Informed Sources e-Preview June 2018

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This month, there's something for nearly everyone. In the main body of the magazine I have a technical update on the systems that together make up a modern digital railway. This is complemented by an initial review of Network Rail's latest policy in the column. I also get into the detail of the West Coast Partnership which will ultimately operate Intercity West Coast and High speed 2 passenger services. Finally, for those interested in traction and rolling stock there's an analysis of the latest light-weight trains

Digital Railway 2.0 – nailing down Government support
West Coast Partnership – DfT's great aspirations
In praise of lightweight trains

On 10 May we were summoned to York to hear the Transport Secretary announce a new strategy for the digital railway. When it was all over the general reaction among the railway press was 'is that all'?

However, if you looked behind the political façade there were some nuggets of information to be found. I also gained an insight into technical policy.
While ministerial careers are ephemeral, for the moment Transport Secretary Chris Grayling has committed his Department to ensuring all new trains and signalling are digital or digital-ready from 2019. In this case, for digital, read ETCS and Network Rail Chief Executive Mark Carne defined ETCS-ready for trains as the wiring being in place. This is the minimum fitment which will be mandated in franchise Invitations to Tender and agreements.

On the track, as Network Rail develops the business cases for signalling renewals, any additional cost of building in provision for digital railway should not prejudice DfT's authorisation of the scheme. For example, to be ready for ETCS Level 2, new signalling schemes will need more, shorter, fixed block sections.

Which brings us back to the importance of that ministerial 'commitment' to all new trains being ETCS ready. Government funding for Siemen's contract to retro-fit the current freight locomotive fleet with ETCS has already been announced. Other than retro-fits, Network Rail will just have to pay for its own ETCS equipment.

The choice of York for the announcement was significant. In his introduction Mr Grayling declared 'it seems fitting that we should be here in York, which could be one of the first cities to benefit from a digital intercity railway on the Trans-Pennine Route'.
Network Rail is still working on its proposals for Trans-Pennine. It is now being emphasised that this will not be a British Rail-style big-bang total route modernisation but a series of upgrades. And Mr Grayling did use the 'E' word.

It is important politically that investment in railways in the north is seen to be happening. According to Informed Sources, Mr Grayling has made it clear to Network Rail that he wants to see some physical activity on Trans-Pennine starting next April.
So much for the politics. In the supporting documentation provided by Network Rail there were some details of the ETCS roll-out strategy and associated costs.

While Network Rail has already said that the emphasis in CP6 will be on the introduction of Traffic Management and Connected-Driver Advisory Systems to generate early benefits at low cost, a programme for the implementation of ETCS covering the next three Control Periods – CP6 (2019-24) CP7 (2024-29) and CP8 (2029-34) is being developed.
CP6, will focus on a line of route deployment of ETCS. The early development phases of ECML South (Kings Cross-Peterborough) are funded. If authorised, ETCS will be implemented in a series of 'sub-tranches' working outward from the two-track section over Welwyn Viaduct.

Chris Grayling is already promoting the Trans-Pennine route upgrade as the first digital intercity railway. Five other schemes in CP6 to be 'ETCS enabled' will include major signalling renewals planned for Crewe and Feltham.

In CP7 the focus will switch to regional deployment of ETCS, mainly in a broad band either side of the Trans-Pennine corridor plus Scotland. In the south, the 40 miles of track from Waterloo will be controlled by ETCS within 10 years, 'providing the potential for a metro style service into Britain's biggest commuter station'.

Finally, linking the regional schemes in CP8 will result in the creation of a national network of ETCS controlled routes. According to Mark Carne, 'within 15 years, we could expect 70% of journeys to be ETCS and Traffic Management enabled'.

On a technical note, the full capacity and other benefits won't be achieved if you simply overlay ETCS Level 2 on the existing signalling design. As a result resignalling ahead of ETCS will be a redesign based on the performance of the trains and service pattern, with multiple intermediate blocks within the existing block section. These intermediate blocks will be designed to optimise capacity for ETCS equipped trains.

Feltham and Crewe will be the first schemes to be redesigned in this way. They will open with Multiple Aspect colour light signals, then, when ETCS fitted trains start running, there is no additional cost to provide full Level 2 ETCS.

