

## **Appendix D Rail Timetable Analysis**

# Allan Rail Solutions

**East Lothian Access STAG – Pre-Appraisal**

**Timetable Report**

**Reference 18/010**

**Date – May 2019**

# AllanRail

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## **1 Background**

This report has been prepared as part of a suite of reports to consider the railway issues and potential interventions that may be available to meet the emerging needs of the East Lothian area.

The key task for this timetabling report is to demonstrate possible options to increase the train services within East Lothian as part of the requirement to cater for planned growth in demand driven through increases in the number of houses and potentially also employment.

It seeks to set out the wider environment which influences the way in which local rail services can be developed and then examines changes to rail services that could be considered to cater for existing and potential future requirements.

It is, as befits a STAG Pre-appraisal, a high level resumé of the issues and what might be possible in a dynamic environment both in terms of rail services and local development.

It does suggest some early interventions and opportunities, as well as longer term options.

## 2 Long Distance Services

The East Coast Main Line (ECML) through the Borders and East Lothian to Edinburgh is one of the most important long distance rail routes on the British network.

It is a vital link between the two capitals cities: Edinburgh and London, which is a highly competitive route, where rail only has about 30% market share, compared with 70% for air.

But it also forms a vital link between virtually the whole of Scotland and the key eastern English regions of the north east and Yorkshire, with a wide range of connections available at Edinburgh Waverley station between internal Scottish services and the cross border trains.

The current service pattern has gradually evolved over time with two distinct operations:

- London orientated services provided now by London North Eastern Railway (LNER) which are currently owned by the DfT although operated at “arm’s length”.
- Services to Leeds, the Midlands and South west of England operated by CrossCountry Trains (XC), who are owned by Arriva a subsidiary of Deutsche Bahn (DB) - although DB have recently announced their desire to sell Arriva.

The current services are now broadly:

- Two LNER trains per hour to/from Kings Cross one with limited stops (Berwick, Newcastle, Darlington and York) and the other which is a bit slower as it has additional calls – Alnmouth instead of Berwick, Durham, Northallerton, Doncaster, Newark and Peterborough. A few services operate beyond Edinburgh to Glasgow (one a day), Inverness (one a day) and Aberdeen (three a day). There are some minor variations in calling patterns and start/end points in the south at start and finish of service.
- One XC train per hour on their core axis of Edinburgh – Newcastle – York - Leeds – Sheffield – Derby – Birmingham – Bristol – Exeter – Plymouth. There are other calling patterns and trains can reach as far as Penzance and Dundee and Aberdeen. Services are varied at start and end on the day and there are calls variously at Dunbar, Berwick, Alnmouth and Morpeth between Edinburgh and Newcastle. CrossCountry advise that it is not anticipated that there will be any material changes to the pattern of service in the short to medium term. In particular, it is not anticipated that any additional stops at Dunbar will be added once the new down platform is complete in the autumn. They noted the possible opportunities of an East Lothian long distance Park and Ride but expressed the view that slotting another call into their already complex timetable is very complicated. They also considered that

additional local services are likely to require additional infrastructure, and raised concerns about the risk of local services causing disruption to their trains which can then spread all over the network.

However there are significant changes now committed:

- TransPennine Express (TPE) have advised that they are planning to operate their current hourly Liverpool – Manchester – Leeds – York – Newcastle trains through to Edinburgh, also hourly, calling only at Morpeth. This is contracted with DfT as part of their franchise award and is planned to start operating in December 2019. There are no plans to call at stations in East Lothian, although the possible Park and Ride station call was of some interest. TPE stated that they will operate the first train north out of Newcastle in the morning and the last train south from Edinburgh in the evening. The possibility of calls at Reston and East Linton was mentioned but TPE are concerned that end-to-end journey times need to be maintained so that they remain competitive. It was noted that TPE's franchise only has four years to run (terminating on 31 March 2023), although there is a two year extension option. Thereafter the franchise will be let by Transport for the North (TfN) not DfT and they may have different views. The extended trains will be to and from Liverpool and will be operating at 125mph north of York (compared with 100mph at present), which will result in earlier arrivals and later departures from / to the south at Newcastle. The train service is unlikely to change in its place on the clockface, so this suggests that the new TPE services will provide a better spread of long distance services but will also use a lot of spare capacity in East Lothian. This may prevent the operation of a second North Berwick service necessary to provide a half hourly frequency.
- First have also recently announced the purchase of new Hitachi 5 car 125mph electric multiple units for new Open Access service (i.e. not operated under a Franchise Agreement with the DfT) between Kings Cross and Edinburgh. They plan a “no frills” single class service, directly competing with air travel. It will have a limited calling pattern: Stevenage, Newcastle and Morpeth, a journey time of around four hours and is also offering an earlier arrival into Edinburgh (before 10 00) from London than is offered by the current LNER service. First stated that their priority will be to introduce the new service in accordance with their Track Access Contract and they are unlikely to consider other calls until the service is operational and has settled down as a high performing operation. They also noted that as an Open Access Operator any decisions to add calls will be based on delivering a commercial betterment to First.
- With the completion of the remodelling of Kings Cross station and other major infrastructure works including the construction of a “dive under” at Werrington Junction (north of Peterborough) a revised LNER timetable is to be developed for December 2021. This will also take advantage of the faster acceleration of the new

Azuma trains which are about to replace the current LNER rolling stock. Whilst the quantum of trains is unlikely to change greatly, their place on the timetable almost certainly will.

