

AllanRail

Milngavie Branch Redoubling

Reference 18/004

Client – Ross Greer Green Party MSP for the West Scotland Region

David Prescott

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Executive Summary

Milngavie has the worst performance in terms of the percentage of trains arriving on time (28.3%) of all of the stations published by ScotRail. Dalmuir where some of the services are integrated with Milngavie is 45.9%, but the terminating services, which are those that are integrated with the Milngavie services, are only marginally better at 28.5%.

Whilst the causes of this poor performance are likely to be widespread and complex the single lead junction at Westerton and two single track sections on the Milngavie branch result in further reactionary delay and amplify any initial late running into greater lateness and over a wider range of trains.

Removal of the single lead junction at Westerton will assist with improving network performance, and would require over a third of the single track section to Bearsden to be redoubled. This suggests that it would be more cost effective and efficient to extend the redoubling to Bearsden, the extra length plain line removing two sets of points and more complex signalling. It would offer greater flexibility in timetabling which could be valuable in re-planning the Glasgow North Electric services to improve performance.

Redoubling the Hillfoot to Milngavie section would further increase the flexibility in timetabling, virtually removing the considerable constraints that the current Milngavie branch infrastructure inflicts on the network, as well as giving some performance benefits.

The total length of redoubling of the two sections (two miles) represents only 5% of the length of railway that has (or is) being redoubled in Scotland over the last ten years. There appear to be few impediments to the redoubling of the Milngavie branch, in contrast to the current Aberdeen (Kittybrewster) to Inverurie redoubling.

The importance of the Milngavie branch in delivering improved performance has been recognised by the ScotRail Alliance, is specifically noted in the Donovan Report on train punctuality and the case for doing something has been broadly accepted.

Allander station cannot be delivered without the redoubling of the whole of the Milngavie branch.

1 History

1.1 The early years of the Milngavie branch

The Milngavie branch from Westerton was opened in 1863 as a single line by the locally promoted Glasgow & Milngavie Junction Railway and was taken over by the growing North British Railway in 1873 to become part of their wider Glasgow suburban rail network. It was doubled in 1900.

There was considerable freight traffic as well as the growing residential travel, with Hillfoot station opened with the doubling in 1900 to join Bearsden as the intermediate stations. The line became part of the LNER in 1923 and then BR's Scottish Region in 1948.

It was electrified in 1960 (originally at 6.25kv AC) as part of the Glasgow North Suburban network based on Queen Street Low Level. It now operates at the standard 25kv AC electric supply. (This may suggest that overhead line wire clearances at overbridges are tight.)

1.2 More recent changes

The line was partially singled in 1990 as part of the Yoker re-signalling scheme which abolished the local signal boxes at Westerton (Junction) and Milngavie. The branch was reduced to single track with a long passing loop (or section of double track) in the middle between and including Bearsden and Hillfoot stations. This was part of the standard form of cost saving employed by the cash constrained Regional Railways, part of British Rail, when a number of other lines were singled and double junctions replaced with "single lead" junctions. It was carried out during the period when Strathclyde Passenger Transport Executive (SPT) was the funder of local rail services. (The Helensburgh Central line was also singled as part of the Yoker resignalling and simplified "single lead" junctions introduced at Newton, Bellgrove and Craigendoran for Helensburgh. The Balloch branch had been singled significantly earlier, in the 1970s.

At this time the Milngavie branch train service operated a half hourly frequency shuttle between Milngavie and Springburn, which was well within the capability of the infrastructure. This service pattern was introduced with electrification in 1960 and continued until the service changes in the mid-2000s as part of the Larkhall – Milngavie upgrade.

1.3 Service Enhancements

The Argyle line opened in 1979, linking the Queen Street electrified network with the Lanarkshire electrified network but had little impact on the nature or performance of the Milngavie train services.

However since the 1990 singling, the railway network in the Glasgow area has been substantially altered and the train services radically changed. In December 2005 the Larkhall branch opened which resulted in two extra trains on the Argyle line to give a 15 minute frequency between Glasgow and Hamilton and at the same time the service frequency to Milngavie was doubled to every 15 minutes. This represents 100% use of the branch infrastructure capacity. (This applies until mid-evening, when the service is reduced to half hourly.)

In December 2010 the Airdrie – Bathgate line was opened and what had been a local shuttle service from Milngavie into Glasgow now became a long distance service to Edinburgh.

