



GREAT NORTH OF SCOTLAND RAILWAY

ABERDEENSHIRE BACK ON TRACK

DETAILED CASE REPORT

JULY 2021

Fraserburgh

A' Bhruaich

Ellon

Eilean

Peterhead

Ceann Phàdraig

Strichen

Srath Eichin

Maud

Màd

Cruden Bay

Croch Dain

Banchory

Beannchar

Peterculter

Cultair

Newmachar

Machar ùr



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I Introduction

Aberdeenshire is poorly served by rail. Aberdeen is the third largest city in Scotland, yet has the least rail connections of all seven. Vast swathes of the region lost vital rail links to the Beeching cuts. Only two lines survived, one to Dundee, and another to Inverness. For the shire, even today only stations that happen to be on the routes between these cities are lucky enough to have access to rail. Only five of the region's 15 largest settlements have a railway station, together Aberdeen and Aberdeenshire have a population of nearly 490,000 people. Tragically, it was only a few years after the closure of the region's lines when the Oil and Gas industry took off, the opportunities rail could have brought were missed.

The loss of local rail has contributed to a deep sense of isolation felt in all corners of Aberdeenshire today. North East communities feel forgotten about, and disconnected from even the rest of Aberdeenshire. The historic areas of Buchan, Deeside, Garioch and Kincardineshire within Aberdeenshire are divided culturally and poorly connected physically. Ask anyone from the shire for their thoughts on rail, and you will find the same two responses: "The railway should have been rebuilt 20 years ago" and "It will never happen".

Public appetite for rail is extremely high, and we intend to demonstrate this. NESTRANS, the transport partnership for Aberdeen City and Shire, recently published their regional transport strategy to 2040. In it, they conclude that a rail link to Fraserburgh and Peterhead is economically unjustifiable. No other possible railway schemes in the area were investigated. In fact, for rail, the most ambitious recommendations are new stations on existing lines and scheduling improvements.

NESTRANS came to this decision because two commissioned studies in 2016 and '17 concluded that both connecting Fraserburgh and Peterhead to the rail network, and connecting only Ellon with a park and ride were "poor value for money". In this paper we will show how if these studies were undertaken again today, they would come to a different conclusion. The coming decades will be extremely difficult for the region. The inevitable downturn in the Oil and Gas Industry will hit hard, forcing the local economy to go through massive changes. We must take action now to allow Aberdeen and Aberdeenshire to take full advantage of the unique opportunities it has today, before it is too late. As the economy changes, so will peoples travel habits. We believe that the plan currently put forward by NESTRANS is insufficient to meet the needs of a changing North East.

Achieving modal shift from private car to public transport is an essential goal of NESTRANS, and the Scottish Government. This is our most powerful tool in the fight against the Climate Emergency.¹²⁵ For Aberdeenshire, this is not effectively achievable by road and bus improvements alone. Particularly in the Peterhead and Fraserburgh corridor we can see this clearly demonstrated, Stagecoach already provide buses of excellent quality, they have plush leather seating, at-seat charging points, and are much larger than the buses serving the rest of Scotland. Despite this, people still overwhelmingly choose to drive into Aberdeen, causing the traffic problems that NESTRANS are currently working to solve. Even if this were not the case, Trains are by far the most environmentally friendly method of transport available today¹, and considering that "in terms of future development, the Aberdeen City and Shire region is expected to be the fastest growing in Scotland over the next 20 years"², leaving the people of Aberdeenshire without a rail option is not compatible with the challenges ahead.

This document seeks to present, in detail, a realistic and ambitious package for implementing transformative public transport for the benefit of the entirety of Aberdeenshire and its local communities. We will explain how the situation has changed since previous rail studies were conducted, and how there is a compelling case for heavy rail links to Peterhead, Fraserburgh and Banchory. We will highlight the opportunities ahead for growth and prosperity, and show how these proposals will allow the people living here to take full advantage of them. It is exponentially more difficult to face these massive Economic challenges and the Climate Crisis together without significant modal shift away from the private car. Aberdeenshire simply cannot go another 20 years without new rail investment.

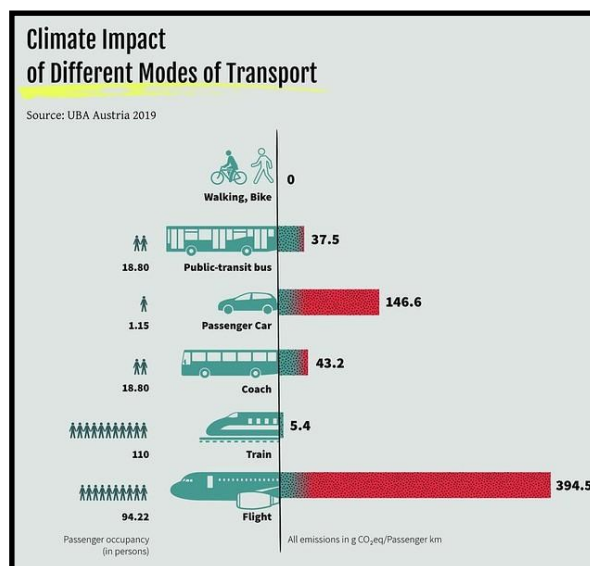


Fig 1.1 Climate Impact of Different Modes of Transport



1.1 About the Campaign

Campaign for North East Rail was formed in February 2021 following the release of NESTRANS' 2040 Regional Transport Strategy. We seek to demonstrate the demand for a heavy rail proposal that should have been built decades ago. This plan comprises reopening of the former Formartine and Buchan line to Fraserburgh, with a new branch to Peterhead from Ellon. Additionally, we propose reopening the Deeside Railway as far as Banchory, with an integrated bus service to Braemar. This major, yet deliverable intervention will set the region up for the difficult decades ahead, and breathe new life into forgotten communities. We will detail how this can be integrated into the current network with consideration given to capacity on existing lines and stations. This is the beginning of a campaign to ask the Scottish Government to finally address the lack of real alternatives to the private car in Aberdeenshire.

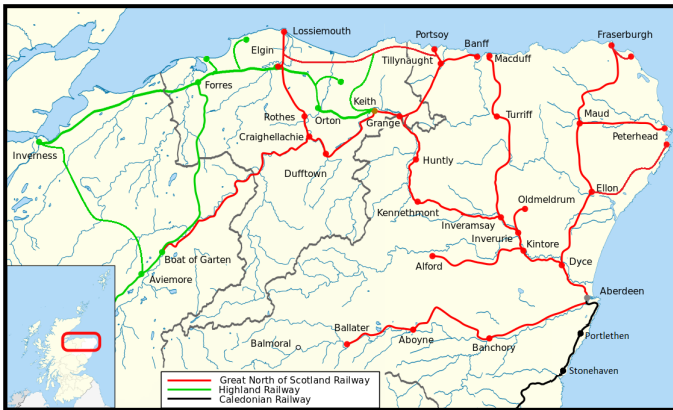


Fig 1.2 Railways in North East Scotland - 1903

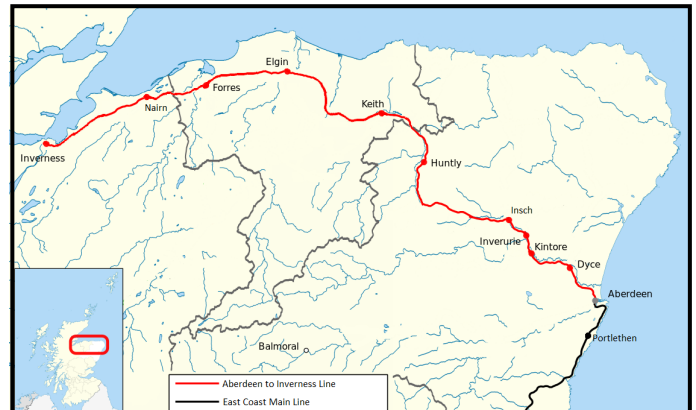


Fig 1.3 Railways in North East Scotland - 2021

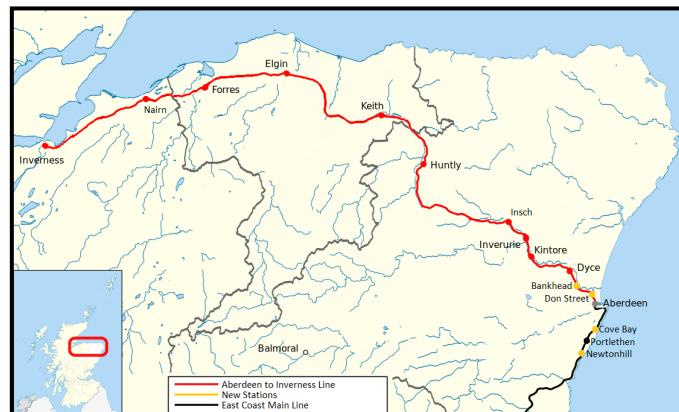


Fig 1.4 NESTRANS Recommendations to 2040



Fig 1.5 CNER Railway Proposals to 2040



2 About Aberdeenshire



Aberdeenshire is vast and has a varied economy. Historically it's economy was based on fishing, forestry and farming, but for decades now has overwhelmingly relied on Oil and Gas production. Fraserburgh and Peterhead to the north are well known for their reliance on the fishing industry, however Peterhead has benefitted from the Oil and Gas Industry much more than Fraserburgh has. Aberdeen itself has all but ceased landing fish since the rise of Oil and Gas. Both towns have been recognised as a regeneration priority in the Scottish Government's Strategic Development Plan.³ **These towns comprise the largest population, the farthest from a train station anywhere in Scotland.**⁶³ Between Fraserburgh and Aberdeen lies Ellon, home to two Global businesses, both of which were founded in Fraserburgh. One of these, Powerjacks, at the time of their move said "Our new geographical location will also give us access to new skills pools, helping us overcome the recruitment issues we have faced in recent years."⁸⁴ Today their facility has been bought by the second international business, BrewDog, which also moved away from Fraserburgh to be closer to Aberdeen. It is clear these towns struggle to attract skilled workers, and as such have lost businesses to areas closer to the workers they need. With the coming decline in the Oil and Gas Industry, and without significant investment in alternative industries, citizens of these towns will increasingly look towards the City of Aberdeen for job opportunities, this will increase the pressure on the already insufficient transport corridor to Aberdeen, and hamper efforts to reduce carbon emissions as travel numbers increase. Additionally, Peterhead is home to HMP YOI Grampian, a 500 offender prison, capable of holding young prisoners, and Fraserburgh is home to a sizeable NES College Campus. The only public transport option available in this corridor is the bus. Recent investment by Stagecoach has seen 'Buchan Link' buses improved, providing large, comfortable and modern buses provided on these routes. However, this has failed to deliver a significant modal shift, and transport problems continue.

Deeside follows the River Dee into the heart of the Grampian mountains, becoming "Royal Deeside" around Ballater and Braemar, thanks to Queen Victoria's affinity for the area. Deeside is extremely popular with tourists due to it's scenic beauty and Royal history. It is likely the reason Aberdeenshire is one of the most popular tourist destinations in the UK. The closer you are to Aberdeen, the more commuters there are, but the bulk of Deeside's economy is based on tourism, farming and forestry. The Royal connections in the area attract tourists from all over the world, and year round fans of the outdoors flock to the area to enjoy picturesque scenery, rugged mountains, and the UK's largest ski resort at Glenshee. The busy A93 runs from Aberdeen to Braemar before leaving Aberdeenshire and heading south. Like Buchan, the only public transport available is the bus. This results in car ownership in the area largely being unavoidable. The construction of Aberdeen's new deep water harbour at Nigg Bay is expected to attract larger cruise ships to Aberdeen,⁴ the bulk of visitors from these ships will be heading into Royal Deeside's attractions by road, further increasing the popularity of an already busy destination.

Tourism will undoubtedly be a major pillar of Aberdeenshire's economy in the future as the Oil and Gas sector contracts. Deeside is already popular and will only get more so as time goes on. Buchan has a strong array of tourist attractions, but has struggled to establish a viable tourism industry because of poor transport options. Reopening these railways will put these places on the map, growing a viable tourist sector in the North East, and helping to share the load as tourism increases. Considering that more than three quarters of tourists that visit Aberdeenshire come from the rest of the UK,⁶⁵ rail is by far the most efficient mode of travel for this particular type of journey.

Still, there is a considerable skilled workforce in the Oil and Gas Industry that will have to be redeployed into other industries. To do this, the Renewable Energy sector will have to grow in the North East. Aberdeen is investing heavily in Hydrogen Technology, and the new deep water harbour opening in 2021 will provide opportunities for this new sector to take advantage of. Without rail making living in these towns more attractive, Fraserburgh and Peterhead will struggle to compete with the city, and will lose out on investment in the Green Industry.



2.1 Population

Aberdeenshire has an estimated population of 261,210, making it the sixth most populous council area in Scotland, while having the fourth largest area. Figure 2.1 below shows the 15 largest towns in Aberdeenshire, towns served by rail are shown in green and are bold in Table 2.1, while those that aren't are shown in red.

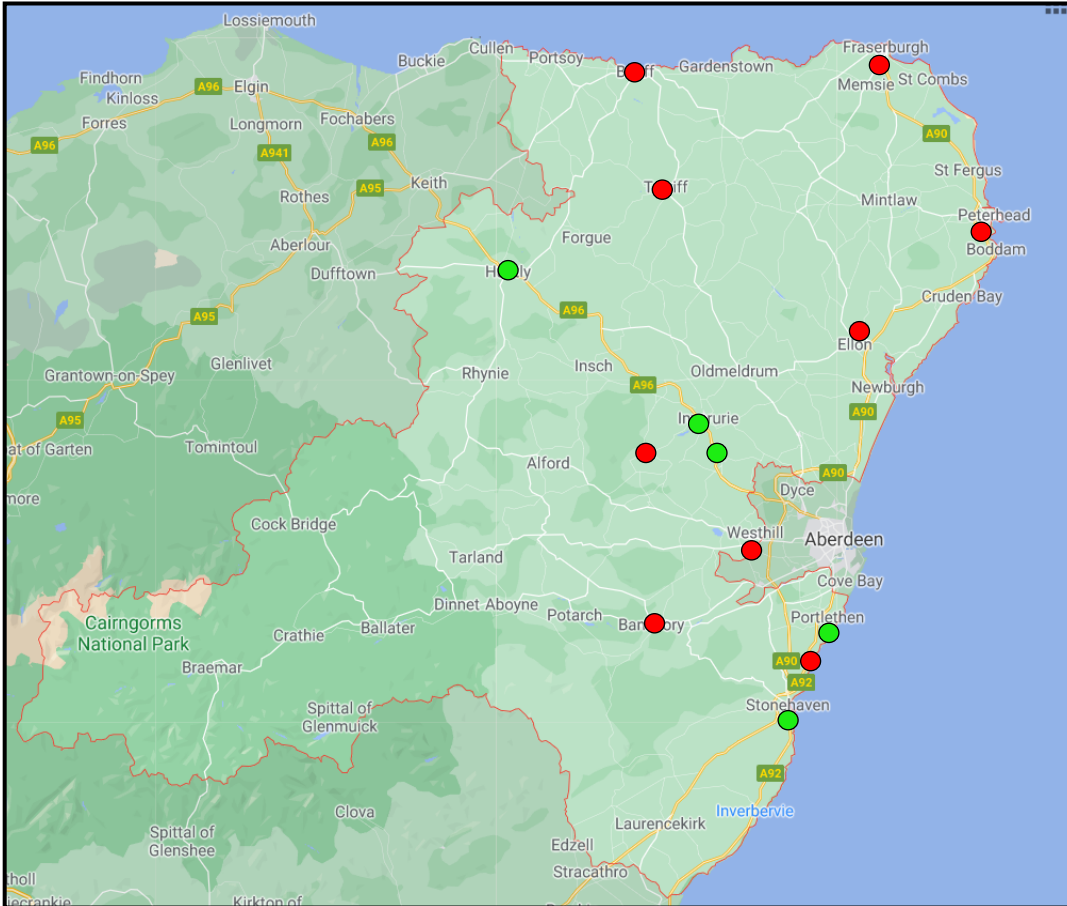


Fig 2.1 Location of the Largest Towns in Aberdeenshire by Population

Town	Population
Peterhead	19,270
Inverurie	13,640
Fraserburgh	13,180
Westhill	12,290
Stonehaven	11,170
Ellon	10,200
Portlethen	9,090
Banchory	7,560
Turriff	4,960
Huntly	4,810
Kintore	4,790
Banff	4,100
Macduff	3,950
Kemnay	3,870
Newtonhill	3,140

Tab 2.1 15 Largest Towns in Aberdeenshire by population.

2.2 Railways in Aberdeenshire

Aberdeenshire suffered heavily as a result of the Beeching cuts. What was once a well connected and expansive rail network has been reduced to nothing but inter-city lines. All but one of the largest towns in Aberdeenshire had a railway station in the past. The railways in the area were built by the Great North of Scotland Railway, and at their peak extended to every corner of the region. Figure 1.2 below shows the extent of the network in 1903. Today, the Formartine and Buchan line to Fraserburgh and Peterhead, and the Deeside line to Ballater are shared use paths, protected from further development. The remaining lines were sold off and are sorely missed, the decision to close them would never have been taken today.



Fig 1.2 Railways in North East Scotland - 1903

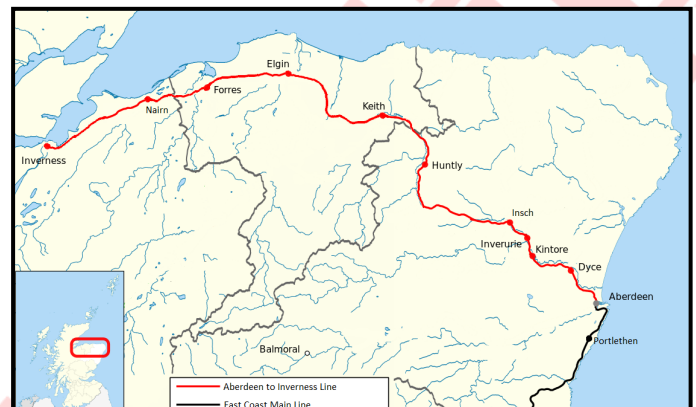


Fig 1.3 Railways in North East Scotland - 2021

3 Studies

NESTRANS is the transport partnership for Aberdeen City and Shire. In preparation for their 2040 Regional Transport Strategy they commissioned several studies into rail options for Aberdeenshire going into the next 20 years. Unfortunately, they have concluded that there is not a case for any new rail infrastructure in the area outside new stations on existing lines. In this section we will examine these reports and highlight why we believe they are wrong in their assessment.

3.1 2040 Regional Transport Strategy

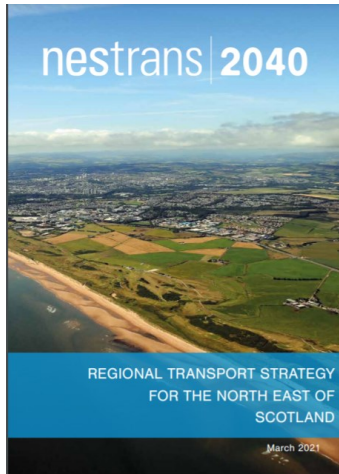


Fig 3.1 NESTRANS 2040 RTS

NESTRANS' 2040 Regional Transport Strategy sets out their vision for transport investment in the North East over the next 20 years. This document details the strategy for all modes of transport investment in this time frame, including rail options. In it, NESTRANS identify some key trends in Aberdeenshire over the past decade, here we highlight a few:

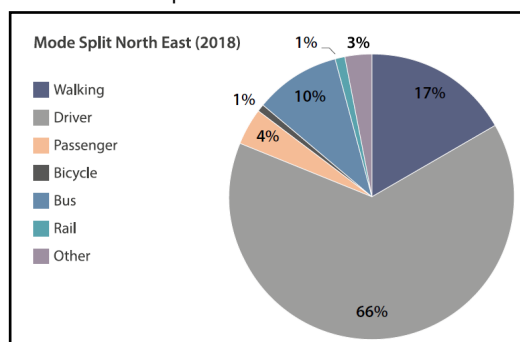
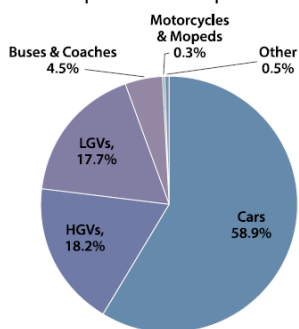
- Rail patronage increased 2011 - 2016, and then fell again 2016 - 2019, this is attributed to the economic downturn and disruption on the network during months long improvement works.
- Traffic has increased over the past decade, up approximately 5% since 2008.
- Freight volumes through Aberdeen and Peterhead harbours has increased 5% since 2005.
- 66% of residents in Aberdeenshire drive to work, higher than the national average.

In addition to these trends, NESTRANS highlight the wider policy context the RTS exists in, particularly:

*"In May 2019, the Scottish Government declared a 'Climate Emergency'. The Climate Change (Scotland) Act 2019 sets a legally binding Net-Zero target for all greenhouse gases by 2045, only five years beyond the horizon of this strategy. Scotland has set some of the most stringent targets for reduction of greenhouse gases and the RTS needs to play its part in meeting these targets."*⁵

*"This RTS will however need to strongly address the challenge of achieving this growth whilst also achieving cleaner, quieter, more pleasant city and town centres as well as reducing carbon emissions and encouraging more active and sustainable journeys. A reduction in traffic will be required in order to achieve this."*⁶

Considering the above quotes from the 2040 Regional Transport Strategy, we can see that our goals are aligned, climate change currently poses the greatest threat to our way of lives, and must be at the forefront of our thoughts when we look to investment for the future. However, when we look at the trends mentioned previously, we can not agree that these goals are achievable without new rail options. With increasing volumes of traffic and a high percentage of travelers choosing to drive to work, we must provide commuters with more and better options that compete with the perceived convenience of a personal car.



The charts to the left illustrate the urgent need to tackle car usage in the North East. The car is both the largest emitter of CO2 on the road, and the vast majority of mode choice in the Area. If we want to seriously face the challenge that climate change presents, we must take drastic action to provide a better choice for travelers than taking the car.

(Far Left) Fig 3.2 Total Road Emissions 2016²⁶

(Left) Fig 3.3 Existing modal split, North East Scotland²⁵

3.1.1 Tackling Car Usage

In Section 8, "Key Issues and Opportunities for the North East", NESTRANS explain the particular difficulties in tackling the high car usage in Aberdeenshire (66%, higher than Aberdeen City at 63%)⁷.

1. Travel Distances - *"Almost half of Aberdeenshire residents travel further than 10km to work. This is an increasing trend - since 2011, total vehicle kilometres travelled annually in both Aberdeen City and Aberdeenshire has increased by 3% and 8% respectively, compared to 5% nationally."*⁸
2. Perceived unattractiveness of public transport alternatives to their current journeys.⁹ - *"Perceptions of public transport are often poor with it seen as an unattractive option due to long and unreliable journey times compared to the car and lack of quality interchanges. Confidence in the reliability of bus services and the disproportionate impact on buses when there is any form of network disruption is off-putting for many potential bus users."*¹⁰
3. Ready availability of inexpensive parking at their destination.⁹



Two of these challenges can be addressed with new rail options. Trains are most efficient over long distances and at sufficient speeds can dramatically lower travel times in a way that road vehicles simply cannot compete with.

The perceived unattractiveness of public transport options can also be solved with new rail options. Looking at the reasons cited for this perception,¹⁰ we can see that the North East public believe that driving is preferable to dealing with “*long and unreliable journey times.*”, and that if they do take public transport they’re faced with “*a lack of quality interchanges*”, there are also concerns about an overall lack of mode choice in the region. Travel times by bus are especially long from Fraserburgh and Peterhead to Aberdeen, significantly longer than the equivalent car journey time.

Disruption on the road network has a disproportionate impact on buses because diversionary routes in the area are long and winding. This is a major factor in the perception that bus travel is unreliable and unpredictable. A new rail option would provide a mode of travel entirely unaffected by road disruption.

Direct bus services would improve these travel times significantly, but would leave the bus service just as vulnerable to disruption on the road network, thus this will not fully alleviate the public concern over reliability of the bus network.

Road improvements will also reduce journey times by bus, however, improving the road network also improves the attractiveness of the car as a travel option. As such, any improvement to the bus service by this method will not encourage mode shift from car to bus, and may even have the opposite effect as driving is made easier.

Due to the layout of the region, buses routes do not often cross in a way that produce useful interchanges. We are proposing that these new railways capitalise on the success of the Inverurie - Montrose Crossrail service, and operate as through services from Buchan to Deeside. This will facilitate meaningful, easy and reliable interchange with other services, stitching the social fabric of Aberdeenshire together, and providing a one-change link to Edinburgh and London for tens of thousands of people.

Finally, it’s simply a fact that people prefer to travel by train over long distances, even when compared to driving. A 2018 study by the Department for Transport found that for long distances, almost half of respondents felt that train travel was both faster and easier than driving,¹¹ and 69% had a positive perception of long distance rail travel.¹² The only way to achieve mode shift away from the car in this region is by providing new rail options.

3.1.2 Opportunities in Aberdeenshire

NESTRANS identify some key opportunities for Aberdeenshire in the coming years, two of these are particularly relevant to our campaign. Firstly, the recently completed works between Aberdeen and Inverurie has greatly increased capacity over this line, and as a result has allowed for a step change in local rail travel from Aberdeen.

“Revolution in rail improvements – investment in dualling the railway line between Aberdeen and Inverurie, and signalling improvements south of Aberdeen, have facilitated the opportunity to separate local rail services from InterCity services. New and refurbished rolling stock have enabled a step change in local rail services, with a dedicated local service calling at all stations between Inverurie, Aberdeen and Montrose and separate services providing an express service between Aberdeen and major markets.”¹³

We intend to capitalise on these improvements by providing another arm to the cross rail network, allowing for far more residents of the region to benefit from these works and travel all across Aberdeenshire sustainably, with ease. Integral to our plans is allowing Aberdeenshire to take full advantage of the new opportunity it has to see it’s Tourism Industry blossom in the coming years as part of the Covid-19 recovery, and as a means of reshaping the economy¹⁶, rail is essential in this endeavour. Putting otherwise lesser known destinations on the map, ferrying tourists quickly and directly to the places they want to visit, taking the pressure off the road network as tourist numbers begin to swell, and reconnecting an entire region to the National Rail network.

The construction of a new deep water harbour at Nigg Bay will allow Cruise Ships to visit Aberdeen, tourists on these boats will be taking day trips into the city and out into the shire.¹⁵ Many will be heading into Royal Deeside and around the countryside to visit castles and distilleries. A percentage of these tourists will want to revisit Aberdeenshire after enjoying their time here. By reopening the Deeside Railway and integrating a regular connection to Royal Deeside, we are providing easy access to the destinations returning tourists recognise from their trip. Without these new connections, destinations in Aberdeenshire with world class tourist attractions will lag behind better connected rivals.

A direct rail link will allow Scots and travelers from farther afield to visit places they otherwise wouldn’t have. This ‘on the map’ effect is well documented, after the reopening of the Borders Railway, tourism to the area increased 4%, then 7%, then 12% in the first seven months. A year later, Transport Scotland conducted a study along the line and found 71% of visitors said that the new railway was a deciding factor in their decision to visit, and 25% said they would not have come at all if it was not for the railway.¹⁴ In Total, **78% of tourists in Aberdeenshire come from the UK**,⁶⁵ rail is by far the most efficient travel mode for these passengers. Connecting these tourists to an integrated North East network will allow seamless travel between where people live, and where people want to go. Aberdeenshire cannot truly take advantage of this golden opportunity to grow it’s Tourism sector without modern rail links.



3.1.3 NESTRANS Rail Proposals to 2040

NESTRANS have recommended new stations be constructed on existing lines subject to business cases being developed in line with feasibility studies.¹⁷ This has been made possible by the separation of local and intercity services since the dualling of the line to Inverurie, and while this specific Regional Transport Strategy does not specify any station sites, we believe both Cove Bay and Newtonhill are suitable sites for new stations on the existing lines.

In 2017, NESTRANS commissioned a study into the feasibility of reopening the Formartine and Buchan line from Aberdeen to Fraserburgh and Peterhead. This study concluded that the costs of such a project are too high to provide a positive business case. A further study was conducted to investigate a partial reopening to Ellon only, and this was also deemed too expensive. As a result, no further studies were commissioned into any other potential reopenings in the region, as it was assumed the business case would be equally as unjustifiable.¹⁸

These studies are obsolete and we demonstrate this by examining these studies in detail in section 3.2.

NESTRANS recommend the following action on rail for the period 2021 to 2040:¹⁹

1. *“Due to the high proportions of long-distance business and leisure travel by rail to and from the north east, the highest priority should be investment in improving the quality of InterCity services, ensuring reliability and performance, adequate capacity and improved onboard facilities as well as reducing end-to-end journey times between key centres.”*

Current passenger demographics should not be the determining factor in developing a transport strategy for the future. While we agree that improvements can be made in the areas NESTRANS detail in their Strategy, we disagree that this is a suitable goal for the next twenty years. Aberdeenshire currently sees low numbers of commuters by rail **because** the infrastructure is not at a high enough standard to be effectively used in this way. We demand that this be changed, we must take the opportunity now to provide a rail service suitable to entice commuters out of their cars, and onto public transport.

2. *“The provision of improved access to the railway network by considering opportunities for additional stations, better integration of local services with InterCity and full access for all.”*

Our proposals are a perfect solution to achieve this goal, a fully integrated Aberdeen city and shire crossrail service will be transformative for residents and visitors to and from the region. New stations should be built in line with modern level boarding principles to allow safe access for all.

3.1.4 NESTRANS Non-Rail Proposals to 2040

Looking through the non-rail proposals, we find the actions listed inadequate in achieving significant modal shift. We must take radical action to achieve major mode shift if we have any hope of achieving Net-Zero by 2045. Addressing every recommendation would mean adding several pages to this document which are not strictly relevant to its purpose, therefore below are a few highlighted items to illustrate this point.



1. Aberdeen Rapid Transport. NESTRANS propose introducing a rapid transport system to provide a “step change in mass transit provision in the north east.”²⁰ However, the proposed routes only cover the City of Aberdeen, Aberdeenshire does not benefit from this at all. Aberdeen Rapid Transport may deliver a step change for the city, but to meaningfully tackle car use even in the city itself, we must also deliver opportunity for significant modal shift for Aberdeenshire.

2. Improving Bus Links. NESTRANS aim to “Provide substantial mode shift away from the private car and on to more sustainable modes.” To achieve this they intend to improve the bus and Park and Ride services to the point that travel time is comparable with the private car. Park and Ride facilities only stretch so far out from the city, as far as Ellon to the north for example. This forces commuters from the large towns in the area to complete at least half of their journey by car anyway. Even if comparable travel times versus the private car were achieved, leaving your car to join a bus is inconvenient, making the choice to make use of P&R less attractive when travel times are equal. When we consider that an improved bus service will still be as vulnerable to disruption on the roads as it is now, one of the contributors to its locally perceived unreliability, we can clearly see that this investment will not provide a more attractive option than driving.²¹

3. Partial Dualling of the A90 North to Peterhead.²² Safety improvements are needed and we welcome road improvements designed to address any safety concern. Good road connections are required for the commercial ports to remain competitive otherwise vessels may choose to go elsewhere. We need the ports of Aberdeen and Peterhead to be well connected by both rail and road to remove the perception of remoteness, whilst recognising that not all freight can readily be transported by rail.

4. Craiginches Rail Freight Terminal.²⁴ A link from Craiginches Rail Freight Terminal and the new Aberdeen South Harbour will be essential heading into the future. As freight arrives from sea it can be transported to the rail network swiftly, reducing pollution and the impact on city traffic. NESTRANS has recommended that the government “support the development of connections from Craiginches...to Aberdeen South Harbour”. We believe this should be reworded to specify a rail connection to the Harbour, this is easily achievable considering the current lack of development on the land between the two sites. Potentially, this spur could also be used to ferry cruise passengers directly into the city or beyond by employing special train services when Cruise Ships are in port.



3.2 Fraserburgh & Peterhead to Aberdeen Strategic Transport Studies

In 2016, NESTRANS commissioned a study to look at re-opening the Formartine & Buchan Railway as part of all-modes study of the corridor from Fraserburgh and Peterhead to Aberdeen. The Study was undertaken in line with the Scottish Government's Scottish Transport Appraisal Guidance (STAG), and looked at seven options for transport improvement in the area. Options 1 & 2 are road dualling and partial road dualling, Option 3 is road safety improvements, Options 4 & 5 are bus improvements, Option 6 is a full reopening of the old Formartine and Buchan line, and Option 7 is an entirely new alignment from Aberdeen to Fraserburgh and Peterhead. The table below shows the summary and scores of the options studied against the STAG criteria and local Transport Planning Objectives (TPOs).

Appraisal Summary Scores and Risk Ratings

Option	Transport Planning Objectives						STAG Criteria					Fit with National Established Policy Directives	Risk Rating		
	TPO1	TPO2	TPO3	TPO4	TPO5	TPO6	Environment	Safety	Economy	Integration	Accessibility & Social Inclusion		Feasibility	Affordability	Public Acceptability
1	3	3	3	1	1	0	-2	3	3	2	1	1	Medium	High	Low
2	2	2	2	0	0	0	-1	2	2	1	0	0	Medium	Medium	Low
3	1	2	3	0	0	0	-1	3	1	1	0	1	Medium	Medium	Low
4	1	0	1	2	2	1	1	1	1	2	2	1	Low	Medium	Low
5	2	1	1	2	2	1	-1	1	1	2	2	1	Low	Medium	High
6	1	2	1	3	3	2	-2	1	2	2	2	1	High	High	Low
7	2	2	1	3	3	2	-3	1	2	2	2	2	High	High	Low

Tab 3.1 FP STAG Study Option Summary Scores

Our proposals for the Aberdeen to Fraserburgh and Peterhead corridor make use of the original Formartine and Buchan Line from Dyce to Fraserburgh, but does not make use of the original branch line from Maud to Peterhead. Instead, we propose to reopen the branch line from Ellon to Boddam, with a short extension to connect to Peterhead. Since this branch closed in 1950, reopening this alignment would be closer to constructing an entirely new line, therefore, it is fair to say that our proposals in Buchan are a blend of Options 6 and 7.

