

trains to operate the extension is included within the JNAT project.

### **NLU2 IN DOUBT?**

The Northern and Jubilee Lines are currently operated using the similar Alstom-built 1995 and 1996 stock respectively. JNAT covers procurement of up to 27 additional trains - 10 for the Jubilee and 17 for the Northern Line - to run alongside the existing fleets. TfL is seeking to obtain the best deal possible through competition while at the same time aiming for a train which is similar to the existing fleet from the perspective of the customer and the operator.

In 2014, Alstom, Bombardier and CAF were shortlisted as bidders for the contract. Contract award is planned for June 2017, with the first train delivered in September 2019 and the fleets in service on both lines by 2021.

However, the outcome of the 2015 comprehensive spending review means that TfL may need to reduce its capital programme, and the NLU2 project is considered to be a lower priority than the Jubilee Line upgrade, having a lower benefit-cost ratio.

As a consequence, TfL is now seeking two prices from the three bidders - one for the full 27 trains and one for the 10 Jubilee Line trains alone. The

issue for TfL is that deferral of the project reduces the payback time on the additional trains, which will have a relatively short life as they would be replaced when the 1995 and 1996 stock are withdrawn from service.

A decision as to whether to proceed with the full order covering both lines or to order only the 10 trains for the Jubilee Line will be taken later this year. In the event that the Northern Line trains are not ordered, TfL plans to cover the introduction of services to Battersea from within the existing fleet of 106 1995 stock trains.

### SUB-SURFACE LINES

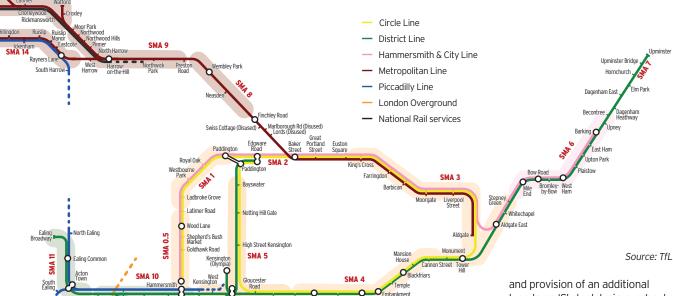
A wholesale upgrade of the Circle, District, Hammersmith & City and Metropolitan Lines is also underway. As with the Victoria Line, this encompasses resignalling and introduction of new trains. The 191-strong 'S' stock fleet began to enter service on the Metropolitan Line in 2010, with a fleet of 58 eight-car 'S8' trains replacing the 50-year old 'A' stock. This was followed by the introduction of 53 seven-car 'S7' trains on the Circle and Hammersmith & City Lines from 2012, replacing the 'C' stock trains which dated from around 1970. With these in service, the remaining 80 S7 trains are being introduced on the District Line to replace the 'D' stock fleet, and the entire sub-surface fleet replacement is due to be completed by the end of this year.

Enabling works accompanying the introduction of the new fleet have included track and signalling modifications at Edgware Road, Baker Street and Aldgate, creation of a new stabling facility at Lillie Bridge, lengthening of 17 station platforms, replacement of track circuits and relocation of signals. The power supply has also been adjusted, upgraded depot and stabling facilities have been delivered at Neasden and Hammersmith and a new service control centre built at Hammersmith to cover all four sub-surface lines.

### RESIGNALLING

The associated project to resignal the four sub-surface lines has led a less happy existence. Twice LU has cancelled contracts with its suppliers, first with Invensys (now Siemens) in 2008, and

### **FIGURE 1: 4LM MIGRATION AREAS**



then on 31 December 2013 with Bombardier.

Gunnersbury

Kew Gardens

A subsequent further procurement process led to the awarding of the contract for what is now termed the Four Lines Modernisation (4LM) last summer. In a deal valued at £760 million, Thales will supply a CBTC system enabling automatic train control (ATC) to be introduced progressively across the sub-surface network. Originally due to be completed by 2018, 4LM will now support progressive timetable enhancements between 2021 and 2023 (Table 1).

The CBTC system has been installed at Network Rail's Rail Innovation and Development Centre (RIDC) at Old Dalby in Leicestershire, and on 25 November the 'S' stock prototype train for the new signalling system successfully completed dynamic testing. LU says this represented a significant milestone for the project, and one that evaded the previous contractors. A production train will then follow, and a variation to the 'S' stock manufacture contract with Bombardier will cover the progressive fitment of ATC equipment across the fleet. A single integrated team is delivering the 4LM programme, adopting the 'one team' approach which was successfully used on the Northern Line resignalling.

### **MIGRATION**

Rollout of the new signalling system will be across 14

migration areas, beginning with the Hammersmith branch in mid-2018 (Figure 1). The entirety of the Circle Line is due to adopt the system by the middle of 2019, concluding with the outer reaches of the Metropolitan Line in the early 2020s.

Vest Brompton ulham Broadway

Putnev

nuthfields

SMA

Parsons Green

Implementing the timetable changes described in Table 1 will require the commissioning and testing of a number of adjacent areas. Project authority was granted against dates with a 90% probability of being achieved, but TfL says the programme is 'endeavouring to better these so that benefit delivery can be advanced accordingly'.

A review of the project following the award of the contract to Thales led to a number of changes to its scope. The Wimbledon branch of the District Line, which is managed by Network Rail, will now have an ATC signalling overlay rather than full resignalling, the same solution which is being applied to the District's Richmond branch, which shares tracks with London Overground services.

Piccadilly Line trains, which share tracks with those on the District and Metropolitan Lines in west London, will not be fitted with new signalling equipment, and plans to resignal the Piccadilly Line between Ealing Common and Rayners Lane have been abandoned. Where tracks are shared, conventional signals will be retained for the Piccadilly Line services, and TfL says this will provide 'a suitable starting point' for the subsequent modernisation of that line.

LU is delivering a series of track layout changes, which will be integrated with planned renewals. The scope of these has also been reduced, with only those simplifications which help minimise the cost of the ATC project retained and others to be delivered at a later date. Additions to the programme are a series of platform works to reduce the stepping distance to the train

and provision of an additional long term 'S' stock train overhaul capability at Neasden depot.

LU is also installing signal equipment rooms and the facilities to power them along with a cable route management system. The depot at Hammersmith is being converted into signalled sidings, with the first handover to Thales due to take place in July 2016, and modification of the control centre at Hammersmith is underway to accommodate Thales' equipment, with handover for fit-out planned for August.

### **CROXLEY LINK**

Construction of the Metropolitan Line extension to Watford Junction is also set to begin this year, with the line now due to open in late 2020. The extension is predicted to lead to the creation of over 2,500 permanent jobs and a £2 billion boost to the local economy.

The project, formerly known as the Croxley Rail Link, will see services on the Watford branch of the Metropolitan Line diverted away from the current terminus. The planned route begins about a kilometre north-east of Croxley LU station at a new junction near Baldwins Lane. A new 400-metre viaduct will take the line over the

55

### TABLE 1: 4LM SERVICE IMPROVEMENTS

May 2021	Runtime improvements on central area sections
December 2021	30tph in central area and 24tph on Metropolitan trunk for 90-minute peaks
May 2022	32tph in central area and 26tph on Metropolitan trunk for 90-minute peaks
December 2022	32tph in central area and 26tph on Metropolitan trunk for three-hour peaks
May 2023	32tph in central area and 28tph on Metropolitan trunk for three-hour peaks
December 2023	Off-peak enhancements

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# LONDON SPECIAL DEL MARIEL MARI



Watford Road dual carriageway and the Grand Union Canal and onto the track bed of the former British Rail Croxley Green branch line to Watford High Street and Watford Junction. New stations will be built at Cassiobridge and Watford Vicarage Road, and although the existing Watford LU station will be closed to passengers it will be retained as sidings for the extended railway.

Once complete, the intention is to run 6tph over the extension in peak periods, with a 4tph service off-peak. An additional 'S' stock train has been added to the order from Bombardier to support the service on the extension.

The scheme was formally initiated in 2011 and a Transport and Works Act Order granting permission for the scheme was made in summer 2013, with Hertfordshire County Council (HCC) the lead authority responsible for its delivery. The estimated cost at the time was £116 million, to be funded by HCC and the Department for

Transport, and the extension was due to open in May 2016.

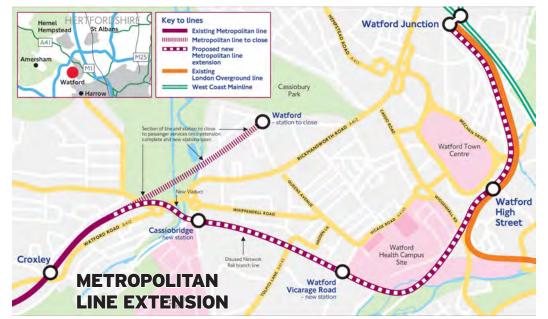
However, with HCC reporting programme slippage and cost escalation DfT determined that responsibility for delivery should transfer to LU. Work by Aecom in early 2015 gave a revised cost for the scheme of £284.4 million, which is now being met by TfL, DfT and local funding partners (primarily the Hertfordshire Local Enterprise Partnership). Any further increase in cost will need to be covered by TfL.

### NEW TUBE FOR LONDON

The final phase of the Tube upgrade programme will cover the remaining four lines: the Piccadilly, Bakerloo, Waterloo & City and Central. These are planned to receive new trains and signalling systems as part of the New Tube for London (NTfL) programme. The overall modernisation cost of all four lines is estimated to be £16.5 billion.

NTfL's vision is for a radically different train design offering greater accessibility and comfort. This will include level access between the train and platform, wider doors and additional space for wheelchairs and pushchairs, while LU plans that this will be the first deep level Tube fleet offering walk-through carriages and air cooling. A common fleet of around 250 trains is planned to serve the four lines (Table 2).

Five manufacturers have been shortlisted to bid for the contract to supply the fleet - Alstom, Bombardier, CAF, Hitachi and Siemens. TfL issued an invitation to negotiate (ITN) in January 2016, with contract award planned for October 2017. The deal will include whole life technical support from the manufacturer to ensure sustained reliability.





### TABLE 2: NTFL FLEET

Line	Number of trains	Capacity increase planned
Piccadilly	100	60%
Waterloo & City	10	35%
Bakerloo	40	25%
Central	100	25%

The aim is to deliver modernisation of the Piccadilly and Waterloo & City Lines by 2026, with the Bakerloo Line following by 2028 and the Central by 2033. TfL had previously intended to replace the Central Line fleet prior to the Bakerloo, but has since committed additional investment to secure the reliability of assets on the Central.

When the new fleet is first introduced it is planned to be manually operated, with migration to ATC on completion of resignalling. TfL says the upgrade will provide system capability for future conversion to driverless operation at a later date. As by far the simplest of the four lines to operate, the Waterloo & City is favourite to adopt driverless operation first.

The Bakerloo Line's fleet of 1972 stock, the oldest on the network, is currently undergoing a refurbishment to allow the trains to remain in service until the new fleet arrives. The work includes replacement of flooring and ceiling ventilation fans, repairs to window surrounds, corner post and door pillars and replacement of seat cushions and fabric. Four trains have been treated so far, with work on the entire 36-strong fleet due to be completed by November 2018.

### RESIGNALLING

Next up for TfL is the procurement of a new signalling control system for the four NTfL lines. An Official Journal of the European Union (OJEU) notice was published in March 2016, with an invitation to tender set to follow in October. Bidders' capabilities will then be evaluated and two tenderers taken forward to a design development process, which will allow them to demonstrate their capability to meet the project requirements. A single railway control system for all four lines will provide integrated control and monitoring of security systems, fire alarms, ventilation, customer information/ CCTV, lifts and escalators and

pumps. As with 4LM, one operational control centre is planned to cover all four lines.

Engineering design work has begun to help TfL understand the range of infrastructure upgrades required on the Piccadilly Line, the first to be upgraded. These will include an enhanced power supply system and provision of station cooling schemes at a number of locations aimed at mitigating projected temperature rises resulting from the introduction of new trains. on-train air cooling and higher service levels. Priority locations for cooling schemes are Holborn and Knightsbridge stations.

Major upgrades at Cockfosters and Northfields depots will include increased stabling capacity and provision of modern maintenance facilities for the new fleet.

Outline plans for the location of maintenance and stabling facilities within the depots on all four lines have been produced to inform rolling stock bidders' train maintenance proposals.

### BAKERLOO LINE EXTENSION

Meanwhile, TfL is pressing ahead with plans for an extension of the Bakerloo Line into south London.

A range of options had been proposed, including routes to



Streatham, Bexleyheath, Hayes and Crystal Palace. Following a series of consultations, the favoured route for the extension has been identified as running to Lewisham via the Old Kent Road; Lewisham is set to develop into a key interchange with the Docklands Light Railway and main line rail services. An alternative route to Lewisham via Camberwell was ruled out because it would be longer, more expensive to build and would

have less potential to unlock growth. Instead, TfL is promoting the provision of a station at Camberwell on the Thameslink route between Elephant & Castle and Loughborough Junction. Current plans envisage submission of a Transport and Works Act Order application in 2020, with construction beginning in 2024 and the extension opening in around 2030.

An extension beyond Lewisham has not been ruled out, with

57



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running over existing Network Rail routes to Hayes and Bexleyheath under consideration. TfL is to work with Network Rail and will examine these options as part of NR's Kent Route Study later this year. Although the first priority will be to reach Lewisham, the line will be built in such a way as not to preclude a further extension at a later date.

### **STATIONS**

While LU is seeking to improve capacity on the lines themselves, there is a recognition that this must be matched by station upgrades to provide more circulation space for growing numbers of passengers. A number of major schemes are already underway, with more in the pipeline.

A recognised congestion hotspot is Victoria, where passenger numbers are predicted to reach 100 million annually by 2020. A new North ticket





hall is due to open in December this year and the existing South ticket hall is being doubled in size, with new 300-metre tunnels connecting the two completed in September 2015. The £700 million project, which will enlarge the station by 110%, also includes nine new escalators, eight new lifts and provision of step-free access, and is due to be completed in 2018.

Major rebuilding projects are underway at Tottenham Court Road and Bond Street stations in conjunction with the Crossrail project. Tottenham Court Road will gain three new entrances, two of which are already open, along with a larger ticket hall, eight new escalators and five new lifts; work is due to be completed this year. As part of the work, 95% of the station's mosaics, designed by the late Eduardo Paolozzi, will be restored to their original 1984 locations. Bond Street is

gaining step free access and a new entrance on the north side of Oxford Street to relieve congestion, and construction of new tunnels and work on new lifts and escalators is underway.

Work is now beginning on the £563 million project to modernise Bank station, the third busiest on the network. Due to be completed by 2021, this will increase capacity by 40%, improve accessibility and reduce interchange times. A new southbound running tunnel will be built for the Northern Line, with the existing platform becoming a new passenger concourse. Two moving walkways will link the new Northern Line concourse with the Central Line and a new ticket hall will be opened on Cannon Street, while three new lifts and 12 new escalators will provide step-free access to the Northern Line and Docklands Light Railway platforms.

Other projects underway include an upgrade at Finsbury

Park, one of the busiest interchanges outside the central zone, which features improvements to the station entrances, provision of step-free access to all platforms and better interchange with main line services; work is due to be completed in 2018.

Meanwhile, at Paddington work is underway to refurbish the escalators to the Bakerloo Line and construct a new walkway linking the line to the new Elizabeth Line platforms. Bakerloo Line trains will not stop at the station until mid-August while this work continues.

Station upgrades planned for the future include Camden Town, where a new entrance on Buck Street would be provided along with new escalators and lifts to offer step-free access, while below ground there would be more circulation space to change between trains. A public consultation was undertaken in 2015, with another planned later this year. TfL proposes to apply for a Transport and Works Act Order in 2017, with work starting in 2019 and being completed by 2023/24. Other major projects in the pipeline for the 2020s includes schemes at Holborn and Elephant &

Castle, although a schedule for these is yet to be confirmed.

Meanwhile, LU has pressed ahead with its plans to close ticket offices and bring station staff into more visible roles. Only 11 ticket offices at former Silverlink stations remain open, and these are set to close later this year when new ticket machines are installed, with staff moving to ticket halls, gates and platforms. LU says that the move to bring staff out from behind ticket office windows has led to a notable rise in customer satisfaction.

#### **CHALLENGES**

Speaking at Infrarail in mid-April, LU's outgoing Capital Programmes Director David Waboso (who moves to Network Rail in June to manage the Digital Railway project) explained that the capital can only afford one major scheme such as Crossrail every 20 years. In the meantime, LU is seeking to build in extra capacity to meet growing demand. The challenges of upgrading an ageing network cannot be underestimated. but the Tube plays a vital role in the success of London as a city and delivery of these schemes is therefore crucial to its economic welfare.

### STAND ON THE LEFT

LU has initiated a six-month trial at Holborn station in which passengers are being asked to stand on both sides of the two'up'escalators. The usual practice on the Tube is for passengers to stand on the right, leaving the left hand side free for those who wish to walk up or down.

The escalators to the ticket hall at Holborn are 23.4 metres in height and are among the longest on the Tube. Research has shown that for escalators with a vertical height of more than 18.5 metres fewer customers will walk up them. A previous test held at Holborn in November and December 2015 demonstrated that up to 30% more passengers could use an escalator at busy times if they stood on both sides. LU says that during the tests there was less need to implement crowding measures at the station, indicating that passenger flows had improved.

LU is testing a variety of messages using methods including electronic signs, instructions from staff, signs on the floors and footprints on escalator steps, and will look to see whether a change in passenger behaviour is noticeable in the longer term.



the instruction to stand on both sides of the escalator during the evening peak at Holborn on 4 May 2016. **PHILIP SHERRATT** 







# TURNING SOUTH LONDON ORANGE

A CENTRE FOR LONDON REPORT HAS PROPOSED SIGNIFICANT UPGRADES TO BOTH TRAINS AND INFRASTRUCTURE TO CREATE A METRO-STYLE SERVICE IN SOUTH LONDON

he London Overground network is one of the railway's great success stories of recent years. Over the seven years to 2014/15, the number of passenger journeys made on the network quadrupled. Since Transport for London (TfL) took control of these services, passenger satisfaction has risen, with new trains, more frequent services, all-day staffing and better station facilities provided.

Witnessing these developments, which have largely been confined to the rail network north of the river Thames, residents of south London have been eagerly calling for the Overground revolution to spread southwards. Satisfaction levels with the train operating companies running suburban routes south of the river remain low.

On 21 January the Department for Transport and TfL jointly

released a prospectus outlining how a partnership between the two organisations could lead to responsibility for rail services being devolved to TfL (page 10, March issue). The Southeastern, Govia Thameslink Railway (GTR) and South West Trains operations were highlighted as prime candidates for such a transfer. Ambitions for a 'London Suburban Metro' network were stated. offering frequencies of at least

four and ideally six trains per hour (tph). In the media it was widely reported that inner suburban routes would become part of the Overground network, when in fact the announcement amounted to little more than an early proposal and the start of a consultation.

### **ORANGE REVOLUTION**

Just a week earlier, the Centre for London, a politically independent, not-for-profit



think tank, in partnership with public and private sponsors, released a paper advocating the incorporation of south London rail services into the Overground network. Entitled 'Turning South London Orange: Reforming Suburban Rail to Support London's Next Wave of Growth', it goes beyond the scope of the Government consultation paper to make suggestions for major infrastructure and governance changes to facilitate a radical improvement in service provision.

The paper concentrates on the 'south central routes', largely those currently within the GTR franchise. Projections suggest that passenger demand at the stations in the study area will double by 2050, and the paper says that accommodating this will require 'a radical transformation of the suburban rail network'.