The key point for local East Lothian train services is that the planning base is not firm and assumptions made now may not be valid in the future, especially post the planned December 2021 timetable changes. Conversely knowing that these changes are going to happen may permit a more holistic view to be taken when planning the combined local and long distance timetables which then enables East Lothian's requirements to be considered. However timetable considerations along the whole 400 miles ECML and also on the routes to Liverpool / Manchester and Birmingham / Bristol will need to be taken into account, including notorious pinch-points such as Welwyn Viaduct in Hertfordshire.

### **3 Existing local service (Edinburgh - North Berwick and Dunbar)**

The existing local services in East Lothian have been in a constant state of change over the past forty years.

#### **North Berwick**

The nadir was in the early 1970s, there were only two trains on weekdays morning from North Berwick and one early morning departure and one evening peak departure (at 17 26) from Edinburgh. These called at the three local stations, Drem, Longniddry and Prestonpans. Drem had additional services, comprising Dunbar/Berwick/Newcastle local services on the ECML.

On Saturdays there were additional trains providing a broadly hourly service in the afternoon and early evening with a summer only morning return working.

The service gradually improved with more services and the construction of Musselburgh (1988) and Wallyford (1994) stations increasing ridership on the route by ¼ million by the turn of the century, but now less than twenty years later their combined passenger numbers are over ¾ million and are the busiest intermediate stations on the route.

The North Berwick branch was electrified in 1991 with the ECML electrification project, as a locally funded add-on, part funded by Lothian Regional Council. It was operated with cascaded obsolete and redundant class 305 electric multiple units (emus) from London Liverpool Street services, which provided more capacity on what had become an overcrowded route.

Since then there has been little change to the train service, although the increasingly unreliable 305s were replaced with more modern trains, - initially class 322s which were originally built for the Stanstead Airport express services. They offered little increase in capacity, but were similar to the other emus operating in Scotland. Platforms were extended to cater for 6 x 20m car trains (the original plan was to use class 318s from the west of Scotland) but this failed to materialise due to demand pressures elsewhere.

Finally North Berwick services received their first new build emus with a share of the 4 x 23m car class 380s which were built to upgrade the Ayrshire and Inverclyde services. These offered a little more capacity because of their 23m long bodies.

They have, in turn, recently been replaced by trains from the Edinburgh based class 385 fleet which is being provided to serve the newly electrified routes west of Edinburgh to Glasgow (via Falkirk, Cumbernauld and Shotts), Dunblane and Alloa. These will operate in multiple providing 6 x 23 m coach trains and much needed extra capacity.



The through workings across Edinburgh, which have occasionally been suspended for major engineering works are now being largely withdrawn, due to the lack of fit between 6 car North Berwick services and the 3, 4 or 8 car services operated to the west. There is no electrified location immediately to the west of Haymarket station capable of holding a 6 car 385 train for reversal. There are now significant pressures on track capacity between Waverley and Haymarket, especially on the south lines, so a short working from North Berwick may not be the best use of scarce track capacity.

There remain a large number of trains between Waverley and Haymarket, so connections should be quite effective, but public timetable journey planners will still plan to the 15 minutes connectional allowance at Waverley station and the time taken to negotiate potentially two sets of ticket barriers will add to delay and uncertainty.

## **Dunbar**

ScotRail continued to provide limited local Edinburgh – Dunbar services until 1990s with some services being provided by InterCity trains. The ScotRail trains were withdrawn and some additional InterCity calls added as part of BR's response to the general downturn in ridership following the recession that occurred in the early 1990s.

Midday off-peak ScotRail trains were introduced from 2010 using spare capacity in the North Berwick fleet. Some additional services and adjustments have taken place subsequently with calls added at Musselburgh to serve Queen Margaret University. The pattern remains broadly hourly, alternating ScotRail and XC services with some additional LNER trains in the peak periods, which provide Dunbar with high quality, non-stop, fast connectivity to central Edinburgh with journey times of around 25 minutes. XC suggested that they will not change the quantum of their services following the construction on the new down platform.

## **4 East Linton and Reston**

The Scottish Government have agreed to provide these stations during CP6, so it can be anticipated that both will require train services before March 2024. For practical reasons it would be desirable for the services that will be calling there to be included in the specification for the December 2021 recast, so that the timetable is planned holistically. That might require additional trains to be run, even if one or both stations are not opened by December 2021.

A new Edinburgh – Berwick upon Tweed ScotRail service is included as a “Costed Option” in the Abellio ScotRail Franchise Agreement, so there is already a timetable and known cost to government to provide this service. It is not known whether the times shown in this Costed Option remain viable. Appendix A shows this Costed Option.

### **East Linton**

The location of East Linton, between Drem and Dunbar suggests that it will be serviced by the existing ScotRail Dunbar local services. However, these are off-peak only, so additional peak services will require to be operated, requiring both additional trains and train crews.