3.2.1 Transport Planning Objectives and STAG Criteria

Looking at Table 3.1 above, and considering our goal of achieving mode shift away from the private car, we can see that only the rail Options (Options 6 & 7) score high on "Increase mode share for non-car based modes"(TPO6). Rail also scores highest on increasing strategic travel choice and increasing direct public transport connectivity (TPO4 & 5). Both rail options score higher than bus options for increasing journey time reliability and predictability (TPO2), and a new alignment scores higher than bus options for reducing journey times (TPO1). Fully reopening the Formartine and Buchan Line does not score well in reducing journey times because the old line branches at Maud. The Maud branch constitutes a significant detour compared to the road route from Peterhead to Aberdeen. However, travel times on the original alignment from Fraserburgh to Dyce will be competitive with the car at a sufficient linespeed. (70mph+)

Assessed against the STAG Criteria, on Environment, the study states the following in regards to the rail options:

"Option 7 scores the lowest, with major negative impact given the major construction works required and subsequent impact with changes in hydrology, land take, changes in landscape character, loss of habitat, and increased noise and air pollution for those close to the new heavy railway or light rail/tram alignment."

Option 6 scores with moderate negative impact and is predicted to increase noise and carbon emissions as well as local air pollutants if a diesel rail locomotive were operated, although this is likely to impact on a relatively small number of people given the rural alignment of the route and the number of properties that are affected. Again, there would be a subsequent impact with changes in hydrology, land take, changes in landscape character, and loss of habitat."



This study assumed that any new lines would not be electrified, and Class 158 Diesel trains would be the main traction operating passenger services over the route. This was correct at time of writing, Scotrail operate three classes of diesel trains from Aberdeen, Class 158, Class 170 and Class 43 HST, the latter being focused on InterCity journeys. It is for this reason that the study has attributed increased CO₂ emissions as a consequence of opening these lines. Today however, this assessment has been superseded. The Scottish Government have committed to decarbonising Scotland's railways within the study period of the Regional Transport Strategy (by 2035).²⁷ These new lines would be included in this decarbonisation plan, and we can therefore dismiss the increased carbon emissions due to the use of diesel traction. We assume that these lines won't be electrified and instead decarbonisation will be achieved by using an alternative fuel source as is suggested by Transport Scotland, such as battery electric or hydrogen fuel cell.

This improves the environmental impact of constructing these new railway lines. Of course, this does not mean that constructing these lines will have an immediate positive impact on the environment, we still have to consider changes in hydrology, land take, changes in landscape character, and loss of habitat. The loss of the old railway line as a long distance cycle path also detracts from the environmental score of the rail options. This can be avoided by constructing a cycle path adjacent to the running line, but it must be noted that this will increase the cost of construction. However, since our proposal does not make use of the original alignment from Peterhead to Maud, that leaves 14 miles of cycle path in place. The decarbonisation of the railway has a further positive effect on the environment scoring for rail options, not only does it remove the impact of diesel powered trains, but once the line is constructed, every successful mode shift from road to rail will result in a greater reduction in carbon emissions. You could say this project would have a decarbonising effect on the road itself. Considering all this, we can see how the environmental impact of this railway is much more positive than this study suggests, and should this study be done today, a better score would be awarded for Environmental Impact .

Option	Score if awarded +1 Environment	Score if awarded +2 Environment
1	19	19
2	10	10
3	11	11
4	15	15
5	14	14
6	19	20
7	20	21

We can see from Table 3.1 on the previous page that rail Options achieve a better score against all remaining STAG criteria except safety when compared to all options apart from Option 1, a full length dual carriageway. Since we are aiming to encourage mode shift away from the car, we can dismiss Option 1. Option 7 is the only option to score higher than 1 when assessed on it's fit with national established policy directives. Considering all these criteria together, we can now adjust the rail Option's Environment scores to account for a decarbonised railway. Table 3.2, left, shows total scores if this adjustment added 1 to Environment, and if this was even more favourable, adding 2 to Environment.

Therefore, by dismissing Option 1 we can clearly see that both rail options meet the Transport Planning Objectives and STAG Criteria better than any other option considered in this study.

Tab 3.2 Total STAG Study Scores when adjusted for Decarbonised Traction

3.2.2 Feasibility

The Formartine and Buchan Line exists today as a shared use path, our proposals make use of this alignment from Dyce to Fraserburgh, but not from Maud to Peterhead. This path is in good condition, and the engineering required to upgrade it to modern standards does not pose a challenge, this work would be similar to that performed on the Borders Railway reopening.²⁹ While not investigated as part of these studies, it should be noted that the Deeside line to Banchory is also a shared use path today, if not as complete as the Formartine and Buchan Way. Additionally, many sections of the Boddam branch are still in good condition, while other sections have been developed or abandoned, works to modernise these sections would be more complicated, but well within the capabilities of modern construction technology.

The largest obstacle to this project's feasibility is current capacity in Aberdeen Railway Station, as well as capacity on the existing running line north of Aberdeen, particularly through the single line tunnel section to Kittybrewster.²⁹ Doubling this section was considered during the now completed Aberdeen - Inverurie redoubling, but was rejected for fear of losing freight gauge. At the time this study was conducted this redoubling had not been completed, and the exact specification was unknown. This issue was highlighted as the key issue for the Buchan Line reopening.

*"If [the single-double points] are located at the north portal of Hutcheon St Tunnel, then the distance to the north end throat points is likely to be well under a mile, which might prove satisfactory."*³⁰

We now know that this was the alignment chosen for the redoubling, and linespeed through the tunnels was increased. Since this was a key issue for feasibility this is encouraging. We prove how the current alignment is sufficient, and explore the Aberdeen tunnel problem in detail in Section 4.3.7.



Similarly, minor concerns were raised over platform capacity in Inverurie station. The implementation of a turnback siding at Inverurie in the newly completed Aberdeen - Inverurie redoubling will have alleviated this concern somewhat by introducing more flexibility in platforming at the station. Outwith this key issue around tunnels, more feasibility concerns were identified, in the remainder of this section we will address each of these concerns individually.

“That the rail commuting market is less mature in Aberdeen than Glasgow, which is probably an understatement as significant rail commuting into Aberdeen has only been happening for the past 15 or so years.”³¹

While no reason is given for the immaturity of rail commuting in Aberdeen, we can safely assume that one of the reasons for this is the inconvenience of rail travel for residents of Aberdeenshire. Inverurie, Ellon, and Banchory are all approximately 30 minutes from Aberdeen by car, and all have equal potential as commuter towns. All three have good road links, being situated on A-roads, in Inverurie and Ellon's case, on a dual carriageway. All have comparable quality of life too, with local beauty spots nearby, such as Forvie National Nature Reserve near Ellon, Crathes Castle in Banchory, and Bennachie in Inverurie. Despite this, looking at data from Aberdeenshire Council we can see Inverurie has experienced significantly more housing development than its rival commuter towns. In the most recent five years where data is available, Banchory saw an average of 24.8 new homes per year, Ellon saw an average of 55.2, while Inverurie averaged a staggering 146.8 new homes per year.³² Since commuting by rail is rapidly becoming more popular on the Inverurie corridor,³¹ we can be certain that the existence of a rail link in Inverurie has had a significant effect on where people in Aberdeenshire have chosen to live. It is worth noting the other station on this line, Dyce, also experienced a high level of new housing development, an average of 162.4.³³ Reconnecting both Ellon and Banchory to Aberdeen by rail will make these towns more attractive for commuters, and will likely more evenly distribute the staggering growth expected in rail use from Inverurie in the coming years, helping ease expected future overcrowding on this route.³¹ This conclusion was also reached by a follow up study commissioned by NESTRANS, highlighting the positive effect a rail connection would have on growth in these towns.⁴³

“The route from Dundee to Aberdeen is being proposed for electrification in CP8 but electrification beyond Aberdeen to Inverurie has been specifically rejected when considered for CP9.”³⁴

At the time of the study this was true, however, since then the Scottish Government has committed to full electrification of the line as far as Inverurie by 2035.³⁵ Electric trains are lighter than diesel trains, and deliver much faster acceleration in comparison, typically, under wires electric trains have twice the acceleration of their diesel counterparts.³⁶ These faster acceleration times further reduce concerns over the single line section Aberdeen - Kittybrewster as trains will spend less time occupying this section compared to the diesel trains considered in this study. Additionally, better acceleration allows more flexibility across the entire Aberdeen - Inverurie section for the same reasons, as such more capacity will be available over the line than has been accounted for in this study.

It is assumed that any new lines will not be electrified, and will instead be operated by an alternative traction such as battery electric or hydrogen fuel cell. Both of these traction types have seen rapid advances in the past few years, in 2018, B-EMUs could reliably demonstrate power output equal to wired EMUs on electrified lines, and could output 1MW on battery power. Compared to the equivalent DMU output of 0.8MW, even battery electric trains show much better performance than has been attributed in this study. These trains will be able to keep pace with wired EMUs under the electrified section Aberdeen - Dyce, and will run faster than the diesel trains envisaged for these lines would have ever been able to.⁴⁴

Hydrogen trains are powered by electric motors, therefore it is safe to assume acceleration will also outperform diesel traction. In fact, Hydrogen trains are already on their way to Scotland.⁸⁰ A consortium of engineering companies are working on a design for Scotland's first hydrogen train.⁸⁹ Since this train will be displayed in Glasgow at COP26 in November 2021, limited data is available on its performance. What we do know is that the train will be converted from a Class 314 EMU. It is worth noting that this specific train will likely be not be a production train, it will be used as a platform for future development, however, we can make comparisons for a loose idea of what this technology will afford. A Class 314 EMU has more than double the horsepower of a Class 158 unit.⁹⁰ Even if hydrogen fuel cells and tanks add significant weight to the Class 314, acceleration will still outperform diesel traction. Aberdeen continues to invest heavily in Hydrogen technology, recently the City Council announced plans to expand the H² bus project.⁹¹ Aberdeen's Hydrogen generation and refueling site is situated immediately adjacent to the current line, making it trivial to expand for use by the railway, and lowering infrastructure costs required for H² refueling in Aberdeen station or Clayhills Service Delivery Depot.

“Differences between the Up and Down journey times reflect the gradient profile of the route, which features steep gradients and a summit north of Newmachar. These journey times may be increased in some timetable options if it is necessary to add ‘pathing time’ to avoid conflicts.”

The Ellon Rail Study noted gradients on the route are steep, this has an effect on train acceleration and puts constraints on timetabling as a result. This has a further impact on timetabling on the Aberdeen - Dyce section, exacerbating the strain the single line section through the tunnels imposes on the route. The higher accelerations achievable by these alternative tractions help to alleviate this problem, earth works can be limited to the small number of sections where gradients do not conform to modern standards.



“[The route] would have potential connectivity with the following three sites: the Ythan Estuary, Sands of Forvie and Meikle Loch Special Protection Area (SPA) within 700m of the A90(T) at Ellon and the Buchan Ness to Collieston Coast SPA and Buchan Ness to Collieston Special Area of Conservation (SAC) within 100m of the A90 near Boddam (also see Appendix A.7.1). The potential for likely significant effects on these sites would have to be considered under the Habitats Regulations.”³⁸

By following close to the alignment of the historic Ellon - Boddam branch line, the impact on these protected sites is minimised. This route does not come within 5km of the Ythan Estuary, or the Sands of Forvie. At it's nearest point, the line would come within 3km of the Meikle Loch SPA,³⁷ and crosses the A90 near Ellon and Hatton. A new short extension of the line from Boddam to Peterhead would also likely require another crossing of the A90 near Boddam,¹¹⁹ however this would be determined in the planning stage. This route would impact the Buchan Ness to Collieston SPA and SAC, particularly over the cliffs from Cruden Bay to Boddam. However, the line would be constructed on the original groundwork that is still present today, minimising the impact compared to an entirely new alignment. It is also possible to entirely avoid the impact on this area by beginning the extension to Peterhead earlier. Finding a new alignment from Cruden Bay to Peterhead, possibly via the historic Peterhead Prison Railway, bypassing Boddam, would achieve this and may prove to be a more attractive option.



Fig 3.2 Existing Railway Structures within Buchan Ness to Collieston SPA and SAC

Both options in this study, fully reopening the Formartine and Buchan line, and an entirely new alignment were awarded a high risk for deliverability. We have shown that the picture today is more favourable than it was at the time this study was conducted. However, if a study investigated either of these options again, or indeed the alignment that we are proposing, it is likely that a high risk for deliverability would still be awarded. This is due to the nature of large scale rail projects, involving major works, planning and consent to complete. That said, a project on this scale is well within the capability of engineers today, and this is highlighted in the study itself.

“Despite this, construction involved would be well within the bounds of standard civil engineering experience. Scotland has now introduced numerous rail lines and extensions in the last 20 years, building up a wealth of skills and experience.”⁴⁰

A further study was commissioned to investigate the potential of reopening the Formartine and Buchan line from Dyce - Ellon only. While focused on a smaller section of the line, the project was examined at a greater level of detail. Many of the issues surrounding feasibility of this project focus on the single line section through the tunnels between Aberdeen and Kittybrewster, as well as capacity in Aberdeen Train Station, we explore these in greater detail in Sections 4.3.7 and 5.1.

“The additional width required to allow a cycleway to be installed alongside the railway would result in more structures requiring superstructure renewal and substructure extensions. There would also be a resultant impact on land requirements. At overline structures, it may not be possible to fit the railway and cycleway through the existing span and there may be a requirement to deviate the cycleway up and over the bridges at these locations.”⁴¹

NESTRANS included the retention of the current shared use path as a red-line for every option studied. Retaining this route as an active travel corridor is a must, however there should be sufficient land or alternative roads along almost the whole route to allow both a reinstated railway and a cycleway to coexist without the need to purchase additional land, and this should be included in any investigation into the Buchan and Deeside lines. The creation of town-village cycle paths is also a key goal of the National Transport Strategy, and is highlighted in SPTR2. However, the large distances between towns along the paths in this area make it's use as an active commuting corridor impractical, even for small commutes between adjacent towns. This limits the shared path's use to recreation only, even so, removal of this path would still certainly be a loss to the community. Locally there is strong desire for more travel mode choice along the Peterhead and Fraserburgh to Aberdeen corridor. More than two thirds of respondents to the study indicated rail connectivity in the area could provide a more reliable travel mode, improve commuting, reduce road emissions and encourage investment in the area.⁴² Considering the significant modal shift from road to rail that would be achieved, and the retention of the path from Peterhead to Maud in our proposals, we can see that the benefits of reinstating the rail connection far outweigh that which is lost by the closure of the cycle path. Therefore, should the work required to deliver both rail and path options increase the cost or complexity of the whole project to the point that it is no longer feasible, then the railway should be constructed. The loss of this active travel corridor should then be treated as a separate project, and funding should be sourced through other means, such as direct active travel funding to retain it's use, however this is done, both rail and path should be available to the public upon project completion. It is worth noting that an access road will be required along the length of the railway during construction, as was done for the Kittybrewster -Inverurie redoubling, this access road can then be converted to a shared use path with minimal extra cost.



3.2.3 Affordability

By far the biggest hurdle for this project is affordability. Both studies on the Fraserburgh and Peterhead to Aberdeen rail options have concluded that the large cost of capital investment required to deliver the project, as well as the required upgrades to the existing line means that on the whole, reopening a rail connection north of Aberdeen would provide poor value for money. The projected construction costs were calculated against the actual cost per mile of the Borders Railway on the low end, and the Airdrie to Bathgate rail link on the high end. The STAG study considered two options, a complete reopening of the Formartine and Buchan line (Option 6), and an entirely new alignment from Aberdeen to Fraserburgh and Peterhead (Option 7). We propose reopening two thirds of the original line, and making use of the long abandoned Boddam branch line, which will be closer to constructing a new railway in cost, therefore the total construction cost of our proposals is likely to be somewhere between the estimated costs of Options 6 and 7. For the Deeside line, the historical alignment is protected for most of its length to Banchory, but due to a higher level of development in this corridor some realignment will be necessary.

The Formartine and Buchan line leaves Dyce and heads north through Newmachar and Ellon to a small village called Maud. The line branches here at Maud, one route heads north to Fraserburgh, and the other east to Peterhead. While this alignment would allow for comparable journey times to Aberdeen from Fraserburgh versus the private car, journey times would be much slower from Peterhead. Compared to the modern route of the A90 from Peterhead, the line via Maud represents a significant detour, providing longer travel times versus the private car. These longer travel times will limit the achievable modal shift car to rail from Peterhead, thus lowering the overall passenger numbers on the line. Similarly, by building a new continuous route from Aberdeen to Fraserburgh via Peterhead, this same effect applies to journeys originating in Fraserburgh, where the rail option would struggle to provide competitive travel times versus the private car via the A952. Our proposed alignment would result in comparable journey times from both towns thanks to the near direct routing to Ellon, higher linespeeds may be achievable on a new alignment Ellon - Peterhead, which will further lower travel time and maximise patronage.

The Ellon Rail Study investigated reopening the line Dyce - Ellon only, with a Park and Ride option for travellers from Fraserburgh and Peterhead. Passenger numbers were benchmarked against recent rail projects in Scotland, including the Borders Railway and the Airdrie to Bathgate rail link. This study concluded that this option also provides poor value for money, but did note that a positive case exists from an operational point of view.

At the time of the Peterhead and Fraserburgh study, data was not available from the Borders Railway. Today, patronage on the Borders Railway has however exceeded all expectations, particularly for the towns on the line farthest from Edinburgh, the same towns that are directly comparable to Peterhead and Fraserburgh. Actual patronage at Galashiels was up 812%, and, at Tweedbank up an incredible 1290% on predicted numbers for the first year of operation. Additionally, the reopening has been hailed as “a phenomenal success that continues to grow communities along its length.”,⁴⁵ later Scottish Government data backed up this conclusion.⁴⁶ This lends credence to our argument that reopening these lines will result in a local house building boom as people see Buchan as a more desirable place to live. Furthermore, this data adds confidence to the growth potential that a new rail connection could bring to Fraserburgh and Peterhead, both have been identified as regeneration priorities in the Strategic Development Plan.³ Over time, this regeneration would increase the population of the towns along the line just as it did in the Borders. This data was available at the time of the later Ellon Rail Study, but since the towns furthest from Edinburgh showed the most significant underestimation of patronage, this did not apply as well to a railway that terminates in Ellon.

As we mentioned in Section 2, there is evidence that firms have struggled to attract skilled labour in Fraserburgh, as a result they have chosen to uproot their business and relocate to Ellon, closer to Aberdeen. This was highlighted in the Ellon Rail Study: *“A lack of public transport options, other than bus services linking North-East communities and the Aberdeen conurbation area, limits the growth potential of the local and regional economy.”*⁵⁸ Connecting these communities to the rail network will breathe new life into their economies, just as rail did for towns in the Borders.⁵⁹ New industries will be attracted to set up in these towns, taking advantage of lower land prices compared to sites closer to Aberdeen. They can be confident that they will be able to attract skilled labour thanks to the new travel options. Fraserburgh in particular has many sites suitable for new industrial investment in the town.

The Ellon Rail Study benchmarks patronage against both Stonehaven and Inverurie, but suggests actual passenger numbers may be slightly less than these stations, stating; *“Stonehaven and Inverurie have slightly higher populations and arguably are more of a ‘destination’ town than Ellon possibly is.”*⁴⁸ We have already established that population is likely to increase after the construction of a rail link, possibly overtaking the population of Stonehaven. Given that 6000 homes are expected to be built between Blackdog and Peterhead by 2035,⁴⁹ this may even happen naturally without a rail link. Stonehaven and Inverurie are not more of a destination town than Ellon. Ellon is home to the BrewDog brewery, where a new visitor centre and museum have recently been completed. Before this was opened the attraction already pulled in thousands from all over the globe to this wee Scottish town, some flying over on BrewDog’s own airline from the United States to visit the brewery.⁵⁰ In addition to this, BrewDog has opened a hotel in Aberdeen for visiting beer fans,⁵¹ a rail connection would provide an easy link for these travellers to tick off their beer itinerary. Outwith this single attraction, Ellon also compares well with Stonehaven, Stonehaven has Dunnottar Castle, Ellon has Haddo House, and both towns have renowned golf courses. Inverurie’s main pull is retail. The town has a multitude of big brand stores and supermarkets, as well as a diverse selection of craft shops selling specialist items and local wares. On balance, Ellon is in a much stronger position from a tourism perspective compared to Stonehaven and Inverurie, we would expect this to be reflected in passenger numbers.



Data from the Borders Railway further supports the arguments we have made so far. In Year 1, 56% of those who had moved house stated the railway was a factor, 89% of users who had changed employment stated the railway was a factor, and 67% of tourists said the line was a factor in their visit, 23% stated they wouldn't have come at all were it not for the railway.⁴⁷ In Year 2, these numbers stay high, most are even better, 58% of those who had moved house stated the railway was a factor, 52% of users who had changed employment stated the railway was a factor. 71% of tourists said the line was a factor in their visit, 25% stated they wouldn't have come otherwise. Incredibly, in the second year almost a third of all users were tourists, up from 15% in Year 1.¹⁴

Rail projects in Scotland have consistently outperformed expectations, the Borders Railway is the most recent example, generating approximately 120% actual patronage compared to expected patronage. Crucially, the stations farther away from Edinburgh experienced massively more actual patronage than expected, Stow up 579%, Galashiels up 812%, and Tweedbank up an incredible 1290% on forecast passenger numbers.⁵² It is important to note that this information was not available at the time of the Fraserburgh and Peterhead STAG Study. The later Ellon Rail Study did have this information, however downplays the significance in regards to the Aberdeen - Ellon corridor:

*"Edinburgh is a larger attractor of demand than Aberdeen, which is likely to drive additional demand to the line. Edinburgh city centre parking is also more expensive than Aberdeen. Conversely, Tweedbank and Galashiels are located further away from Edinburgh than Ellon is from Aberdeen."*⁵³

Aberdeen is the third largest city in Scotland, it is a tourist destination in itself and is the gateway to Royal Deeside and "Castle Country". To the people of Aberdeenshire, the city is their main destination for retail, leisure and onward travel. Aberdeen is growing in popularity and is a larger attractor of visitors than one may think. Recently the city was chosen as a top 20 destination to visit by a global travel company, listed alongside locations such as Bilbao in Spain.⁵⁴ Parking may be less expensive in Aberdeen city centre now, but this will not be the case for much longer, Aberdeen's city centre Masterplan aims to reduce access to the city centre by car in coming years,⁵⁵ continued cheap parking will be antithetical to this plan. Tweedbank and Galashiels are indeed located further away from Edinburgh than Ellon is from Aberdeen, but they are very similar distances as Fraserburgh and Peterhead from Aberdeen.⁵⁶ The similarities between these towns suggests that patronage on the Buchan line would be much higher than has been forecast in these studies, and the business case is therefore far stronger than it currently appears.

Additionally, since we know this line will be operated by some form of electric traction, we can account for an additional boost to these forecast passenger numbers, thanks to what is known as the 'Sparks Effect'. This phenomenon describes the fact that when lines are electrified, patronage increases. The reasons for the increase are due to newly electrified lines often utilising modern rolling stock which is smoother, quieter and faster.⁵⁷

Concerns were raised that the reintroduction of a railway service to the north of Aberdeen would make the bus service as it currently exists unprofitable. This is not a concern from the perspective of the public that would use the train service, more than a third of respondents to the STAG study indicated that bus improvements in the corridor would not impact on them.⁶⁰ Currently, bus services between Aberdeen, and Peterhead and Fraserburgh run from Aberdeen, leaving and rejoining the A90 to stop at smaller towns along the route. If bus services are reduced then it could impact on accessibility to public transport in general in the region. However, we believe this is unlikely, buses heading to both Fraserburgh and Peterhead follow the same route to Ellon. Passengers from small towns in between Ellon and Aberdeen, such as Balmedie, would not see services reduced because the rail route does not come close to the A90 at any point between these destinations. This also applies to towns between Ellon and Fraserburgh, as all regular bus stops on the route are far from the rail alignment, with the exception of Strichen. For towns between Ellon and Peterhead however, this is not the case. The common bus route to Peterhead stops at the same towns a train service would, this means that this section would be the highest risk for loss of bus patronage. The Borders Railway resulted in a 29% modal shift from bus to rail in its first year,⁴⁷ this was maintained in its second year (25%).¹⁴ This could be significant if replicated on this route. Alternative routes may be required to better link in with smaller towns and villages, possibly integrating with the rail timetable. On balance however, the studies expected rail options to perform strongly against accessibility and social inclusion criteria, and this should not be a barrier to the construction of a rail connection.⁶¹

Another area of concern for the studies was high level of car ownership in Aberdeenshire. In the study area car ownership is higher than the national average, but lower than the rest of Aberdeenshire. This would be a particular concern for any study into reopening the Deeside line to Banchory, as car ownership is very high along this line. However, this was also true for the Borders Railway, car ownership and dependency levels were high amongst residents, with the car being the dominant mode of travel for all journey purposes.⁶² This should not have an impact on any assessment into the affordability of these lines. We can be confident of this because only 15% of passengers on the Borders Railway in the first year did not own a car,⁴⁷ and this number did not change in the second year.¹⁴ Additionally, there is evidence of significant modal shift from car to rail despite the high levels of car ownership. 57% of users of the Borders Railway stated before the railway they drove all the way to their destination,⁴⁷ rising to 64% in the second year.¹⁴ Given the similarities between these cases that we previously highlighted in this section, we can be confident that this would also be the case for any new railways in Aberdeenshire.



If a study investigated rail options north of Aberdeen today it would find a much more favourable picture than the previous studies did. We have shown how the coming electrification of the main line all the way to Inverurie, and plans to introduce alternative tractions to Aberdeen improves the feasibility of the project as a whole. We have also shown how these plans have an effect the affordability by increasing potential patronage on these lines. This, and our chosen alignment work together to paint this project in a much better light. On top of this, data from the Borders Railway released following completion of the Fraserburgh and Peterhead to Aberdeen Strategic Transport Study has shown how patronage since reopening has exceeded all expectations. Towns in the Borders the same distance from Edinburgh as Fraserburgh and Peterhead are from Aberdeen experienced actual passenger numbers 8 to 12 times more than expected. There is no credible reason to believe this would not be replicated in the North East. Furthermore, the Ellon Rail Study concluded that a positive business case is present when compared with operating costs only.

*"It is worth noting, however, that the operation of the rail service generates a positive business case when comparing the benefits generated by the service against the operating costs only. Therefore the presence of a positive operating economic case assists in the justification for increased franchise subsidy."*⁵⁵

Given that the whole picture now looks better than it did before, we can be sure that this positive business case is even stronger today. The social benefits of a rail connection to the North East of Scotland cannot be overstated. New roads and bus improvements alone will do nothing to offer the public in Buchan a real alternative to the car. In fact, without a rail connection these improvements will make car journeys in the area more attractive to commuters. Better roads means faster driving times, buses will no longer hold up traffic, and as a result **car use to 2040 will increase**. Additionally, any improvements to the bus service brought about by these road improvements will be overshadowed by the increased convenience of the driving experience. Why would anyone choose to leave the car at home and take the bus when driving has just been made much more appealing? This newly improved bus service will be just as vulnerable to disruption on the road as it is now, doing nothing to alleviate one of the main concerns for potential bus travelers in this area.¹⁰ NESTRANS and the Scottish Government intend to meaningfully reduce car use over the next 20 years,⁶⁺⁶⁶ and Aberdeen plans to decrease the amount of cars in the city centre in the same period.⁵⁵ Road and bus improvements without a rail connection in the Fraserburgh and Peterhead to Aberdeen corridor will make these goals impossible to achieve. In fact, induced demand created by the road improvements may just increase car use in the corridor by 2040.

One other challenge identified in both previous studies was the increased cost of the project owing to two necessary additions to the required construction work, namely dualling the Schoolhill and Hutcheon Street tunnels, and providing a footpath alongside the railway. It is unreasonable to include these projects in the Cost-Benefit analysis for these new lines. Any improvement to this section will benefit the entire existing railway and should be costed and funded separately to a Buchan railway project. As part of the Aberdeen City Region Deal, £200 million was promised to Aberdeenshire to redouble the line between Montrose and Usan Junction with the intention of saving 20 minutes between Aberdeen and the Central Belt. However, subsequent studies concluded that in actuality this saving would only amount to 2 minutes, not the 20 initially forecast.¹²⁴ It has been revealed that the lion's share of the journey time savings are found south of Dundee, while this work will benefit North East residents, it can not fairly be considered investment in North East rail infrastructure. If the Scottish Government is willing to spend £200 million to save 20 minutes journey time, then it should be willing to invest in the North East. For £160 million we can fund all four stations currently favoured by NESTRANS, Cove Bay, Newtonhill, Don Street and Bankhead, finally address the single line section north of Aberdeen, and upgrade capacity in Aberdeen Station. These three projects combined provide much greater benefits to the existing rail network and facilitate the opening of new lines and services. Figure 3.3 below shows the costs estimated in the Ellon Study. By subtracting the circled totals we can see that there is a £38.1 million difference between Options 1 and 2.

Item		Option A (excluding cycleway)			Option B (including cycleway)		
		Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
Construction Cost (allowance)		£89,424,192	£106,563,092	£137,991,740	£122,468,352	£139,607,252	£171,035,900
Sub total		£89,424,192	£106,563,092	£137,991,740	£122,468,352	£139,607,252	£171,035,900
Design Costs (Including: Design, Project Management, Cost Management, Site Supervision)	15%	£13,413,629	£15,984,464	£20,698,761	£18,370,253	£20,941,088	£25,655,385
Miscellaneous Client costs and Project Burdens	-	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
Sub total		£102,837,821	£122,547,556	£158,690,501	£140,838,605	£160,548,340	£196,691,285
Schedule 4 - Allowance for disruption to Network	6%	£6,170,269	£7,352,853	£9,521,430	£8,450,316	£9,632,900	£11,801,477
Sub total		£109,008,090	£129,900,409	£168,211,931	£149,288,921	£170,181,240	£208,492,762
Network Rail costs	10%	£10,900,809	£12,990,041	£16,821,193	£14,928,892	£17,018,124	£20,849,276
Sub total		£119,908,899	£142,890,450	£185,033,124	£164,217,813	£187,199,364	£229,342,038
Optimism Bias	66%	£79,139,873.37	£94,307,697.04	£122,121,861.95	£108,383,756.71	£123,551,580.38	£151,365,745.28
Sub total		£199,048,772	£237,198,147.10	£307,154,986	£272,601,570	£310,750,945	£380,707,784
Inflation - at today's costs (Q2 - 2017)	-	-	-	-	-	-	-
TOTAL		£199,048,772.43	£237,198,147.10	£307,154,986.12	£272,601,569.91	£310,750,944.58	£380,707,783.59

Fig 3.3 Ellon Rail Study Estimated Costs



Figure 3.4 below shows the configuration of the three options examined in the Ellon Rail Study. Option 2 comprises all of the infrastructure of Option 1, and adds redoubling the tunnels, as well as dualled track and an extra platform at Newmachar Station. We can therefore be sure that the cost of fully redoubling the tunnels is less than £38.1 million.

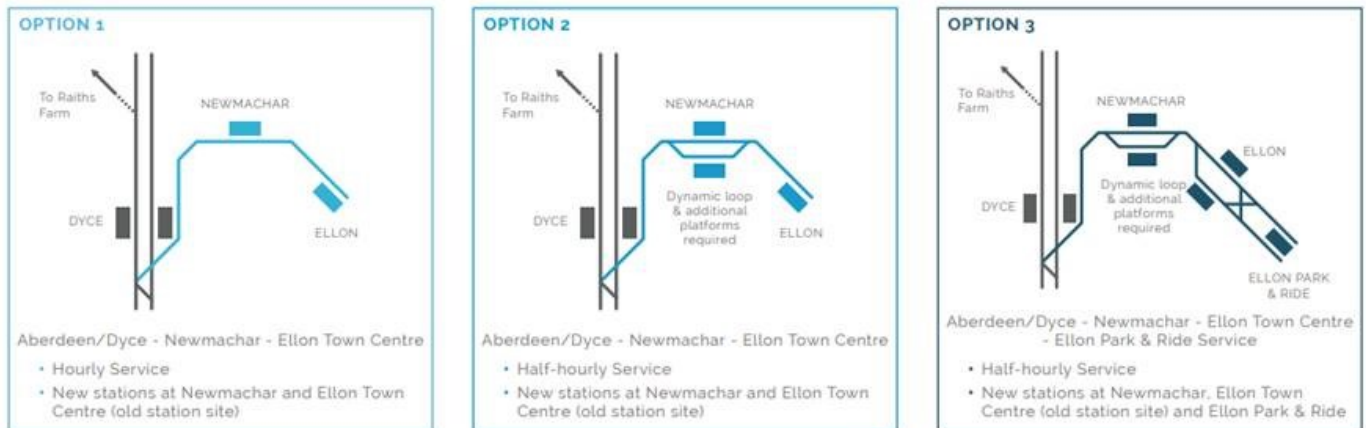


Fig 3.4 Ellon Rail Study Option Configurations

In Section 4.3.7 we show how an hourly service each to Fraserburgh and Peterhead (thus naturally providing a half hourly service to Ellon) can be accommodated alongside the existing timetable without fully dualing both the Schoolhill and Hutcheon Street tunnels. One of these alternative solutions may be preferable so that W12 gauge can be achieved, not to mention the reduced cost of such solutions while still providing capacity to meet all timetable aspirations.

In Section 5.1 we detail a number of upgrades to Aberdeen Station that will significantly increase capacity for all rail services in the North East, not just Buchan and Deeside trains. A future study will determine which combination of presented options will provide the required capacity in Aberdeen, not all of the possible upgrades listed will be required. Finally, it should be noted that all of these figures were estimated with an optimism bias of 66%, which is standard industry practice, and this will likely reduce with future studies.