Limitations of the current railway infrastructure, which largely dates from the Victorian era, are said to affect the reliability of services. Recent



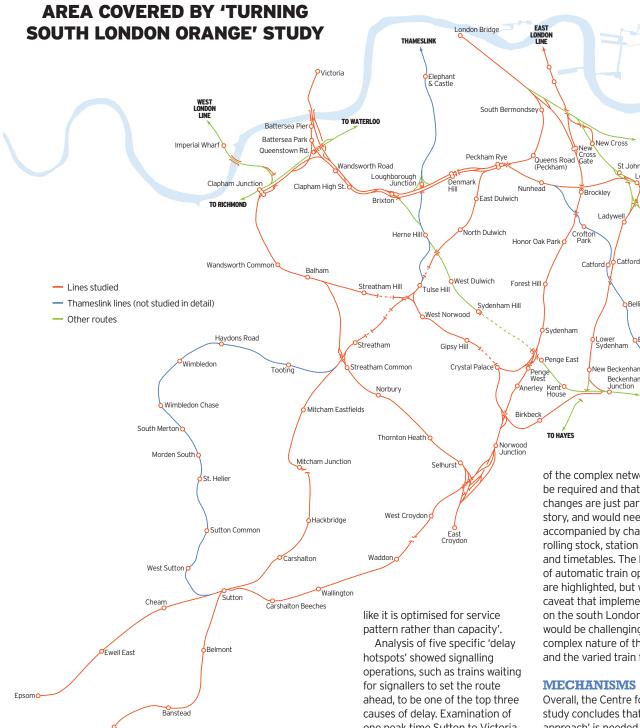
Orange network: unit No 378219 arrives at Wandsworth Road with the 16.16 Clapham Junction — Highbury & Islington London Overground service on 28 August 2015. The right hand pair of tracks is used by Southeastern services into London Victoria but there are no platforms here, an omission which the 'Turning South London Orange' study suggests is corrected. **ANTONY GUPPY** 

data from the Office of Rail and Road shows that the three train operating companies running south London's suburban services were, on average, cancelled or significantly late almost twice as much as services on London Overground. To create a modern rail system which achieves the same standards as the Overground network will therefore require 'significant engineering work, taking the railway through decades of long-overdue upgrades and modernisation









in a single programme'. But the paper proposes that, using Crossrail-style 200-metre long trains, such upgrades could deliver a capacity boost of as much as 130%.

### **SIGNALLING**

As a sponsor and contributor to the paper, Thales assessed the upgrades required to deliver a service comparable to that on the existing Overground network, including a minimum frequency of 6tph during peak periods. These services would combine on the

approaches to either Victoria or London Bridge to create a frequency of between 14 and 22 suburban trains per hour.

In particular, Thales' work demonstrated that the network in the south London area experiences a higher proportion of reactionary delay than other locations, meaning each individual perturbation has a ripple effect across the area and has greater potential to cause disruption. A number of possible explanations are offered, including platform utilisation and the way the train service is planned, with the study stating that performance 'looks

one peak time Sutton to Victoria schedule demonstrated that 15% of the journey is spent stationary, either at stations or at junctions. A sample of dwell times at Clapham Junction in the evening peak showed that these can be anything from 30 to 120 seconds, thereby limiting the frequency of trains which can be run.

Thales suggests that implementation of a modern signalling and control system incorporating traffic management has the potential to reduce delays by around 13% in isolation, and in the longer term by 21% if fully integrated. But the company cautions that further modelling

of the complex network would be required and that signalling changes are just part of the story, and would need to be accompanied by changes to rolling stock, station operations and timetables. The benefits of automatic train operation are highlighted, but with the caveat that implementation on the south London network would be challenging due to the complex nature of the network and the varied train fleet.

TO WOOLWICH

TO ORPINGTON

Beckenham Hill

TO BROMLEY

TO BROMLEY

TO DARTFORM

St John's

Catford Bridge

Bellingham

Beckenham Junction

### **MECHANISMS**

Overall, the Centre for London's study concludes that 'a holistic approach' is needed which incorporates a range of network upgrades. As well as updated signalling and control systems, it suggests that better platform management, improved rolling stock design and track amendments are needed.

Analysis by TfL has shown that station dwell times between Selhurst and Clapham Junction could be cut by up to 42% if the current Class 377 EMUs were replaced with London Underground's 'S' stock, which would be more suited to this type of operation. This would be coupled with better information provision to

passengers, including about which carriages are less crowded.

But perhaps the single biggest (and most expensive) improvement would be changes to the infrastructure, with replacement of flat junctions with flyovers top of the wishlist. Four specific proposals involving major infrastructure changes have been put forward by Jonathan Roberts Consulting, another of the study's partners.

### STREATHAM SOLUTION

Streatham has long had ambitions for a London Underground extension, but with TfL now proposing to route the Bakerloo Line to Lewisham all possible options for a Tube extension appear to have been exhausted. Streatham currently has three main line stations, none of which offers a Tube-style frequency.

TfL has proposed the creation of a Streatham interchange south of the town centre at the convergence of the Thameslink, London Bridge and Victoria routes near Streatham Common. But it is suggested that with such a move Streatham town centre would still be poorly served for travel in the direction of Clapham Junction, Victoria and the West End.

The Centre for London team proposes that with demand at the three stations forecast to double by 2050 there is 'a clear case for radical change', and that the creation of a 'virtual Tube' would enable all three stations to be served. This would be achieved by building a tunnelled flying junction between Streatham and Streatham Hill stations, where the ground is hilly and there are existing railway tunnels. Streatham station would be four-tracked, offering within-station interchange (either at ground level or with additional tracks below ground). The distance in tunnel would be 3km (or 6km for two tunnels) less if surface four-tracking were possible through Streatham.

Heading south, a further flying junction with the local lines would be provided at Streatham Common. Using this new link, some stopping services to Victoria could be re-routed via all three Streatham stations, while it is proposed that Streatham would see a peak service interval between trains of just two to three minutes. To maintain existing journey



Flat junction: unit No 319445 leads the 16.14 St Albans City – Sutton service into Herne Hill on 17 March 2016. The Centre for London paper proposes a tunnel for fast Southeastern services (which use the lines trailing in from the left), reducing conflicts with Thameslink services at this location. **ANTONY GUPPY** 

times to Sutton and Croydon, it is anticipated that 4tph would continue to run directly from Streatham Common to Balham.

### **SOUTH LONDON LINE**

The second change concerns the South London line, which runs east from Victoria and Clapham Junction via Denmark Hill and Peckham. The four-track railway is currently configured as two pairs of tracks, each conveying different services. The southernmost pair is used by London Overground trains from Clapham Junction via Peckham onto the East London line at Surrey Quays, while the other pair is used by Southeastern services from Victoria towards Lewisham and Dartford, which do not stop until Denmark Hill as there are no platforms on these lines at Wandsworth Road or Clapham High Street stations. The study highlights that at present the line 'nominally but incompletely serves the town centres of Clapham, Brixton, Peckham Rye and Lewisham'.

The Centre for London proposes to create a more joined-up corridor here, recognising that not all passengers wish to travel into central London. New platforms would be provided where they are missing, accompanied by an increase in service frequencies. East London line services would be boosted from four to six trains per hour and a similar frequency provided on the Southeastern

route to Lewisham, with these additional trains running on to Catford and Beckenham Junction.

### **HERNE HILL**

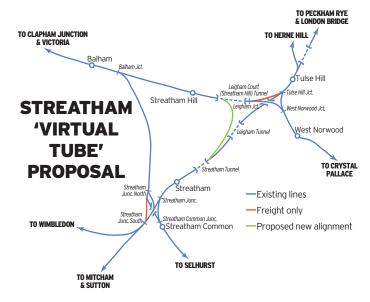
A major constraint on the network has been identified at Herne Hill, where Thameslink services cross fast Southeastern services from Victoria on the level. A similar flat junction at Tulse Hill involves conflicts with south London services into London Bridge. The present junction design also limits train lengths, both on Thameslink and the London Bridge to Tulse Hill route, to eight carriages.

One proposal at Herne Hill is for Thameslink services to tunnel underneath the South Eastern main line, possibly with an underground station. The Centre for London suggests that 'a scheme costing up to £1 billion looks likely', particularly if a second deep-level station is required at Loughborough Junction.

Instead, it proposes a new 5km tunnel for the fast Southeastern services from Victoria, running from the Battersea rail lands near Wandsworth Road to a location south east of Herne Hill. Although it would incur tunnelling costs, this scheme would avoid the need for below ground stations, as it would be used solely by fast trains.

This could then free up track capacity on the existing lines for new stopping services as well as for the reopening of the

63



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disused platforms at Brixton on the Southeastern line towards Peckham, linking in with the improved services already described on this route. A further change could see East London line services diverted to use this northernmost pair of tracks on the South London line, thereby avoiding the need

to expensively build high level platforms at Brixton and giving spare track capacity which could be used, for example, as a freight train management loop.

### **OUTER ORBITAL**

The fourth major scheme involves the creation of an orbital service paralleling the M25. This

proposal builds on work already undertaken by Jonathan Roberts Consulting for the London 2050 plan, which suggested an orbital rail scheme closer to the centre.

With significant housing growth in the outer suburbs, it is considered likely that there will be a growth in the number of orbital journeys, placing further pressure on the already congested motorway. The only comparable rail service at present is that on the North Downs line via Redhill.

An outline proposal would involve trains starting at Woking, either with a new platform on the south west side of the station or using the existing bay platform 6. A limited stop service would then call at Guildford (with a reversal), Horsley, Leatherhead, Epsom, Sutton, Wallington, West Croydon, Norwood Junction, Beckenham Junction, Bromley South, St Mary Cray and Swanley. From here, two of the proposed four trains each hour would continue to the Medway stations and the other two to Maidstone East. The major infrastructure addition would be a 3.2km tunnel running northwards from Norwood Junction to Kent House, west of Beckenham Junction.

The aim would be to provide a limited stop 'turn up and go' service that is competitive with the car, with train interiors designed to a comparable standard of comfort with more seats and Wi-Fi, rather than being of the metro-style used closer to the centre of the capital.

### **INTERCHANGES**

The study also highlights the lack of useful interchanges between rail routes in south London. In 2014-15, the identified interchange volume at suburban south London stations was 52 million, of which 69% was at just two stations, Clapham Junction and East Croydon. Easier interchange, it contends, would allow a simplification of service structures so that higher frequency and more reliable services could be operated.

A review has identified a number of possible sites for new stations or additional platforms, as outlined in Table 1. Estimates indicate that if all the proposals were taken forward. they could have an equivalent passenger entry and exit volume of around 17 million at 2014-15 levels, rising to as much as 38 million by 2050.



As part of the wider improvements, other stations may also require additional platforms, including Balham, Clapham Junction, East Croydon and Norwood Junction, with these provided for operational rather than connectivity reasons.

### **DELIVERY**

The Centre for London report suggests that while individual schemes will require their own business cases, 'a large-scale of ramping up of investment' will be needed to meet projected demand looking ahead to 2050. It also recognises that there is increasing demand for travel to locations away from central London, and to provide a connection from south London to the Canary Wharf development a separate proposal foresees a four-mile tunnel link from Lewisham to Poplar. This is considered a more viable alternative than further upgrading of the East London line, which would be expensive and complex to deliver.

If this were accompanied by the range of projects already described, alongside associated depot provision and stabling for additional and longer trains plus any other projects which may be required, the estimated aggregate cost is put at £10 to £15 billion. This would be on top of renewals such as signalling replacement and provision of new train fleets when vehicles reach the end of their current lives. The report describes this as 'beyond the costs of a Thameslink, and towards the cost of a Crossrail', with the tunnel projects being the largest 'big ticket' items.

While this is a large outlay, the report makes the case that this funding would buy 'a complete metro standard railway throughout south London', representing 'many more bangs for the bucks'. The expenditure would span several railway investment Control Periods, generating a development stimulus which helps to achieve payback to the Treasury. The aim is that the proposed upgrades would offer a solution for this part of south London which would avoid the need for another Crossrail-style scheme incorporating tunnels beneath central London.

### **GOVERNANCE**

A further challenge to implementation of improvements is the way the railway is managed.

While devolution of responsibility for operations to TfL could allow it to specify better rolling stock, for example, this would likely cover only those services within the London area. It is suggested that it may prove difficult to achieve the full benefits of the upgrades and the maximum possible increase in capacity without greater formal integration of the network and a more radical form of devolution.

One possible solution would be to transfer all rail services between south London terminals and the counties of Kent, Surrey, West and East Sussex into a single concession let jointly by these authorities. Dubbed Capital to Coast Rail (CCR), the arrangement could be modelled on Rail North, which brings together 29 local transport authorities from across the north of England and is jointly managing the new Northern and TransPennine Express franchises in conjunction with the Department for Transport.

CCR would begin as a partnership and move towards full devolution over time. Once this has taken place, a board of eight directors would comprise four nominated by TfL and one by each of the four county councils. The

50-50 split between London and the county councils would reflect the concentration of rail traffic within London and TfL's expertise in managing major rail projects.

As with Rail North, the board would nominate an independent chair and would make decisions by majority vote, with the proviso that at least one of the county council directors and one of the TfL directors agree, providing protection for the county councils and ensuring no decisions were made against their collective will.

### **CHALLENGE**

The Centre for London proposals offer the potential for a strategic, staged series of investments aimed at delivering a radically improved, metro-style network in south London. In the short term, devolution could present a number of quick wins by upgrading stations and improving service standards, as seen on the existing London Overground network. But in the longer term, more substantial changes could deliver a step change in capacity, helping to meet growing demand over the next 30 to 40 years and supporting economic and employment growth across south London.

### TABLE 1: STATION AND INTERCHANGE PROPOSALS

Battersea	New platforms on the Southeastern lines into Victoria, near to the Dogs' home, adjoining with the terminus of the Northern Line extension at Battersea Power Station
Beddington	New station between Wallington and Waddon on the line between West Croydon and Sutton
Brixton	Reopen disused platforms on northernmost pair of South London line tracks
Brockley	A new pair of platforms on the South London line between Nunhead and Lewisham, providing interchange with the existing station
Camberwell	New station on the Thameslink line between Elephant & Castle and Loughborough Junction. Parallels with TfL suggestion for a new station here as under current proposals the area will not be served by the Bakerloo Line extension
Clapham East	New station around half a mile north-east of Clapham Junction, to be served by London Overground East London line trains
Clapham High Street and Wandsworth Road	Provide platforms on the Southeastern tracks, enabling a direct service to Victoria to be reinstated. Potentially rename Clapham High Street as Clapham North to highlight interchange with Northern Line station
Imperial Wharf	Provide footpath alongside railway bridge to allow access to station from south of the river Thames
Lewisham	Provide new Lewisham South interchange platform on the South Eastern main line, with 550-metre travelator connection with existing Lewisham station, running alongside the Hayes line
New Cross	Divert current East London line services to instead run via New Cross Gate, with travelator link to New Cross station
Penge interchange	Create walkway link between Penge West and Penge East stations, with potential to relocate Penge West station north of the High Street to reduce walking distance from 650 metres to 400 metres
Streatham Interchange	TfL proposal, as already described
Tooting St George's	New station between Tooting and Haydons Road on Thameslink's Wimbledon loop, with entrance on Tooting/Colliers Wood High Street, helping relieve the Northern Line at Tooting Broadway and Colliers Wood stations, while also serving St George's hospital and high density housing in the area

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In the shadow of the Canary Wharf development: a Stratford service arrives at All Saints on 9 August 2013. This route is destined to receive longer and more frequent trains in the future. **ANTONY GUPPY** 

or the Docklands Light Railway, growth over the past 30 years has been nothing short of remarkable. Originally built to kickstart regeneration at Canary Wharf, the network has expanded faster than anyone could have anticipated.

The DLR opened in 1987 over two routes covering eight miles. The initial lines from Tower Gateway and Stratford to Island Gardens were designed to carry 1,500 passengers per hour using a fleet of 11 vehicles. In the first year of operation, six million passengers travelled on the network.

In 2015-16 the DLR carried nearly 117 million passengers. The network has grown to 25 miles in length, with 45 stations and a 149-strong fleet.

### **EXPANSION**

The first expansion of the original network was in 1991, when the branch to Bank opened, connecting the DLR better with the city of London. Construction work on the extension was carried out while services continued to operate, and an additional 10 vehicles were added to the fleet.

The next move for the DLR was eastwards into the Royal Docks, another area identified as having regeneration potential, with the opening of the Beckton branch in 1994. A new depot was built near Beckton to handle a much larger fleet of 70 B90/B92 stock vehicles. These replaced the

original 'P' stock trains, which were sold to Essen in Germany. A wholesale upgrade of the signalling system was undertaken by GEC, with the Seltrac moving block system eventually adopted.

In 1999 the DLR went south of the river Thames for the first time with the extension to Lewisham via Greenwich. The line was funded and built under a private finance initiative (PFI) deal awarded to CGL (City Greenwich Lewisham Railway). The 24.5-year concession, which also covers maintenance of this section, is due to end in 2021. An additional 24 vehicles, named B2K and similar in design to the original B9O and B92 stock, were delivered in 2001-02.

London City Airport was the next addition to the system - the airport had previously had no direct rail connection. The extension from Canning Town opened in 2005 and ran to a terminus at King George V on the north side of the river Thames. This was followed by the twin bore tunnels beneath the river to Woolwich Arsenal in 2009. Both these projects were also built under PFI deals, but in 2011 Transport for London

announced plans to purchase the two companies holding the respective concessions.

With continuing growth in traffic, the network has been progressively upgraded so that stations can handle three-car trains. A total of 55 B07 vehicles. built by Bombardier, have been added to the fleet, and the first three-car trains ran on the Bank-Lewisham route in 2010, with the rest of the network upgraded thereafter. This necessitated a major programme of infrastructure works, including the complete rebuilding of Tower Gateway, South Quay and Stratford stations and alterations to the delta junction north of West India Quay.

The most recent addition, opening in August 2011, saw the DLR take over the former North London line tracks between Stratford and Canning Town, which had closed in 2006. The line continues north of Stratford to a station at Stratford International, located close to the Olympic Park, where it offers interchange with rail services on High Speed 1.

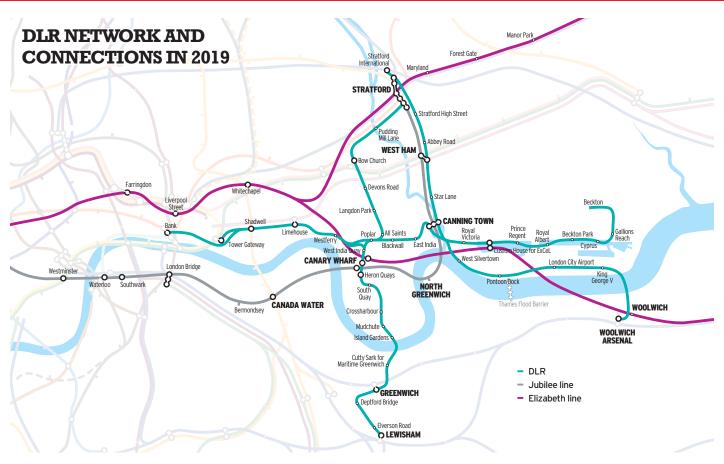
This expansion has matched the growth of this part of east London. For example, the DLR

### **DLR NETWORK EXPANSION**

1987	Tower Gateway/Stratford - Island Gardens	
1991	Shadwell - Bank	
1994	Poplar - Beckton	
1999	Island Gardens - Lewisham	
2005	Canning Town - King George V via London City Airport	
2009	King George V - Woolwich Arsenal	
2011	Canning Town - Stratford International	







was the only rail link to the first 25,000 jobs at Canary Wharf, whereas 115,000 people now work on the estate; transport links here have since been boosted by the Jubilee Line extension, which opened at the turn of the millennium. The DLR has supported notable housing growth at Royal Victoria and in the Greenwich, Deptford and Lewisham areas, while at London City Airport it has facilitated a

significant mode shift to public transport - 66% of airport passengers now arrive by rail.

### **OLYMPICS**

The biggest test of the DLR's ability to handle large passenger volumes was the London Olympics in 2012. During the 45 days of the games, the DLR carried well over 15 million passengers, equivalent to the combined populations of Norway, Finland and Denmark. The busiest single day saw over half a million people use the DLR, and from a performance perspective the games were a success. with a headline performance measure of close to 99%.