1.4 Current usage

The Milngavie branch is not a small and insignificant part of the ScotRail network as the passenger figures published by the Office of Rail and Road demonstrate:

Station	2014/5	2015/6	2016/7	Difference 16/17 compared with 15/16	%	Difference 16/17 compared with 14/15	%
Milngavie	998,354	992,202	966,286	-25,916	-2.61	-32,068	-3.21
Hillfoot	326,896	318,676	317,352	-1,324	-0.42	-9,544	-2.92
Bearsden	570,722	565,354	555,990	-9,364	-1.66	-14,732	-2.58
Westerton	784,490	794,600	794,094	-506	-0.06	9,604	1.22
Anniesland	1,133,042	1,154,430	1,218,022	63,592	5.51	84,980	7.50

The total use of the three stations on the Milngavie branch in 2016/7 was 1,839,628. This represents almost 2% of the total ScotRail journeys and is broadly equivalent to the use of Dundee station.

Passenger numbers are falling, which is counter to the Scotland wide trend. Poor performance may be causing this effect.

2 The Problem(s)

The Milngavie branch is the worst performing ScotRail route in terms of punctuality with only 28.3% of trains arriving on time – (known as Right time (RT) and up to 59 seconds after the publically advertised arrival time) and 79.2% arriving within 5 minutes (0-5).

The punctuality at Dalmuir for terminating trains is nearly as bad as Milngavie with only 28.5% RT and 85.1% (0-5) with 73 trains daily. These terminating trains interwork with the services using the Milngavie branch. All trains calling at Dalmuir achieve 45.9% right time, suggesting that the through services perform a lot better than the terminating services.

A Glasgow Area Network Map is provided in Appendix A.

The bottom seven stations on the ScotRail network (below 40% Right Time) are shown below:

Station	% Right Time Arrivals	% Within 5 minutes
Carnoustie	38.1	83.2
Arbroath	37.8	65.5
Ardrossan Harbour	37.6	92.3
Paisley Canal	37.1	95.5
Girvan	36.5	92.1
Largs	29.1	88.6
Milngavie	28.3	79.2

The remaining Glasgow area terminal stations have RT figures ranging up to 71.5% RT (Neilston) with 28 trains a day.

All performance figures quoted in this report are from ScotRail's website performance page for 29 April 2018 to 26 May 2018, and refer to the previous 13 four weekly periods. The Right Time figures and the 0-5 minutes percentages applying to all trains calling (passing through and terminating), unless otherwise stated.

Data can be found here: <https://www.scotrail.co.uk/performance-and-reliability>

3 Possible Causes of poor punctuality

3.1 Train Services

The two services that operate on the Milngavie branch are:

Milngavie to/from Edinburgh via Glasgow Queen Street Low Level, Airdrie and Bathgate

Milngavie to Motherwell and Cumbernauld via Motherwell and from Larkhall via Glasgow Central Low Level (not an out and back service, but an asymmetric one, with the other west end terminal station being Dalmuir)

Both services are complex and have their challenges, both to plan and to operate. All train service descriptions below are based on Monday - Friday inter-peak standard patterns and there are variations in the peaks, evenings, on Saturdays and Sundays:

3.2 Milngavie to/from Edinburgh

This service is one half of the service over the Airdrie-Bathgate line (reopened in 2010), the other half being a Helensburgh Central to/from Edinburgh service. Additionally there is a Balloch to/from Airdrie service over the west end of the route.

A Dumbarton Central to/from Cumbernauld via Yoker and Springburn service shares the section from Hyndland East Junction to Bellgrove, resulting in the section through Queen Street Low Level being used by eight trains an hour in each direction.

At the Edinburgh end there is interaction with Edinburgh – Glasgow via Falkirk High (the Flagship E&G services) and Edinburgh – Dunblane services (and in the near future also Edinburgh – Glasgow via Cumbernauld services) between Newbridge Junction and Edinburgh Waverley station.

Most trains run on the south pair of tracks through Haymarket station which they also share with twice an hour Edinburgh – Glasgow Central via Shotts service and an hourly service via Carstairs (alternately ScotRail and CrossCountry services) as well as hourly long distance cross-border West Coast Main Line (WCML) services to Carlisle and beyond to Manchester, Birmingham and London Euston. The line occupation through the south side platforms at Haymarket is potentially 15 or 16 trains per hour in each direction, which is towards the limit of its capability; although in practise some trains are diverted onto the north (Fife) lines through Haymarket, where there are normally only 7 trains per hour in each direction. This creates conflicts at Haymarket Central Junction

Access into Edinburgh Waverley station is constrained by the restricted space in which the west end throat sits between the Mound tunnels and the platform ends and now by sufficient west facing platforms of the required length to accommodate all of the longer trains now being used.

