MAKING THE TRAINS RUN ON TIME
THE LITTLE THINGS COUNT

Minor sources of delay add up and can make all the difference to punctuality, LNER MD **DAVID HORNE** and **NIGEL G. HARRIS** of The Railway Consultancy told the Institution of Railway Operators

Performance on the East Coast main line has been far from perfect in recent years. From a high point of a Public Performance Measure (PPM) nudging 90% in late 2015, inter-city performance declined. The dual impact of the 'Beast from the East' in March 2018, followed by the difficult May 2018 timetable change, drove PPM to a nadir of the low 70s in the latter part of 2018. Things have improved somewhat since then, but there is still some way to go.

A number of factors have been identified: trespass and fatalities are more of a problem (up 86% since 2014-15), there have been well-documented issues with the overhead line (failures peaked in 2017) and the changing fleet means East Coast inter-city operator LNER has had to deal with both ageing trains and bedding-in problems on the new Azumas. LNER has seen very few reliability issues with the new Azumas: the majority of issues have been associated with staff getting familiar with them. A positive sign is that since the summer of 2019 Azuma delays per 1,000 miles are over 20% better than InterCity 225s or HSTs.

There has been a 30% increase in trains operating on the East Coast route north of York since May 2018 and there have been problems with the design and implementation of the timetable. Reactionary delay (primarily TOC-on-TOC) has increased by 50% since May 2018.

On top of all that, the delay per incident has increased: delays affect more services and recovering the service is more difficult than it used to be.

WHY DO TRAINS RUN LATE?

It is not only the macro factors that contribute to poor performance. Railway managers often focus on delays over three minutes in duration, as these are the ones that trigger the industry's financial compensation mechanisms. But delays of less than three minutes – so-called sub-threshold delays – can be of crucial importance, as cumulatively they can result in trains running out of path and wider disruption of the timetable.

So, what causes these little delays? In 2018, LNER commissioned The Railway Consultancy to study station working and possible causes of why trains were not getting away on time. People

Slow approach: one of LNER's Azumas arriving at York as it heads south on 18 September 2019. Tony Winward

were sent out to observe operations in detail at stations large and small on the route, such as Peterborough, Grantham, Newark and York.

The study ignored clearly identifiable incidents causing delay, such as a smashed windscreen, as the operator already knows what is going on with something like this. The observers were more interested in the little things that go on at stations that result in a train accumulating delay.

After observation of wheel stop to wheel start time with stop watches, the study found that at Peterborough, trains dwell, on average, 13 seconds longer than they are supposed to. At Grantham, the figure is 11 seconds; at York, seven seconds. Overall, 58% of station stops were within booked dwell time, but 42% were not. You can't get PPM figures in the 90s if almost half of your trains are overstaying their station stops.

Customer friendly? Here at Durham there is plenty of advice for drivers regarding where to stop, but where are the equivalent signs for passengers regarding where to wait? The Railway Consultancy

OPERATIONS IN DETAIL

Once the train has stopped, it takes three seconds to open the doors. Leaving passengers have to alight, joining passengers board. The passenger doors have to close, then they are followed by the train manager's door. Following that, there's a brief pause before wheel start while the brakes are let off.

All this takes time. Azumas have longer carriages with more capacity than the trains they are replacing, which is great for relieving overcrowding, but means each door has to pass more alighting and joining passengers. On the other hand, the automated doors on an Azuma save time compared to slam doors on HSTs.

If you observe operations at somewhere like York, first you see that the flat junctions in the station throat don't help, with some slow approach speeds. Then you see waiting passengers looking to see where they will join the train. Not helping here is the mix of train types in LNER's transition to a new fleet: doors for First Class, wheelchairs and so on can be in different places on different types of train. If the passenger information systems are poor, there can be further confusion and delay while passengers seek advice from staff.


Don't put items of luggage in here: the offending unlabelled cupboard on an Azuma. The Railway Consultancy

If a wheelchair is to board, it takes 30 seconds to access the ramp fixing points on the door of an Azuma. While the operation is very safe, it takes longer to fit the ramp on an Azuma than on older stock.