Pathing of the existing local services to Dunbar between the long distance trains is tight, but the provision of one additional call at East Linton is unlikely to result in the timetable breaking down, although it will put pressure on performance. This will be much less of an issue in the up direction as the punctuality of the long distance trains at the start of their journey should be (as is) quite good. However for down trains the punctuality after running several hundred miles (up to 400 miles from London) from London, Birmingham and southwest England and Manchester and Liverpool is not likely to be so good. So the extended running time from calling at East Linton may well increase the impact on following trains, if they are running out of course. It is unlikely that many (if any) additional calls (other than the existing Musselburgh call) can be made. If they can be added the priority may well be any new Blindwells station first, if the plan to develop a new town centre and employment opportunities comes to fruition.

The consequence of this scenario suggests that there will need to be an hourly Edinburgh – Dunbar service to provide for East Linton and that will probably also squeeze the time window for the second Edinburgh – North Berwick service, which is needed to provide a half hourly frequency during the day. In turn this could potentially result in it not being able to call at all the intermediate stations.

### **Reston**

Reston station is between Dunbar and Berwick upon Tweed. No ScotRail train currently operates on this route section and if ScotRail were to operate train services to serve Reston

there would need to be a new service, almost certainly extensions of any Edinburgh – Dunbar services. These trains would run to Berwick in passenger service then empty to Tweedmouth Yard sidings to wait for their return working.

Pathing these extra trains may prove difficult as running all the way from Edinburgh to Tweedmouth (or back) may require a longer gap in the long distance trains than currently exists. So as well as the slightly longer running time they will need to include two stops, one at Reston and a terminating stop at Berwick, before running forward to Tweedmouth to turn round. Whilst it is anticipated that any following long distance train will probably be calling at Berwick as well the Train Planning rules will expect unrestricted running into the station for the following train, so the ScotRail train will need to be planned to be in Tweedmouth sidings before the following train arrives in Berwick.

However, the speed differential between Dunbar and Berwick is not as great as west of Dunbar. There are only 6 miles of the 29 miles between Dunbar and Berwick where the line speed is over 100 mph (top speed for a class 385) and the line speeds through the Grantshouse area are particularly slow for a main line. Conversely west of Dunbar, some 20 miles of the 28 miles have a line speed over 100 mph. As the class 385s will be shorter trains (3 or 4 x 23 m= 69 or 92 m) compared with the standard LNER (9 x 26m train = 234m) and even the shorter TransPennine trains (5 x 26m 130m) they are likely to accelerate out of the numerous speed restrictions more quickly, so reduce the speed differential even further between Dunbar and Berwick.

## **Possibility of calls made by other operators**

There is no reason why the calls at either or both stations have to be made by ScotRail services and Transport Scotland has aspirations for TPE to call, especially at Reston. However, TPE have other priorities at present such as complying with their franchise agreement for the TPE service extension from Newcastle to Liverpool. They are highly unlikely to call at these stations with their Kings Cross - Edinburgh Open Access Trains as it will not be commercially worthwhile for them.

## **Future Train Services Pattern**

The future train services at these two stations requires further investigation. They may have a material impact on the nature of the services that can be provided in the west part of East Lothian so the principles need early resolution for progress to be made in the west of the county.

## 5 New station for Blindwells

One of the potential solutions to the provision of high quality public transport links for the new community at Blindwells is a new station to serve the site. Prestonpans station is about 2 km to the west of the centre of the initial phase of Blindwells (BW1) but over 5 km from the centre of the potential second phase (BW2).

Two kilometres is beyond what would reasonably be considered a walking distance for regular use of a station and a considerable number of houses will be further away than that. Consequently the provision of an additional railway station to serve Blindwells represents a potential solution to meeting some of the travel demands of the new community.

In addition, the location of any new station can be incorporated into the urban form of the new town because it is all at the design stage. In doing so it can also be made accessible from Tranent, where the current access to Prestonpans is quite poor and can help to reduce traffic and car parking in the residential area close to Prestonpans station.

A new station here would also be better placed to serve Cockenzie and especially Port Seton.

If the second phase (BW2) is developed and the aspirations to grow employment at Blindwells are realised then the justification for new station grows.

The spacing from Prestonpans is potentially going to be quite close – about 2 to 2½km which is slightly less than the distance to Wallyford, west of Prestonpans, which are less than 1¾ mile (2¾ km) apart. Whilst perhaps less common on main lines this station spacing is in line with the new Midlothian stations on the Borders Railway and also in west Edinburgh.

The addition of a new station into the existing North Berwick train service will increase the speed differential between the stopping trains and the non-stopping trains, by adding an extra two minutes into the running time of the stopping trains.

One solution to this is to not call at Drem at the most critical times, but that may not resolve all of the issues depending on the structure of the cross border services. The alternative would be to relocate Drem onto the North Berwick branch which would reduce the occupancy of the ECML back to its current level but increase the occupancy of the North Berwick branch by potentially two minutes a train, which would be a further eight minutes if two trains per hour were run. There is a potential further mitigation which is to increase the line speed from the current rather pedestrian 50 mph to potentially 75 mph or even 90 mph. This will not mitigate the whole of the additional time that the branch is occupied but it is likely to reduce the increase to perhaps four minutes or even less if 90mph were chosen.