### **CROSSRAIL**

But the DLR is not standing still, and growth in this part of east London is set to continue, with new housing developments and employment opportunities

continuing to spring up. The next major milestone will be the arrival of Crossrail, which will link with the DLR at Canary Wharf, Custom House, Woolwich and Stratford. Services on the Abbey Wood branch of the Elizabeth Line, serving the first three of these locations, are due to begin in December 2018.

A three-phase strategy is being implemented to deal with this growth. At present the DLR is making the most of the resources it has by tweaking its service pattern. In late 2015 a more frequent service was introduced between Stratford and Canary Wharf, providing 50% more services but shorter trains, offering an overall capacity increase of 20%. At the same time, the newer B07 vehicles have been converted to offer almost entirely longitudinal seating, enabling improved passenger movement into and through the trains.

When Crossrail opens, it will have a major effect on usage of the DLR. For city-bound passengers, the Elizabeth Line will provide a faster journey, so passenger numbers from Woolwich, Canary Wharf and Custom House into Bank and Tower Gateway will fall. The DLR's role will then become



Crossrail connection: a westbound service departs from Custom House for Excel station on 20 April 2016. At right is the Crossrail tunnel portal, with loco No 66771 at the head of a concrete batching train. **ANTONY GUPPY** 

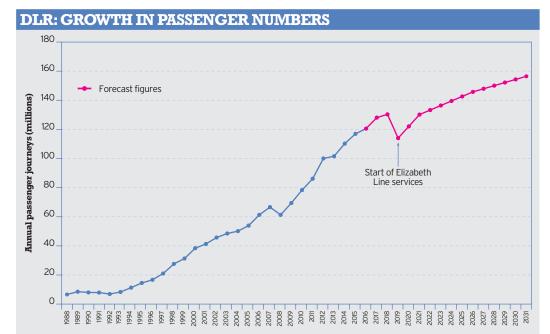
more of a feeder service to these three key locations. A recast of services is planned in 2019 to take account of these changes.

### **HOUSING GROWTH**

But while these flows will get less busy, growth will continue on others as demand for housing continues to rise and further employment comes to the Docklands area. For example, while the DLR at Canary Wharf is likely to see fewer passengers, growth is anticipated as a result of new developments at West India Quay and Stratford and new housing in the Pudding Mill Lane area.

Huge increases in demand are forecast for the Royal Docks area at Custom House, Pontoon Dock and Beckton Park stations, with significant uplifts predicted at Royal Albert, Gallions Reach and London City Airport. This means that Canning Town's current role as a major interchange will remain, in spite of the arrival of Crossrail.

Currently planned developments, such as those for which planning applications have been submitted, are forecast to boost passenger numbers to nearly 160 million journeys per year by 2031. But there is potential for this to be even higher - many areas are developing new masterplans which propose to increase planned growth in the number of new homes. There are currently 180,000 homes within the DLR's catchment area, but by 2040 this could have more than doubled to 380,000, and increased capacity



on the DLR is fundamental to realising this vision.

### **PLANNED**

A series of further upgrades is already funded over the coming years. The second phase of double tracking of the north route from Poplar to Stratford is due to be completed in 2020, covering the section north of Pudding Mill Lane. This will enable frequencies on this route to rise from the present maximum of 15 trains per hour (tph) to 20tph.

Plans are in hand to replace the ageing B92 fleet with 43 new walkthrough trains, which would be fixed formation units of the same length as a current three-car train. This would give an additional 10 trains to boost services in the Royal Docks, enabling a doubling of capacity on the Beckton line and a 20% increase on the Woolwich Arsenal line. The expanded fleet would also enable more services to move to three-car operation than is possible at present. Under current plans, the first trains would enter service after 2020.

Year (financial year starting April)

A number of station upgrades are also funded. At Limehouse new escalators are to be provided to and from the westbound platform for better interchange with c2c services. Improvements at Custom House station are being jointly funded by TfL and the developer of the ABP Royal Albert Dock development. This

£1.7 billion development is set to create more than 15,000 jobs, with the first phase completed in summer 2018. The Custom House improvements will provide more space to accommodate interchange between the DLR and the Elizabeth Line, while ABP is also funding a more capacious station at Beckton Park.

### **ROYAL DOCKS**

But these improvements will not provide sufficient capacity for the DLR to meet further demand growth. Linked with the ABP proposal is the likelihood that brownfield land in the Royal Docks area could accommodate tens of thousands of new homes, spurred on by the arrival of Crossrail. Few







of these developments will be within walking distance of either Crossrail or the Jubilee Line, so the DLR will have an important role in moving people around the Docks area and feeding into other modes.

A gradual increase in service levels on both the Beckton and Woolwich branches will be required, potentially to upwards of 30tph. This will be accompanied by further station upgrades, with Royal Albert and Pontoon Dock both identified as priorities, while at Gallions Reach the aim would be to provide longer platforms. Better interchange facilities at Canning Town are also high on the wishlist, with the current situation unsatisfactory and confusing to many passengers. This could be solved by better wayfinding arrangements and a link bridge connecting the two DLR platforms, which are at different levels and require a lengthy walk via the Jubilee Line platform. There is also the potential for the addition of a station on the Woolwich branch at Thames Wharf, between Canning Town and West Silvertown.

### **CANARY WHARF**

The arrival of Crossrail at Canary Wharf will be a major boost to the area, offering much-needed extra capacity. But it will also create a problem, in that there will be three separate stations for Crossrail, the DLR and the Jubilee Line with no connection

between them. Improved interchange to facilitate better pedestrian flows is therefore high on the list of priorities.

The footprint of the Canary Wharf development will continue to grow, exacerbating current overcrowding, which is a particular issue on journeys 'round the corner' from Poplar. Passengers will therefore need to be encouraged to use the stations at Poplar and South Quay, which are on the fringes of the Canary Wharf area. One plan is to market Poplar station as 'Poplar for Canary Wharf', with the provision of a covered walkway into the development a possibility. Poplar could also gain a new eastern entrance linking to the Billingsgate site, just the other side of the busy Aspen Way road. Similarly, a new footbridge from South Quay could provide a link to the South Dock area.

It will also be necessary to boost Stratford to Lewisham services to three cars, so that all trains are operating at their maximum length. In the longer term, frequencies could increase to as much as 120tph at Canary Wharf, which would require facilities enabling trains to turnback at Canary Wharf and either Poplar or Westferry. But there is also a recognition that many passengers travel through Canary Wharf making journeys such as Stratford to Lewisham, and there is a desire to provide faster journeys for through passengers.

### **CITY CONNECTION**

While the arrival of Crossrail will bring relief to DLR's city-bound services, there is a danger that the capacity offered by the Jubilee Line and Crossrail could be exhausted if Docklands development reaches its full potential. The aim is to make the DLR a more attractive option in order to spread demand more evenly across the three lines, so that strategic capacity on this corridor is not wasted.

At present, 90% of demand for DLR services is for journeys to Bank, but the station only gets 70% of services on the western branch. The biggest constraint is the arrangement at Bank station itself, where trains unload in an arrival platform before moving to a headshunt west of the station and then reversing into a separate departure platform. The points controlling the headshunt are one of the hardest working sets of points in the country, and are therefore a key asset for the DLR. Extra emphasis is already placed on their reliability, with spares and technicians on standby in case of a failure. The aim is to increase turnback capacity at Bank to allow a service frequency of at least 30tph on the branch.

One much vaunted solution would be to extend the DLR westwards, reaching further into central London and obviating the need for the current reversal procedure. Previous proposals envisaged the line going to Victoria via Cannon Street, helping to relieve pressure on the District and Circle Lines, but now the favoured idea is an extension towards Fuston to link with HS2. However, this would be a very costly scheme and is not being pursued at present.

Aside from Bank, another issue for the DLR's western branch is the poor quality interchanges at Shadwell (with the London Overground) and Tower Gateway. At the latter there is a strong desire to improve links with the Underground at Tower Hill, which could help remedy the present relative underuse of Tower Gateway services.

### **ISLE OF DOGS**

Major increases in development are also planned in the central Isle of Dogs, possibly reaching 'Manhattan densities' in the area around South Quay. With each new masterplan comes proposals for more housing. and tens of thousands of new homes could be built over the coming years. Their residents will predominantly rely on the DLR to link them to the rest of the rail network.

The objective will be to progressively ramp up service levels through the 2020s, aiming for a maximum 30tph. As already mentioned, Stratford-Lewisham services will be lengthened to the maximum three cars, and an upgrade will be required at Crossharbour station. Lewisham will become a key transport hub - there are ambitions to devolve control of the South Eastern franchise to TfL, which may lead to a more 'metro-style' operation on main line services, and the Bakerloo Line extension could arrive in 2030. A major reconstruction of the station will be needed to better integrate the DLR with these modes.

### **STRATFORD**

New homes and jobs are transforming Stratford into one of London's biggest metropolitan centres. This will create new travel patterns, with Stratford becoming a destination in its own right as well as an important interchange. The DLR will have a key role to play, particularly in terms of strategic links to



Key interchange: a Woolwich Arsenal to Stratford International service departs from Canning Town on 27 May 2013. Trains to and from Tower Gateway and Bank depart from the high level platforms at top right, beneath which is the island platform used by the Jubilee Line. Better interchange facilities here could include a bridge linking the DLR platforms. **ANTONY GUPPY** 



south east London, and the arrival of Crossrail will make demand on the DLR even more Stratford-focused.

Tranquil waters: a northbound service arrives at West India Quay station on the evening of 22 August 2015. **ANTONY GUPPY** 

An early challenge will be the World Athletics Championships in 2017, held at the Olympic Stadium, for which the rebuilt Pudding Mill Lane station will be a key access point. Plans are already in hand to double the single line section between Pudding Mill Lane and Stratford, enabling a 20tph service to operate, and the aim is to boost through services to Lewisham to 15tph.

On the route to the Royal Docks, better access will be needed to the low level platforms at Stratford, and the plan is to gradually increase frequencies, first to 15tph and eventually to as much as 30tph. The provision of escalators to the DLR platforms at West Ham is another potential improvement compared with the current staircase access - the station is redolent of its former status on the less busy North London line.

### RIVER CROSSING

While connections westwards from the Royal Docks area are good, access from areas to the east and north is relatively poor.

TfL has recently undertaken a consultation on plans for new

river crossings at Gallions Reach and Belvedere, with the possibility that the first of these could carry an extension of the DLR from Gallions Reach across the river to Thamesmead and Abbey Wood. This idea received good support in the consultation, and TfL says work will continue to investigate the options. Current plans foresee the river crossing, which could take the form of a bridge or tunnel, opening in 2025.

The consultation also suggested an extension from the end of the Beckton branch northwards to Barking, which is expanding as a major transport hub. Both these extensions would fit well with the DLR formula of supporting regeneration and allowing new housing to be delivered.

### **MAINTENANCE**

Providing a more intensive service on the DLR will necessitate more intensive use of the fleet and a consequent reduction in the time available for maintenance.

DLR is seeking to exploit intelligent monitoring and automation to reduce costs and prevent service-affecting asset failures. As well as remote monitoring, this will include better analysis of data to identify patterns that lead to failure. Automation would cover

movement of trains around the depot, and advancing technologies could mean some basic maintenance tasks are undertaken using robotics as these become more powerful. However, achieving this will require more depot space, but the view is that upfront investment will yield ongoing cost savings in the longer term.

### **STATIONS**

Adoption of new technology is also planned at stations. The aim is to deliver better information to passengers whilst also improving accessibility of stations and safely accommodating growing passenger numbers. This could include provision of platform edge doors or enclosed platforms at busier stations, more lifts, intelligent platform edge lights, real time crowding information about which parts of the trains are less busy, Wi-Fi and real time station monitoring. Ideas will be developed and tested in a 'station of the future' environment prior to implementation.

### **NIGHT SERVICE**

With the start of the Night Tube service imminent, the Mayor announced in 2015 that a similar concept could be introduced on the DLR in 2021, after station upgrade works at Bank have been completed and the present DLR franchise, held by Keolis Amey Docklands, has ended. Current plans envisage a 4tph service on the Bank to Lewisham and Bank to Woolwich Arsenal routes. Whether these plans move forward is likely to depend on the success of the Night Tube.

### **GROWTH**

The story of the DLR is one of expansion, fuelled by regeneration in this part of east London, and that is set to continue. A move to four-car trains in the future has not been ruled out, but this would present significant difficulties in upgrading infrastructure, notably at Bank and Cutty Sark stations, hence the current focus on increasing service frequencies.

From humble roots, the DLR has developed into a transport success story. But the transformation of the Docklands area has only just begun, and the network is looking forwards not back as it faces the challenge of meeting future demand prompted by housing and employment growth.

This article is based on a presentation given to the Institution of Mechanical Engineers.

71

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# THE RAILWAY INDUSTRY IN

# A PREVIEW OF THE NOMINATIONS FOR THE INDUSTRY'S LONGEST STANDING AWARDS EVENT

### **WINNING MILLING TRAIN**

Austrian firm Linsinger's MG31 rail milling train was selected to meet Transport for London's demands for a rail reprofiling machine with material removal rates of up to 3.5mm for the Crossrail project. The train, which is able to work in Crossrail tunnels and meets the required emissions standard, will also help reduce maintenance costs.

### **IMPROVING ASSET KNOWLEDGE**

To assist maintenance and renewals decisions, Network Rail has developed the Operational Property Decision Support Tool. This gives engineers access to asset data via a single dashboard, covering a range of assets from stations and depots to lineside buildings. The tool allows teams to make 'the right decision, at the right time, in the right place' and promotes safety, better performance and new ways of working.

### **FIX BEFORE FAILURE**

In late 2015 Rowe Hankins launched its Split-Core NIC, a non-intrusive current monitor that is designed to be used in rail condition monitoring systems. It is easily installed without the requirement for a track possession or an electrical disconnection and features an innovative jaw lock aperture. The aim is to allow engineers to 'fix before failure', helping reduce maintenance costs and the resources required.

### ALLIANCE DELIVERS STAFFORDSHIRE SUCCESS

The Staffordshire Alliance is a partnership between Atkins, Laing O'Rourke, Network Rail

and VolkerRail which is delivering the £250 million Staffordshire Area Improvements Programme. By working together on a best for project basis, the alliance has delivered the programme to budget and commissioned the new flyover at Norton Bridge 12 months ahead of schedule.

### SCANDINAVIAN STRAY CURRENT SOLUTION

Concerns over the effect of stray currents from construction of the new LETBANE light rail system in Aarhus, Denmark on the DC track circuits on the existing railway led to the adoption of a new DC track circuit design. Developed by Northwood Railway Engineering, it uses polarised track relays to mitigate the effects of stray currents. Some 35 track circuits were modified instead of being replaced, offering significant timescale and cost savings.

### PLATFORM FOR THE FUTURE

Abellio Greater Anglia and Dura have pioneered the use of a composite platform at Needham Market station in Suffolk. Installed in just 36 hours and thereby minimising disruption to passengers and communities, the replacement platform is low maintenance, has a design life of over 60 years and requires an overall financial outlay of 25% less than the traditional rebuild approach.

### MANUFACTURING RETURNS TO THE NORTH EAST

Hitachi Rail Europe's new £82 million rail vehicle manufacturing facility at Newton Aycliffe

in County Durham was formally opened by Prime Minister David Cameron in September 2015. Hitachi appointed Shepherd Construction to build the facility, which was delivered within budget and completed two months ahead of the contractually obliged date; this was achieved through efficiencies across construction operations.

### **S&C DATA AT THEIR FINGERTIPS**

A first for the rail industry, Network Rail's Switches and Crossings Decision Support Tool provides a single source of data about the network's 23,000 switches and crossings, enabling engineers to make better decisions about renewal and replacement of assets. A proof of concept was provided in June 2015, and rollout is planned in the autumn.

### TRACK CIRCUIT MONITORING

London Underground has installed condition monitoring equipment on new jointless track circuits fitted as part of the upgrade of the Victoria Line. The central condition monitoring server processes more than 7,000 data samples per second, enabling deviations to be quickly identified. Since the system was installed the number of lost customer hours relating to track circuit failures has reduced significantly.

### **FASTENING GETS FASTER**

Fixing and fastening specialist Hilti has developed a solution for fastening track circuit connections to rail tracks, which is now industry approved. The main benefits include the use of significantly



# **INOVATION AWARDS 2016**

lighter cordless equipment, all supplied in a large single case, with no additional requirement to transport ancillary items. Installation times are also significantly quicker, increasing productivity.

## OPEN FORMAT FOR ELECTRIFICATION DESIGN

Atkins and lead partner Laing O'Rourke initiated the Digitally Enabling Electrification (DEE) project to understand how electrification projects can help deliver the Government's building information modelling (BIM) strategy and become a key component of Network Rail's Digital Railway programme. A core part of this was the establishment of an open design format which manufacturers, contractors, designers and installers can access and which can be interpreted by anyone using BIM software.

#### **SMART TRACK MONITORING**

Rail Technology Ltd's SFT Smart-Rail system provides real time monitoring of temperature, rail strain and SFT data on continuous welded rail. This is transmitted via trackside GPRS equipment and a server. The system is a development of the previous Trackload system, and the company is seeking to take the product to a wider national and international market.

## INNOVATION IN COMMUNICATIONS SYSTEM DESIGN

As part of London Underground's Four Lines Modernisation (4LM) programme, Thales has been able to capture significant efficiencies in radio design and survey methodology. The company has applied modern techniques such as 3D laser scan data to existing products, simplifying the survey procedure, minimising setup time and reducing the post processing effort.



New manufacturing facility: driving car of IEP unit No 800002 inside Hitachi's Newton Aycliffe plant. Tony Miles

#### **GREEN LIGHT FOR SENSOR SYSTEM**

Barnbrook Systems' data monitoring system 'BlueCube' uses lightweight sensors to monitor and transmit data. It is already in use on trains to monitor a range of systems, and upgraded models will also deliver asset tracking and asset management capabilities. The user-friendly interface has a traffic light alert and display system, giving a simple visual representation of any issues or problems, and when an indicator hits red an alert is sent by e-mail or text.

#### THE AVENTRA ADVENTURE

Bombardier's new'Aventra' EMU is lighter, more energy efficient, cheaper to maintain and more reliable than existing UK best-in-class EMUs. The modular design offers a range of train lengths and door configurations and a flexible interior, while the Aventra also incorporates the latest 'plug and play' train control and passenger infotainment systems and utilises Bombardier's FLEXX Eco bogie, which reduces wear on track, wheelsets and components.

#### **AWARD CATEGORIES**

- Engineering and safety
- Environment
- Passenger experience
- Cross-industry partnership
- Operations and performance
- Small scale project
- Large project

#### **IN ASSOCIATION WITH**





Railway Industry Association







Train upgrade programme in East Anglia: loco No 90001 *Crown Point* approaches Church Lane Crossing, Margaretting with the 12.00 Norwich – Liverpool Street service on 18 April 2015. Antony Guppy

#### **ACCESSIBLE TOILET MODULE**

Identifying a market opportunity within the rail industry, Birley Manufacturing developed its universal access toilet (UAT) to comply with persons with reduced mobility regulations for rolling stock. The design of the UAT module incorporated a two-part structural module body, leak-proof one-piece floor, non planned maintenance door system with an innovative self-lubricating belt driver system, and low cost lighting using high performance LEDs.

#### **DAS BOOSTS PERFORMANCE**

First introduced in July 2015, Arriva Trains Wales's new driver advisory system (DAS) has now been fitted to over 115 of the operator's trains. The system has helped save more than 300,000 litres of fuel over a six-month period, as well as improving driver performance and efficiency and bringing passengers a smoother and quieter ride through increased use of coasting.

## SCOTRAIL DRIVERS TRY OUT VIRTUAL CAB

For development of the design of drivers' cabs on its new Class 385 EMUs for Abellio ScotRail, Hitachi Rail Europe utilised a virtual reality modelling simulator, which placed the needs of the user at the forefront of the design process. Driver representatives from ScotRail were then invited to try out the simulator and interact with the controls, and their feedback influenced the final design.