The cost of retaining a footpath alongside the railway is also not as significant an issue as it first appears. During construction access roads will be constructed along the length of the railway as was done during the A-I redoubling. These roads can then be converted to a footpath after construction has been completed, significantly reducing the cost of construction compared to building the footpath from scratch. The existing Deeside Way is not actually continuous between Aberdeen and Banchory, the footpath diverges from the historical railway alignment significantly, often directing walkers and cyclists along adjacent roads. Providing a footpath alongside the Deeside railway to Banchory will provide a complete off road path that will connect all towns along its length. Where the existing Deeside Way deviates from our proposals, the new path can be connected to the existing path, eliminating the cost of constructing that stretch of path. No footpath currently exists along our chosen alignment from Ellon to Peterhead. Since Maud and Peterhead are connected by the existing Formartine and Buchan Way, there is not a requirement to provide a footpath along this section, therefore the cost of constructing the footpath is lower than the estimated cost in the previous study. There is merit to providing a footpath alongside the Peterhead Section as far as Cruden Bay, this would open an active travel corridor between all of the North East, and connect the largest town on our Railway, Peterhead, with the popular attractions at Cruden Bay. Even with this additional footpath included, the cost of the footpaths in our proposals would still be lower than the previous studies. Additionally, since the first Covid-19 lockdown, the amount of people engaging with active travel has dramatically increased. All five major parties included promises to increase active travel funding in their manifestos for the May 2021 Scottish Parliament Elections, as such schemes materialise it may be possible to seek funding for the retention of the footpath through direct active travel funding rather than including this work in the Cost Benefit Analysis within future studies.

There is one crucial final point. Fraserburgh and Peterhead are the largest towns the farthest away from their nearest railway station anywhere in the whole of the UK.⁶³ On top of this, 80% of the permanent way substructure is still in place,³⁹ significantly reducing construction costs. If the STAG criteria cannot justify building a railway in these circumstances, **then it will never justify a new major rail connection anywhere in Scotland ever again.** We have demonstrated that a blended Option 6 and 7 approach as we have proposed aligns much more strongly with all local TPOs, and outperforms all other options on STAG Criteria. Additionally this project aligns with National TPOs as we have shown in Section 3.3. We have further demonstrated how the final hurdles of Feasibility and Affordability can be overcome today, and will prove this in the next section detailing our proposals. Regardless of everything we have listed in this entire section, it must be noted that the final study examining the Borders Railway proposals produced a CBR of 0.5,¹²⁶ which is considered poor value for money, and yet, the Borders Railway has been hailed as a phenomenal success. **If this is acceptable for the Borders, it must also be acceptable for the North East.**



3.3 Strategic Transport Projects Review (SPRT2)

In February 2021, Transport Scotland released the Strategic Transport Projects Review, which will inform transport investment in Scotland over the next 20 years. In this section we will show how this review supports the case for new rail in the North East. Furthermore, we will highlight a few sections in the North East Region Option Sifting Update that show how there is a case for change in regards to railways in the region. As with previous sections, we will quote and respond to specific sections below.

“The recent work by the Committee on Climate Change set out an assumption of a 10% modal shift by 2030 within its net-zero scenario and the Update to the Climate Change Plan commits to reducing car kilometres by 20% by 2030.”¹¹¹

“In accordance with the sustainable travel hierarchy, STPR2 should prioritise interventions that increase the modal share of shorter everyday trips by walking, wheeling and cycling; short to medium length trips by public transport and longer trips by rail and low emission vehicles.”¹¹¹

Plans for the North East focus on two points, improvements to frequency and journey times for bus journeys, and upgrades to the A90. The bus service in the region is already high quality, modern, large buses with leather seats move passengers to and from Aberdeen. Studies into the corridor show that the largest barriers are unreliable journey times and a lack of mode choice. The road from Ellon to Aberdeen has mostly been dual carriageway for decades, and bus lanes allow buses to travel from the outskirts of Aberdeen at Bridge of Don to the central bus station uninterrupted. Still public transport uptake is poor in the region. Upgrading the A90 will improve the bus service, but judging by the bus performance from Ellon to Aberdeen, this will not encourage nearly enough modal shift to meet the goals of STPR2. The gains in modal shift will be further restricted by A90 road upgrades, people who drive already are not going to be convinced to leave the car at home and take public transport if the driving experience is simultaneously improved. Modal choice can only be improved by providing a new mode, and that is rail. Peterhead and Fraserburgh are approximately 40 miles from Aberdeen, by any measure this is a medium to long distance trip that we should be facilitating by rail. The Borders Railway is 30 miles long, Peterhead and Fraserburgh are further away, and have a similar population, these cases are directly comparable.

“Whilst bus use in Scotland has been in decline, rail use has increased by over 30% in the last decade. Based on current forecasts for future housing and employment land uses there will continue to be strong demand for rail services particularly within the key corridors to, from and between Edinburgh and Glasgow.”¹¹²

We see this trend of increasing demand for rail in Aberdeenshire as well, year on year patronage has increased on the existing rail network in the region.¹¹³ The rail service between Edinburgh and Glasgow is regular, reliable and fast. Our proposed North East transport solution will meet this rising demand and share the benefits seen in the Central Belt across the North East.

SMART TPOs

Our proposed North East Transport solution fulfills the SMART Transport Planning Objectives better than the existing proposals.

“1. A sustainable strategic transport system that contributes significantly to the Scottish Government’s net-zero emissions target.

Reduce the consumption of fossil fuels through a shift to more sustainable modes of transport.

- *Increase the mode share of active travel for shorter everyday journeys.*
- *Increase the mode share of public transport by providing viable alternatives to single occupancy private car use”*

- Rail is already the most efficient mode of transport, consuming the least amount of fossil fuel per person compared to all other modes.^{Fig1.1}
- Rail will be entirely decarbonised by 2035.²⁷
- Rail will directly address one of the largest barriers to public transport uptake in Buchan, modal choice. Rail will remain to be a viable alternative to the car even if the roads are improved.

“2. An inclusive strategic transport system that improves the affordability and accessibility of public transport.

Increase public transport mode share by connecting sustainable modes of transport to facilitate integrated journeys.

- *Improve mobility and inclusion, recognising the specific needs of disadvantaged and vulnerable users.*
- *Reduce transport poverty by increasing travel choice.*
- *Reduce the reliance on private car for access to key centres for healthcare, employment and education.”*
- Travel choice will only be improved by introduction of rail.
- A newly designed and constructed railway will provide unique access opportunities for wheelchair users that other modes cannot match.¹¹⁴
- Regular buses integrated with rail in Deeside will provide reliable public transport to a region currently lacking.
- As Oil and Gas declines Aberdeen will increasingly be a destination for employment in the North East. Aberdeen is a hub for healthcare and education, home to Aberdeen Royal Infirmary and two world class universities. Rail will bring passengers directly to the city centre car free.



3. A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing.

- Increase the mode share of active travel for shorter everyday journeys.
- Reduce demand for unsustainable travel arising from nationally significant growth areas, taking cognisance of the emerging NPF4.
- Rail travel allows for carriage of cycles for first mile/last mile journeys, most of our proposed station sites link to cycle paths and active travel corridors allowing for active onward travel.
- Fraserburgh and Peterhead have been recognised as growth priority areas, improvements to the A90 will only encourage car use.

4. An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland.

- Increase sustainable access to labour markets and key centres for employment, education and training.
- Increase competitiveness of key domestic and international markets, by reducing costs and improving journey time reliability for commercial transport.
- Increase resilience of accesses to key domestic and international markets to encourage people to live, study, visit and invest in Scotland.
- Increase the mode share of freight by sustainable modes.
- Aberdeen is a hive of engineering excellence and a focus for training and employment in the region, these proposed rail lines will sustainably link major population centres in Aberdeenshire with Aberdeen city, and offshore company bases at Dyce.
- Reducing car use in these corridors will contribute to an increase in journey time reliability for all road users, including commercial and freight.
- Rail will give opportunities for the North East to attract new business across the entire region, not just in Aberdeen itself. These towns can capitalise on the new links and thrive as towns along the Borders Railway have.
- Buchan in particular has two strong cases for rail freight, fish and BrewDog beer. Both of these ship daily, in high quantities, and are long distance, the perfect case for transfer from road to rail.

5. A reliable and resilient strategic transport system that is safe and secure for users.

- Improve resilience from disruption through adaption of Scotland's trunk road, rail and strategic ferry infrastructure.
- Reduce transport related casualties in line with reduction targets.
- Improve resilience through climate change adaptation within the management and maintenance of trunk road, rail and ferry infrastructure.
- Improvements to the bus service will have no impact on the region's resilience to disruption. Buses will be impacted by disruption on the road alongside cars, in fact, this is already a major factor in the region's low public transport uptake. This lack of resilience results in a perceived unreliability that will continue unless a rail link is introduced that is immune to disruption on the road network.
- Safety improvements on roads in the region should go ahead. Rail is the safest mode of transport, much safer than driving.¹¹⁵ Every journey shifted from road to rail will decrease risk in these transport corridors.
- New railways will be constructed with modern planning and techniques, maximising resilience to climate related damage. Every journey shifted from road to rail will decrease the stress on the road surface, keeping the quality higher for longer and helping in the fight to keep our network safe against climate change.

Interventions

7.3.1 Intervention 1 - Development and delivery of Active Freeways

"The Active Freeways programme would build on the Sustrans Scotland's Places for Everyone Programme to bring these benefits to some or all of Scotland's cities and towns."

Maintaining the Formartine and Buchan Way, and the Deeside Way alongside the reinstated railways will allow for long distance travel routes in the region to be retained. Furthermore, if an active travel corridor is constructed along the Ellon to Peterhead section, this will create a new long distance route through Aberdeenshire that will benefit communities immensely. We assert that the benefits of introducing rail outweigh the benefits of these corridors such that if the retention of the corridors increase the cost of the entire project to a point that it is no longer affordable, then the rail project should proceed without retaining the active travel corridors. However, it is undeniable that these active travel corridors are an asset to these communities, and the ideal outcome is for both rail links to be constructed, and the active travel corridors be retained alongside.

7.3.2 Intervention 2 - Expansion of 20mph zones

"Reducing traffic speed on our urban roads, would create streets that provide a more equitable balance between different road users, alongside the creation of a safer environment which promotes inclusivity and encourages people to make active travel choices."

20mph zones will slow the journey of buses and cars into the city centre, increasing the advantage of rail routes.



7.4.2 Intervention 5 - Guidance and framework for delivering mobility hubs

"A mobility hub is "A recognisable place with an offer of different and connected transport modes supplemented with enhanced facilities and information features to both attract and benefit the traveller." "

Railway stations are ideal candidates for mobility hubs. They are a key interchange between multiple modes of transport, and safe places for people to meet before continuing their journeys.

7.6.2 Intervention 8 - Enhancing facilities at major rail station

Works to improve Aberdeen Railway Station have already begun, but there is scope to further expand capacity within our proposals to bring Aberdeen into a new era.

7.7.1 Intervention 10 - Reallocation of roadspace for buses

Both routes into the city already have bus lanes for almost their entire length, there is not much room for improvement over the current layout for buses on their journey from the edge to the centre of the city when coming from these key locations in Aberdeenshire.

7.7.2 Intervention 11 - Supporting integrated journeys at ferry terminals

Aberdeen Railway Station is adjacent to the ferry terminal, linking more Aberdeenshire towns to the rail network will provide direct public transport access to ferry terminals, encouraging walking access to the ferry and public transport use at their destination since the car is left behind.

7.7.3 Intervention 12 - Infrastructure to provide access for all at rail stations.

Newly designed and constructed railway stations can be built to modern standards, providing access for all in the foundations of the spaces.

7.8.2 Intervention 14 - Delivery of Rail Decarbonisation Programme (Phase 1)

"focusses on decarbonising transport through modal shift to rail"

The decarbonisation of the rail network includes electrification to Inverurie. This strengthens our argument for Buchan Railways in particular by facilitating faster accelerating trains through the current single line section north of Aberdeen. Public desire for rail in North East Aberdeenshire is extremely high, and like the Borders Railway, reopening rail connections to this region will instantly achieve significant modal shift away from the private car, and on to a newly decarbonised railway.

7.9.2 Intervention 16 - Infrastructure to encourage Rail freight

"A shift from road freight to rail, where this is viable, can help the Scottish Government meet its commitment to tackling climate change."

Rail connections to Peterhead and Ellon will facilitate the transfer of daily, regular, high quantity, and very long distance freight. To achieve this, the tunnels north of Aberdeen will have to be upgraded to W12 gauge. Providing this upgrade will allow refrigerated containers to transfer fish and beer on their very long distance journeys (Daily to London and France). While costly, this project will see tens of lorries a day, hundreds a week and thousands a year replaced with a few completely decarbonised trains. See section 4.3.7 for more detail.

North East Region Option Sifting Update

Two options stand out while reading this report.

"NE-23 Expand the rail network in the North East (to the benefit of both passenger and freight users) via new and/or reinstated railway lines - New Rail Lines with passenger stations - More passing loops - Rail connections to freight hubs"

"NE-35 Implement new technologies strategy for the region, across modes24 - Electric charging/hydrogen fuelling stations - Hydrogen Trains"

We can see that our proposals align perfectly with the goals of the Scottish Government in this crucial 20 year period. Aberdeen is the third largest city in Scotland, yet has the fewest rail connections of all seven. Peterhead, Fraserburgh and Banchory have populations well over 5000, and the towns and villages on the route to these destinations home thousands more. Aberdeen is a hub for hydrogen technology, and continues to be a leader in this field, recently becoming the first city to introduce hydrogen powered double decker buses. There is a unique opportunity to reopen vital connections across the entire North East, providing massive economic and social benefits, while making huge strides towards making Scotland entirely carbon neutral. Opening these rail lines with trains powered by locally produced hydrogen will be one of the largest reductions in CO₂ brought about in one project, public desire for both of these railways is massive, uptake will outstrip expectations, as it did in the Borders. Furthermore, we must push ahead with this project, and finally address the feelings of loneliness and isolation felt in Aberdeenshire, these railways will elevate the region in untold ways, and rebalance the perceived sense of being left behind.



Detailed alignments are available on the Campaign for North East Rail website in an interactive map.

www.campaignfornortheastrail.org/proposals

4 Proposals

4.1 Overview

4.1.1 The Proposals

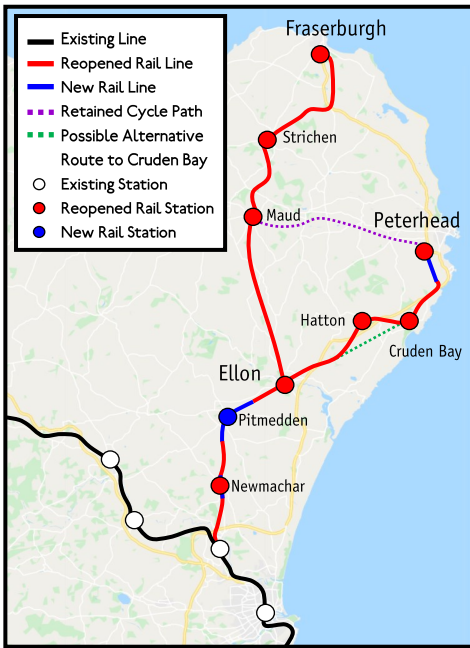


Fig 4.1 Buchan Proposal

We envision a fully integrated public transport system that stitches the social fabric of North East Scotland together. These proposals connect 10 of Aberdeenshire's 15 largest towns to fast, reliable public transport, providing an utterly transformative system that will result in massive modal shift away from the private car for thousands of people in the region, and will set up opportunities for the necessary transformation of the North East economy.

First, a railway linking Fraserburgh and Peterhead with Aberdeen. Much of the new line north makes use of the disused but well maintained alignment of the Formartine and Buchan Way. This line would branch at Ellon and follow the long abandoned Boddam branch alignment to Peterhead. A railway completed in this way would allow for competitive travel times with the car, while stopping at all of the largest settlements in the area. We also show how a half-hourly service can be achieved **without** dualling the tunnels in Aberdeen.¹⁰¹ Crucially, this particular solution has never been investigated in the past.

Furthermore, we see a restoration of the Deeside Railway as far as Banchory, with an integrated bus link to Braemar. This would provide competitive public transport for commuters into Aberdeen from as far as Banchory, and will create a link to Royal Deeside that will simultaneously provide reliable public transport from Aberdeen to the heart of rural Aberdeenshire, and allow us to gauge patronage to assess potential for future rail extension.

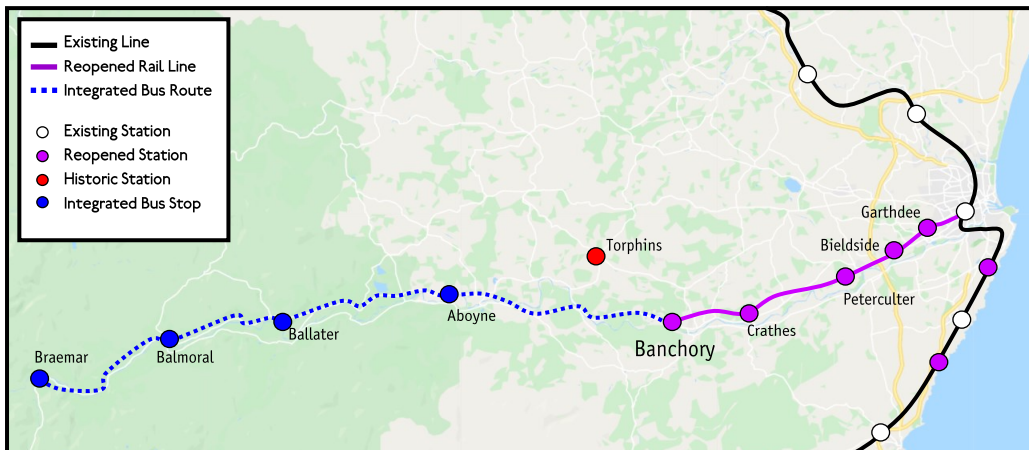


Fig 4.2 Deeside Proposal including new stations at Newtonhill and Cove Bay

Together these new lines will interconnect with the existing rail network. Operating a Crossrail like schedule that compliments the existing and successful Inverurie to Montrose Crossrail route. This style of operation will bring meaningful interchanges to the network, and facilitate rapid, sustainable transport for the entirety of the North East of Scotland.

4.1.2 The Rationale

The closure of railways throughout Aberdeenshire as a result of the Beeching cuts unfairly removed efficient transport links from a whole region. Such a decision would never be taken today. Fraserburgh and Peterhead remain isolated and in decline. Poor links to the city limit their economic potential. These towns represent the largest population, the farthest from their closest railway station anywhere in the UK. Proposed road and bus improvements will not adequately address these problems. Previous studies on reconnecting Fraserburgh and Peterhead by rail are now obsolete, new data from the Borders Railway, changed government policy and our never-studied alignment completely changes the picture. Buchan also has a strong base for tourism with several tourist attractions popular with locals. Rail links will allow tourism to blossom in the area, providing a viable sector for economic growth.

Deeside is already incredibly popular with tourists, the vast majority of these come from the UK, connecting Deeside to the rail network makes rail the natural choice for these travel destinations. Tourist numbers are set to swell with the opening of Aberdeen South Harbour, bringing Cruise Ships to Aberdeen. A rail link will help share the load as transport demands increase and offers a viable option for cruise passengers to travel sustainably. An efficient and easy to use train service will encourage cruise passengers to return in the future.

Aberdeenshire will be forced to go through massive economic change in the coming decades as the Oil and Gas industry contracts. This coupled with Aberdeen's close commuter towns provide us a perfect opportunity to provide revolutionary public transport in the region. Banchory, Ellon and Inverurie are sister towns, all three have equal potential for commuters, but only one currently has a rail link. Connecting the other two to the rail network will rebalance Aberdeenshire and allow significant growth around Aberdeen. Similarly, rail will allow smaller towns to meaningfully compete with Aberdeen for Renewable Energy business as skilled workers are more likely to want to live in these areas.

Our proposals simultaneously set up Aberdeen and Aberdeenshire for the coming economic change, and deliver truly transformative modal shift away from the private car just at the time it is required.



4.2 A New North East Economy



Fig 4.3 Aberdeen's Predicament

"There are always some who would prefer to batten down the hatches and hope for an upturn in oil prices so that they can go back to what they regard as normal. If anyone is still under that misconception then the last few weeks should have put that to bed."⁷⁸

Fig 4.4 Sir Ian Wood on the Oil and Gas Industry

Aberdeen and Aberdeenshire is facing a deluge of economic challenges simultaneously:

1. Highest number of redundancies due to Covid-19 in whole of the UK.⁶⁷
2. Continuing decline in the Oil and Gas Industry impacting the rest of the NE Economy, such as retail and hospitality.⁶⁸
3. Lagged Covid-19 recovery due to ongoing impact of offshore industry downturn, worst in UK for job opportunities.⁷¹
4. Lack of facilities to compete with other UK and European ports to attract decommissioning work for Oil sector continuity.⁶⁹
5. Competition from other Scottish regions for Renewable Industry investment.⁷⁰

The North East **must** diversify it's Economy, this means taking full advantage of the **opportunities** in the coming years to grow two key sectors:



TOURISM

Opportunities

1. Completed Aberdeen - Inverurie double track made it much easier to travel to places along the main line by rail.¹³
2. A New Deep Water Harbour at Nigg Bay will provide the largest berthage in the UK. Bringing Cruise Ships to Aberdeen.⁷²
3. Rising Climate concern amongst UK public,⁷³ rail is by far the most efficient mode of travel, and 78% of tourists to Aberdeenshire come from the UK.⁶⁵
4. Tourism is a growth industry for Aberdeenshire, recent upgrades to Aberdeen Airport will cater to more diverse visitors.⁷⁴ ART connect Aberdeen directly to Dyce, making rail the obvious choice for tourists for travelling into all of Aberdeenshire
5. P&J Live can cater for large scale events and conferences,⁷⁴ Thousands of people from all over Aberdeenshire will have access to the city by rail, avoiding massive traffic jams for gigs.
6. Aberdeenshire is a hotspot for growing Adventure-Tourism market.⁷⁶ rail will bring people to the Aberdeenshire countryside to partake in these activities. Particularly along the Deeside line.
7. Space Tourism is set to take off in Scotland,⁷⁹ and Aberdeen Railway Station connects directly to the ferry to Shetland. Thousands of Aberdeenshire residents will be connected to the network, making it easy to visit these events sustainably.



RENEWABLES

Opportunities

1. A New Deep Water Harbour at Nigg Bay will provide the largest berthage in the UK.⁷² A direct link with Craiginchies Railfreight yard will provide new opportunities for freight by rail in Aberdeen.
2. The advent of Hydrogen trains in Scotland⁸⁰ will allow Aberdeen to further develop it's lead in H² technology. Significant investment to date shows the council's commitment to H² development.⁸¹
3. "Utilising the expert technical knowledge that exists within the substantial UK Oil and Gas supply chain is fundamental if we are to evolve toward a low-carbon future."⁸² As Oil and Gas contracts, the workforce can be transitioned into a new Renewable Energy Industry. A lack of Skilled Workers is a problem for towns such as Fraserburgh,⁸⁴ the town is the place most reliant on fishing in the entire UK⁸⁶, recent efforts to attract new Renewable Industry aim to change this.⁸³ Modern rail links would ensure that these new Industries can set up all over Aberdeenshire, taking advantage of lower land prices, with confidence that Skilled Workers will be happy to live in towns farther from Aberdeen City.⁸⁵
4. North East Scotland has the potential to attract an array of new technical Industries, and rail will ensure these new Industries can spread out across the Energetica area, not just Aberdeen City.⁸⁷
5. Existing Industries can shift their freight from road to rail.⁸⁸



4.3 Buchan

The Formartine and Buchan Line originally travelled through the administrative areas of Garioch, Formartine, Buchan, and Banff and Buchan. For the purposes of this document, we will refer to this study area north of Aberdeen to Fraserburgh and Peterhead as “Buchan”.

4.3.1 Historic Railways

There are three historic railways in Buchan that are Relevant to our proposals.

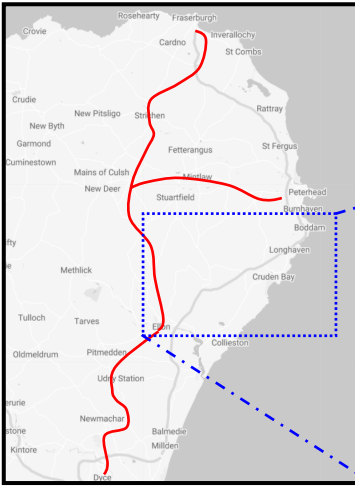


Fig 4.5 Formartine and Buchan Railway

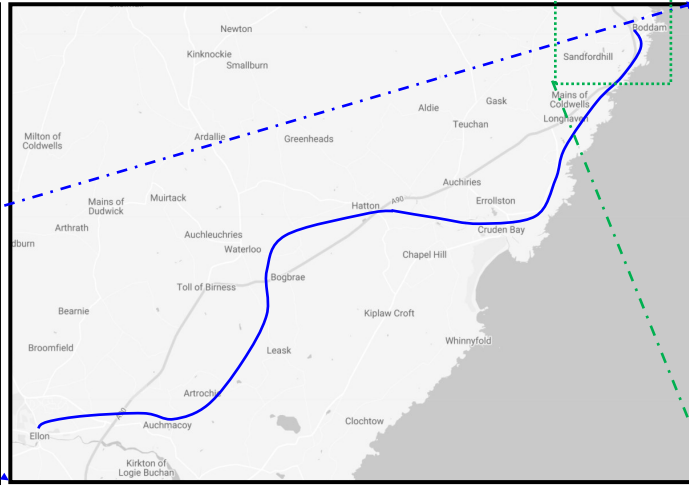


Fig 4.6 Boddam Branch Line



Fig 4.7 Peterhead Prison Railway

The Formartine and Buchan Way is now a shared use path, 80% of the permanent way substructure is still in place.³⁹

The Boddam Branch Line was closed in 1950, much of the groundwork is still in place, but several bridges would need to be rebuilt.

The Peterhead Prison Railway was closed in 1958, much of the groundwork is still in place.

4.3.2 Where People Live

Table 4.1 below shows Population living within the assumed catchment area (30 min max) for stations along the Proposed Buchan Line.⁹¹

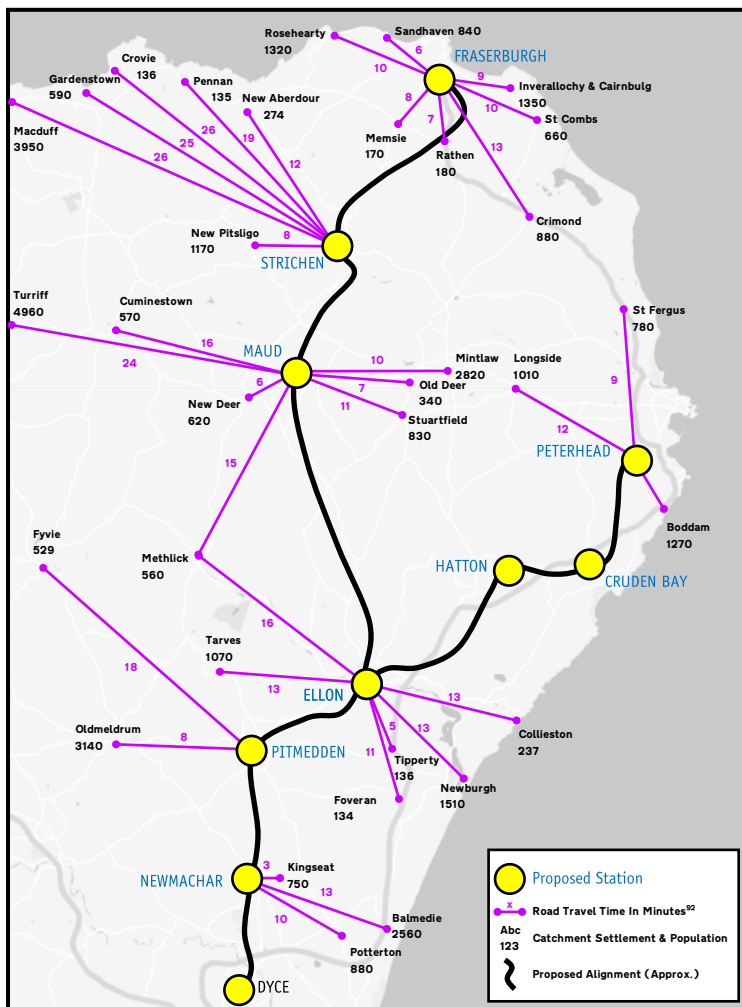


Fig 4.8 Populated Settlements along the Proposed Buchan Railway

Station	Population	Catchment Population	Total Served
Fraserburgh	13,180	5,400	18,580
Strichen	1,020	6,255	7,275
Maud	910	10,700	11,960
Peterhead	19,270	3060	22,330
Cruden Bay	1,640	-	1,640
Hatton	900	-	900
Ellon	10,200	3,647	13,847
Pitmedden	1,440	3,669	5,109
Newmachar	2,500	4,190	6,690
Population Served Directly by Proposed Buchan Railway			51,060
Pop. in other settlements within 30 mins of Proposed Railway			36,711
Total in Settlements Served by Proposed Buchan Railway			87,771

Tab 4.1 Population Served by Proposed Buchan Railway

It should be noted that Table 4.1 does not take into account the significant population living outwith towns and villages that are within 30 minutes drive of stations along the proposed Buchan Line. Aberdeenshire has an estimated population of 261,210, by reopening both of our proposed railways (Buchan and Dee-side), almost all of this population is brought within a 30 minute drive of a railway station.

Updated data will be available upon completion of the 2022 Census. It should also be noted that the total figure above does not double count settlements that share two stations.



4.3.3 Where People Want to Go

Our Proposed Buchan Line will serve commuters along its entire length. In addition to this, the line will bring better connectivity to the region north of Aberdeen and since 78% of tourists to Aberdeenshire come from the UK, rail will be the obvious choice for visitor's mode of travel. The 'on the map' effect documented by the opening of other railways¹⁴ will allow the Buchan area to capitalise on its world-class tourist attractions, and build this sector into a viable new arm of its local economy.

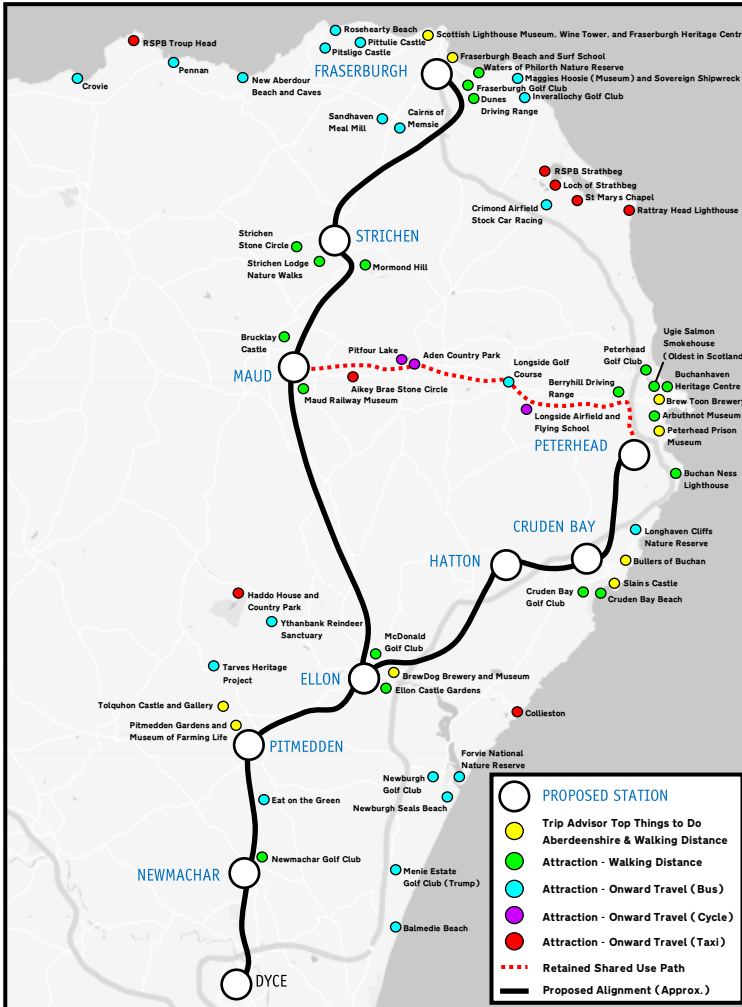


Fig 4.9 Popular Tourist Attractions along the Proposed Buchan Railway

4.3.4 Freight Potential

The A90 north of Aberdeen to Peterhead, and the A952 to Fraserburgh are Principal Freight Routes in Aberdeenshire.⁹³ After the 2017 Strategic Transport Study, the Formartine Area Committee commented on the challenges for freight in the area:

*"Many businesses in the area are particularly reliant on road freight on this corridor, and this freight cannot necessarily be easily transferred onto a rail service. For example, over 1 million tonnes of oil related freight cross the quays annually at Peterhead, and a substantial majority of this moves between the vendor bases in Aberdeen, and Peterhead Port. As another example, the value of fish landed at Peterhead and Fraserburgh can be in excess of £200m annually, and virtually all of this moves out of the area, alongside other movements of shellfish and frozen fish. It is imperative that these goods catch cut off times for Billingsgate fish market, as well as cut off times for cross channel ferries to enter the European supply chain at Boulogne Sur Mer. These freight flows have specific value to the regional economy; however the volume of freight movements on the corridor does impact on other road users."*⁹⁴

Oil Industry freight between Peterhead and Aberdeen is not suitable for movement by rail because there would be no benefit in cost or speed for these companies to do so. There may be an argument for movements by rail if a link is established to the new Aberdeen South Harbour and significant quantities need to be moved between the ports. This is not being considered in this proposal. Instead, we see two viable cases for freight in Buchan. Both of these candidates require refrigeration,⁹⁸ we discuss the implications of this in section 4.3.7.