This may be possible with the current timetable and rolling stock in use on the ECML, but with the advent of the Azuma fleet and assuming full electric power capability<sup>1</sup> it is anticipated that their superior acceleration will eat into the speed differential making it potentially more difficult to operate the local service without impacting on the non-stop trains.

Whilst most of the operation is simple double track there are five places where conflicts arise with trains in opposite directions:

- The North Berwick branch, where the minimum occupation time is in excess of 20 minutes for a round trip, allowing only a minimum turn round time – suggesting that two trains per hour is the maximum capability of the branch;
- Drem Junction where trains from North Berwick cross trains from Edinburgh to Dunbar, Berwick and further south;
- Monktonhall Junction where trains from North Berwick cross trains from Millerhill freight yards;
- Portobello where trains from North Berwick cross trains going to Tweedbank;
- Abbeyhill/Edinburgh where trains need to cross to find suitable platforms and to change from the down direction on arrival to the up direction for departure.

The resolution of conflicts is a major part of the detailed development of a timetable and will vary year by year as timetables evolve. At this stage it is sufficient to be aware of the critical constraints such as the capacity limits of the North Berwick branch.

There are some difficult decisions to be made such as balancing the needs of the local communities in East Lothian against particularly the need for an additional Edinburgh – Newcastle TransPennine service, or more importantly the need to secure the fastest journey times for these trains. Even more is the case for First's new Open Access service the case for which was based on price competition rather than fast journey time. So, based on the Regulator's decision a case could be made that the local service takes precedence over the Open Access service.

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<sup>1</sup> The present power supply requires an upgrade to provide sufficient power for all the new cross border electric trains.

## 6 Reopening the former Haddington branch

A walkover of the former alignment of the Haddington branch line has indicated that it could be re-opened relatively easily to a point just to the north of the A1 bypass at the west end of Haddington. It would not have a large walk in catchment and would need to function more as a Park and Ride station, possibly with the local town buses, run by Prentice of Haddington, calling at the station.

Train operation through to the former station site would potentially be possible but with a considerable cost to drive the railway under the A1 close to the west Haddington interchange. Additionally there is an issue with a potential new level crossing over Gateside Road, something that is generally not permitted on new or re-opened railways.

There are three potential modes of operation for a re-opened Haddington branch:

- **SHUTTLE:** Operation as a shuttle to Longniddry to connect with Edinburgh – North Berwick trains ( either as a conventional heavy rail or a light rail operation) which could be at a half hourly interval;
- **TWO TRAINS PER HOUR:** An hourly Edinburgh – Haddington service on the opposite half hour to the Edinburgh – North Berwick service providing a half hourly interval service for stations from Longniddry to Musselburgh inclusive into Edinburgh;
- **FOUR TRAINS PER HOUR:** A half hourly Haddington – Edinburgh service interspersed with a half hourly Edinburgh – North Berwick service giving at least some stations from Longniddry to Musselburgh inclusive four trains an hour.

### SHUTTLE

The major benefit of a shuttle operation is that it permits the existing North Berwick service to continue as now and almost certainly to become half hourly which is the desirable outcome.

As a heavy rail operation this option is not a very productive use of expensive rolling stock and train crews. It is unlikely to be particularly attractive to users because of the need to interchange at Longniddry and almost certainly could not support access under the A1 to reach Haddington town centre. So it offers the least desirable outcome for passengers.

As a light rail option, which could use the pedestrian subway to get under the A1, it offers a more attractive option to users and at a significantly lower capital and operating cost. In addition, it would allow the benefits of a half hourly Edinburgh – North Berwick service to be retained.

## TWO TRAINS PER HOUR ON THE ECML SECTION

In this case the Haddington service effectively replaces the second North Berwick service for the last part of its journey to Drem (if it calls there) and North Berwick. The Haddington branch will make it easier to add trains onto the ECML because they will turn off the mainline about eight minutes earlier, if the Haddington branch junction is located to the west of Longniddry, thus significantly reducing the time window required to operate the local train between the faster cross border trains. However, one train per hour for both North Berwick and Haddington is unlikely to adequately serve the needs of these communities. Moreover, there would also be an issue with the North Berwick services in the peak periods when it is broadly half hourly and likewise on Saturdays.

This is not considered to be a potentially viable option as it will provide a worse service to North Berwick whilst also not providing a suitable service at Haddington. It is operationally viable in terms of the ability to timetable it, but not commercially or functionally acceptable.

## FOUR TRAINS PER HOUR ON THE ECML SECTION

With the four trains per hour option it is suggested that the Edinburgh - North Berwick service is operated at a half hourly frequency and that an Edinburgh - Haddington service is also operated on a half hourly frequency. This could be part rotated through the clock face to provide a 15 minute frequency service west of Longniddry, which would be consistent with aspirations to enhance public transport provision and encourage modal shift from cars.

However, this presents wider structural issues as the Haddington service would need to present off and onto the ECML mirroring the North Berwick services. These are off peak broadly on the hour or at xx 01 eastbound turning round at the North Berwick and passing Longniddry west bound at broadly xx 41. If this were shifted broadly 15 minutes for the trains to Haddington one would go onto the branch at xx 15 and come off at xx 25 or xx 55 and the next one would go on at xx 45. So there is either an impossibly short period on the Haddington branch or there will be two trains on the branch at any one time, possibly at the terminal station, which will require additional infrastructure.