#### TRACTION MOTOR LIFE EXTENSION

Houghton International's HiTRAX is an insulation system proven to extend the life of DC and AC traction motors, reducing in-service failures. It has been fitted to Class 455, 507 and 508 EMUs and Tyne & Wear Metro vehicles, and has been in use for over 12 years in the UK without a single failure. It utilises durable insulation materials with the highest specification resins and stringent process control, tested to extremes.

#### **SLICK MAINTENANCE**

The Oilaway Universal Adaptor has been developed to simplify the oil disposal and

replenishment cycle during train maintenance. Designed to support a range of click on – click off adapters, the device streamlines maintenance, reduces cleaning and clear-up costs, protects engineers from carcinogenic contamination and slippage accidents and complies with health and safety and environmental regulations.

#### **INVESTING FOR ANGLIA**

Now in the second of two short franchises, Abellio Greater Anglia has more than doubled planned investment in the business to over £40 million. This covers a major programme of fleet enhancements and reliability initiatives to inter-city trains and Class 317, 321 and 360 EMUs, additional resources for train cleaning, station upgrades, improved weekend services, better ticketing facilities and increased support for community rail partnerships.

## INTEGRATED STAFF MANAGEMENT SOFTWARE

Developed by ProActive, Sirenum is a software package which has transformed staff management. Handling all areas from recruitment to intelligent rostering and using GPS monitoring for clocking in at the start of shifts, the efficiency of the software gives operations teams additional time to focus on working with staff and ensuring they are motivated to provide the best customer service.

#### **KEEPING EMPLOYEES SAFE**

In response to revenue protection staff experiencing verbal and sometimes physical abuse, CrossCountry has introduced VideoBadge body-worn cameras. These record both audio and visuals for up to eight hours at a time, and are supported by back office hardware and software through which the footage is downloaded and processed. The system is lightweight, wire-free, robust and weatherproof, and there are now 30 badges in use in rotation across five locations.

#### **TOP MARKS FOR ASSESSMENT TOOL**

3Squared's RailSmart Employee Development system reduces the administrative burden of



compliance for rail operators, enabling them to manage and optimise employee performance. Competencies can be stored, updated and reviewed as required through a user-friendly interface, and paper-based systems are replaced, reducing time spent in assessment planning and follow-ups and making data more accessible.

#### **INSPIRING YOUNG ADULTS**

A joint venture with the Prince's Trust, Govia Thameslink Railway's 'Get into Railways' initiative aims to boost the skills and confidence of young adults. So far 33 individuals between the ages of 18 and 25 have completed a four-week development programme, which involved a mix of classroom-based training and practical work experience at stations across the network; 20 of these participants have since found employment within GTR.

#### **CYCLE FACILITY ON POINT**

The largest cycle point at a UK rail station has been opened by Abellio Greater Anglia at Cambridge. It offers 2,850 safe and secure undercover spaces covered by CCTV, is open 24 hours a day and is free of charge to users. The £2.5 million facility also incorporates a retail



outlet operated by Rutland Cycling, providing maintenance, cycle hire and cycle sales, and will encourage even greater cycle usage in a city with an established cycle culture.

## PROMOTING SAFETY AMONG YOUNG PEOPLE

Working with the Sussex Community Rail Partnership, operator Govia Thameslink Railway has delivered its Go-Learn material to over 4,500 children since July 2015. The programme aims to equip young people with the knowledge and awareness of safe and independent railway travel, and material has been delivered to 89 schools, including through four large scale safety events.

## CONFIDENT TRAVELLER PRESENTATIONS

A collaboration between Arriva Trains Wales and the Cambrian Railways Partnership, the Confident Traveller project has delivered safety presentations and practical guidance on how to use rail services in a confident and safe manner to a range of audiences. The project has promoted improved safety, greater accessibility and a better travelling experience for passengers, as well as helping forge links with the local community.

## CROWDING INFORMATION HARNESSED

London Underground is rolling out a system to measure crowding levels on trains across the Victoria Line fleet. The system uses data loggers bolted to the rolling stock and wireless technology to transmit signals from trains to a new data server. It will enable dwell times to be reduced as passengers are advised which parts of trains are less crowded, helping more evenly distribute loadings and thereby also improving passenger comfort.

#### **TAP, SWIPE, SERVE**

In order to provide better information to its staff, London Overground has developed a new smartphone app named 'Orinoco', which is the first in the UK rail industry to offer comprehensive realtime information to staff, from journey planning to updates from the operator's control room. The launch of the app was combined with the provision of smartwatches to staff and the development of an online knowledge base named 'Lorolpedia'.

#### **INFORMATION SUPER RAILWAY**

Govia Thameslink Railway is seeking to improve information provision with upgrades

to passenger information systems on almost 2,000 vehicles, enabling tailored messages to be displayed and bespoke information provided to passengers, while also offering better support for train crew, especially drivers. This has been accompanied by the provision of free Wi-Fi at stations and on trains and improvements to the operator's online booking system and app.

## WAYFINDING FOR THE VISUALLY IMPAIRED

Designed to make the London Underground network more accessible for visually impaired people, Wayfindr is a mobile app which uses beacons to guide passengers through stations. The system uses commercially available technology to reduce barriers to travel for visually impaired people while helping LU offer a consistent, tailored service and freeing up staff who would otherwise need to escort people around stations.

#### THE HUMAN FACE AT THE TVM

Abellio Greater Anglia and Cubic Transportation have trialled the NextAgent virtual ticket office at Stansted Airport station. The facility provides a flexible, helpful, multi-lingual

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June 2016 Modern Railways

75

service to passengers arriving at the airport, enabling them to talk directly to a remotely located assistant who can answer their individual queries. The initiative has resulted in excellent customer feedback since it was introduced in October 2015.

#### TRAIN LENGTHENING TRIUMPH

Joint working between Transport for London, Bombardier and London Overground saw the operator's 57 Class 378 EMUs extended from four to five cars, providing room for an extra 170 passengers on each train. As well as manufacturing of the additional carriages (which were completed ahead of schedule), the work included modifications to the existing fleet, reconfiguration of the depot at New Cross Gate and provision of additional stabling facilities.

## TRANSMISSION TECHNOLOGY FOR DMUs

As part of a trial, Voith Turbo fitted two new DIWARail transmissions to an Arriva Trains Wales Class 158 DMU. The transmissions have reduced fuel consumption by 16% since June 2015 while offering a weight saving of 216kg per vehicle, as well as lowering emissions. The unique feature of the transmission is the fully integrated patented reversing mechanism, which helps increase availability and reduce maintenance costs.

## MONITORING DLR TRACTION MOTORS

Collaboration between Perpetuum and DLR operator Keolis Amey Docklands (KAD)

led to the installation of a vibration sensor to monitor traction motor bearing failures on the DLR's B07 fleet. The wireless sensor provided continuous feedback to the maintenance and engineering team, allowing defects to be detected early, reducing the number of in-service failures and improving unit availability.

#### **MANAGING WATER FLOW**

A swale is an engineered vegetated area which intercepts, infiltrates, delays and conveys excess runoff to a watercourse or drainage system. In collaboration with the Environment Agency, Transport for London installed a swale near Upminster Bridge station to mitigate flood risk and improve the quality of the water discharging to the nearby river Ingrebourne. Data has shown that water attenuation performance has exceeded design expectations, and it is anticipated that the design will attenuate a 1 in 30 and even a 1 in 100 years weather event.

## ECOLOGY APP PROMOTES CARE FOR CREATURES

Network Rail's new mobile app enables the company's workforce to share images and offers a comprehensive ecology guide to key wildlife and vegetation concerns for NR, with data stored on a central portal. The app can give early warning of the presence of protected species, helps avoid repeat environmental incidents at the same location, promotes positive stakeholder engagement and gives better information to employees.

#### **ONE PLANET PHILOSOPHY**

Govia Thameslink Railway's 'Towards a One Planet Railway' strategy is promoting sustainability within the company. GTR has already achieved an 85% recycling rate across its network, and is now developing a 'zero waste to landfill' programme. Over 40 staff have volunteered as area champions for the environment, sustainability forums have been held, while ongoing projects include the fitment of smart meters to rolling stock.

#### **RECYCLABLE HANDRAILS**

New recyclable escalator handrails, made of polyurethane, are being rolled out by London Underground following trials at four stations. While initially chosen for their waste benefits, other advantages have included the ability to accommodate advertising film and thereby generate £16 million per year in revenue. The new handrails are easy to install and clean, require less energy to drive and need replacing less often than the traditional rubber material.

## PROJECT-WIDE WILDLIFE MITIGATION

In partnership with Network Rail, Atkins has driven the issuing of project-wide mitigation licences for great crested newts, a European protected species. A licence has been applied to a 40km section of the Midland main line electrification scheme, helping remove risk and the potential for delays during construction works, and substantial cost savings are forecast.



76



# 2016 Railway Industry Innovation Awards

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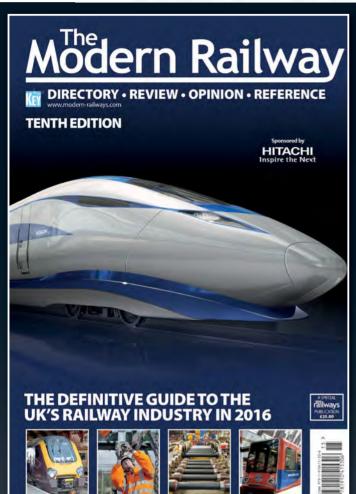
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## **EUROPE**

## EUROSTAR PLANS AMSTERDAM AND BORDEAUX SERVICES

Testing of the Class 374 Velaro e320 trains in the Netherlands began on 28 April with set No 374013/14 reaching Amsterdam via the classic Prorail 1.5kV DC network (the trains are equipped to work off 1.5kV DC overhead). This was followed over the next few days by testing on the 25kV AC European Train Control System-equipped Schiphol – Breda *HSL Zuid*. Eurostar had announced at a media event in London earlier the same week that London to Amsterdam services are currently planned for introduction from December 2017, subject to the necessary approvals for use of the new Class 374 trains in both Belgium and the Netherlands being obtained.

Approval for use in Belgium is not yet complete, with specific problems reportedly concerning use of the dedicated Eurostar platforms 1 and 2 at Brussels Midi station. These problems are due to the fact that the new Class 374 trains are 5.2 metres longer than the 393.72-metre Class 373s, meaning that in addition to the



Stopping aid: mirror to guide Class 374 trains to stop in the correct place in Paris Nord. Keith Fender



Europe's cheapest international high speed train: lzy, with fares starting at  $\in$ 10. Seen here at right at Paris Nord on 16 April 2016 is TGV No 4521, one of the two trains operated by the new operator - the other set is No 4551. Keith Fender

physical constraint of accommodating longer trains the sighting distances for drivers for the stop markers at terminal stations have to change. The driver's seat on the new trains is some distance from the front of the train and therefore the driver needs to be told exactly where to stop to ensure the train is within the platform but not too close to the buffer stops.

At Paris Nord station the new Class 374 trains are assisted by on-platform markers and mirrors to enable accurate stopping in the platforms used by Eurostar, which vary from 406 to 408 metres in length. Despite this, the narrow width of the platforms at the far end mean that passengers are not permitted to use the doors in coach one at the London end of the train.

Eurostar is looking at a further expansion of long distance services from London to French cities with a service to Bordeaux being planned following the opening of the new *Ligne à Grande Vitesse Sud Europe Atlantique* (LGV SEA) Tours to Bordeaux high speed line in 2017. The service is likely to serve key cities en route such as Angoulême.

For the new Bordeaux services it currently seems likely that the existing arrangement used for the Marseille to London service will apply to London-bound trains, with passengers having to de-train at Lille Europe station for 75 minutes for UK immigration checks.

For the new Amsterdam services it is unclear whether these checks will be performed in Brussels or Lille. Eurostar sources have told *Modern Railways* that they would prefer the checks to be undertaken before departure at the Dutch stations (Amsterdam and Rotterdam); it currently remains unclear if the governments involved will facilitate this happening before December 2017 (or at all).

#### PARIS – BRUSSELS LOW-COST SERVICE

Multinational high speed operator Thalys (60% and 40% owned by the French and Belgian state operators respectively) launched a new low-cost service between Paris and Brussels on 3 April. The trains are operated by Thalys employees but use two former SNCF TGV Réseau trains and are branded 'Izy' with a new white and green livery. To avoid paying high SNCF Réseau LGV track access charges for the LGV Nord the trains are routed on conventional lines south of Lille, non-stop, via Arras, the Amiens avoiding line and south of there on the classic route via Creil to Paris.

Unlike the domestic French internet-only 'Ouigo' and 'iDTGV' branded low-cost TGVs, *Izy* can be booked via a select group of travel agents – although most passengers are likely to use the izy.com website.

On test in the Netherlands: Class 374 at Nispen, near the border with Belgium, at the end of April. Maarten Otto







## **BULGARIA**

#### SOFIA METRO EXPANSION

The Sofia Metro system has expanded rapidly to two lines totalling 38.6km in the last two decades after the first section of line opened in 1998. Construction of the third roughly east – west (Green) line has now begun, with work underway on the first 8km underground section from Botevgradsko Shosse to Ovcha Kuptel. This section should open in 2019; eventually 18km and 18 stations are planned. Construction and rolling stock costs are being largely funded via €368 million in EU funds from the European Regional Development Fund.

Siemens and Polish manufacturer Newag have won the contract to supply trains for the new line, which will use 1.5kV DC overhead power supply rather than the 825V DC used for the first two lines. 20x3-car Inspiro metro EMUs will be supplied, based upon the six-car versions supplied by Siemens working with Newag to the Warsaw Metro in 2014-15. The trains will be assembled and commissioned in Poland by Newag at its Nowy Sacz factory using car bodies built by Siemens in Vienna and other components sourced from Siemens factories in Germany and Austria. As part of the €140 million contract Siemens will also supply a communications-based train control (CBTC) signalling system for the new line.

enderleeuw Sud/7uid 7ellik Essene-Lombeek Sint-Agatha-Bercher Berchem-Sainte-Agath Sint-Martens-Bodegem Dilbeek Groot-Bijgaarden BRUSSELS Schepdal (under construction) BRUXELLES-CENTRAL Schuman S Br.-Mérode BRUXELLES-MIDI New link, Schuman to Meiser Sint-Anna-Pede Kerl (under construction) Delta Forest-Midi Watermael ndæl / Boondaal Jccle-Stalle **SCHUMAN-**Uccle Ukke Vivier d'Oie Diesdelle **JOSAPHAT** Linkeheel **TUNNEL** Holleken Hoeilaart Rhode Saint-Genèse Huizingen La Hulpe De Hoek Lembe Waterloo Profondsart High Speed Lin Braine-l'Alleud

This map is based on the Brussels city map in Rail Atlas Europe (lan Allan, £27.50). Along with city maps the atlas provides comprehensive maps of national systems across Europe.

As minimal changes have been made internally to the reliveried trains used, ticket prices vary depending on the level of comfort desired. The former First Class seats are being sold as 'XL' At the other end of the spectrum, not only are the tip-up seats in coach vestibules being sold, but up to 10 standing places per train are available in the otherwise unused bar car (there is no catering) starting at €10 (although standees may use seats if free).

Seats are available from €19 (€29 for 'XL'), two months in advance. Maximum prices have been set of €59 (or €69 for 'XL'). These fares are significantly cheaper than the maximum Thalys prices of €99/€142 for Paris to Brussels. Unlike Thalys (but just like low cost airlines) lzy charges extra for larger items of luggage (€10 in advance or €30 on the day).

## BRUSSELS – STRASBOURG EUROCITY SERVICES END

SNCF (French Railways) has announced that the second stage of the LGV Est Européenne will open on 2 July. The opening was delayed following the catastrophic crash of one of the test trains on 14 November near Vendenheim at the eastern end of the line, which left 10 people dead. Initially at least part of the junctions between the new LGV and classic line at Vendenheim will remain out of use when the line opens. The new line will reduce journey times from Paris to Strasbourg and to cities in Germany such as Stuttgart and Munich.

In advance of the line opening the Brussels to Strasbourg/Basel Eurocity services via Luxembourg ceased operation on 2 April, replaced by three TGV train pairs between Brussels and Strasbourg routed via the LGV Interconnexion Est to the east of Paris. This route was already used by the Brussels to Strasbourg Thalys services operated on behalf of the European Parliament several times most months.



#### **NEW RER TUNNEL OPENS**

Belgian infrastructure manager Infrabel opened the new 1.25km Schuman-Josaphat Tunnel on 4 April. Originally due to open in December 2015, its approval certification was delayed by the security operation after the November 2015 Paris terrorist attacks: this diverted the police and emergency service personnel who needed to be involved in the safety certification.

The new line connects Schuman station, located close to the EU Commission building and on the Brussels to Ottignies line, with Meiser station on the existing radial route from Halle to Vilvoorde that runs to the east of the city centre. The new tunnel, which has cost €537 million, is part of plans for a new Regional Express (RER) system for the greater Brussels area. Schuman station has been rebuilt, with the interchange between main line trains and the Brussels Metro now being much easier.

The new rail link will enable direct trains from Schuman to Brussels Airport, replacing the need to change trains in Brussels. It will also allow more use of the existing Halle to Vilvoorde line for trains starting both north and south of Brussels and thus will relieve some passenger and train path congestion on the congested Brussels Nord to Brussels Midi city centre route. In addition to stopping trains on RER routes S5 (Grammont –

Mechelen) and S9 (Braine l'Alleud – Leuven), long distance services from Charleroi plus Dinant to Brussels Airport now use the new tunnel.



#### PLANS FOR NEW HIGH SPEED LINE SHELVED

On 15 April the highest court in France, the Conseil d'État (Council of State), cancelled the Declaration of Public Utility (DUP) planning consent for the proposed Poitiers – Limoges high speed line, arguing that the project was not in the public interest and nullifying the DUP signed by the French Prime Minister in January.

The planned single track LGV would have connected the new LGV Sud Europe Atlantique (LGV SEA) Tours to Bordeaux high speed line with the existing Paris – Limoges – Toulouse classic route. The route had been planned as single track with passing places as only 10 to 12 trains a day were forecast in each direction, each taking around 35 minutes from Poitiers to Limoges (currently around 1hr 51min in a direct TER train). It would have cost €1.6 billion.

SNCF Réseau is planning extensive refurbishment of the existing Paris – Toulouse (via Orleans and Limoges) line, which will eventually reduce journey times to and from Limoges (currently 3hr 2min Paris – Limoges). Paris to Toulouse journey times are due to be cut from 5hr 25min to 4hr 9min via Bordeaux once the LGV SEA opens in 2017.

Taking its cue from the Conseil d'État decision concerning the Poitiers – Limoges line, the Green party-led local authorities in Grenoble announced on 18 April that they no longer wished to contribute the €130 million planned as part of over €1 billion of funding from 13 towns and cities in the Isère, Rhône, Savoie and Haute-Savoie towards the Lyon – Turin high speed line and its 50km Mont-Cenis-Base tunnel.

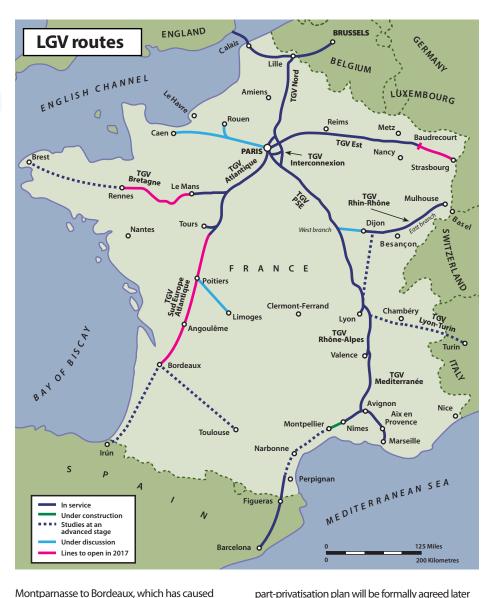
#### **LAUNCH PLANS FOR NEW LGVs**

SNCF has announced details of the services planned for the two new high speed lines in western France that will open on 2 July 2017. The lines are the *LGV Bretagne Pays de la Loire* (LGV BPL) from Le Mans to Rennes and the *LGV Sud Europe Atlantique* (LGV SEA) from Tours to Bordeaux.