BrewDog

BrewDog are based in Ellon and are a company actively engaged in taking action to reduce their carbon footprint.⁹⁵ In 2017, the beer manufacturer was shipping 200 pallets of beer a day from their Brewery in Ellon,⁹⁶ and continues to grow. Much of this freight is heading abroad, as they ship to over 56 countries. Transferring 200 pallets from road to rail would mean a 10 to 20 container Brewdog train leaving daily.⁹⁷ Brewdog have been contacted for comment on this potential move.

Fish

As we see from the quote above, a significant volume of fish is leaving the area heading south. The vast majority is heading for Billingsgate (598mi) or Boulogne Sur Mer (699mi), and is extremely time sensitive. This super long distance freight is the ideal candidate for rail. In our conversations with fish processors in Fraserburgh, most agreed rail freight would work if it was competitive on price, and fast. There is a clear opportunity to see hundreds of lorries replaced by a single Train.

Figure 4.9 shows the wide array of tourist attractions in Buchan. Many are within walking distance of our proposed station stops. This lends credence to the argument that opening this railway will create a strong opportunity for a new Tourism Industry in the area.

Fraserburgh is the town most dependent on fishing anywhere in the UK, looking at this map we can see the potential for the town to capitalise on a rail connection and establish itself as a must visit location, a gateway to the North East Coast.

Peterhead will become more like Fraserburgh as the Oil and Gas Industry contracts, thankfully this town also has a strong foundation upon which to build stronger tourism industry.

This railway will not only connect new visitors to the area, it will also interconnect the region, allowing locals to ditch the car and take the train to the places they want to visit in their free time.

Events

There are also a number of annual events held across the region that regularly attract thousands of visitors from across the UK:

- Fraserburgh Vintage Car Rally
- Fraserburgh Super Saturdays
- BRG Challenge
- Peterhead Scottish Week
- Peterhead Seafood Festival
- Brewdog AGM
- Taste of Grampian



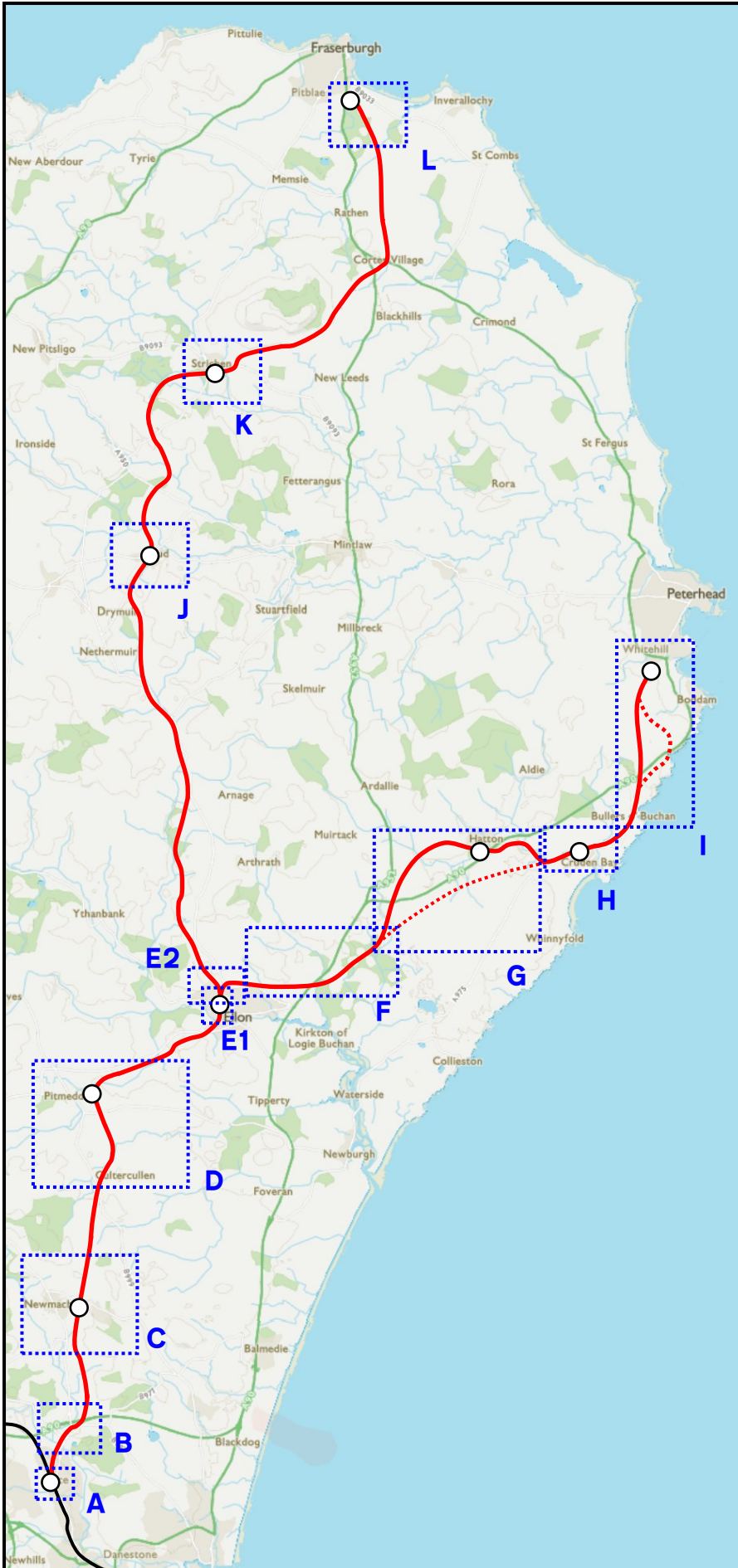
4.3.5 Project Benefits

Proposed Benefit	Outcome
Improved Transport Mode Choice in Fraserburgh and Peterhead to Aberdeen Corridor.	Reduced economic impact of disruption on road network. Reduction in overall traffic, lowering concern over current Oil freight by road.
Better access to Scottish Government regeneration priority areas of Fraserburgh and Peterhead.	Prevent migration away from towns as area becomes a more attractive place to live for commuters to the city.
Increased reliability of journey times across region as transport load is shared across road and rail.	Further increase in the appeal of Buchan to commuters, supporting population growth in these towns. Increased reliability of journey times will encourage more modal shift to both rail and bus from car.
Increased reliability of freight movements by road through a reduction in overall traffic.	'Slack' will no longer have to be built into delivery times, making the region more attractive for business, supporting economic growth and allowing Buchan to compete with Aberdeen for new business.
Capitalise on growing Aberdeenshire rail commuter market, provide growth in home building in Ellon.	Raise Ellon to the same level as Inverurie, and see increased levels of home building as a result.
Direct link from Buchan to Dyce Heliports without entering Aberdeen for offshore workforce who must leave car behind.	Increased use of public transport due to improved convenience, less reliance on long distance Taxi usage on A90 and A952.
Direct link from Buchan to Dyce without entering Aberdeen for access to Aberdeen Airport and events at P&J Live.	Increased use of public transport due to improved convenience, reduced traffic after large P&J Live events, less car use at Airport.
Expanded travel to work catchment and zone of economic influence for Aberdeen.	Boosted employment and economic activity in Aberdeen and the surrounding area
Better inter-town links within Buchan.	Improved mobility for non car owners, greater social inclusion in communities. Modal shift from car to public transport for short journeys.
Direct rail link from rest of UK to North East Coast, star attractions and bucket list destinations.	Delivers a step change in the appeal of Buchan Coast as a tourist destination, allows area to grow a viable Tourism sector.
Direct rail link from Aberdeen to Ellon, providing an easy choice for Beer pilgrimages to Brewdog's 'Flagship' bar and the brewery in Ellon.	Supporting growth of a locally grown international brand, bringing international interest to Buchan, not just Aberdeen.
Much improved public transport access to HMP and YOI Grampian.	Transport made easier for visiting family members of young offenders. Likely increase in overall visits as a result, improving quality of life for these young offenders.
Much improved public transport access to NESCOL Fraserburgh Campus.	Students can travel between Aberdeen and Fraserburgh Campuses sustainably, better access for visiting family.
Bring all of Aberdeenshire north of Aberdeen from the east coast to the Aberdeen to Inverness line within 30 mins drive of a station.	No area of Aberdeenshire is left behind and tens of thousands of people have access to reliable, attractive public transport.
Transfer of fish freight from road to rail.	While this has a low impact on traffic issues, super long haul freight will be moved faster and more reliably, while releasing less carbon.
Transfer of Brewdog freight from road to rail.	Removal of over 200 pallets a day from the road network and linking Brewdog directly to international shipping destinations.
A lifeline for isolated communities.	Reverse the feeling of isolation felt in North East communities, as identified in the 2017 studies, encourage more social inclusion.
Support Aberdeen in reducing car usage in the city and establishing a Low Emissions Zone.	Provide a real alternative to the car, deliver passengers directly into the centre of Aberdeen.
Direct access to the entire UK rail network for medium and long haul travellers.	Further reduce car usage in Aberdeen by eliminating driving and parking in the city as Buchan resident's closest station.
Increase Capacity in Aberdeen Railway Station.	Provide greater flexibility in scheduling of trains in and out of Aberdeen, increasing resilience to delay and disruption.
Increase Capacity between Aberdeen Railway Station and Schoolhill Tunnel.	Provide greater flexibility in scheduling of trains between Aberdeen and Dyce, Inverurie and Inverness, increasing resilience to delay and disruption. Prevent having to fund the cost of redoubling the tunnels.

Tab 4.2 Proposed Benefits of Buchan Railway



4.3.6 Alignment



Our proposed alignment follows the historical route of the Formartine and Buchan Railway from Dyce to Fraserburgh. This section is now a shared use path maintained by Aberdeenshire Council and protected from future development. As a result, very little obstruction exists along the length of this section. Previous studies found that 80% of the permeant way substructure is still in place, and while most overbridges are still standing and in use, many underbridges will have to be replaced, particularly where the line crosses major roads. User worked or Red/Green Level Crossings will have to be provided in many places to maintain current access for farming activity. From Ellon to Fraserburgh the route provides good connectivity and a more or less direct path. This alignment is 28 miles by rail, compared to 27 miles by road, we can see that an easily achievable average speed higher than 60mph would provide travel times comparable with the private car. Therefore we propose no deviation from the original alignment. From Dyce to Ellon we also propose following the route of the Formartine and Buchan Way. It's condition is identical to that of the section north of Ellon, but we propose two major deviations. First, rebuilding the line near Newmachar and Kingseat to be straight, as suggested in the 2017 Study. This cuts out some very tight bends, and allows for a station equidistant from the two towns. Further, we propose a deviation north of Udny Station towards Pitmedden. This involves building 4.5 miles of brand new track compared to rebuilding 3.5 miles on the original alignment. From Ellon to Cruden Bay our proposed railway follows the path of the Boddam Branch line. Since this railway closed in 1950, rebuilding this will be closer in cost to constructing a entirely new alignment. However, the alignment is clear of major development, and is relatively straight compared to the road, therefore providing a good base to build a railway on with minimal environmental disruption. Near the Toll of Birness we explore the possibility of avoiding the old alignment, and heading straight for Cruden Bay, cutting out Hatton. After this, we face a choice between reconstructing the viaduct and embankment, or building a full span viaduct at Cruden Bay. Finally, after the Bulls of Buchan, we propose one final deviation, leaving the Boddam branch behind and following the path of the Peterhead Prison Railway to terminate at the edge of town.

Fig 4.10 Proposed Alignment for Buchan Railway with areas of Interest



A - Dyce Station

In this section we will explore the possibilities for integrating our proposed Buchan Railway with the current Dyce Railway Station. In 2015, NESTRANS commissioned an appraisal of a prospective new car park for Dyce Railway Station, this was to address the growing popularity of the station with commuters and the inadequacies of its car parking facilities.⁹⁹ Six years later this work has not been completed.

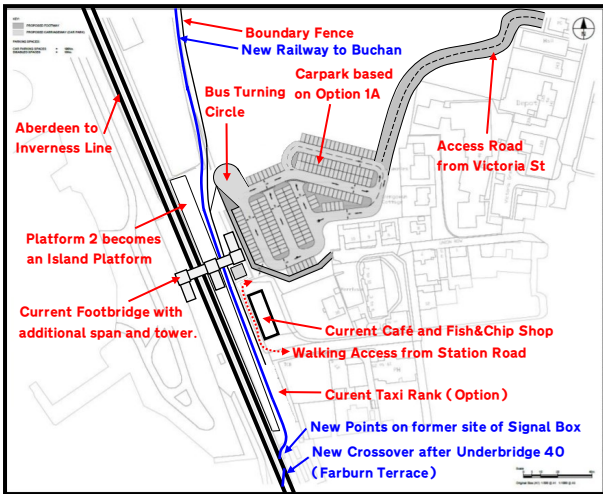


Fig 4.11 Dyce Station Proposal

Figure 4.11 shows a modified Option 1A car park proposal from this Appraisal Document. It is for a feasibility study to determine the appropriate size of car park required, but we have included this option for illustration purposes. Additionally, we have included a bus turning circle on this side of the railway as an option for consideration. The new rail alignment will remove the current car park, making road access from Station Road not suitable. Therefore we recommended an access road be built through disused land from Victoria Street. There is ample space for walking access to be maintained between Station Road and Union Row. To access the platforms from the car park, the current footbridge will need to be modified. This work would involve the addition of another lift tower, set of stairs, and a new bridge span to connect to the current footbridge over the new line. The Buchan Line will leave the A to I line through the former site of Dyce Signal Box, crossover points will bring trains across from the Down line after Overbridge 40.

Benefits of this alignment

- ✓ No land take required from local businesses.
- ✓ Traffic removed from narrow Station Road.
- ✓ Walking access maintained between Station Road, Union Row and local businesses.
- ✓ Car park access provided from the main thoroughfare in Dyce - Victoria Road.
- ✓ Buchan bound trains removed from Aberdeen to Inverness line before Dyce Station stop, keeping capacity high on main-line and allowing Buchan trains returning to Aberdeen to wait for passing trains from Inverness or Inverurie if required.



Fig 4.12 Dyce Station from Current Taxi Rank

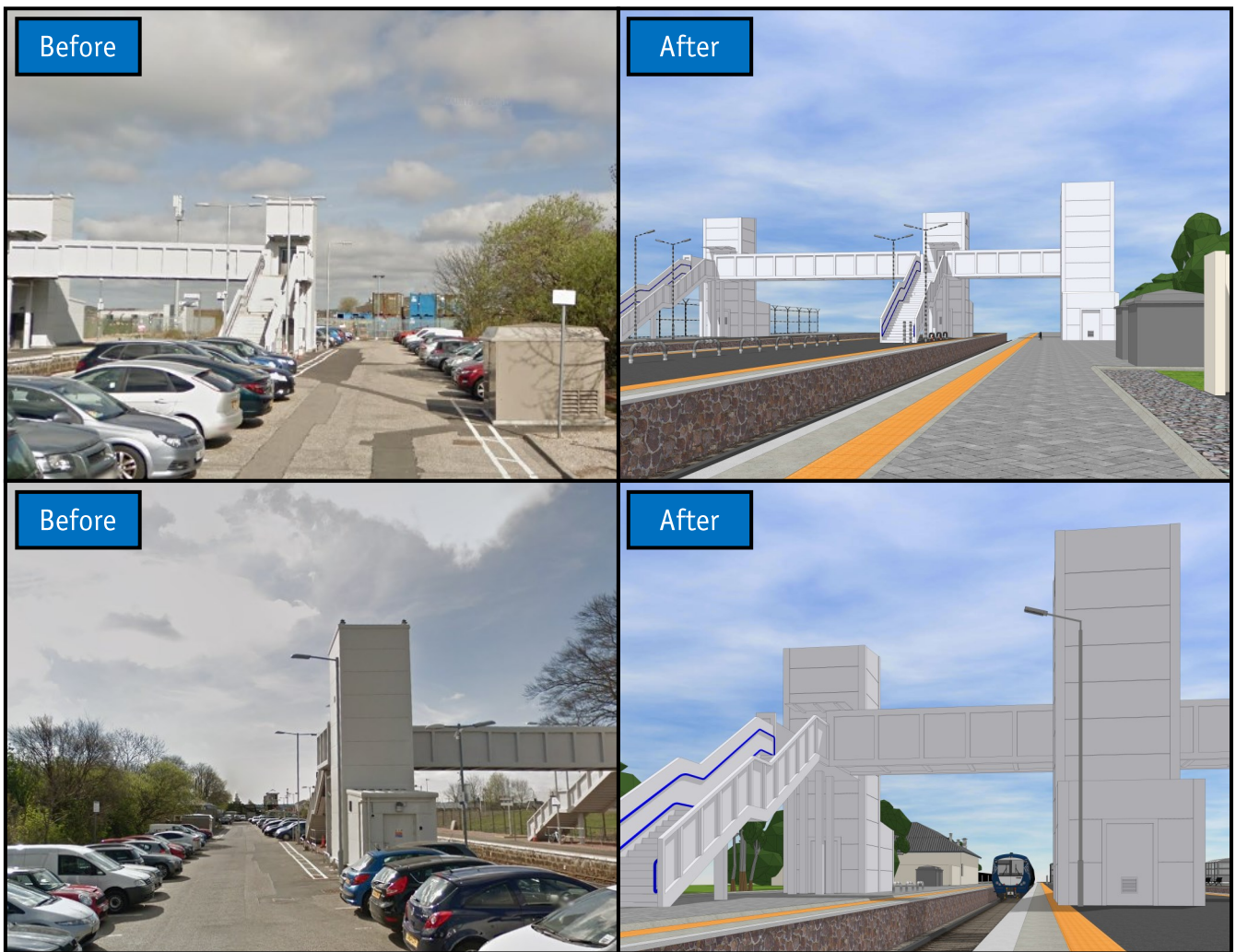


Fig 4.13 New Footbridge Access to Plat forms from Car Park

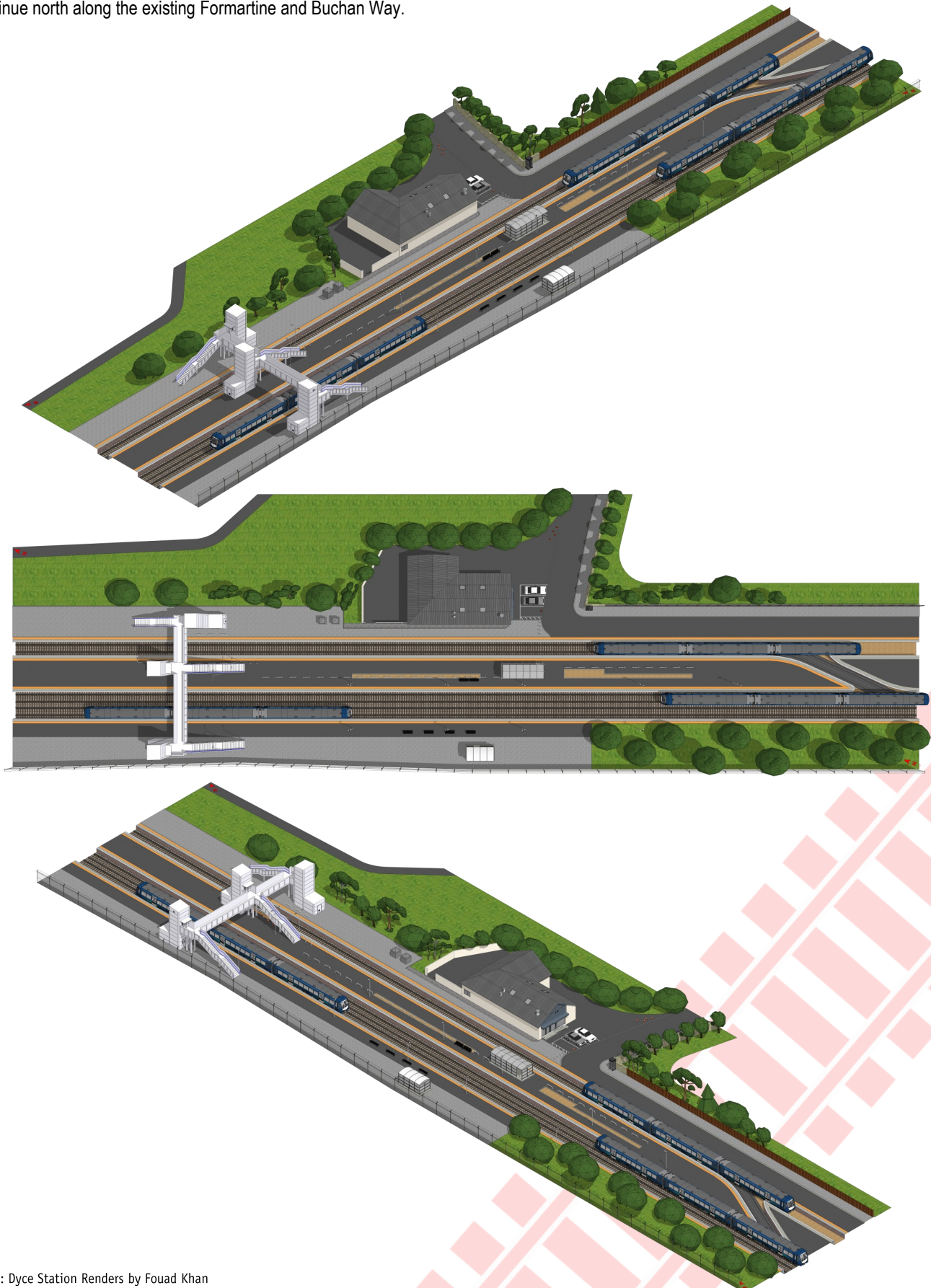


Fig 4.14 New Road Access from Victoria Road



Dyce Station Model

The following images show a mock up of Dyce station after the opening of the Buchan Line. Please note this model does not include our proposal for a new carpark, and leaves room for the current taxi rank to be retained in it's current location. This render includes a headshunt or siding at the south end of the Buchan-bound platform, this was considered earlier in the project, but upon visiting the site it is clear there is not enough space for any useful length of track. After leaving the Aberdeen-Inverness line, trains will stop at Dyce platform, then continue north along the existing Formartine and Buchan Way.



Credit: Dyce Station Renders by Fouad Khan



B - AWPR and A947 Crossing

Concerns were raised in previous studies over the impact of the AWPR which was under construction at the time. Now that the AWPR is completed and open, we can see that the original Formartine and Buchan Way remains clear of obstructions.

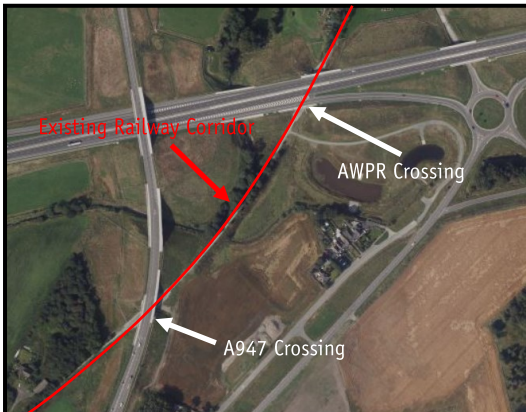


Fig 4.15 AWPR and A947 Underpass Crossings

Visible in satellite imagery, underpasses were provided for the Formartine and Buchan Way to cross the AWPR and A947. Both of these underpasses are sufficiently tall and wide to allow trains to pass through unobstructed.



Fig 4.16 A947 Underpass



Fig 4.17 AWPR Underpass

C - Newmachar Station

The Ellon Rail Study recommended a deviation from the original Formartine and Buchan Way alignment to eliminate two tight curves, and provide a station equidistant from Newmachar and Kingseat. We echo this recommendation, but begin the deviation further south to avoid the need for unnecessary compulsory purchase and demolition.

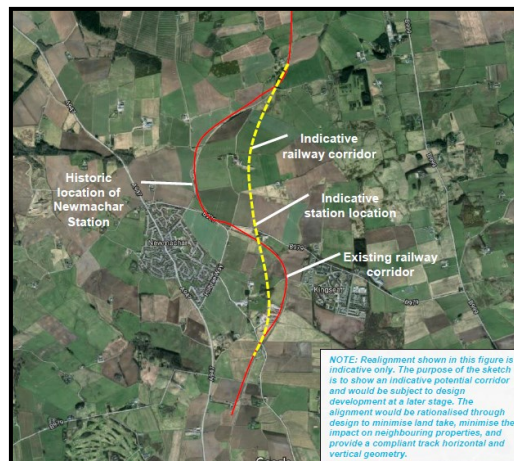


Fig 4.16 Curve realignment at Newmachar¹⁰⁰

D - Pitmedden Station

We recommend a deviation from the original route to provide a station stop at Pitmedden. This requires construction of approximately 4 miles of brand new railway instead of 3 miles on the existing groundwork. The final alignment will be determined in future studies.

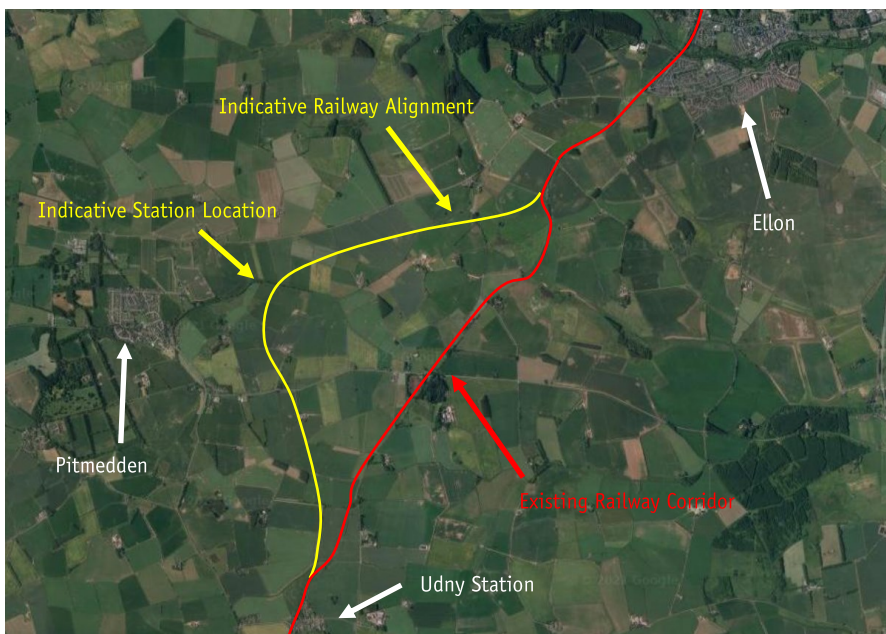


Fig 4.17 Indicative Realignment at Udney for Pitmedden Station

Benefits of this Proposal

- ✓ Pitmedden station serves 1440 directly
- ✓ Pitmedden station serves 3669 indirectly.
- ✓ Oldmeldrum residents will have access to two railway stations within 10 minutes drive, convenience will increase likely modal shift for journeys north by rail .
- ✓ Shared use path Udney Station - Ellon retained with minimal cost.
- ✓ Pitmedden station becomes the farthest west station on the Buchan Railway, increasing the overall population within a 30 minute catchment zone, including Fyvie and Oldmeldrum.



E1 - Ellon Station

The original site of Ellon station is well placed in the centre of the town, providing good access to attractions and amenities on foot. This site remains clear, but has lost adjacent ground that could have been utilised for a car park in recent years. The Aberdeenshire Local Development Plan specifies land set aside and safeguarded for a potential railway, including space for a car park, Figure 4.18 shows this area highlighted in blue, with station site labelled 'R2'.¹²⁰ This site is located north of the historic station site, and is currently in use as an Aberdeenshire Council Depot. Excellent vehicular access is provided from Hospital Road, and on the opposite side of the railway, walking access will be available from Anderson Terrace and Station Brae. Figure 4.19 shows the same area with satellite imagery.

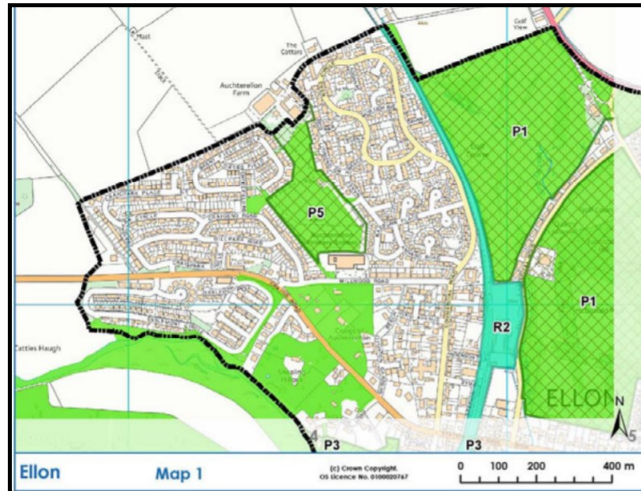


Fig 4.18 Aberdeenshire Local Development Plan - Ellon Map 1



Fig 4.19 Ellon Satellite Imagery

E2 - Ellon Junction

Since its closure in 1950, the Boddam branch junction has been developed upon. To build the Buchan Railway along this alignment would require purchase and demolition of 15 homes and industrial land. Therefore a new junction to the north will be required.

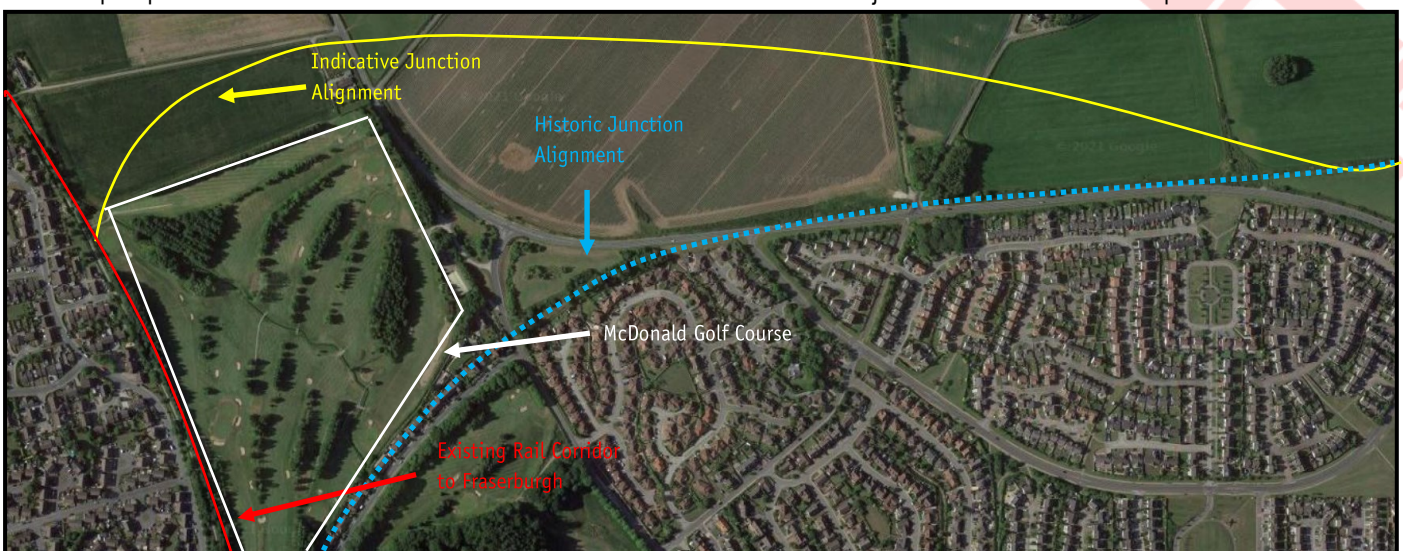


Fig 4.20 Ellon Junction Realignment



F - Auchmachoy

Much of the historic alignment of the Boddam branch line remains unobstructed and can be rebuilt with minor adjustments.

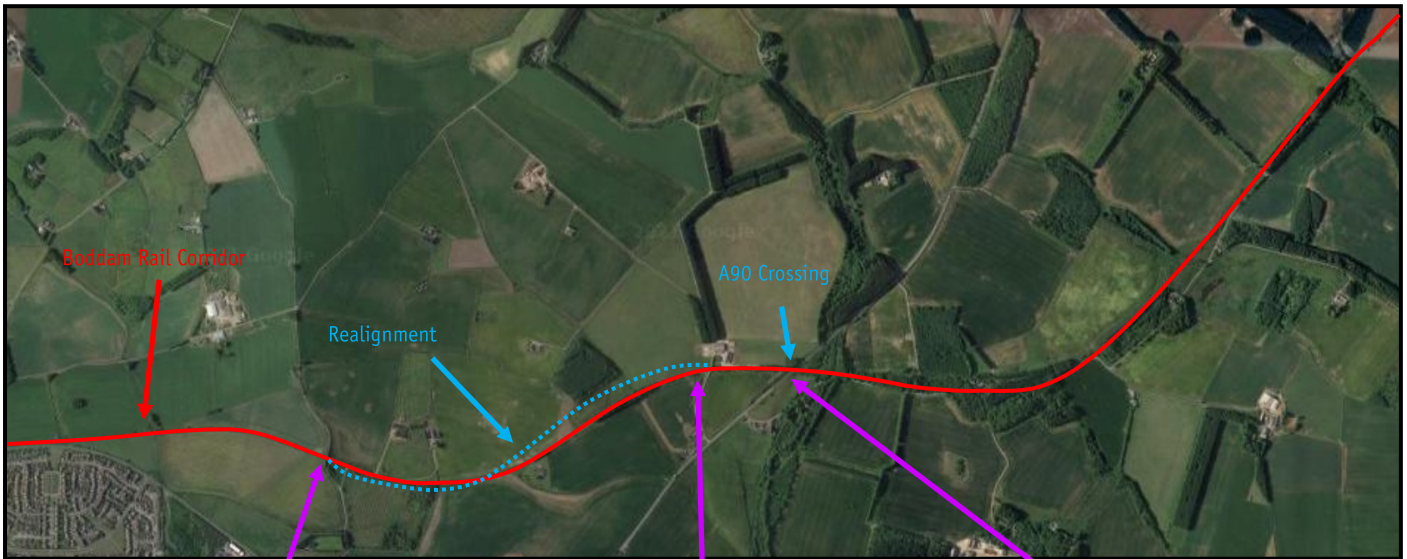


Fig 4.21 Auchmachoy Realignment

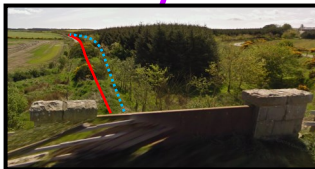


Fig 4.22 Realignment West End



Fig 4.22 Realignment East End



Fig 4.23 A90 Crossing

This realignment moves the new railway a few metres to the side of farm roads that have been built on the alignment of the old line. Work involves constructing one mile of brand new track, including groundwork, with two level crossings along its length. No significant engineering challenge exists along this section. Sticking to the historic alignment will require these roads to be rebuilt somewhere else to provide access to these homes, and likely three level crossings, although this will depend on the chosen route.