This is all without considering the implications of finding paths amongst the four fast long distance trains an hour along the ECML and then platforming them in Edinburgh.

The provision of some four tracking as included in wider Transport Scotland / Network Rail policy would help with these train pathing issues at the “country” end allowing local trains to be slotted in-between faster trains where that is not possible with the current infrastructure. However, it is not clear that there will be sufficient infrastructure at the city end, through Calton Tunnels, Abbeyhill, Craightinny and Portobello Junctions. As currently presented there still appears to be a bottleneck between Wallyford and Portobello Junction, possibly to Abbeyhill Jn where there does not appear to be any proposals for capacity

improvement. This is also where the speed differential between stopping trains, with their two local calls, and non-stopping trains is the greatest meaning the use of the available capacity will be inefficient.

See **Edinburgh Approaches** below for more details

Overall this suggests that the re-opening of the Haddington branch is, at best, a medium to longer term option and is likely to be dependent on other infrastructure upgrades.



## 7 Cross Edinburgh

The extension of peak North Berwick trains to and from Haymarket has long been a feature of the service, which has been heavily used by passengers, especially school children and increasingly by commuters going to work in the financial sector companies that have developed to the west of the city centre.

The service has been interrupted during major engineering works, latterly for the closure of one track through Haymarket North Tunnel to complete electrification clearance works and before that when the Waverley west end throat works were being undertaken.

For twenty years from the start of the electric services to North Berwick in 1990 to the opening of the Airdrie – Bathgate link in 2010 this was the only electric suburban service operating in the Edinburgh area. Consequently the rolling stock was self-contained and cross Edinburgh services were generally only operated as far as Haymarket and were then sent forward empty to Slateford to reverse using the sidings there.

When the new Class 380s were introduced to North Berwick to incorporate them into the wider Ayrshire and Inverclyde fleet selected trains started operating across Edinburgh to Glasgow Central via Carstairs and the timetable was largely planned to provide cross Edinburgh peak services by linking these two services, thus reducing the number of trains stating or terminating at Haymarket. At this time there was a fleet of 4 car class 380s fitted for Guard operation which were reserved for the North Berwick services whilst the remaining class 380s were only equipped for Driver Only Operation (DOO).

This helped reduce the pressure on paths on the heavily used Waverley – Haymarket route section where there are normally 23 trains per hour in each direction.<sup>2</sup>

The use of this route section for North Berwick trains that terminate at Haymarket is no longer tenable given the pressure on capacity from further afield.

Moreover, with the advent of 6 car peak trains to meet the rising demand in May 2019 the through services are going to be curtailed because there is no suitable location to reverse the longer trains.

However, there is still a demand at peak times for travel from the stations on the North Berwick route to Haymarket and also further west to Edinburgh Park, South Gyle and Edinburgh Gateway for the large concentration of employment located in that area.

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<sup>2</sup> The route section between Waverley and Haymarket has the following regular train service during a standard hour: 4 x E&G, 4 x A-B, 4 x Fife locals, 2 x Dunblane, 2 x Glw via Cumbernauld, 2 x Glw via Shotts, 1 x Glw via Carstairs, 1 x Carlisle and south, 1 x Perth/Inverness, 1 x Dundee, 1 x Aberdeen. Total 23 trains per hour, split broadly 14 south lines, 9 north lines. 14 trains an hour is generally considered to be the realistic limit for operation throughout the day, with 16 being possible for limited peak hours.

Rail is well suited to this flow as bus travel will suffer congestion on both sides of the city and it is desirable to offer a rail option to reduce the traffic along the A720 Edinburgh City bypass and through key congested junctions such as Oldcraighall and Hermiston (noting that Sheriffhall is to be upgraded by a grade separated junction).

Connections at Waverley to / from Haymarket are facilitated by the very large number of trains running between the two stations and likewise to Edinburgh Park which has 8 trains per hour, but there are only 2 an hour to South Gyle (more at peak times) and 4 an hour to Edinburgh Gateway.

For through trains to operate from the North Berwick route to / from the west of Edinburgh it is clear that these cannot merely be short extensions of the North Berwick trains, because of the pressure on paths immediately west of Waverley station. So it can only be achieved by linking two services across the city, which also has the advantage of easing the pressure on platform space in Waverley station

There are two issues with the operation of through trains from North Berwick to west of Edinburgh:

- matching the rolling stock requirements; and
- risks to train performance from crossing linking routes.

With the arrival of a substantial fleet of class 385s based in Edinburgh there will be a number of potential routes to cross-link with the North Berwick route including Shotts, Edinburgh - Glasgow shuttle services, Glasgow via Cumbernauld and Dunblane equating to a total of 10 trains per hour.

The current plan for the North Berwick service is 6 car trains which is limited by the platform length at North Berwick. However, the Edinburgh - Glasgow shuttle services will be operated by 8 car trains once the platform lengthening works are complete at Glasgow Queen Street station in 2020. These trains do not call at Edinburgh Park.