As both lines are connected to the original LGV Atlantique line from Paris a major revision of the timetable for both TGV and other trains in the western half of France has been undertaken to accommodate the new services; SNCF Réseau will be changing the times of 2,500 services each day from summer 2017 as a result.

The LGV BPL will be used by 20 Paris – Rennes train pairs with a best time of 1hr 25min (currently 2hr 7min). Services from Paris to Nantes will use the new LGV BPL line from Le Mans as far as Sablé-sur-Sarthe, where a short branch connects to the existing classic route via Angers; 19 train pairs are planned and a best time of 1hr 56min (2016 = 2hr 8min).

The LGV Sud Europe Atlantique (LGV SEA) Tours to Bordeaux high speed line will have 33 train pairs between Paris Montparnasse and Massy TGV; some will begin or end their journeys elsewhere (eg Lille or Toulouse). The fastest services will make the journey in 2hr 4min (2016 = 3hr 16min); around half (17 train pairs) will be non-stop from Paris



controversy in regional cities en route which in some cases had expected more direct services to Paris once the new line opened. SNCF hopes to attract 1.5 million extra passengers on the LGV BPL route and 2.3 million on the LGV SEA route by 2019.

#### BORDEAUX TGV DEPOT OPENS

SNCF opened its new TGV maintenance depot in Bordeaux on 16 March in preparation for the opening of TGV SEA between Tours and Bordeaux in July 2017. The €31 million depot is designed for light maintenance and servicing. It will be working 24 hours a day, replacing some work currently undertaken at the main LGV Atlantique depot at Châtillon (near Paris). 50 employees will work at the new depot, which is equipped with two 500-metre inspection roads.



## DB PART-PRIVATISATION BACK ON AGENDA

On 4 May DB announced that it intends to proceed with the part-privatisation of both its main international businesses: passenger operator DB Arriva and logistics company DB Schenker. DB had previously renamed its rail freight companies from DB Schenker back to their previous name of DB Cargo to remove possible confusion. The

part-privatisation plan will be formally agreed later this year but has been under discussion since mid-2015; in early 2016 DB secured agreement with its owner – ie the German government – that any proceeds from the sale could be retained for use by DB in Germany rather than returned to the Finance Ministry as some officials had proposed.

The context for the DB decision to part-privatise its subsidiaries – both of which were private companies before DB bought them – is a weak financial position in its domestic German market caused in part by losses in DB Cargo. The company's travails have included months of strike action early in 2015 by drivers, affecting both freight and passenger services; and the continuing loss of lucrative regional operating contracts by DB Regio to competitors, principally Abellio, National Express, Transdev, Netinera and Go-Ahead.

In 2015 DB reported its first overall loss for 12 years. Group revenue grew to €40.5 billion (+1.9%) but the final result was an overall loss after exceptional (mostly restructuring) costs of €1.3 billion. The businesses to be part-privatised performed well, with DB Schenker Logistics (the road/air/sea freight business) mostly reporting growth and DB Arriva reporting revenue growth of 7.8% to €4.843 billion and Earnings Before Interest, Taxes, Depreciation and Amortisation (EBITDA) of €525 million (+5.4%).

DB clearly needs the potential proceeds from the part-privatisation to reduce its overall

81



debt burden whilst permitting investments in new trains and infrastructure to go ahead. The company is clear however that only minority stakes are for sale as DB intends to continue to consolidate the results for both DB Arriva and DB Schenker in its overall accounts.

DB issued a press statement from its Supervisory Board Chairman Professor Utz-Hellmuth Felcht making it clear that DB sees third party investors as a good guarantor of overall financial rectitude. He stated: 'If we don't take action, the Group's debt will increase substantially by 2020. A third-party equity interest limits the level of debt and creates the financial scope necessary to continue the quality and investment campaign in Germany'.

From 2016 to 2020, €20 billion of the planned €55 billion that the DB Group will invest will be financed by DB itself; most of the balance will be provided by the German government for infrastructure construction or improvements. Over 90% of the total will be spent in Germany itself.

## GO-AHEAD ORDERS FLIRTS FOR STUTTGART

Having seen off a legal challenge from DB to the award of its first German contracts, Go Ahead's subsidiary Go-Ahead Verkehrsgesellschaft Deutschland GmbH had its final contract award confirmed on 9 May. Two days later, the company announced that an order for 45 160km/h Flirt 3 EMUs had been placed with Stadler. The order

is being arranged in co-ordination with the Baden Württemberg government-owned rolling stock leasing company, Landesanstalt Schienenfahrzeuge Baden-Württemberg (SFBW).

The order comprises 11x3-car and 15x5-car trains for the Rems-Fils Netz contract for 3.7 million train km annually on the routes from Stuttgart to Crailsheim and Ulm (via Plochingen). In addition, 9x4-car and 10x6-car trains have been ordered for operation of the 4.4 million train km Franken-Enz Netz contract, comprising services from Stuttgart to Aalen, Karlsruhe (via Pforzheim) and Würzburg (via Heilbronn). The new trains will all enter service in June 2019 and will be built in Stadler's factories in the Berlin area. The trains for the Franken-Enz Netz services will be fitted from new with the LZB cab signalling system used on sections of the German high speed network, as they will use sections of the Stuttgart to Mannheim high speed line. These trains – but not the Rems-Fils Netz batch - will also be equipped for installation of ETCS Level 2 at a later date, enabling future operation on sections of the new Stuttgart to Ulm high speed line currently under construction.



## €10 BILLION DUBLIN TRANSPORT PLAN

The €10 billion National Transport Authority's (NTA) Greater Dublin Area Transport Strategy 2016-2035 has now been approved by the Irish Transport Minister and put forward to the Irish Parliament.

The DART expansion programme is a cornerstone project of the strategy, with services proposed for extension on existing lines. Included within this programme are electrification of the Northern line over the 36km from Malahide to Drogheda, plus the Maynooth / Sligo line from Dublin Connolly to Maynooth (26.4km) and Clonsilla to M3 Parkway and then subsequently on the Kildare line to Hazelhatch via the (delayed) DART underground project through the city centre. The latter – currently being redesigned after the original plans were scrapped in September 2015 – will also provide additional capacity between Dublin Heuston and Cherry Orchard when and if built.

The NTA strategy also recommends that capacity on the Northern line is increased. To increase capacity on the South East line it is proposed that commuter services operating south of Greystones operate as shuttle services and interchange with the DART is provided at Greystones.

The introduction of commuter services from Kildare to Dublin Connolly in autumn 2016 is included in the strategy, however the mooted extension of the new M3 Parkway line on to Navan has been deferred by the NTA, pending re-evaluation in six years when it will be assessed if new proposed developments in Navan and Dunshaughlin and their environs warrant its inclusion. The corridor previously identified for the link will be protected in the meantime.



Over the next 20 years a number of additional stations will be added to the network in developing areas. Whilst the strategy keeps locations fairly open it does note that Pelletstown on the Maynooth line and Woodbrook on the South East line are likely locations. Existing stations will in several cases also receive enhancements. The strategy also envisages the provision of additional new rolling stock and refurbishment of some of the current DART trains. To manage the increased level of services the control centre will either be upgraded or a new one will be provided.

#### METRO NORTH BACK ON THE TABLE

Metro North will be a new €2.4 billion standard gauge railway starting in Dublin city centre at St Stephen's Green and running north to Dublin Airport and Swords via Ballymun, Dublin City University and the Mater Hospital. In 2011 plans to construct the Metro North railway were shelved – but the strategy firmly reintroduces them, broadly along the originally envisaged 16.5km route, albeit at reduced costs. The route will commence in tunnels in the city centre and it is currently proposed that these will be around 7km in length with several stations, including one at O'Connell Bridge.

Beyond Drumcondra it will continue in cut and cover tunnel through Ballymun with two more stops at Dublin City University and Ballymun town centre. Emerging from the tunnel at the Northwood stop, it then crosses over the M50 motorway to Dardistown, which will have a 300-space park-and-ride facility. The line then dives into a 2.3km tunnel under Dublin Airport with a stop at the airport serving Terminal 1 and Terminal 2, continuing to the northern terminus at Swords Estuary. The maintenance depot will be located at Dardistown.

Journey times from O'Connell Bridge to the airport are expected to be around 19 minutes and to Swords 31 minutes, with trains operating at two-minute headways. It is envisaged that services will be operated with tram-train type rolling stock. Construction will not begin until 2021 and the 14-station line is not expected to open until 2026 or 2027.

#### **LUAS EXTENSIONS TOO**

The LUAS tram network does well in the strategy, with extensions and line upgrades proposed. The Luas Cross City Line is to be extended from its terminus at Broombridge on to the north of Finglas, where a park-and-ride close to the N2 and M50 will be provided. Lucan will also get a new Luas line, along with Ballyfermot. Luas Red Line services currently terminating at The Point are expected to be extended to the Poolbeg development area and will receive additional trams. The LUAS Green Line will be upgraded to metro standard from Dublin city centre to Brides Glen and then extended on to Bray via Shankhill.

The terminus is likely to be at Bray DART station. At St Stephen's Green the line will link to Metro North.

The RPA believes that the strategy will, once fully implemented, create a fully integrated and connected high capacity transit system for the region. The strategy also provides a considerable amount of funding for new roads and road and motorway upgrade works. *Tim Casterton* 

#### **POETIC JUSTICE**

Two criminals who vandalised an larnród Éireann train with spray cans were sentenced by a court to remove the graffiti from the train. larnród Éireann staff supervised the removal of the paint from DMU No 2753 and a great lesson was learned by the individuals involved. *Tim Casterton* 



#### CHINESE ELECTRIC LOCOS

Serbian state electricity company Elektroprivreda Srbije has ordered two 7MW 25kV AC electric locos from Chinese manufacturer CRRC Zhuzhou. The locos will be used to operate trains of lignite between the open cast Kolubara mines and the Nikola Tesla power station in Obrenovac. The 140km/h locos will partially replace older locos delivered before the break up of Yugoslavia; Class 411 built by Končar based on the JZ Class 441 design and Class 443 supplied by Škoda based on the Czechoslovak Class 210.

New investors sought: Arriva operated (ex-Danish Railways) DMU No MR 4055 at Sierpc in central Poland on 17 August 2015, with one of the very few services on the line west from there to Torun. Keith Fender



# **HERITAGE NAME FOR LAST'66'**

**GB RAILFREIGHT** has named the last Class 66 to be built for the UK and European markets, No 66779, as *Evening Star*. The locomotive has also been painted in Brunswick green in

commemoration of the last steam locomotive to have been built by Swindon works for British Railways in 1960, which had the same name. GBRf says that at the end of its working life the loco will be donated to the National Railway Museum National Heritage Committee so it can be preserved for the benefit of the public. No 66779 is the last of seven locomotives which were procured from Electro-Motive Diesel and arrived in the UK in February, meaning GBRf's Class 66 fleet now numbers 78 locomotives.



# **BOMBARDIER OPENS NEW TEST FACILITY**

#### TRANSPORT SECRETARY Patrick

McLoughlin has opened a new £12 million testing and commissioning facility at Bombardier's manufacturing site in Derby.

The facility forms part of a £20 million investment by Bombardier in the Litchurch Lane site. Known as 'V Shop', the building will initially be used for testing and commissioning of the Class 345 EMUs the manufacturer is building for the Crossrail project. With four roads capable of handling trains of up to 250 metres in length, the facility will enable complete nine-car '345s' to be tested without the need to separate them.

Each train road has full length overhead lines and vehicle servicing and inspection pits and is fully accessible by rail at both ends, connecting it to the existing test track and production facilities. Bombardier says V Shop can be configured for both



Official opening: Transport Secretary Patrick McLoughlin reveals the plaque marking the V Shop opening. Courtesy Bombardier

initial engineering type-testing on multiple trains and for final acceptance testing and validation. The building also incorporates a two-storey office annexe with space for up to 90 employees.

Construction of the V Shop facility began in December 2014 and was undertaken by Balfour Beatty.



Smart trainset: with its newly-painted dedicated Class 66 No 66746 in charge, 'The Royal Scotsman' runs slowly through Falkirk Grahamston on 21 April on its way to stable until the following morning on the link line between the Scottish Railway Preservation Society line at Manuel and the national network at Bo'ness Junction. Ian Lothian

## GBRF STARTS ROYAL SCOTSMAN CONTRACT

**GB RAILFREIGHT** has begun a fiveyear contract operating the Belmond Royal Scotsman touring train.

The first journey on 18 April was hauled by loco No 66746, painted

in special Belmond Royal Scotsman livery. GBRf will be providing train crew and traction for the service, and the operator says the speciallyliveried '66' will deliver around 50 multi-day tours each year during the Royal Scotsman's scheduled season between April and October. GBRf is also planning to relivery a second '66' in the same colours.

## PENDOLINO OVERHAUL COMPLETED

**ALSTOM HAS** completed refurbishment of the 56-strong Virgin Trains Class 390 Pendolino fleet. The trains have undergone their fourth heavy overhaul at Longsight depot in Manchester, where the fleet is based.

Alstom built a new bogie overhaul facility at the site, which the company says helped reduce the time taken to overhaul an entire set of bogies for a train to five days, with work on each train taking seven days. During the work bogies were washed and stripped while wheelsets, gearboxes, drop links, yaw dampers and other associated components were exchanged. In addition, a total of 4,100 modules were tested and 2.3 million consumables were replaced. Alstom maintains the Pendolino fleet on behalf of Virgin Trains.

■ Alstom is to invest in a

TrainScanner machine for its depot at Oxley near Wolverhampton. The move follows the successful testing of the predictive maintenance prototype at the company's

Longsight depot in Manchester, which maintains Virgin Trains' fleet of Class 390 Pendolino EMUs. With a second machine installed, Alstom says that on average each Pendolino will be scanned every five days.



# **BRISTOL OPEN DAY**



Designer honoured: to mark the 40th anniversary of HST operation, pioneer production power car No 43002 was named *Sir Kenneth Grange* by the man himself and unveiled in its original livery.

Sir Kenneth was responsible for the distinctive HST nosecone.











Above: Another anniversary: power car No 43300 is decked out in a livery marking 100 years of Craigentinny depot, 1914-2014. Here it is seen blunt end first alongside No 43013 (right).

Left: Western heritage: Class 47
No 47749 caught the eye with its yellow
Colas Rail livery and *City of Truro* plates
(this loco was originally No 47076,
which carried that name). The name
commemorates the Churchwarddesigned machine famed for being
the first steam loco to run at more than
100mph (a claim disputed by some) in
a run down Whitehall bank in 1904.

## NEW MD FOR LONDON UNDERGROUND

**TRANSPORT FOR** London has announced the appointment of Mark Wild as the new managing director of London Underground.

Mr Wild is currently special advisor to the Minister and Secretary of the State Government of Victoria in Australia. Until recently he was chief executive of Public Transport Victoria, the integrated transport authority based in Melbourne. He has worked in transport for nearly 30 years running tram, rail and bus networks and managing major capital programmes, and

in London has been involved with the signalling upgrades on the Jubilee and Victoria Lines.

Mr Wild will take up the role in June. The position had been held on an interim basis by Nick Brown since July 2015, when Mike Brown was elevated to the post of Transport Commissioner (initially on an interim basis until his permanent appointment was confirmed in September). TfL says LU's finance director Andrew Pollins will act as interim MD of LU in the intervening period before Mr Wild joins.

## WAKEFORD NAMED RSG CO-CHAIR

**GORDON WAKEFORD** has been appointed as interim industry chair of the Rail Supply Group (RSG).

Mr Wakeford is managing director of the mobility division at Siemens, where he is responsible for leading the company's Rail Systems, Rail Automation, Rail Electrification and Traffic Solutions businesses in the UK. He is also chairman of the Railway Industry Association (RIA).

The RSG was formed in 2014 to bring together the supply chain and government to ensure the industry capitalises upon investment in both the classic network and high speed lines, and published its sector strategy in February.

Mr Wakeford replaces Terence Watson, who stepped down from the post and his role as managing director of Alstom in the UK and Ireland following allegations of corruption in relation to the supply of trains to the Budapest Metro. Henrik Anderberg has replaced Mr Watson at Alstom in an acting capacity.

## HOUGHTON PROMOTES ROBSON

**ENGINEERING SPECIALIST** 

Houghton International has promoted Chris Robson to the post of sales and marketing director.

Mr Robson was previously technical account manager, a position he had held since 2014. He joined Houghton in 2006 as a fitter in the electro mechanical services division, and later went on to manage the department. In his new role he will join the company's board of directors and will lead the drive to grow sales both with existing customers and by expanding into new markets and new sectors.

## **APPRENTICESHIP TASKFORCE LAUNCHED**

**THE GOVERNMENT** has

launched the Strategic Transport Apprenticeship Taskforce (STAT), which aims to bring employers together to address skills gaps in the sector.

The creation of the taskforce was recommended by Crossrail chairman

Terry Morgan in his infrastructure skills strategy, published in January, and STAT is planned to help deliver the Government's commitment to creating 30,000 new apprenticeships in transport by 2020. The strategy also set targets relating to diversity, with

the ambition that at least 20% of new entrants to engineering and technical apprenticeships in the transport sector by 2020 will be women, with a 20% increase in the number of black, Asian and minority ethnic candidates by the same point.

# College construction starts

GROUND BREAKING

ceremonies have been held to mark the start of construction work on the new National College for High Speed Rail (NCHSR).

The college, based at sites in Birmingham and Doncaster, aims to provide the specialist training, skills and qualifications required to build HS2 and other future rail projects. Of the two sites, Birmingham will focus on digital technology and Doncaster will concentrate on heavy engineering. The college aims to offer qualifications at NVQ Level 3 and above, with an aspiration for 2,000 outputs per annum. The first students are due to enrol in September 2017.



You'll be lucky to get a first sod here: (left to right) Terry Morgan, Chair of the National College for High Speed Rail; Councillor John Clancey, Leader of Birmingham City Council; and Beth West, Commercial Director of HS2, mark the beginning of work on the Birmingham site of the college on 9 May 2016. John Whitehouse

## **APPOINTMENTS AT MTR**

**OPERATOR MTR** has made three new appointments to its senior team.

Rob Needham has been appointed as European engineering director, returning to the UK after eight years in Australia where his most recent role was working for the Alstom-Acciona construction joint venture on delivery of the Sydney Light Rail project.

Mike Bagshaw will join in June from Arriva in the role of bid director, responsible for leading MTR's bid for the Wales and Borders franchise. Mr Bagshaw's career has included 8½ years working for Arriva Trains Wales as commercial director.

Mike Nelson has been appointed as finance director in succession to Richard Drake, who will retire in September. Mr Nelson joined MTR in June 2014 and has been promoted from the role of deputy finance director. He will become the financial lead for bidding and is focused on financial development for the European business.

## MANN MOVES TO DLR

**CLAIRE MANN** has joined the Docklands Light Railway as its new director. She began her new role on 18 April, moving from Arriva Trains Wales where she was operations and safety director. Her career has also included roles at First Great Western and London Overground Rail Operations (LOROL).

## DOBELL JOINS CPC

CPC SYSTEMS has

appointed Malcolm Dobell as non-executive director.

Mr Dobell has more than 45 years of industry expertise, and was formerly head of train systems for London Underground. As part of the CPC Systems team Mr Dobell will provide strategic support to the company. He is a chartered engineer, a Fellow of the Institution of Mechanical Engineers and is a past chairman of IMechE's Railway Division.