3.3 Milngavie to Motherwell and Cumbernauld via Motherwell and from Larkhall via Glasgow Central Low Level

These services are operated as part of the Argyle line through Glasgow Central Low Level. The asymmetric timetable is balanced by a mirror image timetable serving Dalmuir via Westerton at the west end instead of Milngavie. These two routes combined provide a symmetrical timetable

between the east end terminals and Westerton, before the route splits to serve both Milngavie and Dalmuir.

Starting at the west end of the route – there a whole range of constraints and complexities:

- The Milngavie branch as described above
- Dalmuir only has a single turnback platform on the Yoker line and a single turnback siding to the west of the station and junction which can be accessed from both Yoker and Singer (Westerton) lines. The turn round times of the trains that terminate and restart there are limited by access to these facilities. It has to be between the minimum acceptable turnround time (generally five minutes) and with sufficient time to clear the platform or siding in time for the next terminating train.
The turnback sidings are on the main line to/from Dumbarton and west and have to be used by trains via Westerton and Singer, as the turnback platform is on the line through Yoker. This introduces an interaction between Helensburgh Central and Dumbarton Central services which run via Yoker and which would otherwise not have potential interactions with these terminating trains via Westerton, until Hyndland East Junction.
- Westerton Junction leads directly onto the single line – so trains coming off the branch prevent trains going onto the branch. It is a busy junction with six trains an hour in each direction running via Singer and four per hour each direction turning onto the Milngavie branch
- Hyndland East Junction is extremely busy with 14 trains an hour in each direction, four of which run via Yoker and Clydebank and the remainder run via Westerton and Singer.
- The section between Hyndland East Junction and Finnieston Junctions is one of the busiest double track sections in Scotland routinely accommodating fourteen trains per hour in each direction. It includes also two busy stations and driver changes also take place for some services at Hyndland.
- The line through Glasgow Central Low Level only takes six trains an hour – the four services that are the Milngavie/Dalmuir linked services and additionally two Dalmuir to/from Whifflet services per hour in each direction, which make use of the Whifflet line electrification, completed in 2014.
- Rutherglen Junctions bring an interface with Glasgow Central High Level services, four trains per hour that form the Milngavie/Dalmuir linked services plus the seven trains per hour in each direction that run to and from Glasgow Central High Level (2 x Lanark, 2 x Edinburgh via Shotts, 1 Edinburgh via Carstairs (ScotRail or CrossCountry) and two per hour WCML services to London Euston and Manchester/Birmingham alternatively). This is also where the Whifflet trains turn off.
- These eleven trains per hour in each direction share the twin track section of the WCML through Cambuslang to Newton East Junction where the Milngavie/Dalmuir linked services turn off towards Hamilton on the recently redoubled Newton West Junction chord.
- At Newton station the four Milngavie/Dalmuir linked services share the two track station with two “Cathcart Circle” trains an hour from Glasgow Central which terminate here, with a turn round time of only five minutes. These two trains take different routes on the Cathcart Circle one using the east side and one the west side.

- Just east of Hamilton Central station Milngavie/Dalmuir linked services share a single track section through Barncluith Tunnel to Haughead Junctions, with the Larkhall services running onto the single track Larkhall branch and returning to Hamilton just before the next service leaves for Larkhall.
- The train that runs to Motherwell returns so there is no conflict with the WCML here.
- But the one train per hour each way that runs up to Cumbernauld has to cross the WCML at Motherwell, run through the freight lines at Mossend, sharing this part of the route with the two Glasgow Central – Lanark trains per hour in each direction and the one Dalmuir – Whifflet train per hour in each direction which is projected on to Motherwell. It passes through Whifflet station – termination point of the Dalmuir – Whifflet service.
- Finally it shares the route from Garnqueen North Junction into Cumbernauld with four trains per hour in each direction, two from Glasgow Queen Street High Level, one of which runs to/from Falkirk Grahamston, and two from Dumbarton Central via Glasgow Queen Street Low Level. Three of these services require to make use of the turnback sidings as well as the service via Motherwell.

The Milngavie branch Monday to Friday standard off-peak timetable is:

	Edinburgh	Larkhall	Edinburgh	Larkhall
Westerton	XX 10	XX 24	XX 41	XX 55
Bearsden	XX 13	XX 27	XX 43	XX 57
Hillfoot	XX 15	XX 29	XX 45	XX 59
Milngavie	XX 18	XX 33	XX 49	X1 03

	Motherwell	Edinburgh	Cumbernauld	Edinburgh
Milngavie	XX 10	XX 24	XX 39	XX 54
Hillfoot	XX 13	XX 27	XX 42	XX 57
Bearsden	XX 15	XX 29	XX 44	XX 59
Westerton	XX 18	XX 32	XX 47	X1 03

3.4 Observations and Analysis

The integration of the Milngavie and Dalmuir services at the west end of the Argyle Line may explain why they published performance of the trains terminating at these two stations is similar (Milngavie 28.3% RT, 79.2% 0-5 and Dalmuir - 28.5% RT, 85.1% 0-5. The slightly worse performance of the Milngavie services may be explained by the single line sections on this route, but more detailed analysis would be required to fully understand the reasons.