The railway will need to cross over the A90 by means of a new overbridge, raised embankments are still present on either side of the road, minimising the groundworks required. If proposed road dualling Ellon - Toll of Birness goes ahead as planned, this bridge span may need to be increased.

After this crossing, the next 3 miles of track is unobstructed, except for some level crossings that would be required to maintain access.

G - Bogbrae - Cruden Bay

Between the area of Bogbrae and Cruden Bay, an entirely new alignment may prove a better option than the historic alignment.

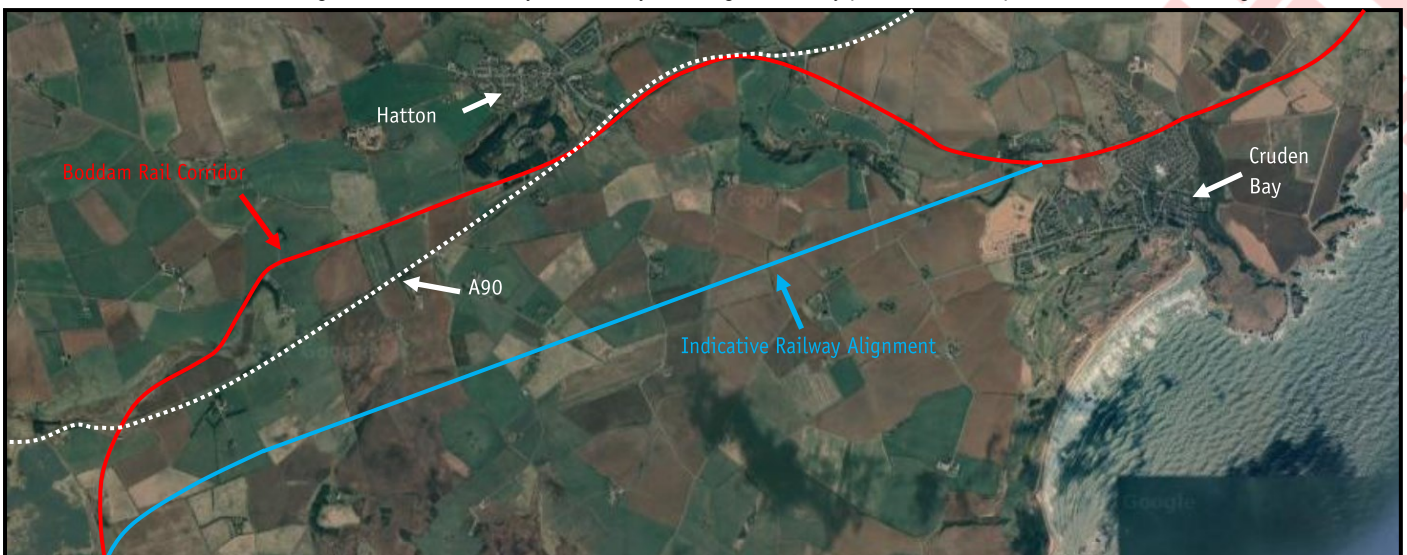


Fig 4.24 Bogbrae Realignment Options



Option 1 - Historic Railway Alignment

Following the historic railway alignment from Bogbrae to Cruden Bay, including a station halt at Hatton.

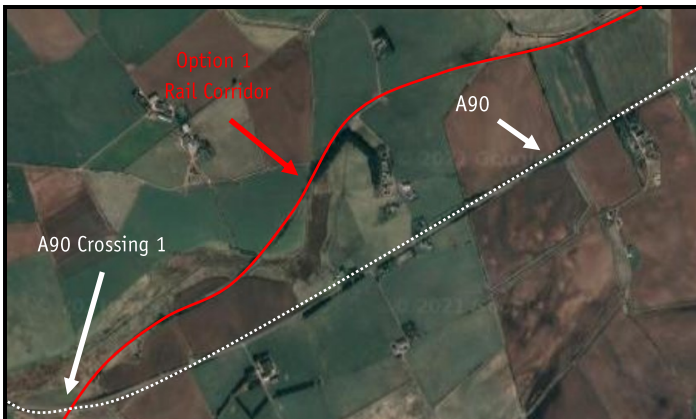


Fig 4.25 Historic Alignment - Hatton

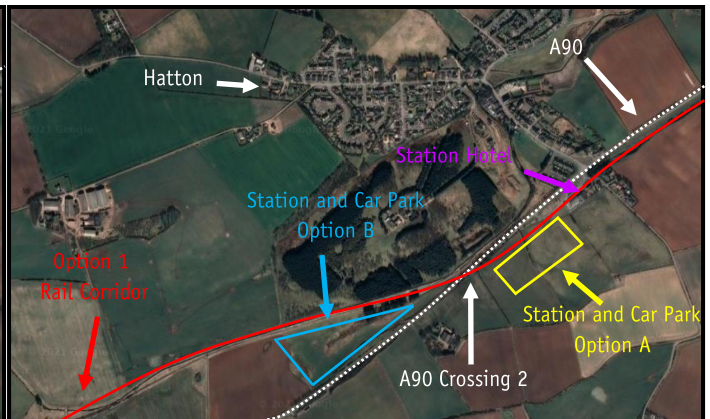


Fig 4.26 Historic Alignment - Hatton



Fig 4.27 Historic Alignment - A90 Crossing 1

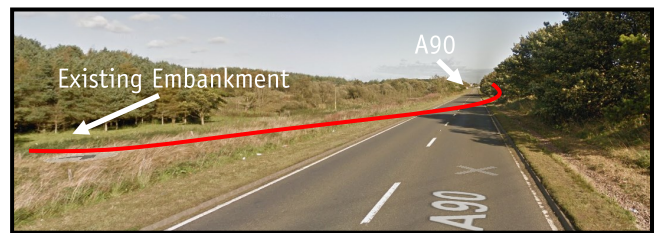


Fig 4.28 Historic Alignment - A90 Crossing 2

This Option requires two crossings of the A90 trunk road, both of these crossings will have to be grade separated, meaning that either the railway will have to be raised over the road, or the road will have to be raised over the railway.



Fig 4.29 Existing Bridge Support



Fig 4.30 Existing Bridge Support



Fig 4.31 Existing Bridge



Fig 4.32 Existing Cutting

Despite the Boddam branch line closing in 1950, much of the infrastructure is still in place, including bridges, bridge supports, cuttings and embankments. Reusing these will reduce the overall cost of construction, only incurring the cost of bringing them up to modern standards.



Fig 4.33 Hatton Station Road Crossing

Hatton presents a number of challenges for a modern railway. Should Option A be chosen as the site for a Hatton station and car park, then this would mean the railway would pass very close to the current A90, after crossing back over the trunk road, trains will have to stop at the station, before immediately passing over a level crossing on station road. Since trains will be starting from a stand, this will mean the barriers will be closed for longer than they would be otherwise, this exacerbates the problem with this Station Road level crossing. Even if Option B is chosen for the station site, a Station Road level crossing will be located very close to the A90 Junction, making queues on the road likely, as possibly creating a dangerous situation for cars from the north. An investigation and redesign of this road junction may be required.

Option 2 - New Railway Alignment

Finding an entirely new alignment from Bogbrae to Cruden Bay, without a station halt at Hatton.

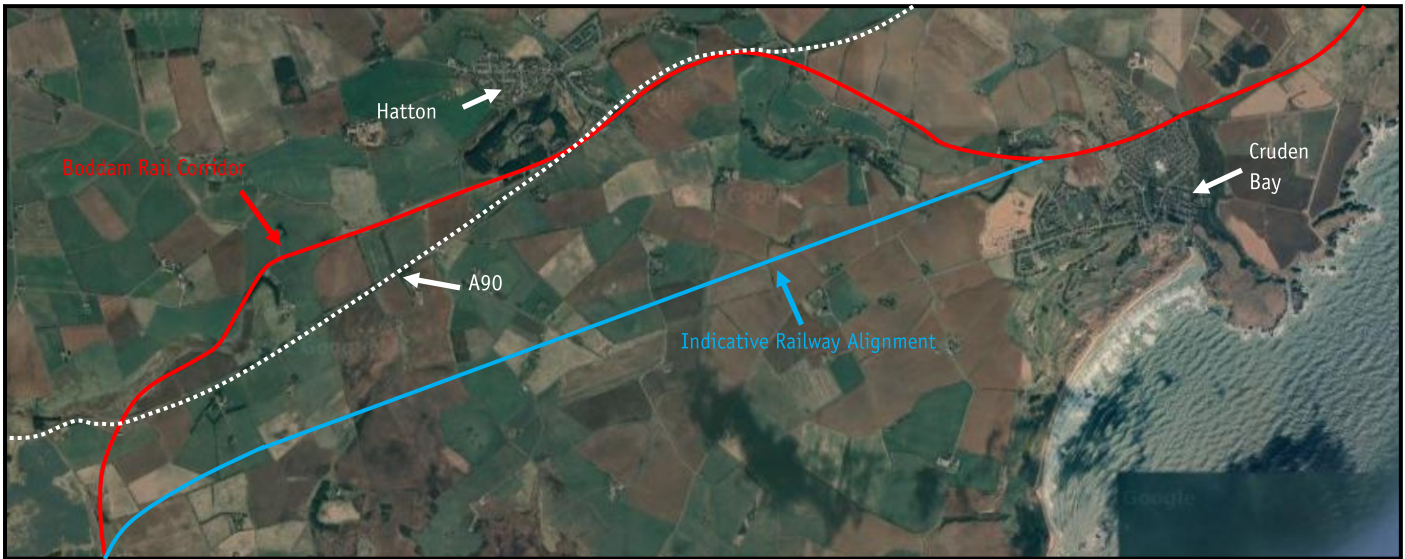


Fig 4.24 Bogbrae Realignment Options



Fig 4.34 Bogbrae Realignment Grade

It may be beneficial to find a new alignment between Bogbrae and Cruden Bay. Figure 4.24 above shows an 'as the crow flies' alignment to demonstrate the approximate path of a modern railway. In reality it is unlikely that such a straight path would be achievable, the final alignment would be chosen based on various factors such as cost, gradient, signal sighting, land take and other factors. Figure 4.34, above, shows the grade of this 'as the crow flies' path. Red parts have a grade greater than $\pm 1\%$ and would likely need significant groundwork, or a different path. It may even be possible to start a new alignment earlier, maybe as far back as Auchmacoy. This should be considered as part of any future investigation into this railway. Table 4.3, below, outlines the potential benefits of this proposed realignment.

Speed	A brand new railway designed from the ground up can potentially achieve a higher linespeed than sticking to an old route.
Crossings	Building a new alignment avoids the problem of creating two grade separated A90 crossings at great expense.
Disruption	This alignment will also prevent possible problems and road disruption caused by a Station Road level crossing in Hatton.
Cost	While a new railway is generally thought to be more expensive than re-opening, this case study may prove to be more cost effective. This is because we save on building 3 road crossings, several bridges, and Hatton station and car park.
Patronage	Patronage may suffer through the loss of a direct station at Hatton (Pop 900). However, decreased travel time and the proximity of Hatton to Cruden Bay (5min road, 7min bus) may offset this loss. It is worth noting there is no significant catchment area for a potential Hatton station that is not also covered by a Cruden Bay station.
Travel Time	A new line will be shorter than the old alignment, coupled with a higher linespeed, and no stop at Hatton, we can reduce travel time. This will make rail more competitive with road, and increase the overall appeal of the line.

Tab 4.3 Proposed Benefits of Bogbrae to Cruden Bay Realignment (Option 2)



H - Cruden Bay Viaduct and Station

Beyond Cruden Bay Station stand three piers of the historical Cruden Bay viaduct which once spanned the Water of Cruden. In it's day this viaduct carried trains across the final section of this small valley, the embankment that once connected to the viaduct has since been removed and ploughed into the fields below. To reinstate this railway crossing either this embankment will need to be rebuilt, or a new viaduct spanning the valley will be required. The alignment through Cruden Bay has been safeguarded for a railway line.¹²¹ Planning permission for 220 homes on our proposed station site (the former brick works) was granted in 2015, this has since lapsed.¹²²



Fig 4.35 Cruden Bay Viaduct Remains

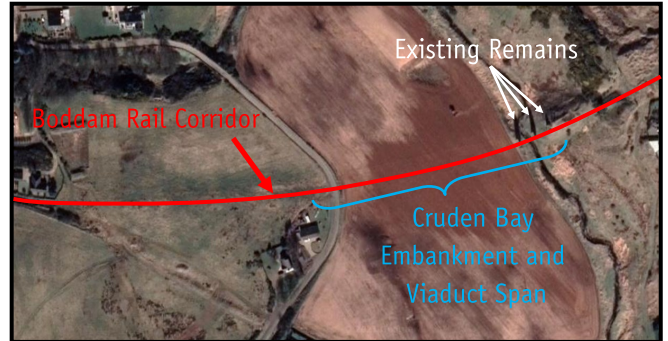


Fig 4.36 Cruden Bay Viaduct Location



Fig 4.37 Cruden Bay Station



Fig 4.38 Embankment behind homes



Fig 4.39 Former Brick Works



Fig 4.40 Existing Bridge Support

I - Cruden Bay - Peterhead

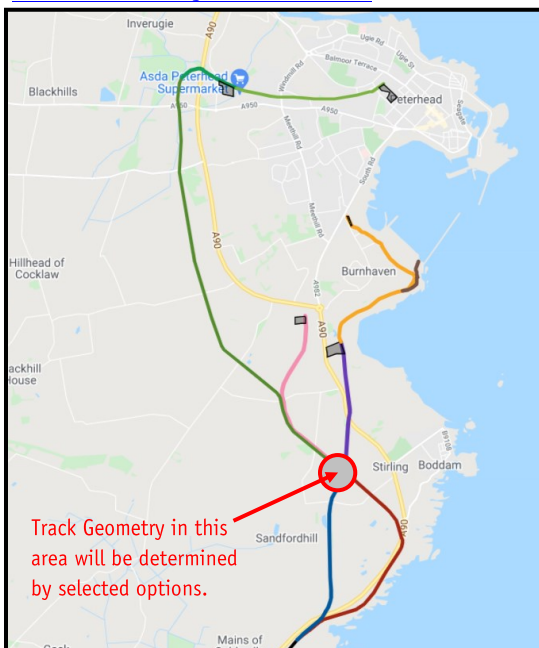


Fig 4.41 Peterhead Terminus Options

After Cruden Bay the Boddam Branch continues along the coast, this line now remains unobstructed for it's remaining length until the terminus at Boddam. The historic station site has been developed upon, and to continue the railway to Peterhead would require some tricky engineering. To avoid this, we suggest either leaving the historic alignment behind shortly after Longhaven, crossing over the A90, and continuing to Peterhead to the west of Stirling Hill (blue), or, continuing along the cliffside route further to then cross the A90 and path around Stirling Hill on the east side (red). From Longhaven, the railway can either follow the historic Peterhead Prison Railway alignment, making use of remaining infrastructure such as bridges and embankments with short realignment required to avoid the newly constructed substation, then crossing back over the A90 (purple), or, build a brand new alignment passing around Boddam substation to the west (pink). If the former option is selected, there is an opportunity to continue the line around HMP Grampian to connect to the South Pier for freight, providing a station at the popular Lido (orange). This option provides much better links to the town and incredible views. It may however be preferable to continue into the centre of Peterhead via the Formartine and Buchan Way and reconstruct the station on the historical station site. This site is much more central and is within walking distance of all Peterhead residents, as well as being better situated for visitors to the town. The existing building occupying the site will no longer be in use by 2025.¹²³



J - Maud Station

Maud station was the original junction for the historic Formartine and Buchan Railway. The line continued north towards Strichen and Fraserburgh, and branched east to Mintlaw, Longside and Peterhead. To accommodate this, Maud station was built to have four platforms, two stand alone and one island. These platforms are in remarkable condition, thanks to the 'Friends of Maud' preservation group, who have looked after the station, and established a Museum in the old station building. In recent years this group has laid short sections of rail to house restored carriages that operated on the Formartine and Buchan Railway, including an old prisoner wagon that once operated on the historic Peterhead Prison Railway. Since we are not making use of the historic Peterhead branch, we can see Maud being popular with users of the Formartine and Buchan Way, and by train users who wish to visit Old Deer Abbey, Mintlaw, Aden Country Park, Pittfour lake and the various ancient monuments accessible via this short stretch of the shared use path.

The restoration of the Buchan Railway through Maud will benefit the village enormously. Maud has a larger population in catchment settlements than any other station on this new railway, as such we have included proposals for a large car park at Maud station, despite the relatively low population of the village. We propose the railway makes use of only one platform at Maud, and that this platform be the current island platform, encouraging train users to take notice of the Museum and to maximise interest in ongoing preservation efforts. In the planning stage, it may be determined that Maud should be used as a passing loop or as part of a dynamic loop, if this is the case then both Fraserburgh bound platforms should be utilised, leaving the Peterhead bound platforms free for use by the railway Museum to showcase these restored historic carriages.

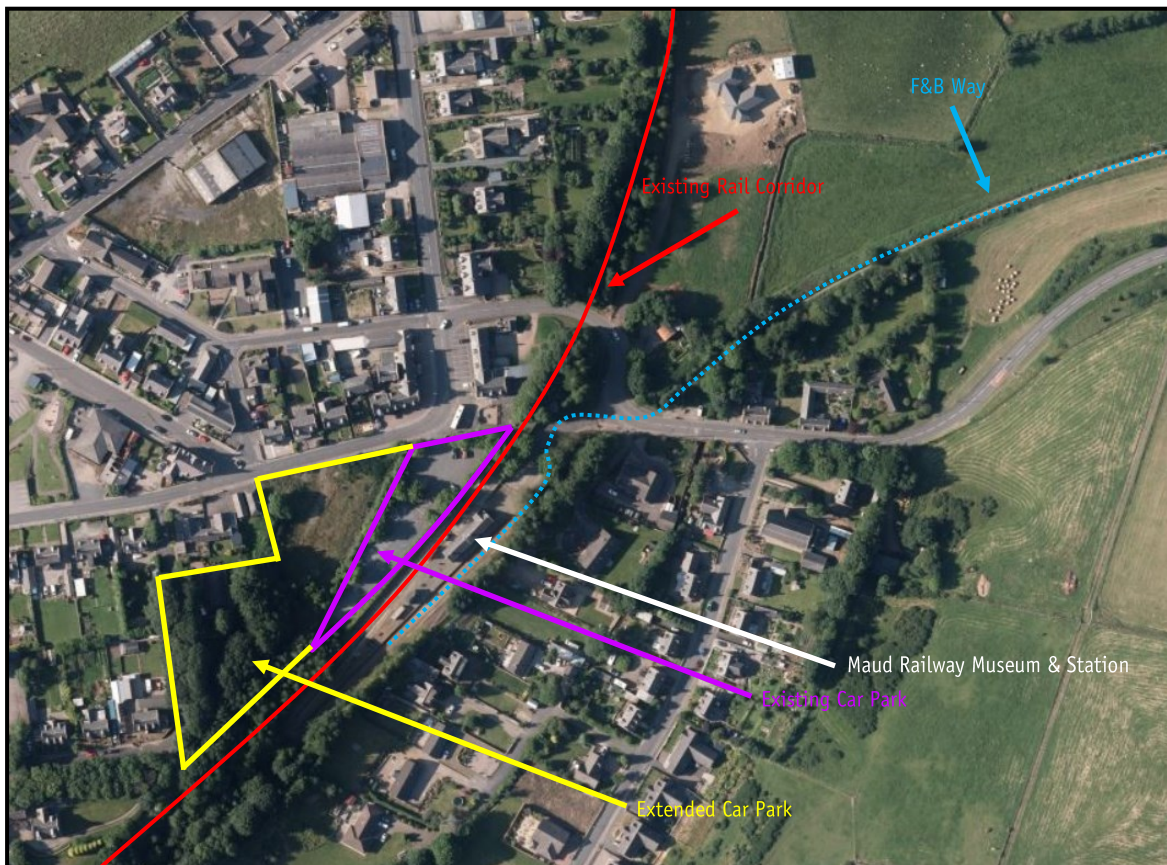


Fig 4.42 Maud Station Proposal



Fig 4.43 Maud Station Today



K - Strichen Station

The historic site of Strichen station is not suitable for a modern railway station. This is because the station house and platform are now a private home, and all nearby land is in other use, including a public park. We propose a station be built along Brewery Road, near a field suitable for a sizeable car park. This positions the station immediately adjacent to popular walks around Strichen Lodge, although a footbridge would be required to cross the railway to access these walks. Similarly, the car park will be situated at the other side of Brewery Road from the station, therefore access would need to be provided via a crossing. The site is within walking distance of Strichen Village centre along an existing pavement. It is possible to find a new, more direct path to Fraserburgh from Strichen, this is discussed in our interactive alignment map.

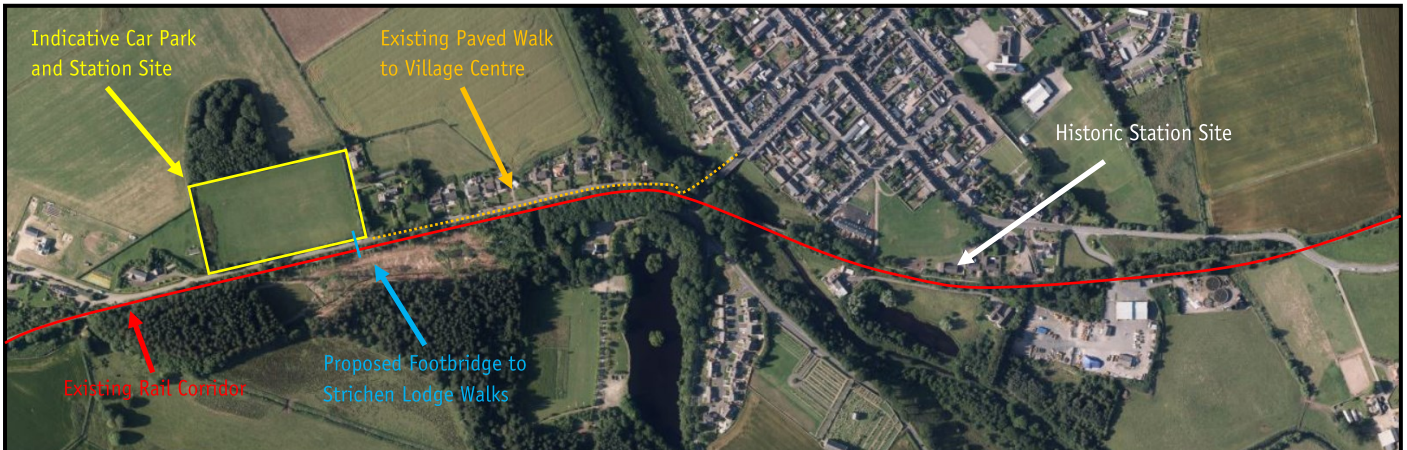


Fig 4.44 Strichen Station and Car Park

L - Fraserburgh Station

The historic site of Fraserburgh station has now been developed upon. Today this site is in use by fish processing companies, and the original path from the outskirts of the town to the station site is now the busy Beach Road, the main thoroughfare for freight into and out of Fraserburgh. We propose Fraserburgh station and car park be built on disused ground near the current retail park, a large site exists along the path of the railway corridor that is suitable for both a station and a sizeable car park. A WW2 era structure exists in this site, and work would need to be carried out with Historic Environment Scotland to ascertain it's status.



Fig 4.45 Historic Fraserburgh Alignment



Fig 4.46 Proposed Fraserburgh Station and Car Park



Fig 4.47 WW2 'Pillbox' Structure



Fig 4.48 Disused Land

4.3.7 Operation

If the Buchan line was opened today, it would be operated by Class 158 DMUs, top speed 90mph. Electrification is planned through Aberdeen as far as Inverurie within the timeframe of the Regional Transport Strategy, it is assumed that the Buchan line will be operated by an alternative traction, either Battery-Electric, or Hydrogen. Linespeed should be as high as possible, particularly on any newly aligned sections.

A major concern highlighted by previous studies into the feasibility of reopening the Buchan Railway was the cost of redoubling the single line section through the Schoolhill and Hutcheon St tunnels. The AECOM Ellon Rail Study determined that any mode of operation other than an hourly service to Ellon was not feasible without redoubling this section. These calculations were estimated, done before the redoubling of the line from Kittybrewster to Inverurie was opened in 2019.¹⁰² Now that this work has been completed, we can replace the estimated travel time through the single line section with actual travel time, and recalculate the achievable trains-per-hour through the section.

"This single track section has to accommodate all the Up and Down trains and therefore becomes the controlling constraint on capacity. Based on AECOM's calculations a passenger train may occupy the section for 2½ minutes in either direction. After a train has exited the section a margin is applied in timetable planning before reoccupation by a train in the opposing direction. After discussion with Network Rail and Scotrail, 3 minutes was determined as the minimum margin for re-occupation. A shorter margin (e.g. 2 minutes) was considered too much of a performance risk. The passage of one train therefore uses 5½ minutes of each hour (2½ occupation plus 3 minute margin before a subsequent train can be timetabled to enter in the opposite direction). In a 60 minute period therefore, 10 trains would theoretically be able to use the single line on this basis. However the actual number will be less than 10."

"[Hourly Operation] calls for 9 tph, and [Half-Hourly Operation] calls for 11 tph in the standard hour. To overcome the single line constraint it is possible to try and timetable consecutive trains in the same direction which has the advantage of using less capacity because the normal planning headway can be applied without a margin for re-occupation. This approach has been possible to a limited extent but in general the nature of the train specification means that alternate Up-Down-Up-Down sequences of trains are largely unavoidable."¹⁰²

Travel time through the single line section was estimated to be in the region of 2½ minutes. Today, actual travel time between platform 6N in Aberdeen, and the end of the Single line section is 1:59 in the Down direction, and 2:05 in the Up direction.¹⁰³ We have recalculated the available trains per hour by the method above, including a 3 minute buffer as stipulated by Network Rail. Results are shown in Tab 4.4 below.

Single Line Section	Down	Up	Hourly Operation Achievable?	Half-Hourly Operation Achievable?
Travel Time	1:59	2:05	-	-
+3 min Buffer	4:59	5:05	-	-
Trains-per-hour	12	11	Yes (+2 TPH)	Yes (+0 TPH)
Time Elapsed	59:48	55:55	-	-
1 Extra Train per	24+ hours	1:14:41	-	-

Tab 4.4 Trains per hour through single line section today

As we can see, actual travel time is consistently less than the predicted 2½ minutes, over six trains operating normally, the longest recorded time was 2:05. Travel time is shorter than predicted because the Aberdeen to Inverurie redoubling project positioned the Double-Single points very close to the mouth of the Hutcheon St tunnel, rather than closer to Kittybrewster as previous studies assumed. Additionally, linespeed has been increased from 40mph in the Hutcheon St tunnel to 50mph, this small change means trains travelling north do not need to ease back on the throttle to maintain 40mph before the end of the single line section as they previously had to. Table 4.4 above shows us that travel time in both directions allow enough trains per hour to satisfy the 11 TPH required for a Half-Hourly Ellon service. It should be noted that there is a small delay margin of 12 seconds in the Down direction, meaning no extra trains would squeeze through as the hours past. The healthy delay margin in the Up direction does allow for one extra train every second hour, meaning that the theoretical TPH is slightly higher than 11. It should also be noted that in the near future this section will be electrified,²⁷ faster accelerating trains will further improve this situation. The actual operational TPH would likely be lower than 11 or 12 due to the realities of scheduling and the need to maintain freight paths.

Therefore, it is theoretically possible to achieve the required trains-per-hour to operate both an hourly and half-hourly service on the Buchan line. As the line exists today, a regular half-hourly service would be scheduled 'down to the wire', with very little margin to absorb delays before the line starts to experience disruption in the form of knock-on delays. In light of this, the only feasible services would be:

1. **Hourly splitting service** - Whereby a coupled multiple unit train departs Aberdeen, then upon arrival in Ellon, decouples. From Ellon One unit travels to Fraserburgh, while the other travels to Peterhead. On the return journey these units then recouple upon arrival in Ellon. This type of decoupling and recoupling service is well established and still regularly scheduled in the UK Rail Industry today.
2. **Peak Only Half-Hourly** - Whereby Fraserburgh and Peterhead trains depart hourly, only increasing to half-hourly at peak times. This minimises the risk of knock on delays and provides catch up time to eliminate built up delays in the schedule in off-peak hours. Normal operation without a splitting service would mean Fraserburgh and Peterhead will only see a two-hourly service, which is not desirable.

Neither of these modes of operation are ideal, although they are feasible. Next we will explore interventions that will increase the operational trains per hour through the single line section, without the need for a full length redoubling of the tunnels.

The Tunnel Problem

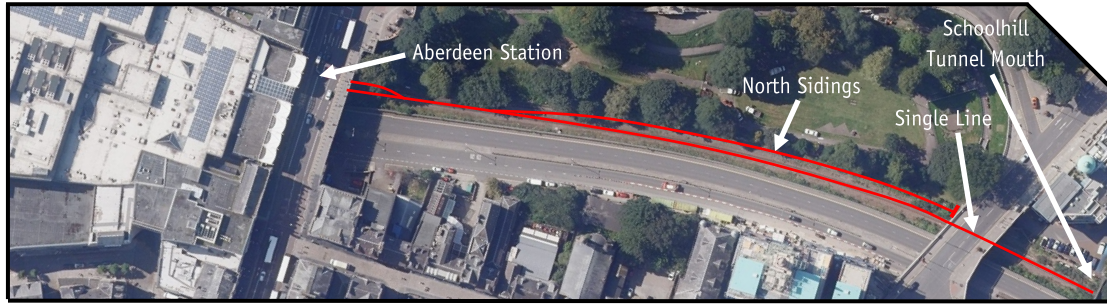


Fig 4.49 Aberdeen Single Line Section

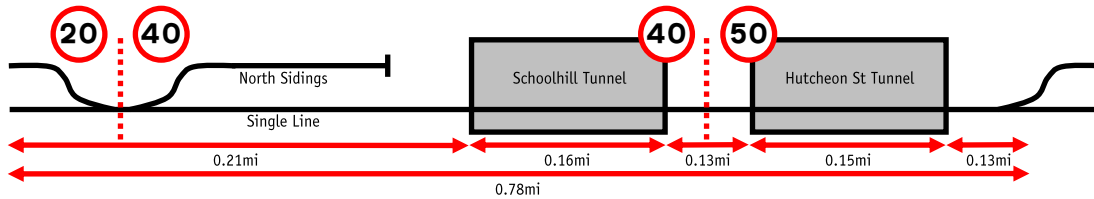


Fig 4.50 Aberdeen Single Line Section - Current Layout

As we have shown, the single line north of Aberdeen has the capacity to handle Buchan trains as it currently exists. However, there is not much room for manoeuvre in scheduling, delays would likely occur with the slightest disruption, and these would knock on and impact other services frequently. Therefore, action should be taken to address this single line section. It is not reasonable for this work to be included in any cost-benefit analysis for a potential Buchan line, all services across this section regardless of destination, including passenger, freight, and maintenance movements will benefit from the completion of this project, and as such it should be costed separately.

Any appraisal of options for upgrading this section should be mindful of the potential for freight on a potential Buchan line as well as existing lines. Network Rail will be upgrading the freight gauge of the line south of Aberdeen to W12 by 2043, while the line to Kittybrewster will be W8-W9.¹⁰⁶ To accommodate the type of freight that would travel on the Buchan railway, namely fish and BrewDog beer, W12 gauge would be required. This is because both types of freight require refrigeration. Both of these case studies are very long distance freight, perfectly suited to rail. Including this section in the W12 upgrade will maximise the economic benefit to an area already identified by the Scottish Government as a regeneration priority. Options A and B below allow for a dramatic increase in capacity while maintaining the single line through the Hutcheon Street tunnel. This may be a better option than fully redoubling the entire section as we can centre align slab track through the Hutcheon St tunnel to allow for refrigerated wagons, while maximising capacity through the Schoolhill Tunnel and keeping costs relatively low.

Option A - Dual to Schoolhill Tunnel

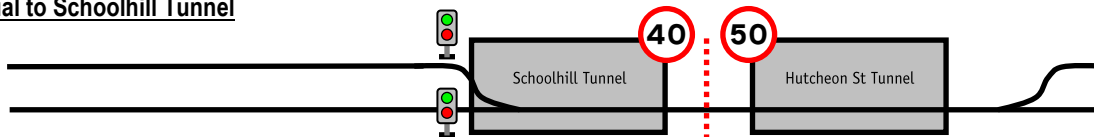


Fig 4.51 Aberdeen Single Line Section - Option A

Aim	Dual line from Platform Edge to the mouth of the Schoolhill Tunnel.
Work Required	0.21miles of New Track, Realignment of short section of existing line under Union Bridge, New 40mph Cross-over Points at mouth of Schoolhill Tunnel, Additional Signals (2) to protect conflict point, Medium Cost.
Benefit	Single line section shortened, Departing Train can be permitted through single line before Arriving Train has entered station, Trains can depart station to clear Platform for an arriving train.
Effect on TPH	Dramatic. Single line Travel Time is reduced to 0:45 Down and 0:58 Up. TPH increased to +4 Down, +4 Up.