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THE BRANCH LINE SOCIETY
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#### ANGLIA

Shenfield (2:5B & 2:10A)
As part of the Crossrail remodelling works, Shenfield Down Sidings, at the western end of the station, and the Middle Sidings, at the eastern end of the station, along with the 'Chelmsford Loop', have all been removed.

#### **EAST MIDLANDS**

Corbv (4:3A)

A new trailing crossover has been installed and secured out of use north of Corby station at 79M 65ch. It will eventually replace the current single to double track turnout at 79M 58ch.

#### **LONDON NORTH EASTERN**

Newark (2:27D)

In connection with the East Nottingham Resignalling Scheme, a new trailing crossover has been installed at 17M 15ch, to the east of Newark Castle station. The connection will be clipped and padlocked out of use until the final commissioning. When commissioned, this crossover will replace the existing crossover closer to the station. Level Crossings The following changes have taken place: Between Knottingley and Stainforth Jn (2:40A); Gills No.1 (User Worked Crossing - UWC) at 63M 07ch has been fitted with telephones which connect to Ferrybridge Signal Box. Between Bottesford West Jn and Allington Jn (2:25B); Sewstern Lane (UWC with Red/Green

#### LONDON NORTH WESTERN

warning lights) at 110M 69ch

has been upgraded to an MSL

(Miniature Stop Lights) crossing.

Between Manchester Victoria and Rochdale (4:47A)

The trailing crossover at Vitriol

The trailing crossover at Vitriol Works at 4M 64ch has been recovered and the Up and Down lines have been plain lined. Norton Bridge (4:12B)
As part of the Staffordshire Area Improvements Project, the Norton Bridge scheme has introduced a new flyover to allow traffic on the Up and Down Slow lines to connect with the existing Up and Down Norton Bridge lines (to & from

Stoke-on-Trent) without affecting traffic on the Up and Down Fast lines.

The existing Down Slow line has been taken out of use between the new Little Bridgeford Junction (137M 40ch) and Hearnies Bridge (140M 00ch), pending future recovery. A new Down Slow has been introduced between these two points on a straighter (16 chains shorter) alignment, which has also been given a new line of route code of LEC6. On this new alignment a diverging junction has been provided at 138M 55ch, called Searchlight Lane Junction.

The existing Up and Down Norton Bridge lines have been taken out of use between Norton Bridge North Junction and a new junction which has been introduced at 2M 50ch, called Yarnfield Junction. A new Down Norton Bridge line has been provided between Searchlight Lane Junction and Yarnfield Junction and parallel to this a new Up Norton Bridge line has been provided between Yarnfield Junction and Little Bridgeford Junction. All new lines have been equipped with overhead line equipment energised at 25kV AC.

The Up and Down Recess line at the closed Norton Bridge station site has been taken out of use, as have both Norton Bridge South and Norton Bridge North Junctions.

All signals between 136M 40ch and 154M 40ch on the West Coast main line, currently prefixed SC and controlled by Stoke-on-Trent Signalling Control Centre (SCC), Norton Bridge Workstation, have been re-controlled to Rugby ROC – Stafford Workstation, as have those signals on the Norton Bridge branch prefixed NS. Norton Bridge Workstation is thus abolished. Those signals on the Norton Bridge Branch prefixed SOT will continue to be controlled by Stoke-on-Trent SCC - Stoke South Workstation.

Further work to reinstate a single bi-directional 'Norton Bridge East Chord' between Yarnfield Junction and the fast lines at the former Norton Bridge station site was due to take place in late May. Princes Risborouah (3:19B) The Chinnor & Princes Risborough Railway now has a permanent connection to Network Rail at 0M 50ch onto the Thame Branch. Oxenholme (4:28C) The Siding accessed from the Up Goods Loop at 19M 00ch has been recovered. The Up Goods Loop and Down Goods Loop have both been taken temporarily out of use. Between Birmingham New Street and Wolverhampton (4:19) The existing track layout in and

around Galton Jn (3M 64ch) has





All change in North Kent: prior to the Easter commissioning of new signalling, unit No 466017 enters Rainham at the head of the 11.52 Dover Priory to Victoria service on 11 March 2016. The 1959 signalbox is on the left, while at right a new signal which will allow trains to depart coastbound from the Up platform can be seen. Colin Scott-Morton

been remodelled by replacing and moving all switches. The turnout located on the Down Stour, forming the facing connection onto the Down Stourbridge line, has been repositioned 61/2 chains closer to Birmingham. The switch diamond in the Down Stour/Up Stourbridge lines has been recovered and replaced with a normal turnout 2 chains closer to Birmingham. A new trailing crossover between the Up and Down Stour lines has been formed from a turnout on the Down Stour 31/2 chains closer to Birmingham than the previous switch diamond and

a corresponding turnout on the Up Stour 5 chains closer to Birmingham than the turnout it replaces.

#### SCOTLAND

Nothing to report.

#### **SOUTH EAST**

Between London Bridge and North East Kent Junction (5:3) As part of the ongoing Thameslink programme at London Bridge, two new crossovers have been installed and are clipped out of use pending future commissioning. One is a facing crossover between the Down



Charing Cross line at 3M 74ch and the Up Cannon Street line at 4M 00ch and the second is a trailing crossover between the Up Charing Cross line at 3M 66ch and the Down Charing Cross line at 3M 72ch.

Between Higham and Longfield to Sittingbourne, including the Sheerness-on-Sea Branch (5:7 & 5:8A/B) As part of the East Kent Resignalling Project, re-control of existing signalling in the Strood/Rochester/Sittingbourne area has taken place and the area is now controlled by the East Kent Signalling Centre at Gillingham (36M 05ch). The area includes between Higham (28M 42ch) and Strood (31M 11ch)/Rochester Bridge Junction (33M 01ch), formerly controlled by Ashford IECC - signal numbers continue to be prefixed 'NK' and remain unchanged. Between Kemsley (45M 20ch) and Sheerness-on-Sea (51M 19ch), formerly controlled by Sittingbourne SB, signal numbers continue to be prefixed 'EV' and remain unchanged. And finally between Longfield (23M 30ch) and Sittingbourne (44M 59ch), formerly controlled by a combination of Rochester Signal Box (ER), Gillingham Signal Box (ET), Rainham Signal Box (EU) and Sittingbourne Signal Box (EV), signal numbers will now be prefixed 'EK'. The signal boxes at Rochester, Gillingham, Rainham and Sittingbourne have all been abolished.

A number of line re-designations have taken place. At Strood the existing Up Passenger Loop is now the Up Strood Loop. The existing Down and Up Chatham Main lines between Longfield and Sittingbourne are now the Down and Up Chatham lines respectively. At Rochester (33M 34ch) the existing Down Platform Loop is now the Down Rochester Loop and the existing Up Platform Loop is now the Up Rochester Loop and has been extended towards London over the route of the former Up Layby Siding. At Gillingham (35M 75ch) the existing Up Passenger Loop is now the Up Gillingham Loop, the Up Sidings are the Up Gillingham Sidings, whilst the existing Down Siding Nos1-3 are now the Down Gillingham Sidings Nos1-3. Between Rainham (38M 74ch) and Newington (41M 42ch), the existing Down and Up Passenger Loop lines are now the Down and Up Newington Loop lines respectively. Between Western Junction (43M 70ch) and Middle Junction (44M 13ch), the existing Down and Up Spur lines are now the Down and Up Sheppey Spur lines respectively, whilst between Eastern Junction (44M 18ch) and Sheerness-on-Sea the existing Down and Up Branch lines are now the Down and Up Sheppey lines respectively, the existing portions of Single line are now the Sheppey

Single line, the existing Down and Up Loops at Queenborough are now the Down and Up Sheppey Loops and the existing Down and Up Sidings at Queenborough are now the Down and Up Queenborough Sidings, At Sittingbourne (44M 59ch), the existing Down Sidings Nos 1-3 (Woods Sidings) are now the Down Sittingbourne Sidings Nos 1-3, the existing Down Goods Loop is now the Down Sittingbourne Goods Loop, the existing Carriage Siding is now the Sittingbourne Carriage Siding and the existing Down Passenger Loop is now the Down Sittingbourne Passenger Loop.

A small number of track alterations have taken place. The existing crossover at the end of the 'old' Rochester station on the Up Rochester Loop has been secured out of use in the normal position, and likewise the existing trap point at the country end of the former Up Layby siding has been secured out of use, both pending removal at a later date. The trailing crossover at Rainham (39M 06ch) between the Down and Up Chatham Main lines has been recovered. At Sittingbourne the existing trap points in No 1 (Down) Siding have been secured out of use in the reverse position pending removal, whilst the points off the Down Sittingbourne Passenger Loop to access the Down Siding have also been secured out of use in the reverse position (for through running between the Down Chatham and Down Sittingbourne Passenger Loop) pending replacement with plain line.

A number of station platform alterations have also taken place. At Rochester the new dead-end platform 3 has been brought into use on the new Down Rochester Loop and is available only to and from the London direction. A temporary buffer stop has been provided at 33M 39ch and platform 3 has a current operational length of 205 metres (224 yds). This platform will become a through platform at a later stage, once the old Rochester Signal Box is no longer in the way. At Sole Street (26M 71ch), platform 2 on the Down Chatham has been extended by 15 metres (16 yds) and now has an operational length of 178 metres (195 yds). At Rainham the new platform 0, on the Up Rainham Bay line, has opened to traffic with an operational length of 257 metres (281 yds). Platform 1, on the Up Chatham line, has been extended by 108 metres (118 yds) to have an operational length of 351 metres (384 yds).

Finally, the existing manned crossing with barriers (MCB) level crossing at Gillingham (36M 17ch)

and the existing manned crossing with barriers (MCB) at Rainham (39M 01ch) have been converted to barrier crossings with closed-circuit television (CCTV), supervised and controlled from the East Kent Signalling Centre at Gillingham.

#### WALES

Tenby (3:26C)

Tenby Ground Frame and the Down Siding at 274M 46ch have been recovered. The associated trailing connection between the siding and Down Loop has also been recovered and replaced with plain line. Pembroke Dock (3:26C) Pembroke Dock East Ground Frame at 285M 76ch and Pembroke Dock Station Ground Frame at 286M 14ch together with the loop and siding have all been recovered. The connections between the single line and loop have been recovered and replaced with plain line. Cardiff Central (3:22)

A new facing connection has been installed in the Down Barry line at the Newport end of the station which leads towards the new platform 8. This connection has been secured out of use until further notice.

#### WESSEX

Nothing to report.

#### WESTERN

Between Par and Newquay (3:9B)
The trailing connection at 287M 43ch
between the Up Main Line and Up
Refuge Siding has been recovered
and replaced with plain line.

#### LONDON UNDERGROUND

Acton Town (5:43B)

The point work that forms half of the scissor crossing at 52.76km that allowed facing access off the Westbound District Local line on to siding 24 at Acton Town has been plain lined.

### NORTHERN IRELAND RAILWAYS

Bellarena (6:20A)

A new passing loop (74M 48ch to 75M 05ch) has been introduced at Ballarena, along with a new two platform station at 74M 67ch (currently only the Down Platform line is open). The old single platform station at 74M 77ch has now closed.

Information has been grouped according to the main Network Rail 'Routes' in March 2016. All details can be subject to subsequent amendment. Books and Diagram Reference Numbers (in brackets) relate to the latest relevant Quail Track Diagram books obtainable from Trackmaps at www.trackmaps.co.uk.

# **VTEC REFURB FOR YELLOW RAIL**

**YELLOW RAIL** has secured a multimillion-pound refurbishment contract for the upgrade of Virgin Trains East Coast's 270-strong fleet of Mk 4 carriages.

The work is taking place at Bounds Green depot in north London, where a 200-metre wooden platform has been specially constructed alongside specialised workstations and equipment, designed, built and installed to optimise the production process, ensuring that all materials requiring refinishing are removed, processed and dispatched to specially selected sub-suppliers for a rapid turn-round.

The refurbishment involves a full strip out of the saloon, vestibule and toilet. The scope of works includes interior paint and powder coating, refinishing of seat



and table pedestals, fitment of new body side and dado panels, provision of replacement seat cushions and covers, on-board signage, new saloon and vestibule carpets, replacement lino, tables and renovation of the toilets. In addition, first class carriages benefit from the fitment of leather seats and mood lighting.

The refurbishment team consists of 42 staff, including

management, production supervisors, logistics specialists, skilled and semi-skilled artisans.

Yellow Rail currently employs 70 staff throughout the UK to deliver services from the provision of skilled staff to managed installation and full turnkey projects including supply, design, installation and support. Current projects include DMU heater replacements, HST spark guard removals, GSM-R software updates, air conditioning modifications, driver advisory system (DAS) installations, full fleet refurbishments and classified repairs.

The company has recently secured funds to enable continued growth of its business, which has seen recruitment in the areas of finance, operations, sales and engineering.

## Linsinger wins Crossrail deal

**CROSSRAIL HAS** awarded a £12 million contract for the supply of a rail milling train to Linsinger.

The model MG31 vehicle will support maintenance within the tunnels, reducing long term wear of rails and wheels by restoring rail head geometry. Its low emission engine facilitates operation in tunnels while the suction system ensures

that milling chips or grinding dust are not left on the track. The train, which will be the first of its kind in the UK, will be delivered in spring 2018 and will be based at the Plumstead infrastructure maintenance depot. It will be installed with communications based train control (CBTC) signalling to allow operational hours running between sites.

## Perry opens LPA's new facility

welcomed Rail Minister Claire Perry to officially open its new connection systems facility in Saffron Walden, Essex, on 5 May. The site forms the company's new centre of excellence for electro mechanical design and

manufacture of connection systems

for rail vehicles, infrastructure and

aircraft. LPA recently sold its

**ELECTRONICS SPECIALIST LPA** 

old facility in Saffron Walden for residential redevelopment, reinvesting all the proceeds in the new facility and also committing to expand its LED lighting design and manufacturing facility in Normanton, West Yorkshire. About 25 new full time jobs have been created during the past year between the two sites.



Welcoming the new LPA facility: (left to right) Cllr Stephanie Harris, chairman, Uttlesford District Council; Sir Alan Haselhurst, MP for Saffron Walden; Rail Minister Claire Perry; Cllr Heather Asker, Mayor of Saffron Walden; Peter Pollock, chief executive, LPA Group.

# KEEPING COUNT OF SCOTTISH PASSENGERS

**SCOTRAIL HAS** awarded a contract for provision of automatic passenger counting equipment on its fleet to Infodev, with installations carried out by Onyxrail as main contractor.

The equipment will be fitted to ScotRail's Class 156, 158, 170, 318, 320/4 and 334 vehicles. Infodev equipment is already fitted to a significant number of fleets in the UK, and uses technology that

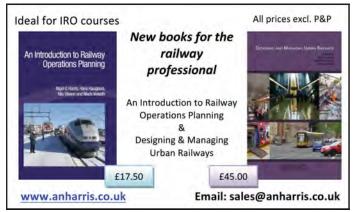
registers true counts, providing accurate data, while the sensors require minimal maintenance and have a low cost of ownership. The equipment is backed up by analytical software packages which will be further developed for ScotRail by Infodev and franchisee Abellio. Infodev has a longstanding relationship with Onyxrail, which ensures that the equipment can be installed swiftly.

## SAFE CABLING INTERFACE

**ENGINEERING FIRM** Henry

Williams has received product approval for its Distribution Interface Transformer Assembly (DITA). The product is the first interface system which enables new Class II cables

being installed by Network Rail to connect safely with existing Class I systems. The company says the product avoids the problem of poor earth continuity, which placed workers at risk of injury or even death.



## RAIL LIVE PREPARES TO CONTRACTS FOR MECHAN **WELCOME VISITORS**

THE LARGEST outdoor rail show in Europe, Rail Live is to be held at the Ouinton Rail Technology Centre in Warwickshire on 22 and 23 June. Organisers promise that the show will be the biggest vet, with an expected footfall of over 6.000 visitors over the two days. Exhibitors from across the

rail sector will demonstrate their products and services using the rail infrastructure and outdoor space available to them. This will include companies from throughout the supply chain, including the plant and infrastructure, traction and rolling stock, electrification, signalling and digital sectors.

# Perpetuum wins DMU deal

specialist Perpetuum has been awarded a contract by Govia Thameslink Railway to fit its wireless sensor systems to the four Class 170 DMUs the operator has received from ScotRail.

The sensor system monitors wear of bearings and wheels by collecting vibration data to help engineers determine when maintenance is needed, rather than undertaking it on an arbitrary basis of the number of miles a train has accumulated. The new agreement follows the successful installation of Perpetuum sensor systems on a number of GTR's fleets in 2014.

Perpetuum is also working with KeolisAmey Docklands to monitor the condition of the Docklands Light Railway operator's traction motors, with equipment installed on 20 traction motors on five trains.

# Docklands technology deal

#### TECHNOLOGY COMPANY

Tracksure is working with Docklands Light Railway operator



Safety feature: the Tracksure locks ensure against bolts working loose. fit its track locking devices across the network. Following a period of testing of products already used on London Underground, Tracksure is being fitted in fishplated rail joints and will soon extend to other components. The devices, which prevent unintentional bolt loosening as a result of vibration and settlement, are designed to optimise maintenance and enhance track safety.

## **IEP TEST SUPPORT**

#### **CONSULTANCY FIRM DB**

Systemtechnik is running the testing programme for Hitachi's new Class 800/801 Inter-city Express Programme (IEP) trains for the Great Western and East Coast main lines

The trains are being tested at Network Rail's Old Dalby facility and on a dedicated section of the East Coast main line. Work already carried out has included uplift and contact force measurement testing to check that the overhead lines interact properly with the train pantographs and dynamic testing, with the next phase covering aerodynamic and brake testing.

ESG, a UK subsidiary of DB Systemtechnik, is assisting with this programme, and the use of its wheel slide protection evaluation rig in Derby will support online brake system testing.

## THURSFIELD SMITH CONSULTANCY

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**DEPOT EQUIPMENT** specialist Mechan has supplied eight 25-tonne jacks for Network Rail's High Output Operational Base (HOOB) on behalf of contractor Amey Rail. The HOOB houses NR's High Output Plant System, which is being used to install overhead wires along the Great Western main line.

The jacks are fitted with Mechan's patented Megalink control system, enabling the entire chain to be operated by just one person from a remote, full colour touch screen that displays useful data about the lift.

The company has also supplied a bespoke two-road traverser for VolkerFitzpatrick, which is building a new stabling facility at Ilford for the Crossrail project, Due to the limited space available, it was not possible to use sidings to transfer carriages from the shot blast bay to the paint booth. so an alternative solution was required. The 28-metre long traverser was constructed and tested at Mechan's headquarters before being taken apart and moved to Ilford for installation.

#### FORTHCOMING EVENTS

#### Safety Learning in the Rail Industry, seminar, 7 June, London

Details at http://events.imeche.org/ViewEvent?e=6368

Innovation for Tomorrow's Railway: Young

Engineers' Railway Seminar, 15-17 June, London

Details at http://events.imeche.org/ViewEvent?e=6362

**Managing Economic Development with** 

Environmental Impact, lecture, 16 June, London

Details at http://events.imeche.org/ViewEvent?e=6377

Intermodal, conference, 20-21 June, Nottingham

Details at http://mainspring.co.uk/i-modal/

Railway Signalling and Control Systems, course, 20-23 June, Derby

Details at http://conferences.theiet.org/rscs/

Rail Live, outdoor show, 22-23 June, Long Marston

Details at http://www.raillive.com/

**Railway Industry Innovation Awards** at the Modern Railways Fourth Friday Club,

luncheon, 24 June, London

Details at www.4thfriday.co.uk and on page 77 of this issue

ALARP: Risk Management for Engineering,

seminar, 28 June, Birmingham

Details at http://events.imeche.org/ViewEvent?e=6360

Lightweight Interiors for Transport, conference, 28-29 June, Birmingham

Details at http://events.imeche.org/ViewEvent?e=6372

Opening a new railway – a 21st century

challenge, lecture, 29 June, Guildford

Details at http://www.theiet.org/events/local/235402.cfm

Rail Vehicle Enhancements 2016, exhibition and forum, 6 October, Derby

Details at http://www.railve.com

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Scheme plans and cost estimates



t is only two and a half years until the Crossrail underground railway opens. To whet our appetite, new images have been released giving us the clearest indication yet of what the Elizabeth Line's central London stations will look like.