LESS OBVIOUS CAUSES OF DELAY

Sometimes a minimal amount of expenditure will save minutes. As a micro example, take the case of the man the observers saw who was refusing to allow the door to shut at Peterborough. It turned out he wanted to speak to the train manager as he could not retrieve his suit, which he had placed in a cupboard on the Azuma when he joined the train at King's Cross – only to find that the cupboard had been locked by the time he reached Peterborough. It turned out that the cupboard was for staff use only – but there was

no sign to that effect. A few pounds on some stickers would have avoided this situation.

£1,000 or so on a bus shelter would free up operations at Peterborough. This important nodal point often sees driver changes on freight trains. The fresh driver is supposed to wait by a signal off the platform – which is fine in dry weather. But in wet weather, human nature being what it is, drivers often wait under the footbridge in the station. Result: the train arrives and the loco pauses under the footbridge. The two drivers have a conversation at changeover, doubtless about important issues such as the latest operating notices – but all the while 25 bogie flats behind the loco are stretching across the layout at Peterborough, delaying trains on both up and down main lines. With a bus shelter by the signal, the new driver could wait at the right point and this situation would be avoided.

PLATFORM MANAGEMENT

There are niggles in platform operation that can result in delays arising. One increasing problem as the railway has become more popular is that crowds on platforms mean platform staff and train managers have difficulty in getting a clear view, delaying dispatch.

Ramps for wheelchairs can cause delays, especially when not booked in advance. At big stations such as York, where a train might have booked dwell time of three or four minutes and there are plenty of platform staff, this is not such an issue. But at smaller stations like Grantham, it can take a while to get the ramp to the right spot if the platform staff are not expecting to have to deploy it.

Only about one in three platforms in the UK have level boarding, so this is likely to be a problem all over the country. Steps up into the train also mean able-bodied passengers take longer to board.

Frequent rail passengers know what they are doing and are generally ready to join or leave a train as soon as the doors are released. Infrequent passengers may struggle to find their way and may prolong dwell times as a result. The doubling of rail journeys since privatisation means there are not only more passengers, but also more novice passengers than there were. In rough figures, at the time of privatisation 25 years ago, about 45% of the population used trains at least occasionally. Now the equivalent figure is 65%: so that's 10 million new people who are less used to the railway system who are having to find their way around it.

LUGGAGE AND BIKES

Not only are there more passengers, they are also tending to bring more luggage. So, there are both more people and more bags and suitcases to get in and out of the door during each station dwell. This is a non-trivial issue: at Durham, for example, at the end of the university term a train can be delayed by as much as eight minutes by the quantity of luggage to be got on board. The Christmas holidays are another crunch time.

Train layout has a part to play here. If the stacks are at the vehicle ends, the first passengers to join take their time to place their bags on the racks – while other passengers are held up on the platform. Result: increased dwell time. If luggage stacks or seatback luggage space are in the middle of a vehicle, incoming passengers walk down the aisle to deposit their bags, which means the aisle gets blocked but does at least give the space to get people into the train.

Perhaps the worst position is where there is no obvious place to deposit bags. LNER's decision to take some seats out of the Azumas to make more space for luggage stacks is a sensible one.

But maybe limitations should be placed on how much luggage passengers can bring with them. On the Shinkansen in Japan, for example, if you want to take large bags you will soon have to reserve the space for them in advance. How far are we from having to do something similar?

The seating layout is another issue. Passengers searching for reserved seats can delay other passengers. Clear displays on the outsides of trains showing the seat numbers accessible from each door can help here, while the 'traffic light' seat reservation system on the Azumas helps those with no reserved seat find a place quickly.

One thorny question is bicycles. Unlike the HSTs they are replacing, the Azumas have

no van for bikes. Instead, bikes go through the same door as other passengers. Once inside they can hold things up while owners manoeuvre their machines into bike racks.

Bicycles may be a green form of transport. But if they extend dwell times, introduce unreliability into the timetable and consequently decrease the attraction of another green form of transport (rail), clearly there are questions to be asked. At some point someone may have to grasp the nettle and ban bikes from busy inter-city services.