Option A	Down	Up
Travel Time	0:45	0:58
+3 min Buffer	3:45	3:58
Trains-per-hour	16	15
Time Elapsed	60:00	59:30
1 Extra Train per	NIL	7:55:59

Tab 4.5 Trains per hour through single line section - Option A

Option A presents a good cost-benefit solution for this single line section. Trains per hour is increased by 4 in each direction, providing ample 'wiggle-room' in real world terms for scheduling Buchan services. In addition to the benefits listed above, the single line through the tunnels is maintained, reducing the cost of any future upgrades. The North Sidings are rarely used,¹⁰⁵ however there is still room to build new sidings on the site of the Aberdeen North Turntable. Table 4.5 shows that Option A provides a theoretical TPH between 15-16. This is enough to comfortably operate an hourly service to Fraserburgh and Peterhead without splitting trains, naturally delivering a half hourly service to Newmachar, Pitmedden and Ellon. Additional TPH will be swallowed up by delay mitigation and freight trains.



We have now shown how Option A provides more than enough capacity through the single line to accommodate a Buchan railway operating an hourly service to Fraserburgh and Peterhead, with extra capacity to run more a more frequent service at peak times, or provide paths for freight and track machines.

Option B - Dual to Hutcheon St Tunnel

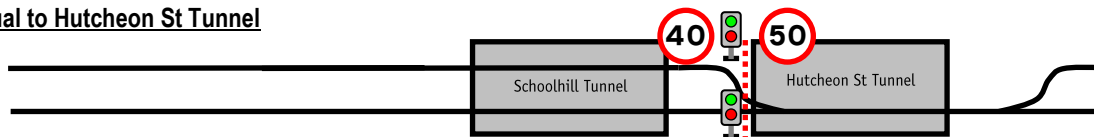


Fig 4.52 Aberdeen Single Line Section - Option B

Aim	Dual line from Platform Edge to the mouth of the Hutcheon St Tunnel.	
Work Required	0.5 miles of New Track, Realignment of short section of existing line under Union Bridge, New 40mph Crossover Points at mouth of Hutcheon St Tunnel, Additional Signals (2) to protect conflict point, Repositioning of A98 Signal, Medium to High Cost. (Track already aligned to one side, may not need realignment)	
Benefit	As Option A, but Single line section significantly shortened again. (To 0.28mi)	
Effect on TPH	Dramatic. Single line Travel Time is reduced to 0:22 Down and 0:28 Up. TPH increased to +5 Down, +6 Up.	
Option B	Down	Up
Travel Time	0:22	0:28
+3 min Buffer	3:22	3:28
Trains-per-hour	17	17
Time Elapsed	57:14	58:56
1 Extra Train per	1:09:39	3:40:00

Option B grants all the benefits of Option A, but with a shorter single line section and therefore a higher TPH. Trains-per-hour is increased by 5 and 6, providing more than enough slack for scheduling of Buchan Trains. The single line through this section is already aligned to one side of the tunnel, suggesting that dualling can proceed without realigning the current track or lowering the trackbed, minimising costs. Table 4.6 shows that Option B provides a theoretical TPH of 17. This is enough to comfortably operate an hourly service to Fraserburgh and Peterhead without splitting trains, with potential for even a half hourly service to these towns.

Tab 4.6 Trains per hour through single line section - Option B



Fig 4.53 Schoolhill Tunnel Path and tunnel mouths

Option B - Dual to Hutcheon St Tunnel (Alternative Solution)

It should be noted that nothing exists above the Schoolhill tunnel except a grass bank for more than three quarters of it's length. The historical northern tunnel mouth has been extended with a modern horizontal concrete span. This means that the northern end of the tunnel is sufficiently tall and wide enough to facilitate dualled track without any modification. Therefore, it is possible to remove the arch of the Schoolhill tunnel, leaving nothing in place but retaining walls either side of the track for the 130m of tunnel covered by grass bank. The remaining 90m of arched tunnel under the Denburn Roundabout can either be lowered, including slight gradients down to and away from the section, or the arch can be replaced with a horizontal concrete span similar to the northern mouth of the tunnel. Of course, this will involve removing and replacing the Denburn Roundabout once works on the tunnel are complete, but the new square shape of the tunnel will provide more than enough clearance for W12 freight and beyond. This may prove to be a better solution than lowering the entire length of the Schoolhill Tunnel.

Option C - Full Redoubling

Of course, fully redoubling the single line will have the greatest benefit for Aberdeen and all lines north of the city. Whiles costs may be high, all timetable aspirations today, and far into the future will be achievable, even if additional lines are considered for construction. Full redoubling will also remove the impact of disruption caused by track defects, as the loss of the single line will not close the route fully to traffic. Again, we should consider the aim of achieving W12 freight gauge through this section, and should therefore lower the trackbed sufficiently to allow for refrigerated wagons on slab track.

Any study into the reopening of the Buchan Line should consider the three options for the Single line section described in this section. Any cost-benefit analysis performed should further take into account the wider benefits of these options to the entire rail operation around Aberdeen, including Aberdeen-Inverness, Montrose-Inverurie, Aberdeen to Inverurie, and Buchan trains.



4.4 Deeside

The Deeside Railway stretched from Aberdeen to Ballater, the original plan saw this line reaching Braemar. This was changed when Queen Victoria purchased swathes of land between Ballater and Balmoral to prevent the line coming close to her Castle. The line closed to passenger services in 1966, after 113 years of operation. Today, the Deeside Way is a shared use path popular with walkers, wheelers, cyclists and horse riders. While not as complete as the Formartine and Buchan Way due to some development on the historic alignment over the years, much of the route remains clear to this day.



Fig 4.54 Historic Deeside Railway

4.4.1 Where People Live

Table 4.7 below shows Population living within the assumed catchment area (30 min max) for stations along the Proposed Deeside Line. ¹⁰⁶

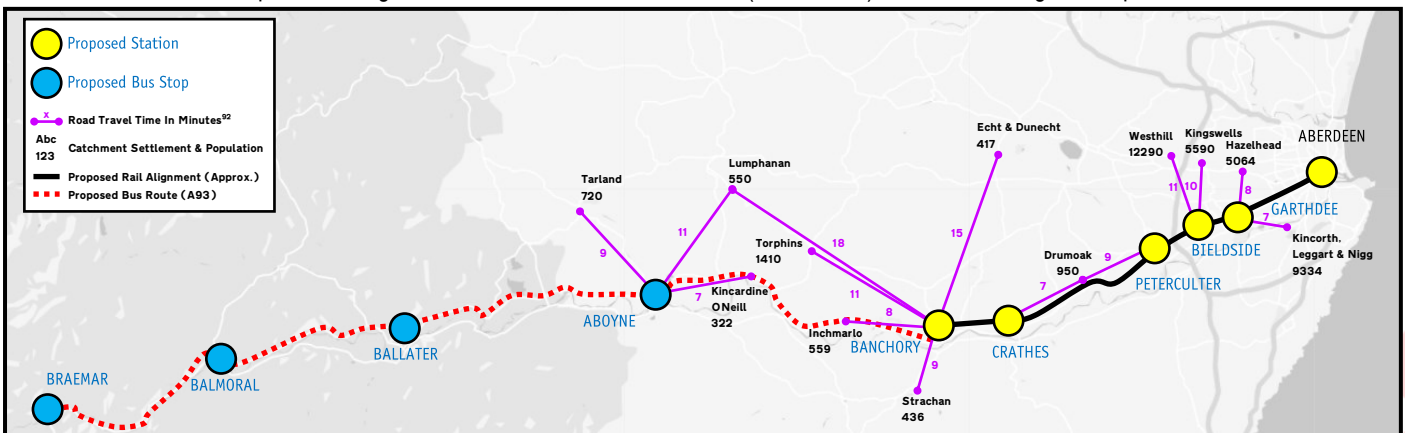


Fig 4.55 Populated Settlements along the Proposed Deeside Railway and Integrated Bus Route

Station	Population	Catchment Population	Total Served
Rail			
Garthdee	5,374	14,398	19,773
Bieldside*	10,940	17,880	28,820
Peterculter	4,570	950	5,520
Crathes	192	950	1,142
Banchory	7,560	3,372	10,932
Bus			
Aboyne	2,910	1,592	4,502
Ballater	1,460	-	1,460
Crathie	96	-	96
Braemar	445	-	445
Population Served Directly by Proposed Deeside Railway			28,636
Pop. in settlements within 30 mins of Proposed Railway			37,550
Population Served Directly by Proposed Integrated Bus service			6,503

Tab 4.7 Population served along the Proposed Deeside Railway and Integrated Bus Route

service operate from Banchory, both to provide meaningfully improved public transport to the area, and to gauge whether tourist load is significant enough to bridge the population gap and justify further reopening of the Deeside Railway in the coming years.

*Bieldside population encompasses areas of Bieldside, Cults and Milltimber, Aberdeen City Council supplies population figures for area as a group.

It should be noted that Table 4.7 does not take into account the significant population living outwith towns and villages that are within 30 minutes drive of stations along the Proposed Deeside Line. Aberdeenshire has an estimated population of 261,210, by reopening both of our proposed railways (Buchan and Deeside), **almost all of this population is brought within a 30 minute drive of a railway station**. The catchment area of the Deeside line is limited by the two existing main lines. Many of the settlements within 30 minutes of Deeside stations are also within 30 minutes of stations on these lines. Therefore, Deeside's catchment is significantly smaller for journeys away from Deeside, compared to its catchment for visitors into Deeside. Looking at the population distribution along the former Deeside line, we can see that it is heavily biased to the Aberdeen end of the line. Rail experts have stated that a population of 5000 is a good rule of thumb for estimating whether a station would produce a positive result in any cost-benefit analysis. Unfortunately, this means that a railway would likely be economically unjustifiable by current standards any further west than Banchory. However, the population of Deeside suffers feelings of isolation just as strongly as is felt across Buchan, additionally, Royal Deeside has unmatched potential for tourism growth in Scotland, therefore, we recommend an integrated bus



4.4.2 Where People Want to Go

Our Proposed Deeside solution is divided into two halves, the first will serve commuters along its length from Aberdeen to Banchory, and will be comprised of a heavy rail line. The other section, from Banchory to Braemar, will capitalise on the vast array of attractions in Deeside, providing fit for purpose public transport for residents and tourists to the area, the majority of whom are based in the UK.⁶⁵ An integrated bus service will make public transport regular, reliable, and easy to understand, breaking reliance on the private car and making public transport the natural choice for visitors and residents alike.

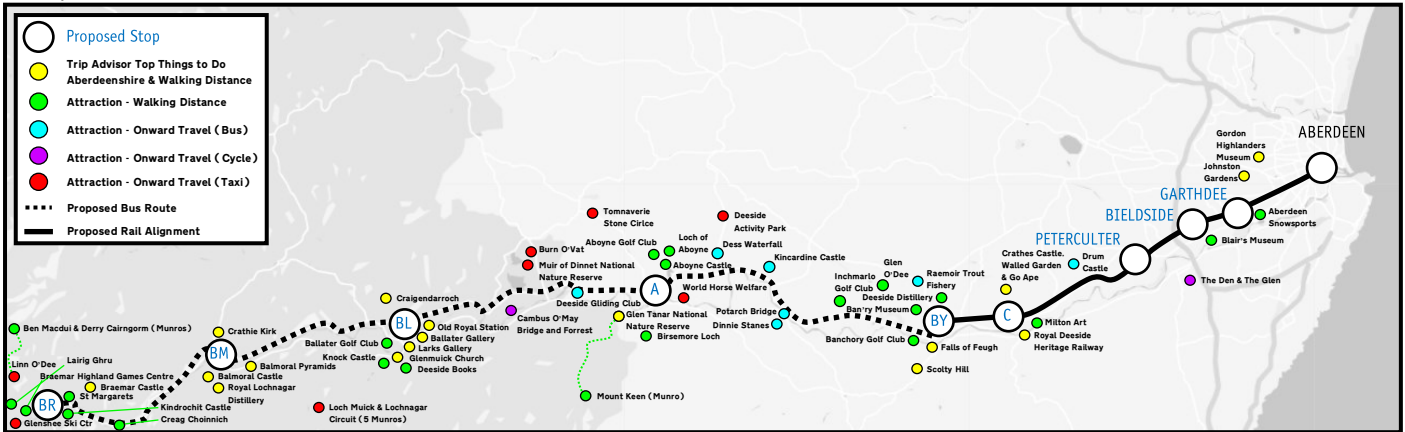


Fig 4.56 Popular Tourist Attractions along the Proposed Buchan Railway

Figure 4.56 shows just how densely packed Deeside is with tourist attractions. The vast majority are within walking distance of our proposed station and bus stops. Deeside already has a thriving tourism sector, introducing reliable, integrated and easy to understand public transport will allow tourists to travel the length of Deeside without relying on driving. A regular service can be set up in a 'hop on hop off' style to facilitate tourists looking to visit all the sights, helping them spend more across the entire region. Most tourists visiting Aberdeenshire come from within the UK, by any standard this trip is the exact medium length journey that we should be shifting from car to public transport. A bus and railway service integrated through ticketing, marketing and scheduling can provide a seamless experience for those looking to travel to Deeside from the rest of the UK using the existing rail network. This system will improve the lives of residents, and provide simple connections for tourists such that they won't have to spend time planning around irregular connections. A regular, integrated public transport system will make all of Deeside accessible without a car. The bus route will not deviate from the A93, providing competitive journey times with driving. This will set up the region for the coming surge in tourism as cruise ships arrive, provide a sustainable option for new visitors, and alleviate feelings of isolation for residents in these rural communities.

An interconnected service will support Aberdeenshire in its efforts to establish itself as a destination for 'adventure tourism'. The public will have the confidence that sports equipment will be carried on the bus service, as it would be on the train. Deeside is filled with grueling long distance walks, gnarly mountain bike trails, and towering munros waiting to be conquered. Not to mention the Lairig Ghru, one of the most popular Mountain Passes in Scotland, each year thousands complete the journey from Braemar to Aviemore, usually opting to leave a car at the Linn O'Dee car park, returning days later to collect it.¹⁰⁸ Now, walkers can choose to leave the car at home, confident that reliable public transport awaits them at the other end to carry them home. If the Deeside line proves popular with adventure tourists, Scotrail may find that this is another line suitable to operate their sports equipment carriages now being introduced to the West Highland Line.

This solution will see the A93 and surrounding roads become safer. In the peak tourism season, load will be shared between public transport and car users, removing countless cars from the road. A viable public transport option will allow tourists to visit venues that serve alcohol, and will remove the risk of patrons sampling the local spirits, and driving to their next destination as is a particular problem in areas near distilleries.

Culturally, Aberdeenshire does not feel like one connected region, Deeside, Buchan, and Garioch have their own identities, separate from one another. This line combined with our other proposals will see Aberdeenshire completely accessible by reliable public transport, the entire region will see internal tourism spike as formerly isolated towns are linked to the city and to each other. We will see the region enter a new era of interconnectivity and pull the fabric of social cohesion tighter.

Events

Deeside is brimming with annual events that regularly attract thousands of visitors from across the UK, some are even world famous:

Braemar Gathering	The Great Outdoors Challenge	Deeside Railway Santa Specials
Aboyne Highland Games	Cairngorms Nature Big Weekend	Deeside Local Food Festival
Royal Deeside Walking Festival	Banchory Beer Festival	Crathes Classic Car Rally
Run Balmoral	Ballater Victoria Week	Deeside Vintage Steam Rally



4.4.3 Project Benefits

Proposed Benefit	Outcome
Improved Transport Mode Choice in Deeside Corridor.	Reduced economic impact of disruption on road network. Reduction in overall traffic.
Increased reliability of journey times across region as transport load is shared across road and rail.	Further increase in the appeal of Banchory to commuters, supporting population growth. Increased reliability of journey times will encourage modal shift from car.
Capitalise on growing Aberdeenshire rail commuter market, provide growth in home building in Banchory.	Raise Banchory to the same level as Inverurie, and see increased levels of home building as a result.
Direct link from Deeside to Airport links, allowing travellers to leave car behind.	Increased use of public transport due to improved convenience, less reliance on long distance taxi usage or airport parking.
Direct link from Deeside to Dyce for access to events at P&J Live.	Increased use of public transport due to improved convenience, reduced traffic after large P&J Live events.
Direct access to the entire UK rail network for medium and long haul travellers.	Further reduce car usage in Aberdeen by eliminating driving and parking in the city as Deeside resident's closest station.
Expanded travel to work catchment and zone of economic influence for Aberdeen.	Boosted employment and economic activity in Aberdeen and the surrounding area
Better inter-town links within Deeside.	Improved mobility for non car owners, greater social inclusion in communities. Modal shift from car to public transport for short journeys.
Easy to understand public transport connecting all of Royal Deeside, including star attractions and bucket list destinations.	Makes public transport the natural choice for visitors, allows tourists to use the service to visit all of Deeside, not just one destination.
Bring almost all of Aberdeenshire West of Aberdeen within 30 mins drive of a rail station, and all withing easy access of public transport.	No area of Aberdeenshire is left behind and tens of thousands of people have access to reliable, attractive public transport.
A lifeline for isolated communities.	Reverse the feeling of isolation felt in North East communities, particularly those without access to a car, encourage social inclusion.
Support Aberdeen in reducing car usage in the city and establishing a Low Emissions Zone.	Provide a real alternative to the car, deliver passengers directly into the centre of Aberdeen.
Increase Capacity in Aberdeen Railway Station.	Provide greater flexibility in scheduling of trains in and out of Aberdeen, increasing resilience to delay and disruption.
Make natural attractions accessible by public transport. (Munros, Long Distance Walks, Lairig Ghru)	Reduce strain on natural environment as car parks fill up and cars park on verges and damage surrounding area.
Interconnect bus and rail into one through service.	Reduce difficulty of planning return journeys via public transport, give people confidence in knowing they can find their way home. Ticket acceptance will allow Deeside residents to plan and buy their ticket for whole journey, increased ease of use will maximise patronage.
Better connect smaller communities in Deeside.	Smaller communities such as Torphins and Lumphannan can connect to the new system and wont rely on slow long distance buses.
Bus route does not deviate from the A93.	Provide journey times competitive with the car, maximise public transport uptake.
Provide opportunities for growth in tourism sector.	Tour, Accommodation, and Event Companies can reliably collect tourists from Stations and Stops without the need for an on site car park or regular travel into Aberdeen City.
Reduce Strain on A93 and surrounding roads as tourism increases with arrival of Cruise Ships.	Share load between rail and bus, reduce car traffic on road to safely accommodate more travellers.
Low Cost and relatively simple implementation.	Railway route remains mostly clear, Integrated bus is low cost and easy to establish once railway is complete.

Tab 4.8 Proposed Benefits of Deeside Railway

4.4.4 Alignment

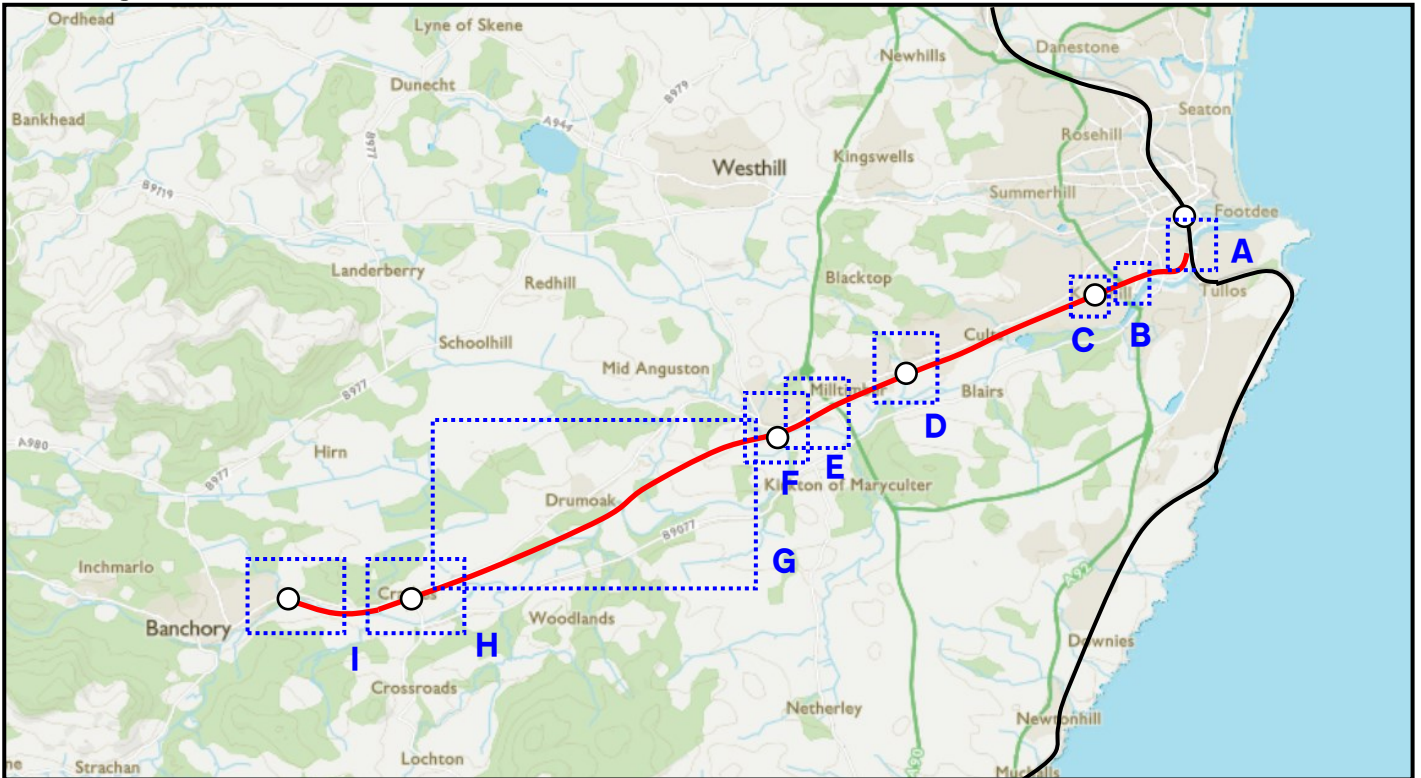


Fig 4.57 Proposed Alignment for Deeside Railway with areas of Interest

This section of rail follows the historic Deeside Railway from Aberdeen to Banchory. Today this route is a shared use path, completely unobstructed from Duthie Park to Milltimber, where it is severed by the newly constructed AWPR. Across the other side of the road, from Peterculter, the Deeside Way starts and stops on it's incomplete journey to Banchory and beyond.

A - Connecting to the Main Line

Today the Deeside Way begins at Duthie Park, some 300m from the existing line. An embankment joining the two points still exists, but has been taken over by the residents of Polmuir Road and Deemount Gardens. To reconnect the Deeside Railway to the main line this embankment will need compulsory purchase of the sections of resident's gardens that have extended onto the route. Very little modification would be required in Aberdeen station itself, there is room for the new Deeside line to cross the Ferryhill line while being protected by the existing ground position signals A21 and A22. The existing points connecting the Down Main with Ferryhill Local Depot will need repositioning.

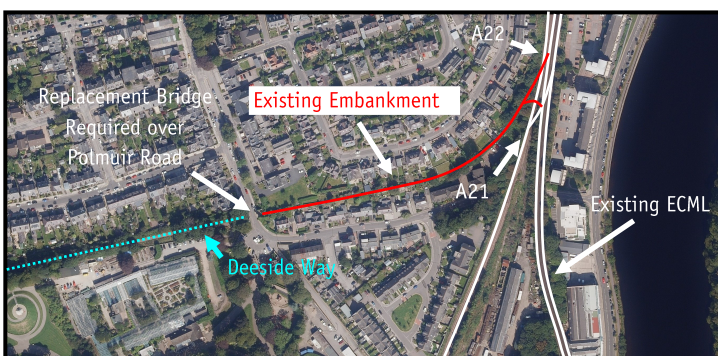


Fig 4.58 Historic Alignment of Deeside Railway

B - Holburn Street Crossing

A new bridge will be required over Holburn Street to replace the existing footbridge carrying the Deeside Way.



Fig 4.67 Holburn Street Footbridge



Fig 4.59 View from rear of home on Polmuir Road showing existing embankment and boundary wall. Other homes have gardens that extend to encompass the embankment itself.



Fig 4.60 View of bridge span required over Polmuir Road. Original Bridge support walls still visible with foliage covering.



C - Garthdee Station

There are two viable sites for a Garthdee station. Both are within walking distance of the Garthdee Retail Park and Robert Gordon University.

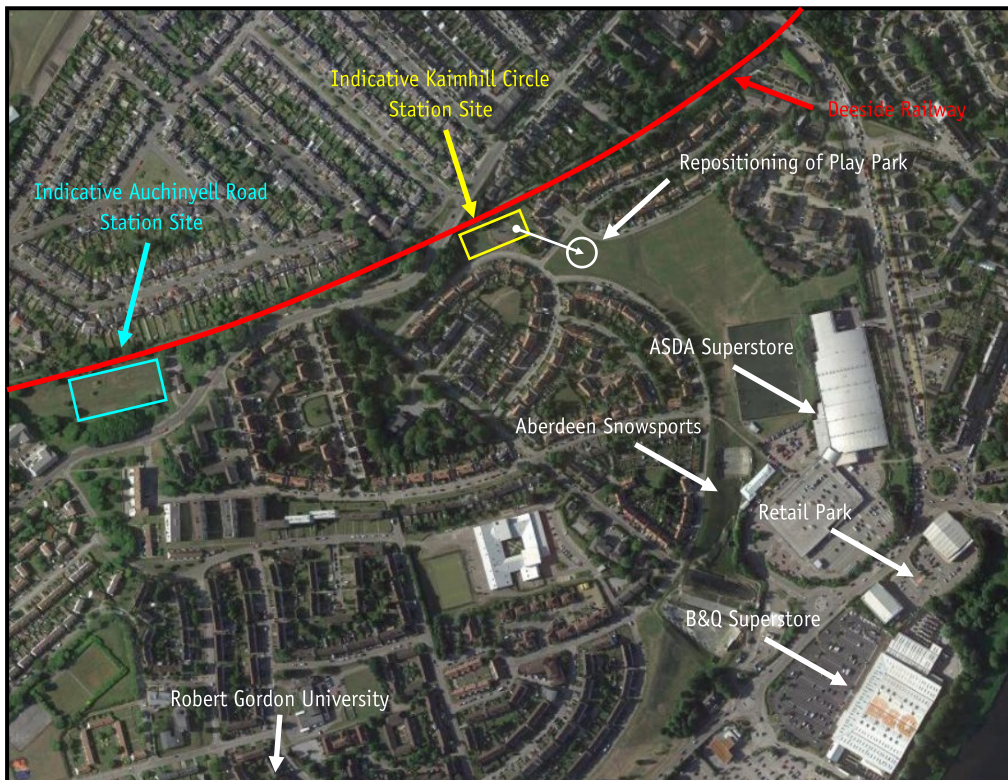


Fig 4.68 Garthdee Station Options



Fig 4.69 Garthdee Station Option—Kaimhill Circle

The Kaimhill Circle option has space for a small car park. A children's play park exists on the site near the railway alignment, this would have to be repositioned across the road. This option is closest to Aberdeen Snowsports, Garthdee Retail Park, and ASDA, Sainsburys and B&Q Superstores, while still within walking distance of Robert Gordon University.



Fig 4.70 Garthdee Station Options—Auchinyell Road

The Auchinyell Road option has space for a larger car park. There is no development on the site that would require demolition. This option is closest to Robert Gordon University, but is farther away from Aberdeen Snowsports, Garthdee Retail Park, and ASDA, Sainsburys and B&Q Superstores, while still being within walking distance.

D - Bieldside Station

Placing a station on the Western edge of Bieldside serves all three areas of Bieldside, Cults and Milltimber. This location is flat, has space for a large car park, and is within walking distance of Deeside Golf Club, and the Bieldside Inn. Access can be granted directly from the A93 (North Deeside Road).

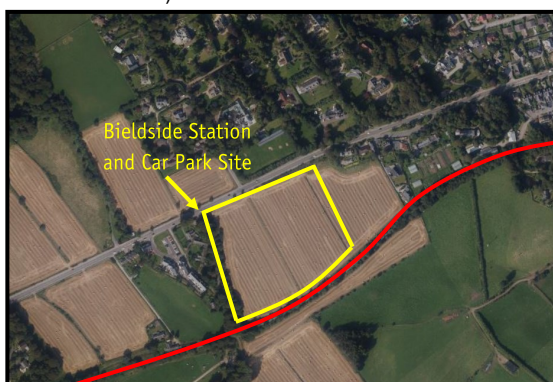


Fig 4.71 Bieldside Station Location



Fig 4.72 Bieldside Station Location



E - AWPR Crossing

The newly constructed AWPR crosses the historical path of the Deeside Railway. There is sufficient room for a bridge without modification to the road, and since the AWPR is a dual carriageway, it is likely that disruption can be kept to a minimum during construction. A level crossing will be required if the bridge is kept level and does not rise to cross the B979.

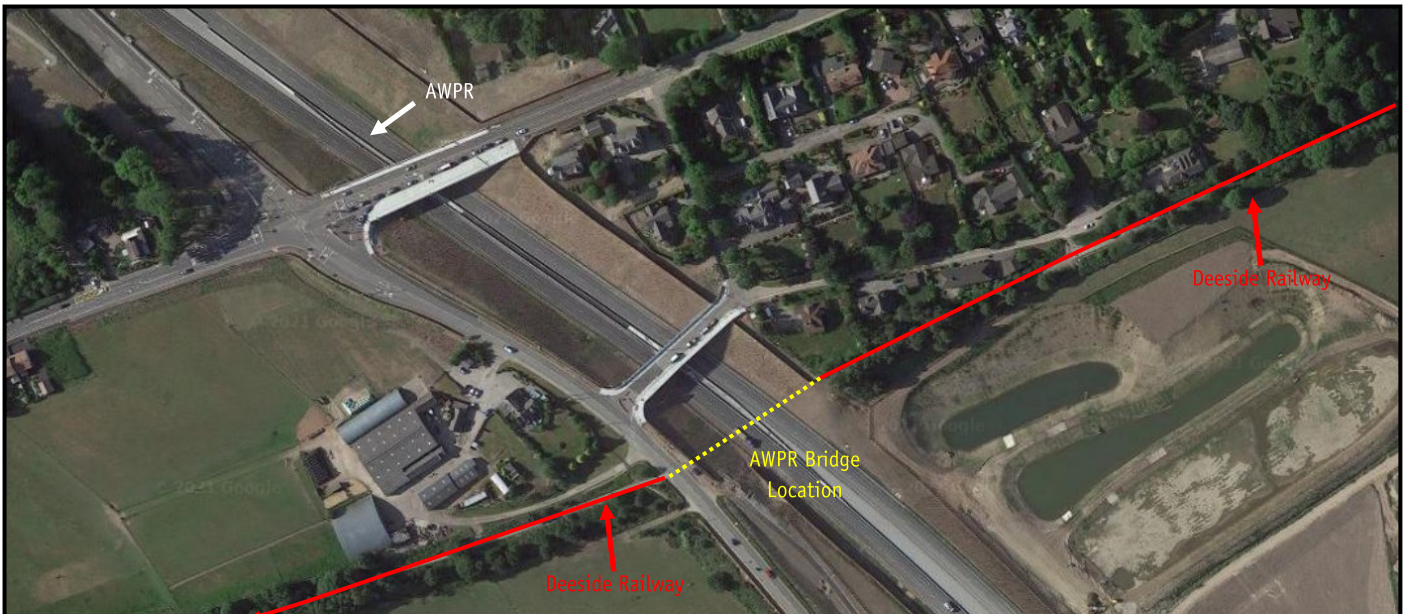


Fig 4.73 AWPR Crossing

F - Peterculter Obstruction and Station

In the West end of Peterculter, homes have been constructed on the historic alignment of the Deeside Railway. There are two options to overcome this:

1. **Compulsory Purchase and Demolition.** - This would involve the purchase and demolition of maximum four homes, as well as work to realign Station Road East and install either two level crossings or underbridges.
2. **Realignment** - Constructing a route around St Peter's church completely avoids the need for demolition. Two crossings of the River Dee will be required. This route is entirely flat, maximum gradient along the indicative alignment is 0.9%. Groundwork will be required to raise the track back up to the height of the Deeside Way at the Western end of the realignment. One level or grade separated crossing will be required close to the Western End of the realignment. This may prove a good option to minimise disruption during construction, and minimise noise when the line opens.

A new Station and Car Park can be provided on the east side of Peterculter.