It was back in 2010 when the last major set of station design visuals was released and since then Crossrail pictures have been primarily of engineering and building sites, with few further design details shown in images circulated to the public.

Now we have a major update of the Elizabeth Line appearance, showing how the finished railway – specifically all the new central London underground stations – will look.

On the subterranean section, what we see at platform level is recognisable as London Underground, but brighter and much bigger. We have the 250-metre platforms – four of the stations have ticket halls at each end – and the larger tunnel bores. In addition to the sense of space, platform edge doors keep



STATION DESIGNS UNV

Whitechapel: the pedestrian concourse perches above the Overground line (a train can be glimpsed in the cutting at bottom left) with daylight flooding in from above.

the mechanics of the railway at bay and lighting panels above shine onto the ceiling and reflect, illuminating the platforms.

Perhaps the sharpest contrast between Underground as we know it and Elizabeth Line is where platforms and subways connect and intersect. The use of sprayed concrete lining has led to curved junctions and spaces that are larger than existing London Underground assets. Glass-fibre reinforced concrete is being used to clad the structural tunnel lining, leaving smooth, sweeping, curved edges that should

make it easier for passengers to find their way underground.

As passengers make their way to the surface, through the ticket halls and into the urban realm outside the station, the underground consistency will give way to individual designs said to reflect local character and context.

In an attempt to build on the design legacy of Brunel's existing terminus, the layout and structural elements of Paddington Crossrail have been set to the 10-foot imperial grid system to match Brunel's original Paddington station. At ground level a 90-metre clear opening will be covered by a steel and glass canopy eight metres above the ground that will let natural light flood down to the station platforms. Here, a series of eight flared elliptical columns, clad in bronze to head height at their base, will carry the weight of the structure. Dark anodised 'lily pad'light fittings are embedded into concrete ceiling coffers.

At Bond Street colonnades will be used at both station entrances, although the materials differ – red



sandstone and bronze for Davies
Street, pale Portland stone for
Hanover Square. The unused
spaces between columns will be
filled with glazed window panels
and ventilation grilles framed in
bronze. Above the escalators bronze
panels add decorative detail while
providing acoustic absorption.

Tottenham Court Road's ticket halls will offer a striking contrast. White glass and stainless steel dominate the colour palette at the eastern entrance to complement the 1960s design of Centre Point tower. Glazed elevations to the ticket halls together with clever lighting should reinforce the presence of the station at night and provide a connection to natural light during the day.

However, the western ticket hall in Soho is described as 'dark and cinematic', reflecting the nocturnal economy that characterises the area. At this site black is the colour of choice for the glass and stainless steel inside the station. Below ground, distinctive 'drum' light fittings include acoustic absorbers to keep down

noise and echo. Intended to reference theatre-style lighting, the drums are set between the deep roof beams.

At Farringdon east, the soffit design references the Barbican Centre and heavy metal sliding-screen gates form part of the approach. In the western ticket hall the soffit and material selection is said to be influenced by the nearby diamond and jewellery quarter. Diamond patterns draw on the jewels sold nearby and the visuals show how Elizabeth Line escalators will link to what is currently a blank wall in the Thameslink ticket hall on Cowcross Street. Champagne coloured stainless steel cladding and etched glass panels bring together the design at both ticket halls.

The new visuals of Liverpool
Street highlight the drama of designs
that have perhaps been undersold
hitherto. With the underground
constraints of utilities and the Post
Office Railway putting space at
a premium, a shallow, geometric
folded ceiling plane will be formed
by ribbed pre-cast concrete soffit
panels to break the perception of
the low flat ceilings and create a
greater sense of space. Grooved,
angled ceilings are said to resemble
the pinstripes worn by City workers.

Liverpool Street's eastern ticket hall will be accessed through a five-metre high glazed canopy located in an open pedestrian plaza. The western ticket hall will be at street level and reached through an angular portal entrance framed by bold blue coloured glass. Glass panels and acoustic panels made from perforated vitreous enamel steel will be used on walls.

At Whitechapel the concourse will perch on steel struts, resting on the brick arches of the London Overground cutting, allowing daylight down to the Overground platforms. The concourse will dip under the road bridge at Durward Street and continue along the course of the railway cutting where it then provides access to Crossrail platforms.

Escalators down to the Elizabeth Line platforms at the northern end are placed in a diagonal slice through the western vent shaft building. The designers say the concrete lining to the escalator hall is based on a notation of bell resonance in a nod to the bell foundries that used to exist in the area.

These images give us the clearest indication yet of features we can expect at Elizabeth Line stations – everything from roundels, way-finding posts and real-time information displays to fire safety equipment, handrails, platform edge screens, escalators and lifts. With Crossrail construction now three-quarters complete it will not be that long before we get a chance to compare the visuals with the real thing. — Dan Harvey



Pinstripes: the upper escalator from the Broadgate ticket hall at Liverpool Street, with inclined lift at right.



Tottenham Court Road, Dean Street entrance: designers have gone for a cinema feel.

he Fourth Friday Club 'Rail in the North' conference enabled the Managing Directors of TransPennine Express and Northern to describe their investment plans to move the passenger railway in the North of England to the new sunny uplands of a world class regional network. It was heady, exciting stuff, and I had to pinch myself that the Government has committed to this level of expenditure, both through the franchise agreements and by supporting massive infrastructure enhancements.

The last Northern franchise was specified on a minimalist basis by a Labour government, with a significant proportion of the fleet on short term leases to allow for expected retrenchment and possible closures. But the penny dropped that withdrawing, for example, the Leeds - Carnforth service doesn't really save much money in the grand scheme of things, and would have a disproportionate political price. So now we have a Conservative government driving major expansion of rail in the North. The train operating companies (TOCs) have done a great deal to drive this extraordinary turnround, with massive growth on TransPennine Express, and highly successful stakeholder management by Northern MD Alex Hynes and his predecessors it's great news that Mr Hynes is staying at Northern following the change in franchise ownership, and he's clearly relishing the challenge of delivering the new railway.

Leo Goodwin of TransPennine Express confirmed its bi-mode order, so through trains to Hull, Scarborough and Middlesbrough are safe. But Stuart Baker, for the DfT, said in response to a question on electrification that it's not a big issue for passengers, and has to be justified on the basis of reduced operating costs. A combination of Network Rail's extraordinarily high capital costs and the introduction of fleets of bi-modes probably means that the Control Period 6 High Level Output Statement won't include any significant new electrification.

had more correspondence about my criticism of the new Birmingham New Street concourse in the January issue than on anything else I've written, universally highly critical of the new station layout. But the reaction of Transport Focus, supposedly the statutory champion of passengers' rights, was extraordinarily disappointing. Quite clearly no-one at Transport



Focus read the piece properly and considered whether they should take a pro-active interest in a station used by five million interchange passengers a year. The organisation simply referred it to Network Rail, as if I was a passenger complaining about an individual journey, not making a serious point about one of the most important stations on the network.

In due course I had a sensible reply from Network Rail, advising that arrivals screens are to be installed and wayfinding signage is under review. But there are still fundamental flaws. One correspondent, who had found himself interchanging through two sets of barriers, was told that 'interchange can still be achieved by passing through the two sets of Automatic Gate Barriers. The barriers must be in place so that there is a clear and physical separation between the paid and unpaid areas of the station'. But New Street is a vitally important hub; shouldn't the concourse design have started with an absolute requirement to deliver a stress free experience for passengers, with the easiest possible interchange?

Signage outside the station is dreadful too. The entrances are prominently signed 'Grand Central' for the retail development, as if everyone involved is ashamed that there is a station there.

Of course, people who commented to me were knowledgeable and confident about using the rail network. The experience for many passengers will certainly have been far more stressful. But never mind -

I'm sure the retailers in the shopping centre are happy with the new layout.

S2 Ltd recently published a report on options for upgrading the routes to Scotland (p11, last month), targeting a three-hour journey time from both Glasgow and Edinburgh to London. It's quite a solid report, in truth rather better than much earlier HS2 development work, but the case doesn't look good. The present value of the benefits is estimated at only c.£7 billion, set against costs of £22-25 billion. Even this excludes the cost of an Edinburgh - Glasgow high speed line. However, the equivalent report from Transport Scotland concludes that the benefits of a high speed rail route between Edinburgh and Glasgow are not sufficient to cover its costs as a free standing scheme, so there's a further cost of around £10 billion not covered.

Not surprisingly, the HS2 Ltd report is coy about the benefit:cost ratio, which works out at something like 0.2. But ministers are still talking up extending HS2 to Scotland. Scottish Government Infrastructure Secretary Keith Brown said: 'This report is a major milestone in the campaign to deliver high speed rail to Scotland'.

opefully it's not too late to take action to improve the connectivity of HS2 itself. So far, the project has gone in the opposite direction, becoming overwhelmingly focused on travel to and from central London. The link to HS1 and the Heathrow spur have both been quietly dropped; neither had anything like a good business case, but both were presented as strategically vital, until they vanished with minimal publicity or outcry.

However, a link in the Washwood Heath area of Birmingham is certainly practical, and would spread the benefits of HS2 much more widely. All of the Plymouth -Edinburgh, Bristol – Manchester, Bournemouth - Manchester and Reading - Newcastle trains could leave New Street, with its range of connections, then access HS2 to give a massive improvement in journey times to Manchester and the North East; and the cost of the connection would be offset by a smaller station at Curzon Street.

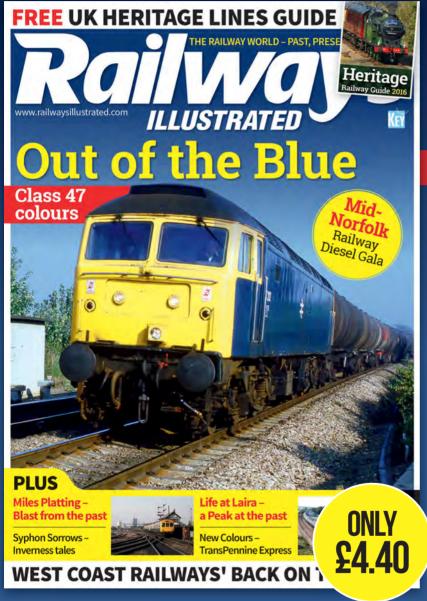
With hindsight, Euston is the biggest mistake - a terminal station that craters both the local neighbourhood and the reliability and capacity of the classic route for years to come. The right solution would have been an underground station with through links across London; is it possible even at this late stage that HS2 might initially terminate at Old Oak Common, while a more imaginative and less disruptive proposal is developed? This wouldn't necessarily be more expensive, as Crossrail demonstrates that we're getting good at building underground railways on time and on budget, and might even be tied in with Crossrail 2, providing a four-track trunk route across London.

chrisjstokes@btopenworld.com

96

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Nigel Antolic provides a detailed account of the eradication of British Rail blue livery on Class 47 locomotives.

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t is a truism that the only completely safe railway is one on which nothing ever moves. Nevertheless, there is no denying that the determined - some might say zealous – thrust towards this ultimately unobtainable goal in the last two decades has improved railway safety, even if often at considerable financial and operational expense. But there is one glaring exception: level crossings. With improvements in safety pretty much everywhere else across the railway operating spectrum, a collision with a road vehicle at a level crossing is now by a considerable margin the greatest single threat to the safety of a train and its passengers.

When it comes to rail versus road safety, we are obliged to live in a world of massive double standards. The public expects railways to be totally safe, yet shrugs off the daily carnage on our roads. Road accidents involving buses, even when people are killed or injured, often don't even make national news.

The police simply clear up the mess, take a few measurements and reopen the road. There is certainly no formal inquiry. Yet if the same fate befalls a train (or even more absurdly a tram) at a level crossing which let us be clear is essentially a road, not a rail, accident - the media pounces, train services are suspended for hours and there is yet another report from the Rail Accident Investigation Branch, which all too often seems to require yet more restrictions (and thus cost) for Network Rail and the wider rail industry, rather than the road users who are overwhelmingly the major cause of reported incidents. And that's just when things go wrong. You only have to look at recordings from crossings equipped with closed circuit television to see how many 'near misses' occur every day.

Historically, the thousands of level crossings of all types date back to the 19th century construction of the railway networks. Railway companies, as ever keen to avoid the costs of providing bridges, and pre-mechanisation farmers and other users equally keen to avoid gradients, often agreed on a 'level crossing of the new railway with no more than a gate in the lineside fence. Then, as now, these 'occupation crossings' opened away from the railway and in the early days were entirely unprotected from rail traffic.

Then the arrival of motorised vehicles and metalled roads at the beginning of the 20th century saw almost all surfaced roads protected from rail traffic by gates which, in a reversal of previous practice, were normally closed across the railway rather than the road, and therefore were an obstruction to trains (although curiously they were often not regarded as such for the purposes of block working). From then on, for the next half century, the familiar robust white wooden level crossing gates were ubiquitous across the country. Controlled and supervised from an adjacent signal box or hut, few road users chose to argue with them, and there were remarkably few level crossing incidents. Indeed, such statistics as are available suggest that on the very rare occasions that things went awry, they were usually the result of a train driver's misjudged braking or some over-zealous shunting.

This half-century of relatively peaceful co-existence between road and rail, with road users having unrestricted priority except when the gates were closed, whereupon rail had a clear and unchallengeable path, began to change when, following an Act of Parliament in 1957, automatic half-barrier crossings were introduced in 1961. Such crossings had been in use elsewhere in Furope for some time and became known as 'Continental crossings'. The spread of modern, more centrally-controlled signalling meant that there was no longer any other need for the many signal boxes that also controlled crossings, while the manpower and maintenance savings that could be achieved by installing automatic crossings and abolishing boxes were obvious. And there was mounting pressure from road users to reduce the time crossings were closed for the passage of trains.

Ever since, automation of crossings has proceeded apace - but not without human cost. The major accidents at Hixon in 1968, in which 11 people died, at Lockington in 1986 in which nine people were killed, and at Ufton Nervet in 2004 in which seven people lost their lives, were all the direct result of misuse by road users, and there was no fault on the part of the railway or the drivers of the trains involved. Perusal of the many reports issued by the Rail Accident Investigation Branch since it was formed 10 years ago suggests that similar incidents continue unabated, thankfully by chance so far with less catastrophic consequences, and again almost always as a result of misuse by road users. But the potential for another serious mishap has not gone away.

So why, when everywhere else on the railway we resolutely pursue absolute safety, requiring our signalling to guarantee a clear path, not only for safe braking to a standstill from the highest permissible speed, but also with a safety overlap beyond, do we continue to tolerate a situation where every day, at any time, at locations all over the country, anyone can, either by accident or with malign intent, obstruct the railway at a level crossing with potentially disastrous results?

Network Rail is in a bind. Almost every incident results in demands from the local populace that 'something be done', usually aimed at NR even though it has neither the funds nor, in many cases, the powers to do so. Local opinion, as I know from the letters and emails I receive, is long on demands but rather less keen to address closure or alternatively the provision of overbridges, for which convention suggests that the local road authority rather than the railway pays. Rightly, the Office of Rail and Road has a policy of not allowing the creation of any new crossings, and Network Rail has successfully pursued the closure of approaching 1,000 since 2010. It needs to go much, much further. But it is not an easy task, and over 6,300 of all types remain. Even the notorious crossing at Ufton Nervet is only now, a decade later, being replaced by a bridge, thanks to the need to find funds and negotiate the necessary additional land. In the meantime. there have been no less than four further fatal accidents at the crossing, none of them as a result of a malfunction of the equipment or passing trains. If it takes a decade to replace just one crossing like that at Ufton in open countryside, how long to replace others in far more restricted sites, and at what cost? On present plans, with the money

available, the answer is 'far too long'. Meanwhile, following a fatal accident at Halkirk in Scotland, Network Rail has announced completion of a programme to upgrade 66 Automatic Open Crossings (AOCL) by fitting barriers but using the existing warning equipment, so remaining 'locally monitored', which unlike a rural automatic half barrier crossing means that drivers of approaching trains must still reduce speed, often to 15mph, or even stop, to ensure the crossing is clear. Although this has proved cheaper than upgrading to full automatic half barrier standards, the cost has nevertheless been substantial and the operationally crippling need for all trains to

continue to reduce speed is a huge impediment on those lines where there is a desire to increase linespeeds. And therein lies a growing problem; crossings are now not only the number one major accident risk, but increasingly becoming a serious impediment to the further development of the railway.

There are already many instances where maximum linespeeds are dictated not by the state of the track, its alignment or structures, but by the existence of level crossings. And this has got markedly worse nationwide following the imposition of more onerous minimum sighting distances for user-worked vehicle and foot crossings as a result of recommendations in the RAIB report into an accident at Jetty Avenue, Woodbridge in July 2013.

The RAIB and its forebears seem to have been producing reports and recommendations - which they have no responsibility for implementing and funding faster than Network Rail, the ORR or RSSB can deal with them.

And they are all pussy footing around rather than confronting the basic problem, which is that the equilibrium between the safety of road and rail traffic established and firmly maintained by big white level crossing gates for the first half of the 20th century has since drastically shifted in favour of the road user to an unacceptable extent, to the financial and safety detriment of the rail user.

The Hixon and Lockington accidents were both followed by independent inquiries, neither of which in retrospect really addressed this fundamental problem, while the proper response to Ufton and the many other AHBs on high speed lines was surely so obvious as to not require the slightest second thought. But it has still taken over a decade to resolve.

Worryingly, the law of averages tells us that a further major level crossing accident is likely in the next few years. And an incursion by a road vehicle into the path of an approaching train would appear to be the one thing that the 'digital railway' cannot address, unless it comes with a time machine. So high time then for another considerably more robust and wider ranging review, free from the emotion that has inevitably surrounded previous post-accident inquiries, and unequivocally addressing the correct balance between both rail and road users of level crossings, and who should pay for them or, preferably, their replacement.

## We're recruiting

Govia Thameslink Railway (GTR) are recruiting for several key vacancies across the business.

The full list of roles that we are recruiting for can be viewed on our website, **gtrailwaycareeers.com** but below is an overview of some of the key roles which we're currently looking to fill.

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A good knowledge of Network Rail operational and engineering planning procedures











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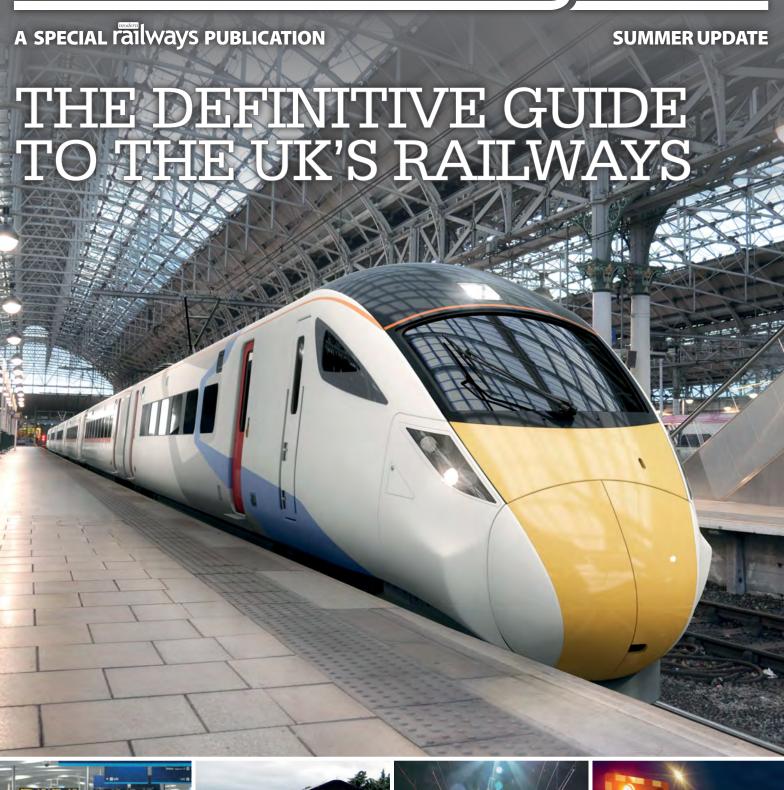
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# THE MODERN RAILWAY 2016 - UPDATE

Exclusively for Modern Railways subscribers, this special supplement contains a free, fully updated mid-year edition of our rail industry directory. The 11th annual edition of our full yearbook and directory will be published next autumn.