West Coast Partnership goes for quality

Slogging through the 293 pages of the Invitation to Tender (ITT) for the West Coast Partnership (WCP) was a dispiriting experience. Since it covers the gestation and birth of an entirely new Intercity Network it ought to have been an inspiring read, but somehow it wasn't

WCP comes in three parts. First, there is the franchise that will run Intercity West Coast (ICWC) services from September 2019 until the opening of High Speed 2 in 2026. This is termed the Initial Franchise Period (IFP)
Second, during this time WCP will also act as the HS2 'shadow operator', responsible for planning the integration of the combined ICWC and HS2 passenger services. Finally, WCP will run the two routes as a single business from 2026 to 2031.

All good positive stuff;, so what's not to like? Well, after a while the relentless virtue-signalling reiteration of the blindingly obvious tends to pall. On page 17 of my 27 pages of notes and extracts I typed 'everything is innovative'. And the detail is excruciating.

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Examples range from smelly toilets to boarding at Euston.

Risk
What about the money? During the seven years while HS2 is being built, ICWC will, in effect, be just another replacement franchise with revenue and cost risk borne by the successful bidder, although, after the VTEC debacle, there will be a revenue risk-sharing mechanism. From the start of the Integrated Operator Contract DfT will retain 'the large majority of risk on costs and revenue'.

ICWC will be a classic Intercity Franchise where the premium profile in the bid is extremely sensitive to external factors. In a section with the grim heading 'Consequences of forecast Financial Ratio Breach on evaluation' DfT includes a table of its 'baseline' premium payments. I have added two introductory lines to this table to show current payments.

Having converted the table into a premium profile chart I was amused to see that DfT's own forecasts reveal the same heavy back-end loading that has caused franchisees so much grief over the years.

With three stages to bid for, evaluation will be more complex than usual. The three elements, ICWC, Shadow Operator and initial operation of the combined service, are broken down into sub plans and the relative importance of the sub-plans is then weighted. Under the new evaluation scheme introduced by Franchise Director Peter Wilkinson, the 'final score' is a combination of the Net Present Value of the premium profile plus the financial value placed on the quality elements of the bids. The winning combination is termed the Most Economically Advantageous Tender (MEAT).

The formula used is: Final Score = ICWCP + (n x Q)
ICWCP is the Bidder's Risk Adjusted NPV, measured in millions and Q equals the Quality Score. Each sub-plan is marked out of 10 to give an evaluation score. This is then converted into a quality score on a 13 point scale (don't ask). The overall Quality Score (Q), also out of 13, is the aggregate of the Sub-Plan quality scores.

Finally, 'n' is a number selected by DfT to put a financial value on the importance of quality in the bid. In the case of ICWC the magic number is 250. Thus the maximum value of n times Q is £3,250 million. As an indicator of scale, I make the NPV of DfT's baseline premium profile £1,600 million.

In the sub plan evaluation, the 'pass mark' is 6 which gives a minimum n times Q of £1,500 million or roughly 50% of the MEAT. So you can see that DfT is pretty serious about rewarding quality.

With the current VTEC crisis is mind I ought to mention the Parent Company Support (PCS) required. This is the bonded sum which the franchise can draw down from its owners should it start to lose money. DfT has set the PCS at £45 million plus 10% of the difference between DfT's baseline premium and the premium in the bid. Bidders can also offer additional PCS up to a maximum of £20million. Compare and contrast with VTEC's PCS of £165 million – now all gone.

Lightweight trains paying off

A few years back, when the first Siemens Desiro EMUs were entering service, I introduced a new technical term to the rolling stock lexicon: lardbutt. Compared with the previous generation of EMUs the Desiros were heavy. Add in stiff continental bogies and they proved to be track crunchers, eventually requiring an innovative variable rate damper modification to reduce track wear. Bombardier's Electrostars weren't exactly track friendly either.

When procurement of the new trains for Thameslink and Crossrail started light weight was a feature of the invitations to tender. After the contracts were let the successful bidders assured me that the Lardbutt era had ended.

My analysis of the Class 700 Desiro City and Aventra Class 345 multiple units in the column confirms this to be true

Obviously Siemens' 12 car Class 700 Desiro City benefits from several very light trailer cars, but to get the average vehicle weight to 33.53 tonnes is a considerable achievement. This is the same as Mk3 coach, which has long been my gold standard for efficient vehicle design.