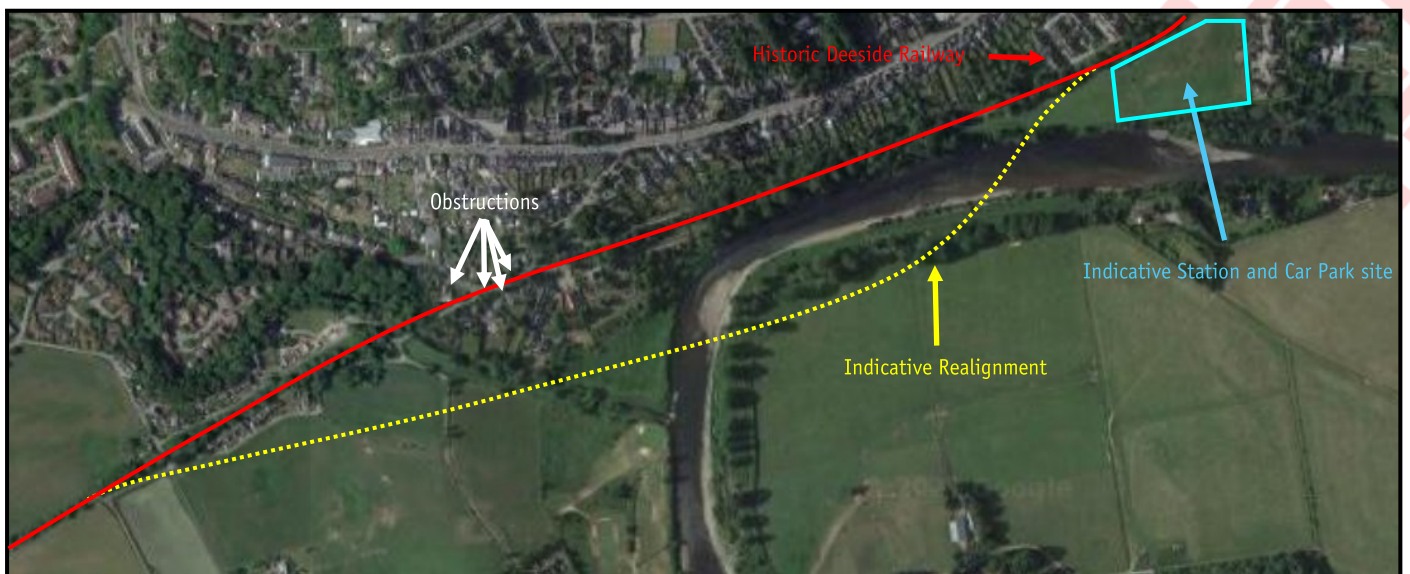


Fig 4.74 Peterculter Obstructions and realignment option



G - Drumoak Obstruction

Since the Deeside Line closed homes have been constructed on the alignment to Drumoak, this can be solved with slight realignment.

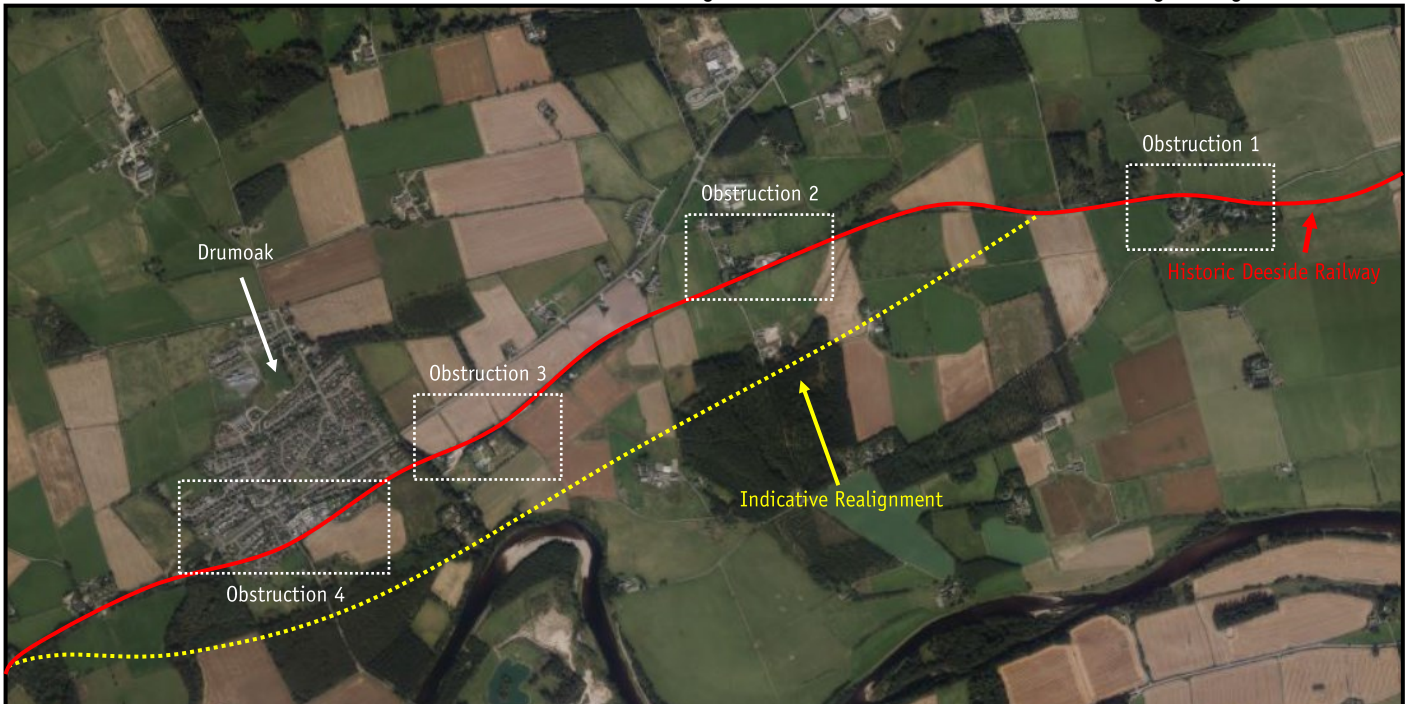


Fig 4.75 Drumoak Obstructions and realignment option



Fig 4.76 Drumoak Obstruction 1

Obstruction 1 is a short section that has been converted into an extended private garden. This area can be used as part of the Deeside Railway by repurchasing the land, no demolition required. User Worked or Red/Green level crossings will be required to maintain access to the home's driveways. Obstructions 2 and 3 are developed land where new homes and businesses have been constructed in the path of the historic Deeside Railway alignment. Obstruction 4 is a caravan sales business and a newly built housing estate.



Fig 4.77 Drumoak Obstruction 1

A short realignment can completely remove the need for compulsory purchase and demolition. The land is flat and mostly fields. Level crossings will be required to maintain access to private homes.

From Drumoak, the line can continue alongside the A93 as the historic alignment did, by following the Deeside Way the route remains free of obstruction until Crathes.

H - Crathes Halt

Milton of Crathes is the current home of The Royal Deeside Railway. Despite the proximity of Crathes to Banchory, the new railway should supply a station at Crathes to allow access to the heritage railway by rail, similar to how the Strathspey Railway interconnects with Aviemore station. This will allow the heritage railway to continue to thrive, and will allow easy access to popular attractions at Milton of Crathes and Crathes Castle. At Crathes, the historic alignment passes through the bottom end of four gardens, a track width from each would need to be purchased. A new bridge over the A957 and two level crossings will then be required to carry the track to a station at Crathes.

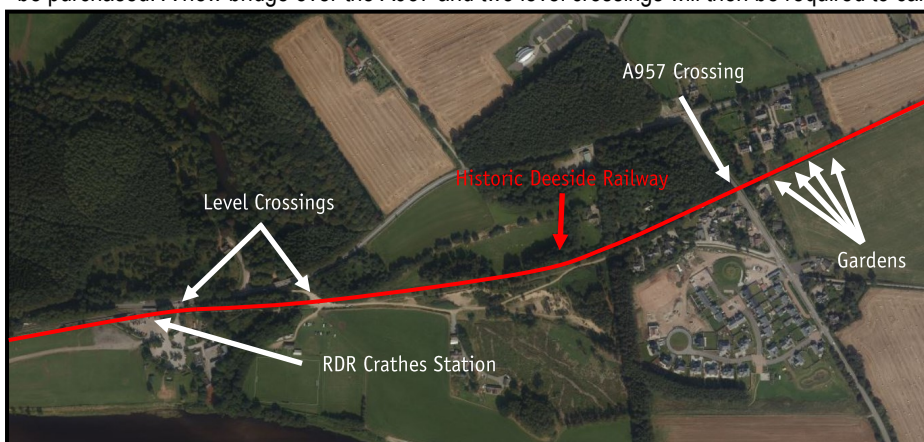


Fig 4.78 Crathes crossings

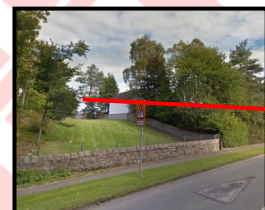


Fig 4.79 A957 Crossing



Fig 4.80 Milton of Crathes Level Crossing

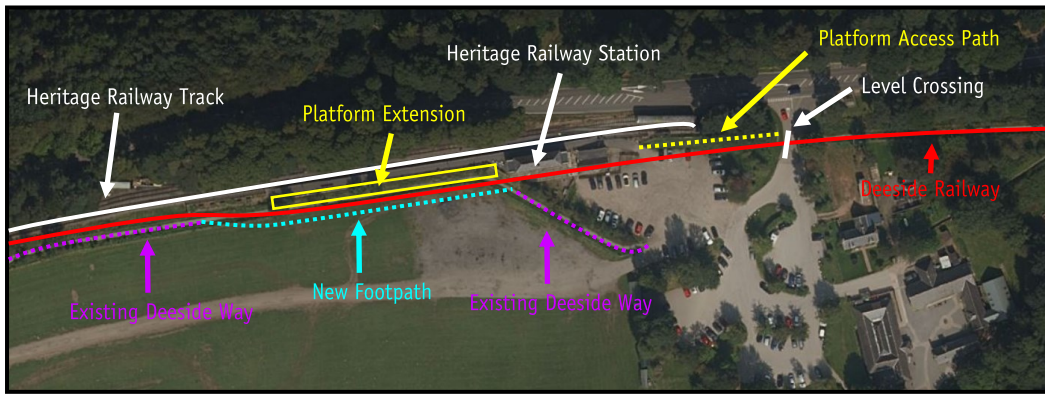


Fig 4.81 Crathes Station Aerial



Fig 4.82 Milton of Crathes Station

Figure 4.81 shows how a Deeside Railway can be aligned alongside the existing heritage railway to preserve it in its current state. The current platform in use by The Royal Deeside Railway can be extended along its length to widen the current passenger area. This would create a shared island platform at Crathes. Access to the platform can be maintained by adding a pedestrian lane to the level crossing, and constructing a new footpath to the Platform, alternatively a better solution may be found such as a footbridge or a separate level crossing. The existing Deeside Way can be joined with a short new section along the length of the platform track, then it can be retained alongside the railway for the remaining length from Crathes to Banchory. To achieve this, the two railways should converge after leaving Crathes platform and continue to Banchory as doubled track, this leaves enough room for the Deeside Way to run alongside the railway as it currently exists for most of its length, some sections will need realignment. It should be noted that arranging the track in this formation means that a new bridge will be required at the Bridge of Bennie to carry the modern railway and the Deeside Way, and the existing manual level crossing will have to be replaced with a more appropriate crossing.

I - Banchory Station

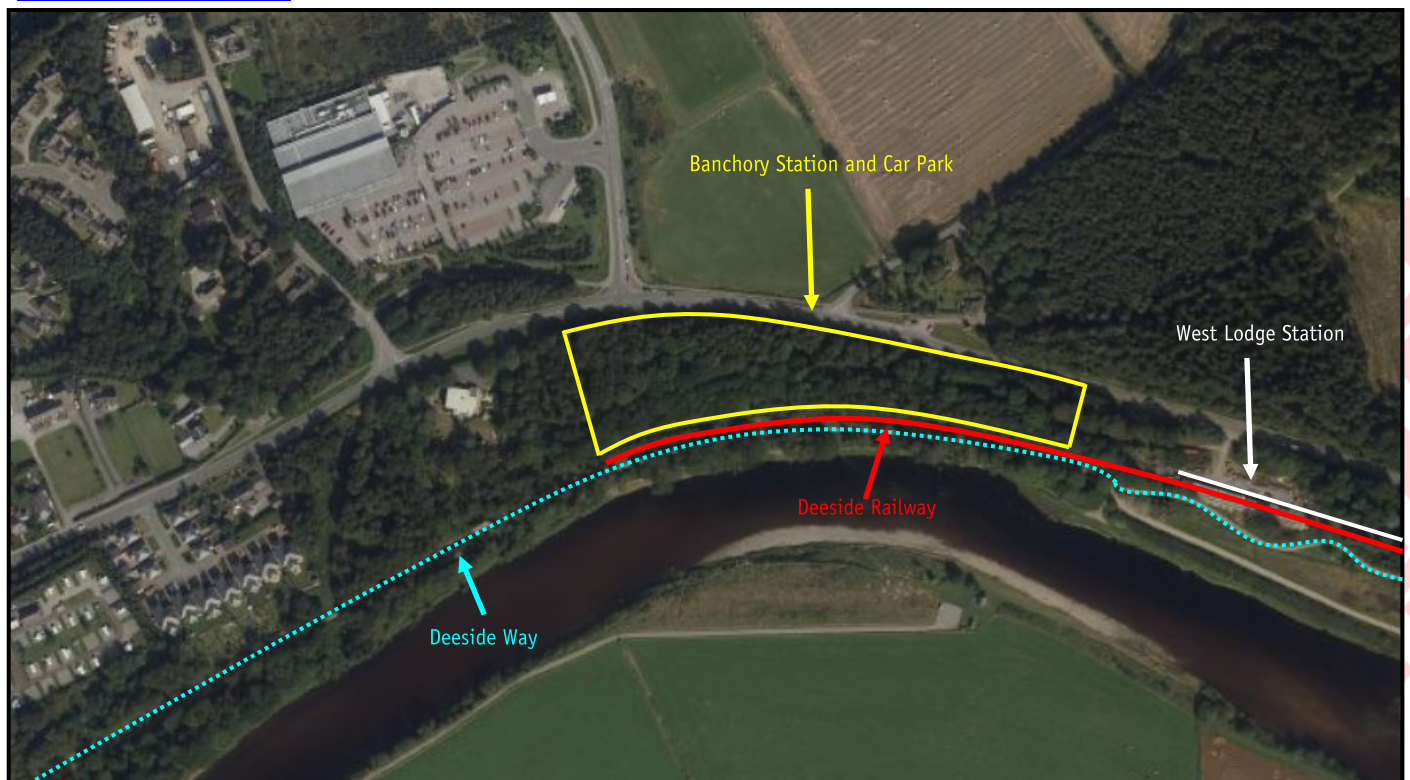


Fig 4.83 Banchory Station

Due to development in the path of the Deeside Way, the only suitable location for a heavy rail station in Banchory is on the eastern edge of the town. Here there is ample space for a station and large car park. This site is directly adjacent to the A93, allowing connecting buses to be on their way into the rest of Deeside as quickly as possible. The Royal Deeside Railway halts very close to this location, their West Lodge station will be within walking distance of a Banchory station on this site, allowing users of both railways to share the car park.

The Deeside Way continues into the heart of Banchory, this gives a safe and popular active travel route to and from the station, as well as a straightforward route leading tourists to the area directly into the centre of the town.



4.4.5 Operation

If the Deeside line was opened today, it would be operated by Class 158 DMUs, top speed 90mph. Electrification is planned through Aberdeen as far as Inverurie within the timeframe of the Regional Transport Strategy, it is assumed that this line will be operated by an alternative traction, either Battery-Electric, or Hydrogen. Linespeed should be as high as possible, particularly on any newly aligned sections.

With consideration made during the planning stage for passing loops, a half hourly service is more than achievable. Journey time will depend on the final average linespeed of the route, but there is potential for a rail option to be significantly faster than driving. Journey time by car is calculated at 35 minutes, covering 18 miles in that time, this gives us an average speed of 30mph from Aberdeen to Banchory.¹¹⁶ The railway will be capable of achieving an average speed much faster than 30mph, maximising patronage on the new system.

An integrated bus service will replace the current 201 service that runs from Aberdeen to Braemar. This service will see a bus meeting every train upon arrival in Banchory, these will then continue along the A93, stopping at Aboyne, Ballater, Crathie (for Balmoral), and Braemar only. Buses will be operated as express services, only permitting one stop in the most appropriate place in each town, minimising journey time for each bus journey. Current journey time from Banchory to Braemar is 50 minutes on the A93, giving a better average speed of 48mph. Bus journeys will inevitably be slower than journey by car due to the nature of buses, and the need to stop for pickup and drop off. Assuming a one hour journey time one way, to run an integrated service a minimum of four buses will be required, however this number will be higher due to driver working regulations and the realities of operation, particularly during busy summer months. Despite the slower journey time, reliability of integration with the rail service and high frequency will encourage modal shift from road to bus and on to rail. This route should be operated by comfortable coaches, capable of accommodating with ease everything a train is capable of, including wheelchairs, bicycles, and large luggage. These buses should be sustainable, preferably hydrogen as is currently in use in Aberdeen, with a suitable range. A new hydrogen refuelling station will need to be constructed somewhere along the route. A Stagecoach depot exists in Ballater that may be suitable.

The existing Stagecoach 202, Aberdeen to Banchory service will be rerouted, now running from Aberdeen to Torphins regularly to account for the loss of the 201 service in Torphins, and linking the town directly with Banchory. This service will provide a normal bus service along it's route, providing public transport access for areas not stopped at by the rail service.

To provide a fully integrated public transport system, and to encourage interchange between rail and bus at Banchory, a method of through ticketing should be adopted. Tickets must be purchasable for destinations on the entire rail network to and from towns along this integrated bus route. Achieving this will allow for a seamless experience travelling in either direction, and allow passengers to change at Banchory without the need to purchase another ticket. When purchasing their ticket, passengers will see a single price that will cover their entire journey, and will therefore be encouraged to remain on public transport for the entire length of their journey. This can be achieved in a number of methods, such as:

- Constructing purpose built ticket machines along the length of the integrated bus route.
- Employing railway trained Ticket Examiners to work on the buses.
- Training Scotrail staff to establish cross ticket acceptance.
- Printing QR codes on bus tickets that are acceptable to railway station passenger barriers.
- Integration of mobile ticketing systems such as apps, on-phone tickets and smartcards.

Current rail franchise agreements do not permit Scotrail to operate a service such as this directly, however, recent moves towards public ownership by the Scottish Government may see this changed in the coming years. Any contract for this integrated service must have a provision for through ticketing between bus and rail, and marketing should reinforce the “one service” message.



Fig 4.84 QR Readers in Network Rail Stations



5 Capacity

5.1 Aberdeen Station

Aberdeen currently has 3 south facing bay platforms, and two through platforms subdivided into north and south sections. In total this makes 7 active platforms that can service trains. These platforms are numbered 3, 4, 5, 6N, 6S, 7N and 7S. In 2017, the Fraserburgh and Peterhead to Aberdeen Strategic Transport Study concluded that a half-hourly Buchan service will require *“another bay platform or possibly two”*.³⁰ These platforms will have to be north facing to be used by Buchan services.

A half-hourly service to Deeside will also require additional platforms in Aberdeen, but south facing. In this sections we will detail options for increasing capacity at Aberdeen station. It is up to future studies to determine how many and which of these interventions will be necessary to achieve the required capacity for these lines, not all of the options below will be needed. Aberdeen has room for expansion.

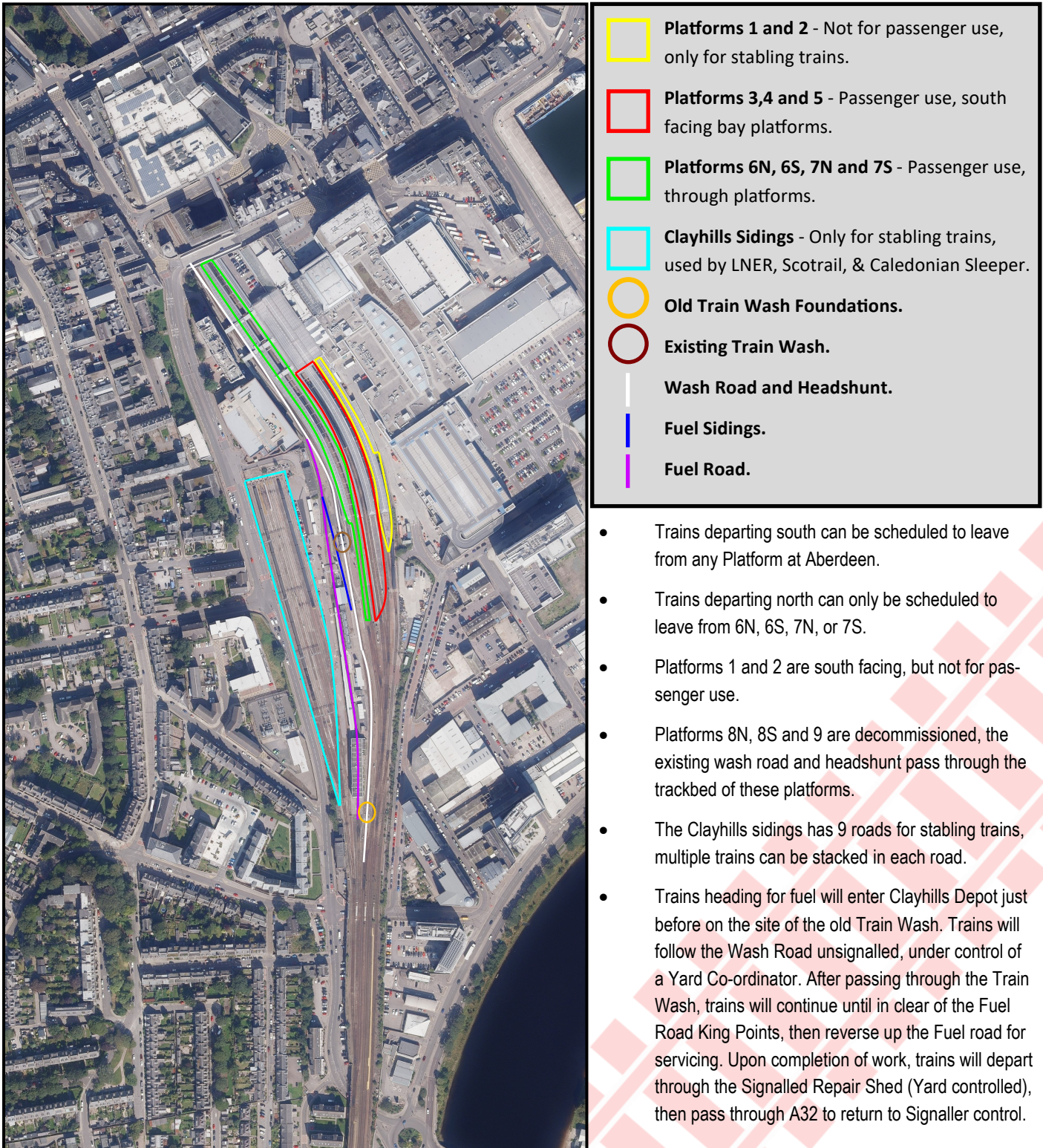


Fig 5.1 Aberdeen Station Aerial



Upgrade A - 6/7 crossover

Between the north and south Platforms, a one way crossover exists. This allows passage from Platform 6N to Platform 7S and vice versa. Upgrading this crossover to a two way will increase flexibility in scheduling and allow a more options for maintaining a through-path throughout the day. This option has been included as part of all following options due to it's low cost.

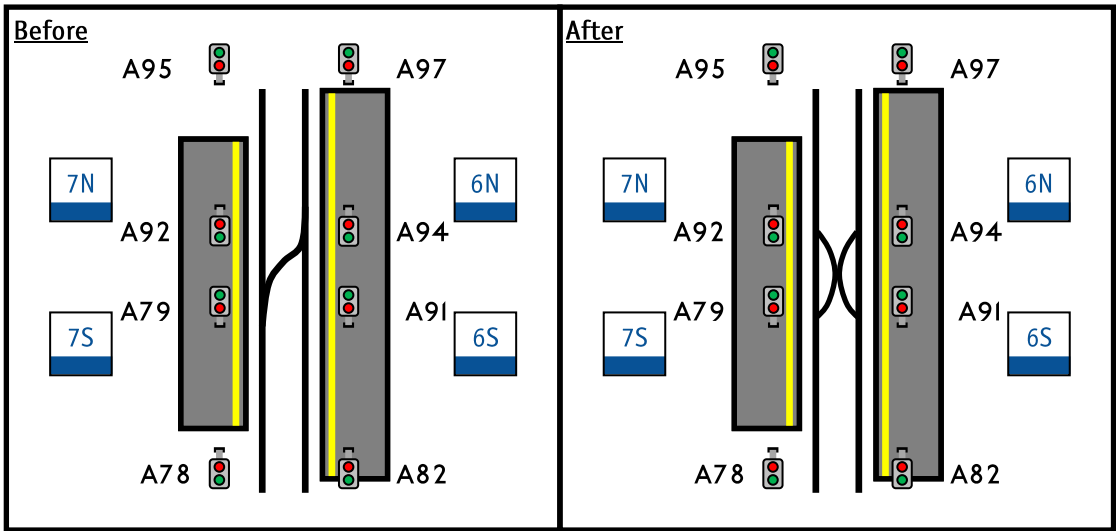


Fig 5.2 Upgrade A - Route Map



Fig 5.3 Existing Crossover

Work Required	New Crossover Points, Addition of Direction Indicators to A91 and A92
Benefit	Increased flexibility in scheduling, easier to maintain through path, reduced chance of blocked platforms.

Tab 5.1 Upgrade A - Work and Benefits

Upgrade B - Platform 8 Bay Platform

The simplest way to add capacity is to reinstate Platform 8 as a north facing Bay Platform. By realigning the existing Fuel Road to the historical Platform 9, we make space for trackbed serving Platform 8. In this configuration we add a new Platform serving destinations north of Aberdeen only, this may indirectly help Banchory services by allowing current north services such as Inverness and Inverurie services to depart from Platform 8, leaving capacity that would have otherwise been occupied in Platform 6 or 7. Figure 5.4 shows Platform 8 as a single Bay Platform, however, this could be subdivided like the others to form 8N and 8S. Services in 8S could not depart with 8N occupied, but this may still be useful say at busy times when two northbound services are departing one after another.

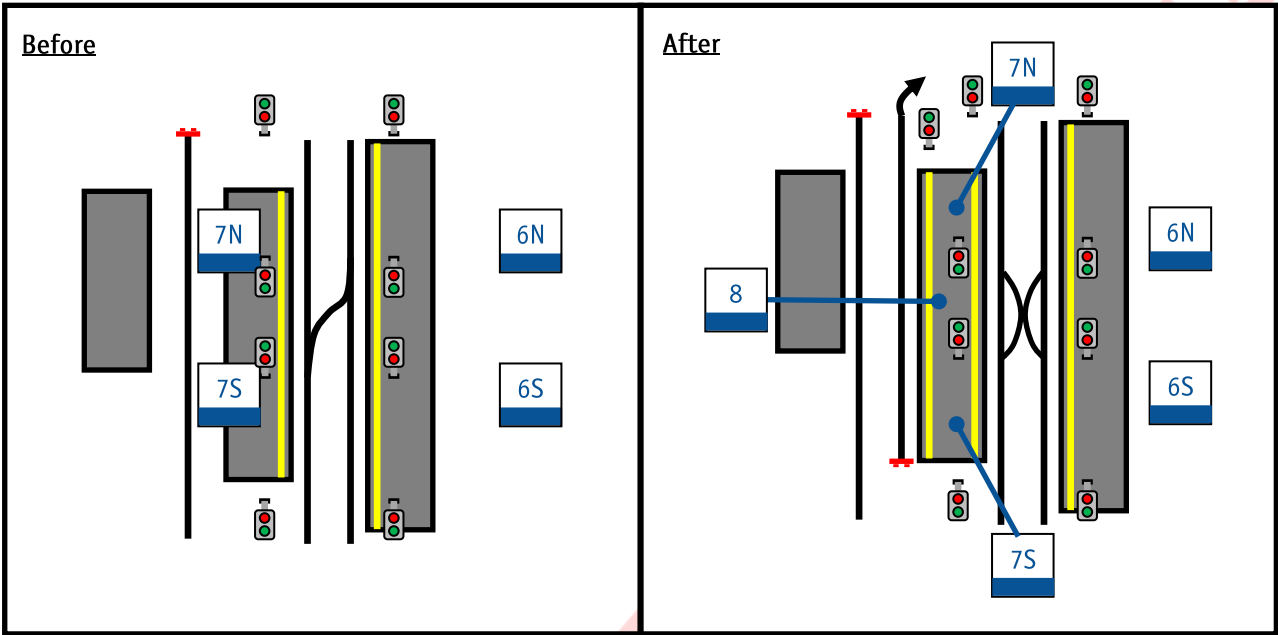


Fig 5.4 Upgrade B - Route Map



Fig 5.5 Existing Fuel Road from Platform 8

Work Required	New Points at north end of station, New Signal serving Platform 8, two further Signals if subdividing Platform 8, Upgrade A98 to display Platform 8 indications, Realign Fuel Road in line with Platform 9, New Track for Platform 8, Platform 8 Signage and Screens.
Benefit	Increased flexibility in scheduling, one or two new platforms for northbound services, freed up capacity from Platform 6 and 7 for through services.

Tab 5.2 Upgrade B - Work and Benefits

Upgrade C - Platform 8 Through Platform

Possibly a more sensible option is to reintroduce Platform 8 as a through platform, doing this provides two extra platforms which can serve northbound, southbound and through services, as well as an extra path through the station for freight or empty coach services, freeing up capacity on Platforms 6 and 7. To achieve this however, the current Train Wash will have to be relocated. There are many possible locations for a repositioned Train Wash, however, we propose the former site of the previous Train Wash may be most suitable (See Page 51). This location, adjacent to the existing Train Repair Shed, has foundations and presumably plumbing still in place, reducing the work involved.

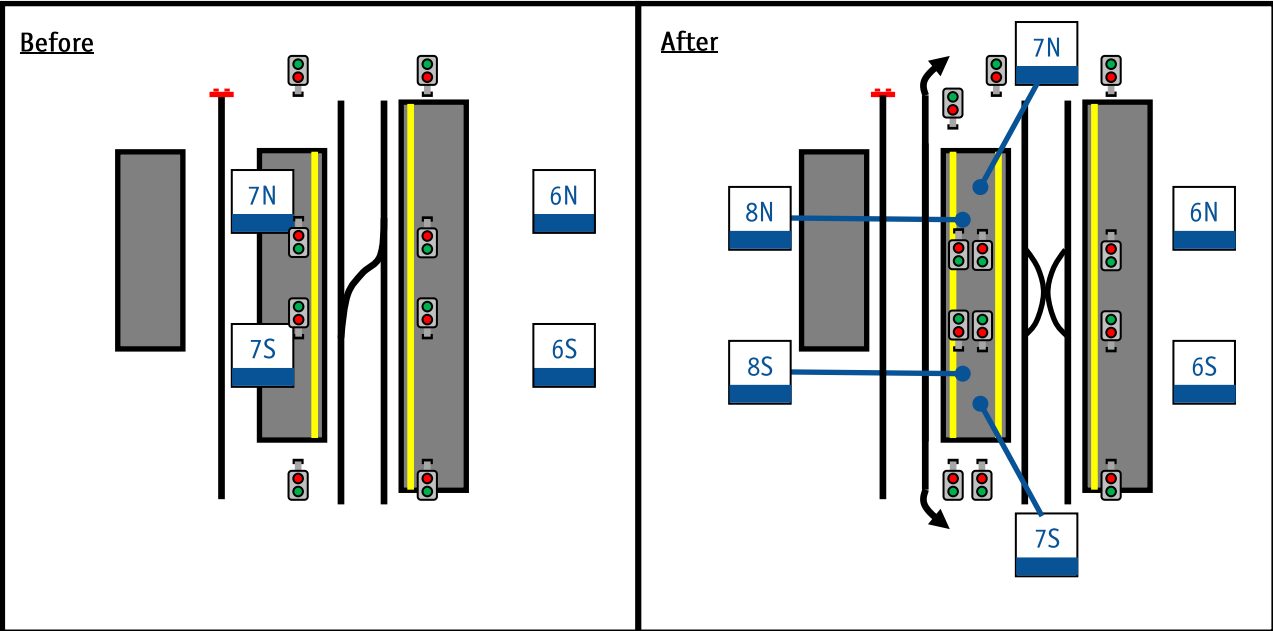


Fig 5.4 Upgrade C - Route Map

Work Required	New Points at north and south end of station, Two New Signals serving Platform 8, two further Signals subdividing Platform 8, Upgrade A98 to display Platform 8 indications, Realign Fuel Road in line with Platform 9, New Track for Platform 8, Platform 8 Signage and Screens, Removal and Reinstallation of Train Wash.
Benefit	Increased flexibility in scheduling, two new platforms for through services, freed up capacity from Platform 6 and 7 for through services, new through path for freight and empty coach services.

Tab 5.3 Upgrade C - Work and Benefits



Fig 5.5 Existing Train Wash Location



Fig 5.6 Existing Train Wash



Fig 5.7 Old Train Wash Foundations



Fig 5.8 Old Train Wash Location



Upgrade D - Platform 8 and 9 Through Platform

To add even more capacity to Aberdeen we can add yet another through platform. Work to reinstall Platform 9 will be more involved as it will require a redesign of the fuel road and headshunt, and the reinstatement of the Platform itself which is currently uncovered and not suitable for passenger use. The benefits of this addition however cannot be overstated. Platform 9 isn't as long as Platforms 6,7, and 8, but it is long enough to be subdivided into two platforms long enough for 6 carriage trains (including 4+2 HSTs). This would add four new through platforms to Aberdeen, include two through paths, providing a massive increase to current capacity.