The Modern Railway covers all aspects of today's rail business, with main subject areas including policy and finance, key projects, passenger and freight operations, light rail, consultancy, infrastructure and rolling stock.

This supplement opens with updates on the past six months' industry developments, with the same section layout as The Modern Railway annual.

We hope you find our free rail industry directory and news updates useful.

by improving the conditions



Cover: Impression of Hitachi AT300 train for TransPennine Express. Hitachi

#### **SETTING THE AGENDA - INDUSTRY STRUCTURE**

IN ASSOCIATION WITH Inspire the Next

## DRIVE FOR UK RAIL GROWTH

The Rail Supply Group (RSG) has launched its strategy to build growth in the UK rail industry and support exports.

The strategy from RSG - the sector council representing the

rail supply chain in the UK - aims to support suppliers of all sizes

across the supply chain. The RSG's sector strategy sets out the group's plan to: ■ improve market conditions for the rail supply sector by securing greater visibility of

> procurement approaches; ■ accelerate the uptake of innovation in the supply chain by promoting effective collaboration between clients and suppliers and improving the UK's capacity for testing and research;

planned investments with

government and improving

- invest in people and skills, including developing a network of training centres, an industry talent pool and incentivising training through revised procurement approaches;
- grow exports and inward investment by working closely with government to

improve access to foreign markets, clients and investors, as well as supporting smaller suppliers to export.

Patrick McLoughlin, Secretary of State for Transport and co-chair of the Rail Supply Group said: 'We are funding the biggest rail modernisation programme since Victorian times which is creating opportunities for UK suppliers across the country. We support the rail industry's plans to strengthen our supply chain so British companies can win more work here and abroad.

'Rail Supply Group's focus on developing a skilled rail workforce is very welcome. Our priority is to attract the nation's talent to the industry and to equip them with the skills to deliver on our commitment to build a world class transport infrastructure system.'

The RSG brings together private sector leaders from large and small businesses across the rail industry with government.



One of the latest products from Bombardier Transportation's Derby factory is Class 387/2, ordered for Gatwick Express. Bombardier

#### **FINANCE AND LEASING**

IN ASSOCIATION WITH angel®



## NEW GENERATION OF TRAINS FORECAST

Britain's train fleet could almost double by 2045 to meet rising passenger demand, according to forecasts in the rail industry's fourth Long Term Passenger Rolling Stock Strategy. More than nine in ten trains are set to be electric-powered or able to run on either diesel or electricity in the next 20 years.

The strategy, which projects how many trains will be needed to meet future growth, estimates that:

- The national fleet is forecast to grow by between 51% and 99% over 30 years;
- Around half of the 4,500 new carriages - worth £7.5billion already under construction or on order are being built in Britain,

supporting thousands of jobs and scores of apprenticeships;

- On average 17 vehicles a week will be built between now and 2020;
- The average age of trains is estimated to fall from 21 years to 16 years over the next five years;
- The proportion of electricallypowered vehicles will rise from 70% now to more than 90% by 2034;
- Between 13,000 and 20,000 new electric vehicles will be needed by 2045.

The strategy is produced by the Rolling Stock Strategy Steering Group (RSSSG), which brings together rolling stock companies (Angel Trains, Eversholt Rail Group and Porterbrook Leasing) and the Rail Delivery Group (RDG), representing train operators and Network Rail.

Paul Plummer, RDG chief executive, said: 'Passengers want better services and faster journeys so we are investing in a new generation of trains with more carriages, more seats and better facilities. Rail is ever more important in Britain and it is vital that we plan long-term for the bigger, better railway that the nation and our economy need.'



Above: Siemens electric multiple-units for Govia Thameslink Railway will make up the first fleet for new rolling stock company Rock Rail. Equity for a deal worth over £200m is being provided by Standard Life Investments through SL Capital, with debt from Aviva Investors. The 25 six-car dual-voltage trains will be a high-capacity variant of the Desiro City, and will replace Class 313s on Great Northern routes. Siemens

#### TRAIN FLEET MAINTENANCE AND MANUFACTURE



## NEW TRAINS FOR TPE AND NORTHERN

TransPennine Express and Angel Trains have ordered 95 inter-city rail vehicles from Hitachi Rail Europe. The contract is for 19 five-car Hitachi AT300 bi-mode trains, capable of operating on both electric and diesel power. Each of the new trains will provide an extra 161 seats compared to the Class 185 train's average. The initial trains will be built at Hitachi's Kasado Works in Japan, with the majority to be assembled at Hitachi's Rail Vehicle Manufacturing Facility at Newton Aycliffe, County Durham. The new trains will be introduced to the network from December 2019, Hitachi will also provide full service provision, including heavy maintenance,

cleaning and stabling, at its **Doncaster Carr and Craigentinny** (Edinburgh) maintenance depots.

With Office of Rail and Road (ORR) approval of a further ten year track access agreement for First Hull Trains, this company also plans to purchase new bi-mode trains. A conditional agreement for five 5-car trains from Hitachi was announced in 2015.

The Northern rail franchise will also see new trains, under a contract between Arriva and manufacturer CAF to build 281 vehicles, forming both diesel and electric multiple-units. The first of the new 100mph trains is due to be delivered by October 2018. The deal will be financed by Eversholt Rail Group. Formed as



Alex Hynes, Managing Director of Northern, with a visualisation of a new-look Northern train from CAF. Northern

25 two-car and 30 three-car units. the diesel multiple-units will be allocated mainly to the 12 new

Northern Connect routes. The new EMU fleet will be formed as 31 three-car and 12 four-car units.

#### **PASSENGER TRAIN OPERATORS**



## SMARTER TRAIN TICKETS ON THE CARDS

Pioneering plans for rail passengers across Britain to be able to travel anywhere on the network using new-style 'm-Tickets' have been set out by the Rail Delivery Group (RDG).

The rail industry has piloted a new flexible barcoded m-Ticket, which passengers download to smartphones or other mobile devices, and wants it to be available nationwide as soon

as possible – which RDG says could be within three years.

A pilot scheme covering more than 230 stations in the north of England, Scotland and the Midlands lets people switch between different train operators' services on a single journey.

The RDG is working also with the card payments industry to explore how people outside London could use new'ticket in the cloud' technology to use contactless

credit or debit cards as a 'token to travel, replacing paper tickets.

In future instead of just paying for journeys with a bank card, customers will be able to book online or via a mobile phone app and simply use the same payment card to go through the gates at the railway station. Customers with compatible smartphones would not need their bank card with them, simply touching their device on the reader at the station.

Rail operators have agreed to fund a joint project with the UK Cards Association to explore how contactless cards and devices could support long-distance train tickets or season tickets, so passengers no longer have to print out tickets.

The RDG would like to see more pay-as-you-go smartcard schemes available to rail travellers in cities outside London too over the next three years.



## **THE MODERN RAILWAY UPDATE 2016**

#### **FREIGHT AND HAULAGE**



## LAST EVER CLASS 66 LOCOS

GB Railfreight (GBRf) has welcomed the arrival of the last ever batch of new Class 66 locomotives.

The procurement of the seven locomotives (Nos 66773-79) from Electro-Motive Diesel Inc (EMD) is in addition to 21 EMD Class 66s that arrived in the UK last year, bringing GBRf's Class 66 fleet total to 78



GB Railfreight's Class 66 locomotive No 66709 heads a train transporting waste from its new North London Railfreight Terminal, a strategic freight site in Cricklewood that the company leases from Network Rail. Under a three-year contract with FCC Environment for material storage, handling and haulage, GBRf runs one train a day (Monday to Friday), carrying waste from a variety of locations in London, including construction sites and development areas. GBRf

locomotives. GBRf said that, given their heavy freight capabilities, they will be used to support operations across various GBRf market portfolios.

These arrivals marked the end of the Class 66 builds, as a result of EU emissions legislation changes. John Smith, Managing Director of GB Railfreight, said: 'The rail freight industry now needs to work together to deliver a new generation of diesel locomotives that are legally compliant with the EU's new diesel emissions regulations.

'We are very pleased to have been able to secure these last seven Class 66 locomotives. They support the company's continued growth and enable us to carry on serving our customers across various markets, particularly aggregates, reiterating our commitment to supporting the Government's building Britain agenda.'

Billy Ainsworth, President and CEO of EMD's parent Progress Rail Services, said: 'Today serves as a milestone with the delivery of our last Class 66 locomotives. I'm pleased we were able to meet GBRf's needs for reliability. fuel efficiency and overall locomotive performance. The Class 66 ranks as a top performer in its category. We are currently developing new generations of locomotives to meet our customers' demands around the globe, just as we did through this offering.

#### INNOVATION AND ENVIRONMENT

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## RESEARCH FROM SHIFT2RAIL



The first train passes newly installed sliding-gate level-crossing barriers at West Dyke Road, Redcar in December 2015. Developed and supplied for Network Rail by EDS Ltd, they incorporate position/rotation sensors and a programmable logic controller to vary speed dependant on the position of the gate, and have 'fast stop' edge sensors. The previous boom gate barrier was plagued by reliability problems during high winds. Network Rail

Projects valued at 222 million Euros have been proposed under the first call for research from Shift2Rail, the first European rail Public Private Partnership tasked with developing strategically-focused research and innovation and market-driven solutions, and with integrating these to create the railway system of the future. With a total budget of 920 million Euros for the period 2014-2020, Shift2Rail is promoting the competitiveness of the European rail industry and ensuring the attractiveness of rail as a safe and sustainable low carbon transport mode.

Projects starting this year cover most areas of Shift2Rail's programme, including:

■ Rolling stock: development of new traction systems, concepts and architectures for train control and monitoring, and advanced brakes.

- Signalling: on-board automation systems, highcapacity radio communications systems, safe train separation systems, cyber security systems, innovative testing processes.
- Infrastructure: switch & crossings and track systems, extending life of bridges and tunnel assets, managing assets in a more holistic, intelligent and consistent way.
- IT solutions for 'one-stop shop' sale and use of tickets and travel disruption assistance.
- Freight: including automation, noise, and new developments on freight locomotives, driver advisory systems and intelligent freight wagons.
- Socio-economic factors that can contribute to an attractive railway system, the development of tools and approaches to enable the impact evaluation of new technologies.

#### **KEY PROJECTS AND CONSULTANTS**

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## LEARNING LEGACY FOR PROJECTS

Crossrail has launched an initiative to share insight from Europe's largest construction project with the wider infrastructure industry. The Learning Legacy initiative seeks to collate knowledge and share good practice on a wide range of topics, including Health & Safety, Project Management, Engineering and the Environment.

The first tranche of material shares some of the early lessons that have been learned from the Crossrail programme. It includes technical papers, peer-reviewed case studies and procedures, which have been published on a dedicated website (learninglegacy.crossrail. co.uk). Further material will be published every six months.



Electrification improvement work under way for Crossrail's Shenfield route near Ingatestone in February. Network Rail

Andrew Wolstenholme, Crossrail Chief Executive, said: 'Passing on the lessons and good practice that

we have learned at Crossrail is an absolutely essential part of raising the bar in the delivery of major

projects. With an unprecedented number of infrastructure schemes around the corner, now is the time to start sharing what we have learned so the UK can build on its reputation for delivering safely, on time and on budget.

Tony Meaas, Chief Executive, Infrastructure and Projects Authority (IPA), said: 'The IPA is wholly committed to ensuring the UK's delivery of major infrastructure projects is achieved efficiently and effectively. The creation of a learning environment is vital to improving project performance, and we see Crossrail's Learning Legacy as an impressive example of best practice. We encourage all project professionals to draw on this excellent resource; the more we can learn from the experience of others the closer we will come to flawless project execution.'

### INFRASTRUCTURE MAINTENANCE AND RENEWAL

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## EXCEL DEBUT FOR INFRARAIL

With unprecedented levels of rail investment and the rise of national infrastructure up the political agenda, the organisers found an upbeat mood at the Infrarail 2016 exhibition of railway infrastructure products and services, and also at CITE 2016, covering the civil infrastructure sector, which successfully took place together at ExCeL London in April.

The total number of attendees at the combined event was 6,596 – virtually the same as the figure for the two shows in 2014, when Earls Court was the host venue. They comprised 5,293

visiting managers, engineers and industry professionals and 1,303 exhibitors' personnel. Visitors came from 51 countries, underlining strong international interest in both Infrarail and CITE - and in the markets they serve.

Exhibitors totalled 242 overall, including those in the CITE hub, with 13 countries represented. The number of companies present was again similar to that for 2014 but the amount of exhibition space taken rose by around 12% to 3,370m<sup>2</sup>. Exhibiting firms displayed a vast range of innovations and state-of-the-art technologies

aimed at optimising the safety, reliability and cost-effectiveness of rail and civil infrastructure projects and operations.

Infrarail and CITE were formally opened by Claire Perry MP, Parliamentary Under Secretary of State at the Department for Transport. Also speaking were Sir Peter Hendy CBE, Chairman of Network Rail, and David Waboso CBE, Capital Programmes Director at London Underground.

Next year, the Railtex 2017 railway technology exhibition will be held at the NEC in Birmingham from 9 to 11 May.



The new tunnel at Farnworth near Bolton opened to passenger services on 14 December 2015. One of the two existing tunnels was enlarged to accommodate two tracks and overhead electrification. Network Rail

## **INTO EUROPE**



## **EUROTUNNEL CAPACITY FOCUS**

Developments to increase capacity and availability on Eurotunnel are continuing, with the first wagons of three new lorry Shuttles ordered by Eurotunnel in 2015 expected to enter service this autumn. Once the three new trains are operational, the cross-Channel freight offer from the lorry shuttle service will have increased by 20%.

The Maintenance 2.0 project, which involves implementing a continuous improvement

programme to maintain rolling stock, is aimed at enhancing the maintenance efficiency of a fleet of 57 locomotives, 18 lorry shuttles and nine passenger shuttles, which are all subject to increasing use due to increase in traffic.

Increasing the reliability and hence the availability of rail facilities is another fundamental challenge, says Eurotunnel. The objective is to go from two to one night's tunnel maintenance per week,

and to shift platform maintenance to off-peak days, using predictive maintenance tools. An inspection train that is specific to the tunnel is to be introduced in 2017, and two initial devices to measure the geometry of the track and catenary were acquired in 2015. They will be joined by other modules to allow ultrasound analysis of rails and signalling checks.

A campaign of replacement of 100km of tunnel rails, just

concluding, was seen as an opportunity to test a new grade of steel over a few kilometres, which should further increase track durability. At present, Eurotunnel replaces its tunnel rails once they have carried a load of 800 million tonnes, with the next campaign set to take place in seven or eight years. An innovative acoustic process, fine-tuned in partnership with the École Nationale des Ponts et Chaussées ParisTech, now enables checks to be carried out on sleeper blocks without removing them.

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## **THE MODERN RAILWAY UPDATE 2016**

#### SIGNALLING AND CONTROL





## SIGNAL TEAMS COMPLETE COMMISSIONINGS

A range of high profile signalling and control schemes were successfully commissioned by Network Rail and its contractors over the Christmas and Easter periods.

In North Lincolnshire, a 17-day blockade (during which Immingham Port was closed for five days), saw at its peak a 600-strong Siemens team working to re-signal 60 miles of railway. The work represented the last stage in the migration of signalling control to Network Rail's new Rail Operating Centre (ROC) in York.

Major stages of the Thameslink Programme at London Bridge have also been commissioned. with Siemens' new Zone Controller system now controlling the signalling system. This technology now forms part of Siemens' core solution.

A 70-strong team of Siemens' installers and testers also made alterations to two solid state interlockings in the Anniesland station area in preparation for the 20-week closure of

Glasgow Queen Street High Level station, with layout improvements providing a new connecting line at Anniesland.

At Easter, Stafford Area Improvement Programme works (delivered by alliance partners Atkins, Laing O'Rourke, Network Rail and VolkerRail) included signalling upgrades, with control of the Norton Bridge area added to Rugby ROC. Crossrail work in east London also saw signalling improvements under

a contract with Alstom, which has recently added a contract for full re-signalling of the Great Western main line between Reading and Paddington to its previous contracts for the surface railway sections of Crossrail. With Atkins providing signalling renewal and design, the East Kent Signalling Centre at Gillingham took control of Strood and the Sheerness branch as well as new signalling between Longfield and Sittingbourne.

### **LIGHT RAIL AND METRO**

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## TRAM TRAINS ON LINE

After testing, the new vehicles for the Sheffield-Rotherham tram train route are soon expected to begin operation on the existing Stagecoach Supertram network in Sheffield to enhance capacity during peak times. Tram trains will start running on the newly constructed rail network to Rotherham in 2017.

The government is working in partnership with South Yorkshire Passenger Transport Executive (SYPTE), Network Rail, Stagecoach Supertram and Northern Rail to pilot the pioneering technology.

Three tram trains an hour will travel on the Supertram network from Sheffield Cathedral to Meadowhall South, before proceeding over a new section of track - the Tinsley chord - linking the tram line to Network Rail tracks, continuing to Parkgate

Retail Centre via Rotherham Central station. New platforms will be built at Rotherham Central and Parkgate.

South Yorkshire's tram train pilot project will run for two years while customer satisfaction, passenger numbers, reliability and costs are tested. It is intended to help the rail industry understand and assess the technical issues involved with planning and operating a tram train service, and is expected to continue as a local service if the pilot is successful, said SYPTE.

SYPTE was awarded £51 million from the Department for Transport to undertake the two-year pilot, with the project partners. The project is expected to create 35 local jobs.

Work to prepare for the tram train service also includes electrification of the line from Meadowhall South to Rotherham Central and Parkgate; rail replacement on the Stagecoach Supertram network, and modifications to the Stagecoach Supertram depot. Seven tram train vehicles were ordered from Vossloh Rail Vehicles (now owned by Stadler Rail) in Spain.



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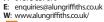
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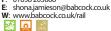
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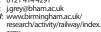
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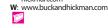
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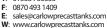
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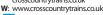
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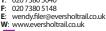


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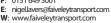


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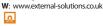


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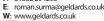
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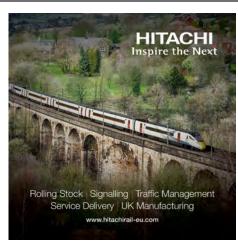


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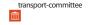
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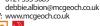
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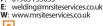
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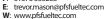
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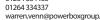
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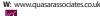


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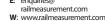
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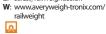


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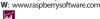
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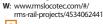


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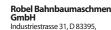
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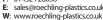
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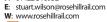
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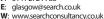
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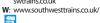


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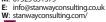
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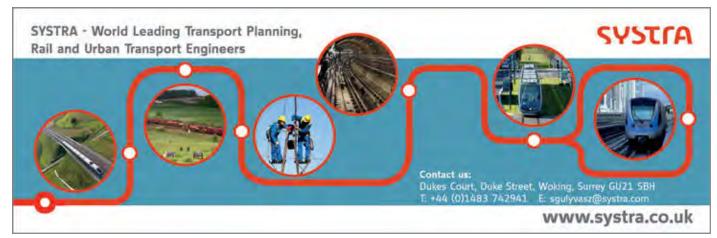
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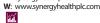
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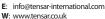


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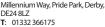
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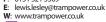
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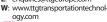
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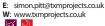


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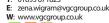
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