The Shotts line is only likely to require 3 car trains generally with perhaps one or two 4 car peak trains. The Dunblane and Cumbernauld services will generally only require 3 car trains during the day with some 4 or 6 cars trains possibly required in the peaks.

The Airdrie – Bathgate trains are operated by a fleet of DOO equipped class 334s which are primarily Glasgow area suburban units which are only 20 m long and if used on the North Berwick route would reduce capacity by effectively a single coach compared with the 385s. Additionally the acceleration of the 334s is not as good as the 385s which might cause difficulties in planning a timetable on the ECML. Consequently they are unlikely to be viable for operation on the North Berwick route and these two routes are not considered compatible for linking.

As the Fife routes remain diesel operated they are not considered suitable to link with the North Berwick route, although they could (and do in the peaks) cross link with the Borders Railway services.

So the opportunities for cross-Edinburgh working would appear to be limited to the Glasgow via Cumbernauld and Dunblane services west of Edinburgh. Even here the risks are that the resource requirements of the different routes results in a lot of vehicles miles being run, with their attendant costs and environmental impact, for a relatively small outcome.

If it is assumed that it is possible find a cost effective method of crosslinking the services the issue of reliable train performance still has to be considered. As a minimum a station dwell time in Waverley is required that is considered adequate to absorb “normal” levels of late running from the incoming route so that it is not transmitted on to the outgoing route. A minimum of five minutes is probably required, but this needs detailed appraisal to determine it precisely with the possibly more time would be required in bound from North Berwick. This would be because of the risk of longer delays due to late running on the long distance ECML, compared with east bound services which, given that the routes to the west of Edinburgh are shorter, should not suffer such long delays.

Add to this the potential mismatch of inbound into Edinburgh times with the linked outbound time and there is a risk that it may not be possible to crosslink service through Waverley station.

Crosslinking of two terminating trains to form one through train can be very cost effective in terms of rolling stock utilisation and also train crew use. However, on the North Berwick route it may be that the capital costs saved through the efficiencies of cross-linking services are lost as a result of running longer trains than required for the demand over parts of the routes for much of the day.

In conclusion, whilst it is a desirable and laudable concept it may prove difficult to deliver in practise on the current or currently planned infrastructure.

## 8 Four tracking and/or possible High Speed Lines

There has been a growing recognition that there is insufficient capacity on the ECML through East Lothian and on to the border. This was first recognised in Network Rail’s 2016 Scotland Route Strategy and included in the subsequent Strategic Business Plan published in 2018<sup>3</sup>.

This issue has continued to be recognised so that is included in the Transport Scotland’s policy document Scotland’s Railway (Control Period 6: 2019-2024)<sup>4</sup> where reference to is made to “wider connectivity improvements from East Lothian and the Eastern Scottish Borders into Edinburgh and improvements for passengers and freight travelling to and from England”.

The original concept was the simple addition of two tracks to the existing railway alignment from Prestonpans to Drem. However, it has been recognised that this may not be the best option and that the addition of more capacity might be better achieved by the construction of a completely new railway, which would be both shorter and aligned for higher speeds. Such an alignment would extend towards East Linton / Dunbar at the east end and pass closer to Haddington than the existing railway, very broadly following the A1, rather than the ECML.

These offer two different solutions to achieving broadly the same objectives and are in the Transport Scotland “Pipeline” process which will look at the relative merits of both approaches.

However, if a decision is taken to provide four tracks this is a long-term option, with a likely minimum potential opening date of 2030 (based on the recent successful and relatively quick delivery of the Airdrie-Bathgate scheme) but is possibly post HS2 completion (i.e. 2035 – 2040).

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<sup>3</sup> <https://www.networkrail.co.uk/who-we-are/publications-resources/strategicbusinessplan/#downloadall>

<sup>4</sup> <https://www.transport.gov.scot/publication/scotland-s-railway-control-period-6-2019-2024/>

## 9 Edinburgh Approaches

There is little material publically available to indicate what is planned for the Edinburgh approaches, which for the purposes of this analysis are considered to be from the end of any potential four tracking at Prestonpans through to Waverley station.

The known proposals are for Portobello Junction, where providing a double junction and increasing the maximum permitted speeds will provide a little more capacity on the up ECML and potentially quite a bit more on the down line. In addition, the Currie Electric Traction Power Feeder upgrade will boost the power available to handle all the electric trains in the Edinburgh area and along the ECML.

The constraints of the Borders Railway single line sections will make it challenging to plan the desirable, capacity maximising, parallel moves through Portobello Junction.

The speed differential between Waverley station and Prestonpans is significant. Currently a stopping train travelling from Waverley takes 13 minutes to arrive at Prestonpans whereas a non-stop Voyager express (which appear to offer the fastest acceleration of existing trains) is passing through in only seven minutes, creating a speed differential of six minutes. Extending the four tracking to Wallyford would mean that a ScotRail train would arrive at Wallyford in ten minutes and the Voyager pass in six minutes, giving a differential of four minutes. If the four tracking were to extend as far west as Monktonhall Jn a ScotRail train would pass in five, with the Voyager passing in seven and a half minutes, a differential of only two and a half minutes.