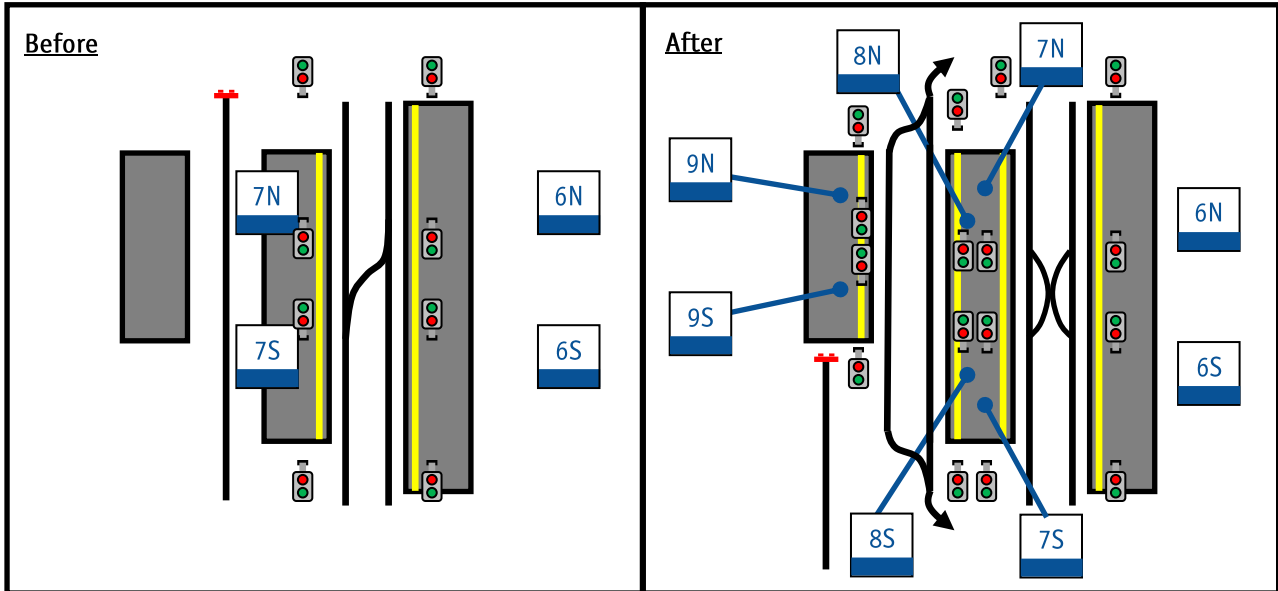


Fig 5.9 Upgrade D - Route Map

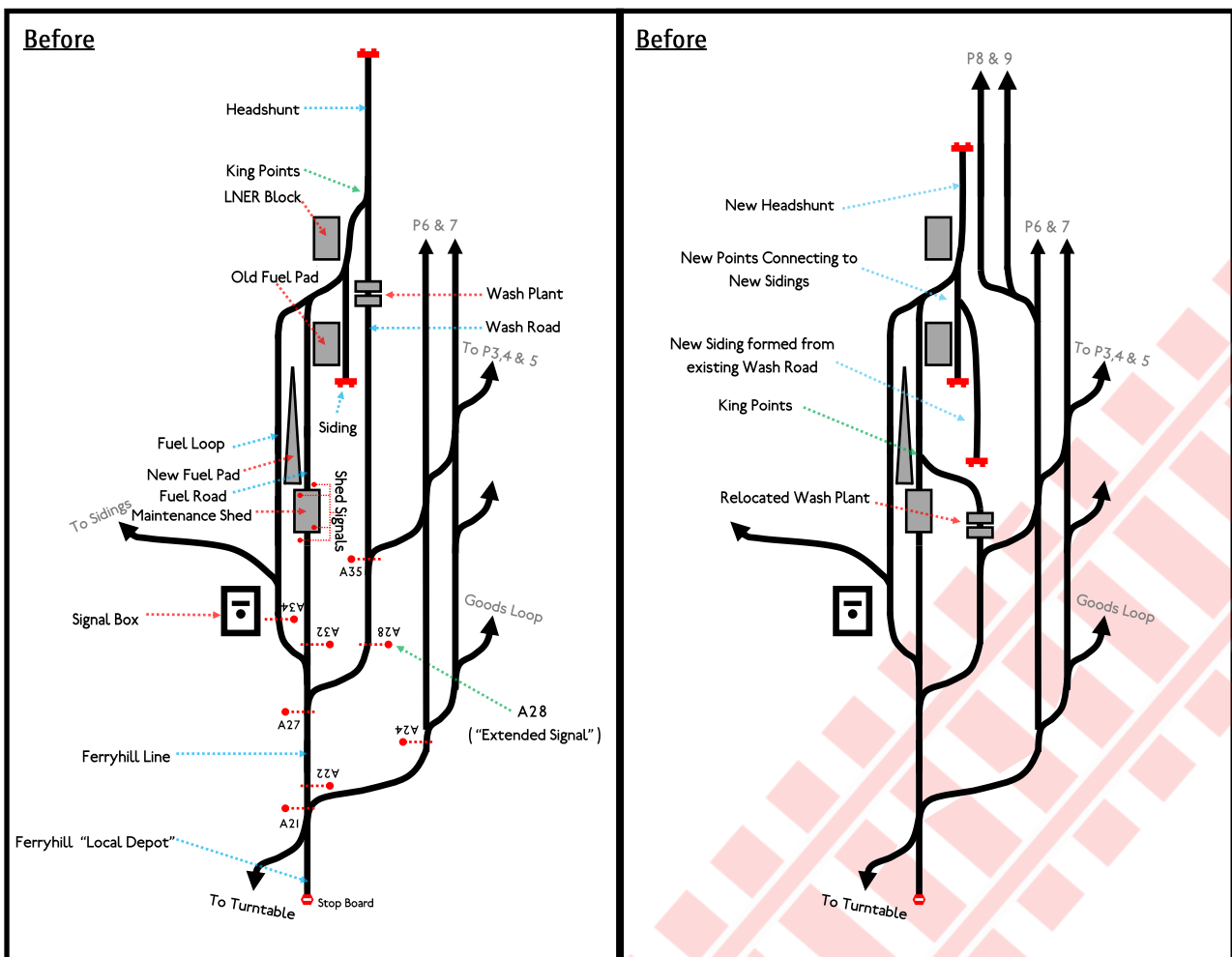


Fig 5.10 Upgrade D - Clayhills Depot Route Map



To facilitate Platform 9, the existing headshunt must be replaced. This is because trains today must move clear of the King Points after travelling through the Train Wash so that they can then reverse back up the Fuel Road for Servicing. This headshunt must be long enough to allow the longest train that requires depot services at Clayhills to reverse (LNER Class 800 Azuma, 10 carriages). Fig 5.10 shows one possible layout that would satisfy this requirement, others are possible.

Our proposed layout would have trains enter Yard Control at the same point they do in the existing layout (A35). Trains would then immediately pass through the relocated Train Wash, the new Wash Road bends to the left through the location of an existing storage shed*, then a relocated set of King Points controls movements between the Wash and Fuel Roads as they do now. Trains will continue down the Fuel Road until they are clear of the King Points, where they can halt as the King Points are switched, then reverse up the Fuel Road for servicing. From here no other changes have been made so trains would continue back to Signalled control as they do today. This Fuel Road continues along the existing alignment of the Fuel Road until reaching a new Buffer End at the ramp of Platform 9. This proposal also includes an additional Siding, this is not necessary for the Yard's operation, but does make use of the sections of existing Wash Road that may not need to be ripped up, while providing a long siding for use by TOCs or Network Rail.

*Note: One of the Shed control signals is attached to this storage shed, this would need to be repositioned to the adjacent shed, attached to the Repair Shed itself, or placed on a freestanding mount.

Work Required	New Points at north and south end of station, Four New Signals serving Platforms 8 and 9, Four further Signals subdividing Platforms 8 and 9, Upgrade A98 to display Platform 8 and 9 indications, New Track for Platform 8 and 9, Platform 8 and 9 Signage and Screens, Installation of Platform 9 canopy, installation of Platform 9 access lift, possible replacement of passenger steps, Removal and Reinstallation of Train Wash, Removal and Installation of new yard layout, relocation of Repair Shed Position Light Signal, relocation of King Points, installation of new Buffer Ends, Installation of Safe Walking Route.
Benefit	Increased flexibility in scheduling, four new platforms for through services, freed up capacity from Platform 6 and 7 for through services, two new through paths for freight and empty coach services, additional stabling space in Clayhills Depot.

Tab 5.4 Upgrade D - Work and Benefits



Fig 5.11 - Existing access stairs

The existing steps are used as Staff Only access to Clayhills Depot. If Platform 9 is recommissioned, these may or may not be suitable for passenger use, it should be noted that this particular set is modern and was installed in 2019. Additionally, there is no wheelchair access to Platform 9, so a lift would have to be installed adjacent to these steps. This lift, along with the three newly installed lines will block the current access route for Staff. Platform 9 is open to the elements, and therefore would need a canopy reinstalled, however, lighting is in place already. If Platform 9 is reinstated as a subdivided platform, consideration should be made to the possibility of reopening the historical Victorian waiting room at the north end of the platform.

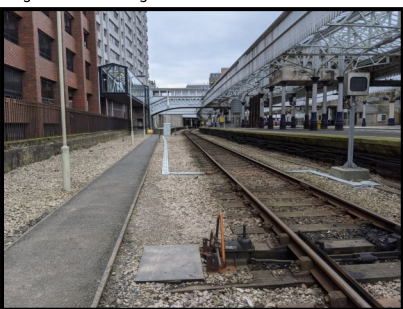


Fig 5.12 - Existing Staff walking route

Two new lines will replace the existing centre aligned headshunt. Platform 8 will have track aligned with the platform for its entire length, once the line leaves Platform 9 to the south, it will continue alongside Platform 8's track before joining to cross onto the Down main with Platform 8's track. Arranging the track this way allows Platform 9 to operate independently and retains access from the south when Platform 8S is occupied. The new headshunt will lie adjacent to Platform 9's track, approximately where the lampposts can be seen in Fig 5.12, and continue to a buffer end stop at the bottom of Platform 9's ramp. This will provide a Fuel Road and headshunt as long as the existing one, at the cost of the existing staff access walkway.



Fig 5.13 - Walking route and curved wall section

We can see a small concrete wall in Fig 5.13, this will be the location of the new buffer end stop at the terminus of the headshunt. To construct the trackbed for this headshunt, the car park wall that can be seen in Fig 5.13 curving towards the track may have to be removed. This area is not used and is approximately 2m lower than the existing trackbed. A new wall section in line with the existing wall will be installed and the gap left by the curved section filled or bridged. Staff access can be maintained in a few ways, either by painting a walking route down the existing road to the Depot, or by installing a staff only level crossing at the end of Platform 8. This style of crossing is in place in other stations, such as Dundee, and will only permit access by PTS trained staff.

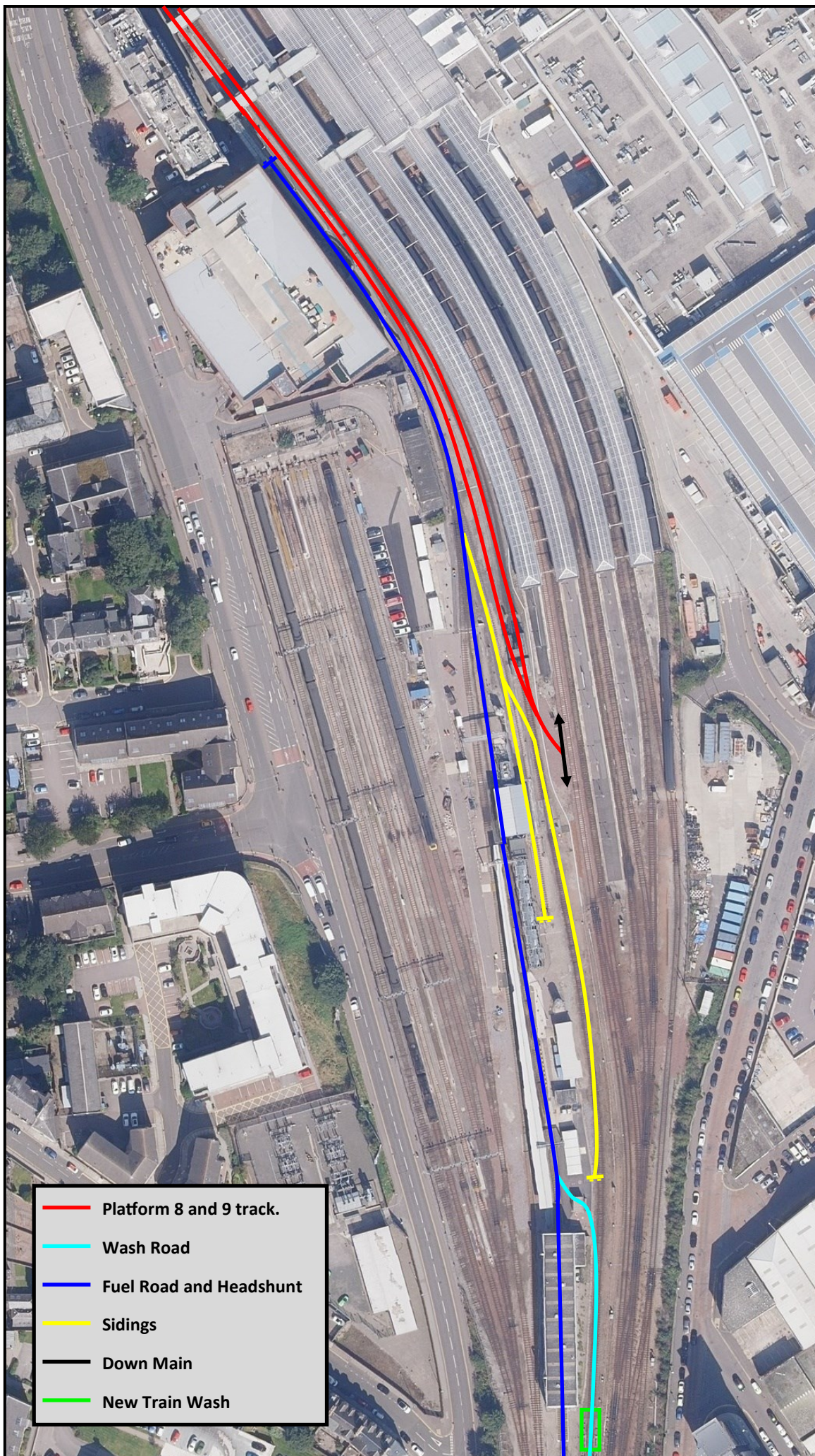


Fig 5.14 - Aerial View of Upgrade D

Upgrade E - Platform 1 and 2 Bay Platform

Capacity for trains departing north can also be increased by providing additional capacity for trains departing south on other platforms. This is achieved by removing the need for southbound trains to depart from through platforms. Platform 1 and 2 in Aberdeen are not currently in passenger use, both are used solely to stable trains throughout the day.

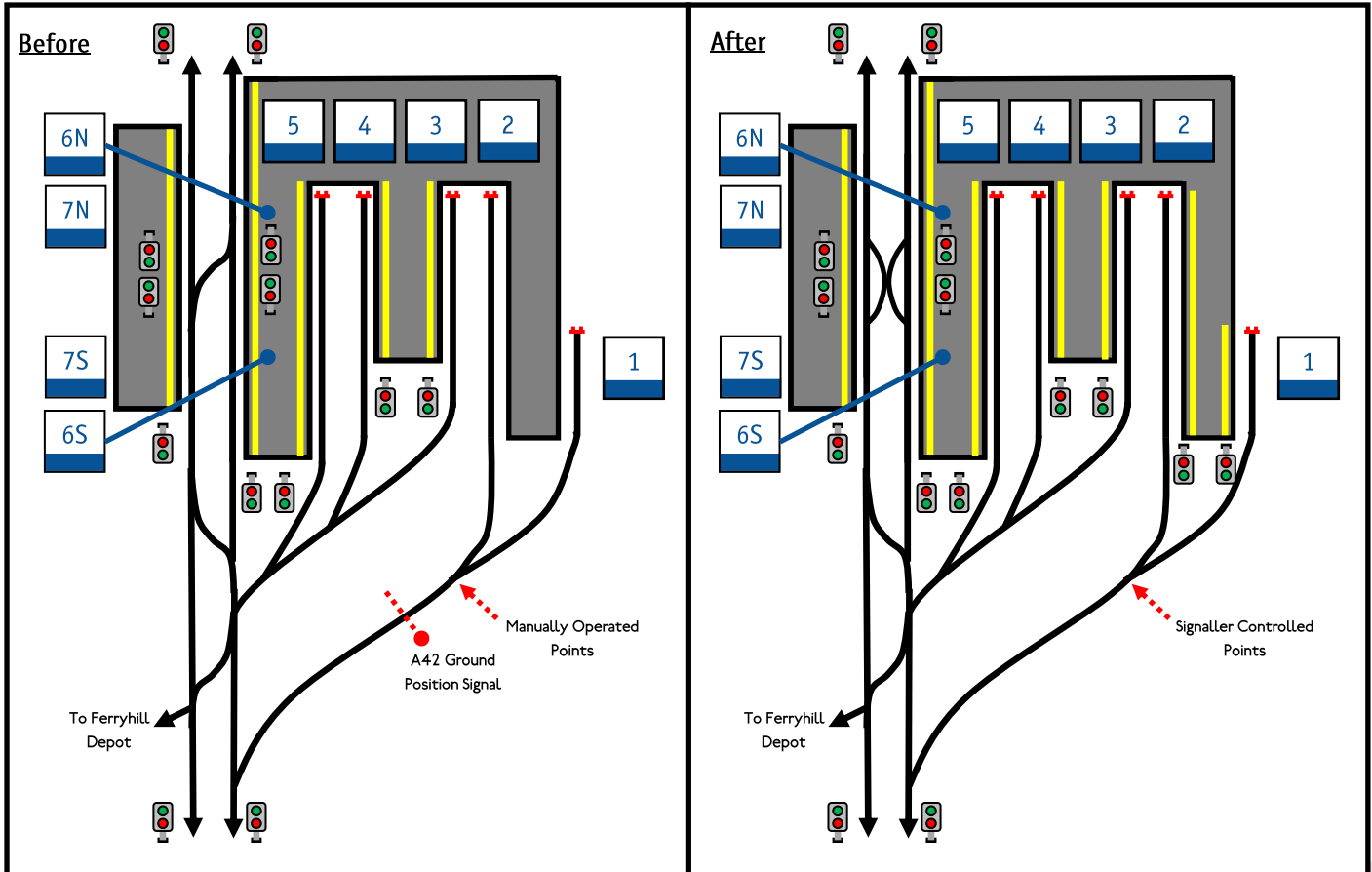


Fig 5.15 Upgrade E - Route Map

Work Required	Replace Manually controlled points with Signaller controlled semi-auto points, renew track to raise line-speed from 5mph to 20mph, two new signals serving Platforms 1 and 2, Platform 1 and 2 Signage, removal of existing restricted access gate, removal of A42 Ground Position Light Signal.
Benefit	Increased flexibility in scheduling, two new south facing bay platforms (one short), freed up capacity from Platform 6 and 7 for through services.

Tab 5.5 Upgrade E - Work and Benefits



Fig 5.16 Platform 1



Fig 5.17 Platform 1 and 2 Restricted Access Gate



Fig 5.18 Platform 2



5.2 **Stabling**

Each option listed in section 5.1 has advantages and disadvantages, notably, some have an effect on the stabling capacity. This is key as the introduction of new lines through Aberdeen will necessitate more train sets being stabled at Aberdeen and Clayhills Depot. The impact each option has on stabling capacity can be seen below:

- A. No Effect on Stabling
- B. No Effect on Stabling
- C. No Effect on Stabling
- D. Additional Sidings at Clayhills Depot
- E. Loss of Platforms 1 and 2 for stabling.

A feasibility study into the reopening of these lines will calculate the number of additional train sets required to operate any particular service pattern. If it is determined that there is not enough capacity in Aberdeen and Clayhills depot for servicing and stabling of the required number of trains, there is a solution.

Raiths Farm is a freight depot in Dyce that was constructed in 2007 after the closure and demolition of Aberdeen Guild Street Sidings to make way for the Union Square retail complex. The depot is underused, Aberdeen Waterloo Depot by the Harbour and Craiginchies Yard south of the station have accommodated much of the traffic from Guild Street. Since 2007, the most significant usage Raiths Farm has seen was during the construction of the Aberdeen to Inverurie redoubling project, where it was used as a staging site and delivery depot for materials such as ballast, sleepers and rail. Now that this work is complete, the site has fallen back into underuse.

Should it be determined that there is not enough capacity in Aberdeen and Clayhills for stabling and servicing, Raiths Farm can fulfil this role. The depot can be used simply as sidings with no alterations, or, can be converted to a Scotrail Depot to perform servicing work. Aberdeen drivers would shuttle trains back and forth between Raiths Farm and Aberdeen to meet the demands of the schedule throughout the day. There is precedent for this mode of operation, both Glasgow Queen Street and Edinburgh Waverly operate their schedules in tandem with a nearby offsite depot, Eastfield and Haymarket.



Fig 5.19 Raiths Farm from access road



Fig 5.20 Raiths Farm from Kirkton Drive



Fig 5.21 Raiths Farm Aerial

5.3 Our Zero Carbon Future

With the publishing of the Scotland Rail Services Decarbonisation Action Plan in 2019 by Transport Scotland, we can now see just how the Scottish Government plans to bring the railways into a new zero carbon future. If all goes to schedule, the plan will be completed by 2035, this is especially relevant to our proposals as we are planning for the next strategic period of 2022-2040. Any new rail project in Scotland will have to bear the environmental impact in mind while planning, including our own proposals. This is great news, the coming 20 year period is critical in the fight against climate change, and our action or inaction now will determine our impact on global climate change far into the future. Fig 5.22 below is taken directly from the decarbonisation plan, it shows that by 2035, Aberdeen will be operating both fully electric

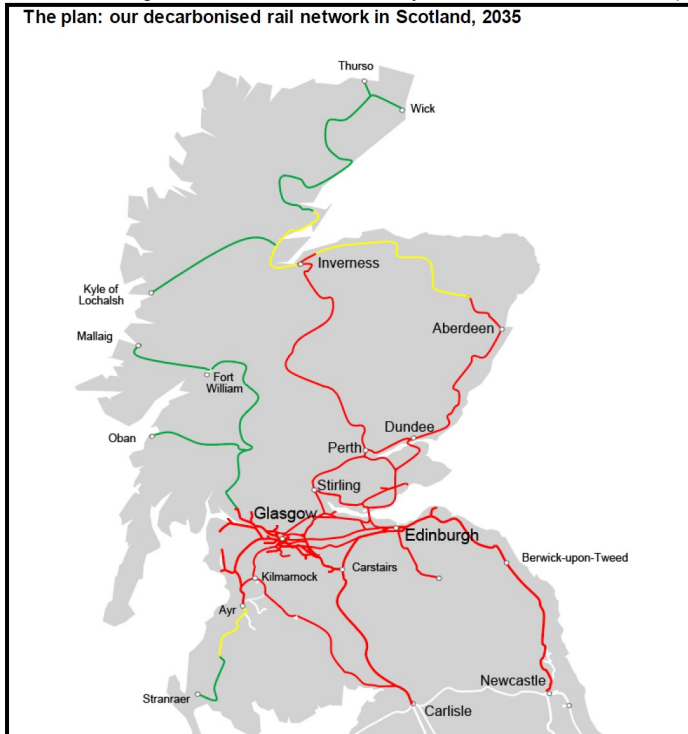


Fig 5.22 Transport Scotland Decarbonisation plan to 2035

and alternative traction vehicles from the station. We assume by the end of the strategic study period, to 2040, the yellow section from Inverurie to Inverness will be fully electrified. While we would prefer for the Buchan and Deeside lines to be fully electrified, and for Aberdeen to operate only fully electric trains, we recognise that these lines may be more suitable for alternative traction types.

Should this be the case, we assume that the chosen traction will be battery-electric, or hydrogen. Both of these have implications for the infrastructure required in Aberdeen, as well as the existing and proposed lines.

If battery-electric is chosen as the alternative traction, trains would run under wires on electric power to Dyce, then lower the pantograph to continue their journey into Buchan. Vivarail have a working battery-electric train capable of travelling 60 miles on a single charge. This is more than enough to reach both Peterhead and Fraserburgh, even considering the steep gradients on the historical sections of line to Ellon. Crucially, Vivarail have demonstrated that they can recharge fully in as little as 7 minutes.¹¹⁷ Considering that under current driver time regulations, DMU trains need a minimum of 9 minutes before they can begin a journey in the opposite direction,¹¹⁸ we can see that battery-electric trains will be feasible on the Buchan and Deeside lines, with

just as much flexibility in scheduling as existing trains enjoy. In regards to cross rail operation, battery-electric trains can operate solely on electric power, so will be able to seamlessly transition to operating under the wires for continued journeys to Montrose and Inverurie. Additional infrastructure will be required at Fraserburgh and Peterhead for recharging battery-electric trains, namely short sections of overhead line equipment over the platforms in these stations. It may also be advisable to install this equipment in Ellon so that Ellon terminating services can be scheduled if this is required in the future.

The other alternative is Hydrogen, Aberdeen is a leader in hydrogen technology, the city is the first in the world to introduce double decker hydrogen fuel cell buses. Hydrogen trains already exist, and while data on their range is difficult to find, considering that Aberdeen's double decker buses can "go all day" on a single tank, it is safe to assume that the technology provides enough range to cover the Buchan and Deeside lines. Choosing hydrogen as the alternative fuel source will further cement Aberdeen as a global leader in hydrogen technology, and allow the railway to benefit from the depth of technical knowledge and skill already present in the City's population. Of course, hydrogen refuelling for trains will need to be available somewhere, this can be provided with modifications to add Hydrogen generation in Clayhills Depot, or Raiths Farm as mentioned in section 5.2, or, trains can be given access to Aberdeen's existing Hydrogen generation plant in Kittybrewster.

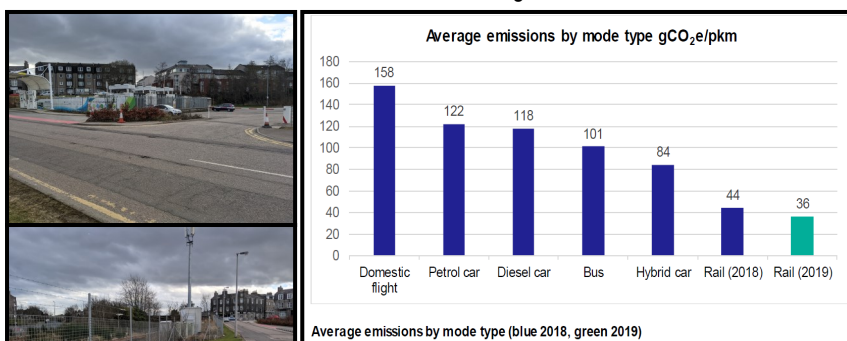


Fig 5.24 Emissions by Mode in Scotland

Track can be laid in a tight 5mph bend from the existing line at Kittybrewster, across the road with a level crossing, and alongside the existing hydrogen generation plant. Here refuelling equipment can be fitted, and a signal can be maintained at danger to allow the level crossing to remain open while trains refuel. This work requires building over a row of car parking spaces used by Aberdeen City Council, and leaves enough room to further expand the hydrogen generation plant for use far into the future.

Whichever technology is chosen, we can be sure than opening the Buchan and Deeside Railways will be a huge boost to all of Scotland's decarbonisation efforts. Thousands of journeys by car will be transferred to rail, which is already the lowest carbon method of transport, and soon will be entirely zero carbon in this country.

Fig 5.23 Aberdeen Hydrogen Plant



5.4 Journey Times

In the North East, over two thirds of local journeys are undertaken by private car, much higher than the UK average. Should we wish to maximise railway patronage we must consequently provide a service that is better than all other modes of transport. Therefore, one of the most important aspects we considered during CNER's proposal preparation were journey times. Buchan and Deeside trains must be competitive with driving on local roads, and journey times to Aberdeen minimised to keep long distance journeys from further afield as attractive as possible. Both previous studies that examined the Buchan corridor assumed a maximum linespeed of 75mph. Since much of CNER's new proposals are entirely new alignments, these sections can be designed to achieve even higher speeds. Both Electric and Diesel trains in Scotland regularly run at 100mph for long sections, and even single line sections in the UK are rated for 100mph. CNER want the design phase of these proposals to aim for 90 or 100mph wherever it is possible considering geometry, signal sighting, and scheduling. The tables below show average speeds required to compete with driving times* on local roads.

Aberdeen Station to Ellon

Scheduled journey time to Dyce is currently 9 minutes with a linespeed of 75mph. This has been accounted for within calculations. Significant straightening of the line at Newmachar and the relatively straight alignment of the remaining railway make the required 57.8mph average speed more than achievable on this section. The fact that this railway would be operated by higher acceleration trains, either electric, hydrogen, or battery, the gradients on the historical sections are less of a concern than they may have been in the past. The slow speed curve at Pitmedden is also not a concern as trains would be slowing to stop or accelerating away from the station while traversing the bend.

Proposed distance by Rail	Distance by Road	Journey time by Road	Average speed by rail required to equal road journey
13.5 mi	16.2 mi	23 min	57.8 mph

Ellon to Peterhead

The existing condition of the Boddam branch line is such that constructing the line to Peterhead would be closer to that of constructing a new railway than reopening an old one. This would however present more of an opportunity to achieve higher speeds. There are multiple options for alignment in this section. The table below shows the shortest route possible on top, and the longest below to provide a 'best case/ worst case' scenario for all of the available options. As we can see all options are easily achievable, particularly the shortened and much straighter Bogbrae section, providing much better journey times when compared to the line via Hatton.

Proposed distance by Rail	Distance by Road	Journey time by Road	Average speed by rail required to equal road journey
15.5 mi	15.6 mi	19 min	48.9 mph
20.6 mi	17.3 mi	24 min	51.5 mph

Ellon to Fraserburgh

The 2016 Fraserburgh and Peterhead to Aberdeen Strategic Transport Study stated that journey times on a reopened Formartine and Buchan line would compete with the private car, even at a maximum speed of 75mph. Our proposals mostly follow this route from Ellon to Fraserburgh, but we also include the option of a more direct path to Fraserburgh, the table below shows the former on top, and the latter below. Again, both options are readily achievable.

Proposed distance by Rail	Distance by Road	Journey time by Road	Average speed by rail required to equal road journey
27.2 mi	25.3 mi	31 min	52.6 mph
24.3 mi	25.3 mi	31 min	47.0 mph

Aberdeen Station to Banchory

The Deeside Railway was not studied following the 2016 Fraserburgh and Peterhead to Aberdeen Strategic Transport Study. CNER's proposals follow the historic alignment of the Deeside Railway for most of its length. The section we propose opening, to Banchory, is remarkably straight for a Victorian railway, and would serve our modern needs well. As the table below shows, in this section of CNER's proposals, competitive journey times with the private car are again achievable. This is particularly relevant in Deeside as the area has high car ownership.

Proposed distance by Rail	Distance by Road	Journey time by Road	Average speed by rail required to equal road journey
15.6 mi	17.4 mi	27 min	34.6 mph

*Journey times have been sourced from Google journey time calculator using the most common roads in the area.



6 What Must Be Done

This is a critical time for our campaign, STPR2 is underway right now and concludes in August 2021, this will determine the transport infrastructure in Scotland over the next 20 years, we are asking the Scottish Government for the following:

Commission a fit-for-purpose feasibility study into our proposals, including:

- A Buchan line from Dyce to Ellon, then on to Fraserburgh and Peterhead. (Section 4.3)
- A Deeside line from Aberdeen to Banchory. (Section 4.4)
- An integrated bus route connecting to the Deeside line at Banchory. (Section 4.4)
- Possibility of including these lines in electrification (decarbonisation) plans, or providing infrastructure for alternative tractions. (Section 5.3)
- New stations at Cove Bay, Newtonhill, Don Street (for Aberdeen University), and Bankhead (for TECA). (Section 4.1)
- Upgrading Aberdeen station and Clayhills Depot to meet capacity requirements. (Section 5.1)
- Different Methods of solving the Tunnel Problem, attribute costs to a separate project, it is unreasonable to expect the Buchan lines factor this into a Cost-Benefit calculation. (Section 4.3.7)
- Modes of operation, including a joint Inverurie-Montrose-Peterhead-Fraserburgh-Banchory Crossrail
- Methods of establishing through ticketing between Bus and Train in Deeside. (Section 4.4.5)
- Retention of the existing active travel corridors and possibility of additional active travel corridors alongside Ellon - Peterhead route, if this is the only option preventing feasibility, investigate alternative methods of funding through direct government active travel schemes. (Section 3.2)
- Connecting Craiginches Yard to Aberdeen South Harbour by rail for freight and cruise passengers. (Section 3.1.4)
- Provide stations long enough to handle special steam services as was successfully achieved on the borders railway.
- Feasibility of Fish, BrewDog and any other freight on the Buchan line, analyse cost vs benefits of upgrading track to W12 to handle refrigerated containers. (Section 4.3.4)

Aberdeen is the third largest city in Scotland and deserves modern, integrated transport connections as strong as those in the central belt, we must take action now to put our best foot forward in the fight against the Climate Emergency, and to alleviate deeply held feelings of isolation in these North East Communities.

Our Proposals connect Mountain and Sea, stitching the social fabric of Aberdeenshire together, and connecting rural communities in a sustainable way that that will have a meaningful impact on local lives, economies, and health. Aberdeenshire can enter a new era of connectivity, and leave the dark days of isolation since the Beeching Cuts behind. This project will bring a whole region into the 21st Century, and sustainably connect tens of thousands to the rest of the country and beyond.



How can you help?

Politicians

Pledge your support to funding a full and fit-for-purpose feasibility study.

Lobby colleagues to adopt a North East Cross-Party partnership for funding and delivery.

Business owners

Tell us how our proposals will help your business to grow and create new local jobs.

Community leaders

Organise a public meeting in your community to raise awareness and canvas opinion. Approach us about providing a speaker.

Local residents and supporters

Visit the Campaign for North East Rail website. See how you can get involved and sign the petition, contact your locally elected political representatives and tell them you want them to support our campaign.

Media

In addition to press releases we are happy to provide media comment upon request. We are a community group and can provide radio and television comment and written copy.

Visit our Website to sign the petition! www.campaignfornortheastrail.org

Facebook: Campaign for North East Rail Twitter: @CNERail

This document has been compiled by:

Jordan Jack (Train Driver) **Wyndham Williams** (Mechanical Engineer) **Craig Leuchars** (Project Manager)



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