REGULATION

The Railway Consultancy's observations on the East Coast main line indicated that, in some instances, there is poor train service regulation. Either trains are being prioritised in a sub-optimal way, or they are plain not being prioritised at all, with some moves allowed that hold up lots of other trains. At Peterborough, for example, a freight train may be allowed to cross the layout at a time when it obstructs Edinburgh expresses on the main lines.

There may be all sorts of reasons for this sort of thing, from a very busy railway where it is difficult to find any crossing time, to decisions being made by an Automatic Route Setting system that was put in the best part of four decades ago and which is not suited to the conditions of 2020.

But some of it is down to human factors. At York, the observers witnessed a southbound train being put into platform 11 around 11.00,

Blocking move: passengers wait on the southbound platform at Peterborough whilst a Felixstowe-bound container train prevents any other trains running at all. The Railway Consultancy

Don't try to board this train: information systems do not always reflect the train actually in the platform! The Railway Consultancy

at a time when the other through platforms (Nos 3, 5, 9 and 10) were all unused. As it happens, an hour earlier, this would have been the correct regulating decision. But at the time it did happen, using platform 11 delayed four other trains. The railway is so busy nowadays that you don't need to get much wrong at our big stations to have a serious impact on the service.

Further complicating the issue is that Azumas are longer than the trains they replace, which has an impact of a second or two on signal section blocking times. On the other hand, Azumas are more reliable than '91s' and when there are problems with them the delay per incident is lower, so the new trains mean the lengthy delays that ensue when a train sits down on the main line are more likely to be avoided.

How much opportunity do new staff have to learn the job? How many signallers know, for example, how long it takes to ladder a freight train across the Peterborough layout? And are we doing the most we can to retain the knowledge of long-serving staff? Network Rail's policy of moving signalling control into Rail Operating Centres covering hundreds of track miles adds urgency to this question. It is interesting to note in a companion article in this issue (p70) that Network Rail Chief Executive Andrew Haines has scrapped plans to move control of the sensitive Thameslink core from West Hampstead power box to the ROC in Derby, as he is concerned that such a move risks losing a store of accumulated operating knowledge.

Another issue is so-called 'professional' driving. In the wake of accidents in the 1990s, understandably, more cautious driving techniques were adopted. For example, time was when a double yellow was noted but not acted on by the driver: braking was saved for a single yellow. Nowadays, a sunflower on the Automatic Warning System for a double yellow will prompt a brake application, in anticipation of a red (and the network is so congested that often that's a fair call). But early braking means it takes longer to clear the section for following trains.

Feathered off: an InterCity 225 leaves Doncaster on 9 July 2018. Russell Wykes

Some drivers will stop short of a signal 'to be on the safe side' – again, this means that when a proceed aspect is shown, it takes marginally longer to clear the section. New, less confident, drivers may want a straight section where they can see the greens stretching into the distance before they will let rip – another factor in reducing track capacity.

Coupled to the impact of professional driving are infrastructure layouts that in many instances were designed to cope with flows much less dense than those using them nowadays. The approach to Doncaster for up trains from Leeds, for example, was designed for a service half as frequent as today. Drivers creep up as they approach the signal on the curve into the station and track capacity is eaten up.

There are few easy answers: plainly, it is unacceptable to instruct drivers to speed up, while new layouts take time to plan and are costly to install. Cab signalling will improve things, but is still some way off.

A WAY FORWARD

The Railway Consultancy's observations showed that there is a genuine problem with excessive and variable station stops. As this article has shown, there are multiple reasons for this, but overlong dwell times can result in knock-on delays and poor performance over a wide area.

What is to be done? Regulating is one area to be looked at, and things like bike policy can be reviewed.

One conclusion we are drawn to is that there needs to be more realism about the timetable. 120 seconds are not enough at Peterborough when the average overstay is 13 seconds. Three minutes would give a cushion for added reliability.

This need not be a counsel of despair. Customer research has shown that passengers dislike delays three times more than they value journey time improvements: there can be a financial incentive through the farebox to implement a realistic timetable.