This suggests that it is desirable to include Wallyford in the proposed four tracking as it would reduce the “dead” time left behind a North Berwick train to the minimum, but with sufficient time to insert a Borders Railway service if that were the optimum time for this route. Freight considerations might suggest that extending the four tracking to Monktonhall Junction would be beneficial, especially in the down direction.

From Portobello Junction to Abbeyhill Junction just east of Edinburgh the two track railway will be something of a constraint, but trains will be passing at similar speeds so capacity will be higher than those parts of the ECML where stations are located.

The major constraint is the two parallel single lines on the final approaches to Edinburgh Waverley from Abbeyhill Junction through the Calton Tunnels. These constraints are such that they can and often do impact on the smooth flow of trains through the double track section for trains arriving in Edinburgh.

The two single lines effectively extend the station throat over more than half a mile and there is significant wasted capacity when consecutive trains are handled in opposite directions. Limitations on platforming remain in spite of the provision of the two new

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platforms (5 & 6) as these platforms are accessed from the North Tunnel, whereas when 8, 9 & 11 (which were in use for East Coast trains) used the South Tunnel with 11 having the option of using both tunnels. Now there will be relatively little traffic able to use the South Tunnel.

This will be a major constraint that is being considered by Network Rail as part of both the Waverley station masterplan and their work for Transport Scotland on the whole of Edinburgh to the Border route section.

It is not anticipated that any physical changes will happen in the current five year control period to 2024.

In the short term it is considered that extra demand could be catered for by extending trains to eight coaches (2 x 4 car sets), which will require a platform extension at North Berwick to enable eight car trains to be fully platformed as the regulations require that terminal stations have to be able to accommodate the whole of the train on the platform. In addition, at least a few of the platforms at the busier stations would also need extended to ensure that passengers are able to board and alight from the longer trains and make full use of the extra capacity. This would also minimise any risk of the extra passengers increasing the station dwell times because of the limited numbers of doors in use on short platform stations.

## 10 Options for Tactical and Strategic Interventions

This overview suggests that there are a range of potential rail interventions that could assist in meeting the travel needs of the growing population of East Lothian. It also demonstrates that the timescales for delivery can be extended over potentially 20 years.

This section attempts to identify the options that can be considered for early interventions and which will take longer. An important part of the strategic approach is that the earlier tactical interventions should, if possible, all contribute to the longer term strategic outcomes and that “stranded investment” is minimised or eliminated.

### Early interventions – Tactical – from now into early 2020s

The stations in East Lothian have highest concentration of hourly frequency train services in the Central belt with the only other stations that have a base of an hourly frequency being:

#### Station                      Annual Passenger Demand 2017/18 - Source ORR

#### Edinburgh –Glasgow via Shotts

Slateford	34,004
Kingsknowe	20,452
Wester Hailes	41,322
Curriehill	69,340
Kirknewton	50,202
Addiewell	19,616
Fauldhouse	38,612
Breich	102
Hartwood	13,566
Cleland	87,614
Carfin	124,146
Holytown	129,128

#### Fife

Cardenden	52,374
Lochgelly	65,934

#### Central Scotland

Alloa	388,194
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Comparison with the North Berwick line stations shows that the annual passenger demand is much higher:

<u>Station</u>	<u>Annual Passenger Demand 2017/18 - Source ORR</u>
Drem	120,316
Longniddry	195,290
Prestonpans	270,028
Wallyford	316,948
Musselburgh	488,636
North Berwick	599,788

This strongly suggests that a move to a ½ hourly frequency should be an early objective both to boost off peak use and to provide capacity in the shoulder peaks by spreading the loads out over longer periods.

Early assessment suggests that there may be potential paths although the operation of the two hourly ScotRail Dunbar services does appear to impact on the potential paths.

It is possible that not every station will be able to be served by the additional trains, in which case a priority of calls would need to be established, with number of passengers being the initial indicator of any ranking.

It is suggested that service enhancements could include an earlier start in the morning, inter-peak frequency and post evening peak frequency improvements, with the key objectives of improving connectivity, not just to Edinburgh but more widely to attract users whose work or education links range across Scotland and further afield.

This would need to be worked up in detail with ScotRail.

It is suggested that East Lothian Council make this request of Transport Scotland, as a matter of some urgency, to ensure that this aspiration is included in forthcoming timetable developments. A Business Case will need to be presented which can be built up through the completion of the STAG process. This would need the active involvement of Transport Scotland and ScotRail / Network Rail as it would be a franchise change and there are special arrangements for dealing with franchise changes.

A further reason for making this request is that there may be “Penalty” discussions about recompense following the very poor performance of the franchise over the past year. It may be that a service upgrade of this nature could be secured under such arrangements.

The provision of train services to the new stations at East Linton and Reston should be considered as part of any package solution.

Separately the possibility of some long distance cross-border trains calling at a Park and Ride station in East Lothian may assist with the wider strategic development of the area, offering improved connectivity to large areas of England, potentially including London.



## **Medium term – mid-2020s**

A potential station at Blindwells is likely to be a medium term solution as it requires time for appraisal, design and delivery.

As has been discussed it is not a simple task to incorporate an extra station into the North Berwick train services, as there are wider timetabling impacts.