At first sight, Bombardier's nine car Aventra, with an average of 35.4 tonnes per vehicle, seems less impressive even compared with the eight car Class 700 at an average of 34.4 tonnes. However, the Class 345 is formed from 22.5m long vehicles compared with the 20.2 m of the Class 700 so you are getting more floor space for that extra tonne per vehicle.
But this is nit picking. The reality is that both Bombardier and Siemens have produced two very impressive lightweight designs, which are going to produce substantial benefits throughout their working lives.

Obviously, a lighter train uses less energy to accelerate, and with all those motored axles you should recover at least 20% through regenerative braking. But Network Rail has just published the Variable Usage Charge (VUC) for these two trains. The VUC is intended to reflect the cost of the wear and tear caused. The calculation takes into account axle load, bogie stiffness and various suspension parameters.

VUC is calculated as pence per mile per vehicle. I have worked out the cost per train and once again there is not a lot in it. The nine-car Class 345 costs around the same per mile as the eight car Class 700.

To provide a point of reference I have also calculated the VUC for an eight-car Class 460. The new trains save about a third.

Further calculations, based on Great Northern fleet mileages, indicate that running the current Thameslink Class 700 diagrams with eight and 12-car Class 387 formations would, increase GTR's annual VUC from £5.5 million to £9 million.
Obviously, this is a rough approximation, but it does indicate the practical benefits of light weight trains which accumulate over their service life. Congratulations all round.

New Train TIN-watch
I hope readers are finding this new feature interesting. This month includes some additional analysis based on the results for the last four periods of 2017-18.
Both the Siemens Desiro City fleets and Hitachi with the Class 800s are seeing mileages increase steadily. Class 800 mileage has almost doubled over the four periods with TINs halved.

Roger’s Blog
Well May has been a lively month. It kicked off with Infrarail, where I enjoyed meeting readers and lead a mass groan by the railway press when, in his speech opening the exhibition, Chris Grayling touted hydrogen power over electrification.

The following week it was Waterfront’s second annual ETCS conference which, if anything, was even better than the first,with some excellent presentations matched by equally useful questions and some intensive notebook activity with Informed #Sources during the breaks. Two days later it was off to York with Virgin Trains East Coast for the digital railway strategy function. Out by IC225 and return in an IC125 where I found the vertical ride a bit bouncy at times.

Then last week it was up early on Tuesday to do an interview in the Today programme’s 06.15 City slot ahead of DfT’s imminent VTEC default date announcement. Thanks to elder grand-daughter for a quick conversion course to FaceTime on Mrs F’s i-Pad.

Then, on Friday, out of the blue, I got a call from the Times asking if I would like submit a follow-up letter to correspondence the previous day reacting to the VTEC announcement – including one from Alastair, now Lord, Darling.

While I fire off the occasional letter to the national press, which sometimes get published, an invitation to pontificate from the ‘Thunderer’ was something new.

This is what I said.
Sir, Lord Darling of Roulanish (letter, May 18) is partly correct when he says that the last thing the railways need is an ideological battle over public and private ownership. I think ownership is irrelevant: what matters is the structure of the industry.
Privatisation’s fundamental flaw has been the separation of responsibility for the tracks and the trains. A railway is a complex integrated system and with digitisation is becoming even more so. Having politicians and regulators determine the scope and timescale of major infrastructure upgrades has created uncertainty for train operators bidding for franchises . In the case of Virgin Trains East Coast the franchise would have collapsed by 2020 anyway when enhancements expected to generate increased revenue through more capacity and reduced journey times will no longer be ready .
Chris Grayling is proposing a novel private-public partnership to revive the East Coast line. However, this partnership will perpetuate the separation of not only track and trains but the expertise of the various engineering and operating disciplines that make up a working railway. The way forward is to reunite track and train under one management. Once this is done politicians can argue about ownership to their hearts’ content.

June starts off quietly, but livens up at the end of the month with the Modern Railways Innovation Awards on the 24th (www.4thfriday.co.uk). The final week includes an IMechE conference on Traffic Management and the Stagecoach summer reception, which is going to be even more lively this year!

Now it’s time to get on with my analysis of the East Coast Franchises since 1996, with a strong Groundhog Day ambience pervading the office.
Roger