A potential mitigation of the timetable impact could be the relocation of Drem station onto the North Berwick branch, to ensure that the ECML is only occupied for the same length of time as now. This will require an appraisal of the most suitable location, given the current use of the existing station and also the potential offered by relocation, particularly in the context of a Park and Ride station to better serve North Berwick and the adjacent coastal villages.

As moving the station onto the North Berwick branch increases the occupancy of the branch this further reduces timetable flexibility. Moreover, the two minutes extension in each direction to the journey times will reduce the turn round time available at North Berwick.

The potential to increase the line speed (possibly up to 90mph) should be an option that is considered as part mitigation of these operational impacts. It would also reduce the journey time increase for North Berwick passengers arising from adding Blindwells stops into the service. As North Berwick has the most passengers of any station along the route this would neutralise one of the big negative aspects on the Business Cases that arises from adding new stations.

It is suggested that Blindwells station is developed as potentially a package of measures including:

- the station itself;
- potential line speed improvements on the North Berwick branch; and
- potentially the relocation of Drem station.

## **Long term – Strategic direction**

In the longer term there is a possibility of more capacity being provided on the railway through East Lothian and in the surrounding areas. The most tangible is the current investigation into a possible High Speed line or adding an additional two tracks to the existing infrastructure – currently suggested as Prestonpans to Drem.

There is no clarity in the current plans as to what might happen. The early investigations into 4 tracking are likely to take place during the current five-year control period, so it is unlikely that anything significant will happen in terms of a decision on which option to adopt

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before the mid-2020s which, even with a strong drive to complete, suggests nothing will be operational before the 2030s.

It is suggested that East Lothian Council remains strongly involved in the development of this work, but that they need to reflect on the fact that it is not included as an infrastructure capability enhancement on which they can rely in the short to medium term.

David Prescott

27 May 2019

## **Appendix A Extract from Abellio ScotRail Franchise Agreement - Schedule 3 (Page 261)**

### **Priced Option 1 – Improved Services between Edinburgh and Berwick-upon-Tweed/Newcastle**

(a) Description, objective and specification

The Franchisee will maintain the current Passenger Service and overlay on it a two hourly off-peak daytime interval for the Dunbar service, extending it into the peak travel hours to provide additional capacity on the Berwick-Dunbar-Edinburgh axis. This will allow New Stations at East Linton and Reston to be served during the Peak as well as the Off-Peak when the current Passenger Service generally runs. It will also provide connections at Berwick into Up and out of Down Cross-Country trains as well as some East Coast services. Trains would run across the bridge to Tweedmouth in order to turn back without causing congestion at Berwick-on-Tweed station. Owing to pathing constraints, it will not be possible to use the new service to create an even interval service at Dunbar, but it will allow for a service in each to be provided from Dunbar in combination with the existing trains that call there, running between Dunbar at Edinburgh. Overall the new service will require one additional EMU diagram along and an increase in driver establishment of 12 drivers at Edinburgh along with relevant route learning costs.

References to Edinburgh are to Edinburgh Waverley station.

(b) Price for exercising the Priced Option

Please refer to the incremental price analysis contained in the Appendix to this Schedule.

(c) Timescale for implementing Priced Option

Twelve months from exercise of option.

(d) Other effects on this Agreement

None identified.

(e) Last date for exercising the Priced Option in order to maintain the price detailed in (b) above.

1<sup>st</sup> December 2018

## (Timetable Option EWD timetable)

<b>Start time</b>	<b>Start Point</b>	<b>End Time</b>	<b>End Point</b>
06.31	Edinburgh	07.30	Berwick
08.36	Edinburgh	09.33	Berwick
10.33	Edinburgh	11.30	Berwick
12.33	Edinburgh	13.30	Berwick
14.35	Edinburgh	15.32	Berwick
16.34	Edinburgh	17.31	Berwick
18.34	Edinburgh	19.31	Berwick
20.33	Edinburgh	21.30	Berwick
22.33	Edinburgh	23.30	Berwick

<b>Start time</b>	<b>Start Point</b>	<b>End Time</b>	<b>End Point</b>
07.41	Berwick	08.39	Edinburgh
09.47	Berwick	10.45	Edinburgh
11.50	Berwick	12.48	Edinburgh
13.47	Berwick	14.45	Edinburgh
15.47	Berwick	16.45	Edinburgh
17.48	Berwick	18.46	Edinburgh
19.47	Berwick	20.45	Edinburgh
21.47	Berwick	22.45	Edinburgh
23.44	Berwick	00.42	Edinburgh

## Option SuO Timetable

<b>Start time</b>	<b>Start Point</b>	<b>End Time</b>	<b>End Point</b>
08.36	Edinburgh	09.33	Berwick
11.36	Edinburgh	12.33	Berwick
14.36	Edinburgh	15.33	Berwick
17.36	Edinburgh	18.33	Berwick
20.36	Edinburgh	21.33	Berwick

<b>Start time</b>	<b>Start Point</b>	<b>End Time</b>	<b>End Point</b>
09.47	Berwick	10.45	Edinburgh
12.47	Berwick	13.45	Edinburgh
15.47	Berwick	16.45	Edinburgh
18.47	Berwick	19.45	Edinburgh
21.51	Berwick	22.49	Edinburgh