What is less easy to understand is the performance at the east end of these services with relatively good performance Larkhall 54.2 RT, 90.1% 0-5, Motherwell 53.4%, 88.2% 0-5, Cumbernauld 52.2% RT, 90.2% 0-5, Whifflet 58.1% RT, 88.5% 0-5.

This will require further detailed analysis on the causes of delay to these services, particularly interaction with other services. But there may be issues with the differences in performance between north bound long distance services at the end of their 300 or 400 mile journey and south

bound trains which should be running close to the planned times having only just started their journeys. This will impact on the Newton Junction – Rutherglen Junction section.

3.5 Infrastructure

The Milngavie branch is now operating for the bulk of the day with the double track intermediate crossing section in use for every train. The time between trains arriving and then leaving Milngavie is five or six minutes. This railway is operating at effectively 100% of its capability, with little scope to permit recovery from late running.

This is not, in itself, a cause of poor performance, but it does mean that the Milngavie branch does not have the capacity to assist in any recovery from late running induced elsewhere and that late running on one service can react onto other services.

4 Train Operations

There are two aspects to this infrastructure design:

- The base train service plan - the timetable
- The daily operation of services

4.1 Timetabling

On a single track railway the train service has to be planned so that trains pass on the two track sections. This means that trains in opposite directions are linked together in a much more constrained fashion than on a double track railway. The operation of four trains an hour on a single track railway requires trains to cross 7½ minute intervals – on the Milngavie branch crossings include the terminal station at Milngavie (same train in and out), the double track Bearsden – Hillfoot section and then to the east of Westerton station, on the main double track line to Anniesland.

As the Milngavie branch is operating at 100% of its capability this means that once one train is planned the rest of the trains, in both directions, must fall into their required place in the timetable and there is virtually no flexibility to move trains relative to one another. Clearly taking the Milngavie branch in isolation the trains can be anywhere around the clock-face, but the structure of the service is fixed.

This creates a considerable constraint on train planning across the wider network as there is limited flexibility to move any of these trains to resolve conflicts elsewhere, because they are already fixed in their times on and off the Milngavie branch at Westerton.

So the planning of the moves at Hyndland East Junction and the spacing of trains through the busy Hyndland - Partick section becomes more difficult, which, in turn, reacts on other services.

Clearly the further east/south from Westerton the location are, the less constraint arises as there is scope to add time into the timetable (known as pathing time) but this has the effect of increasing published journey times and also takes up capacity on the network.

Westerton Junction at the south end of the Milngavie branch is also a constraint.



Any train going onto the Milngavie branch requires a planned gap in the train service in the opposite direction from Dalmuir, so it can safely, and without disrupting the timetable, cross onto the Milngavie branch.

With a double track junction the ideal timetable is for a train to come off the branch at about the same time as one goes on, so that the one coming off can drop into the vacant path (due to the crossing move) after the junction. This does not have to be exactly on the double junction, but that is likely to be the most efficient in making use of scarce paths.

However with a single lead and the single track section between Westerton and Bearsden this is not possible as any train going onto the branch conflicts with a train coming off the branch.

Consequently every train that turns onto the Milngavie branch creates dead space on the line in the opposite direction through Westerton towards Anniesland and another path, at a defined point has to be found for the train coming off the Milngavie branch.

4.2 Daily Operation

The constraints that apply to the planning of the timetable also apply during the day-to-day operation of the network.

Late running trains running onto the Milngavie branch will potentially impact on trains coming off the branch, both at Hillfoot, the north end of the intermediate double track section and arriving at Milngavie where a late incoming train may well result in the train it forms departing late.

Clearly a train that is late coming off the Milngavie branch could cause further delays in the congested Hyndland - Partick area and, depending on the degree of lateness, further afield.

However a train coming off the Milngavie branch late also prevents the next train going onto the branch and requires it to stand in Westerton station platform. This creates a particular problem at Westerton because for every train that goes onto the Milngavie branch there is a train for Dalmuir following only three or four minutes behind. Whilst this does not impact on the Milngavie branch it impacts on the services as a whole.

There is a high degree of judgement as to the best course of action when train running is perturbed, with decisions as to which trains to delay needing to be made frequently, especially with the current overall performance of the services through Westerton.

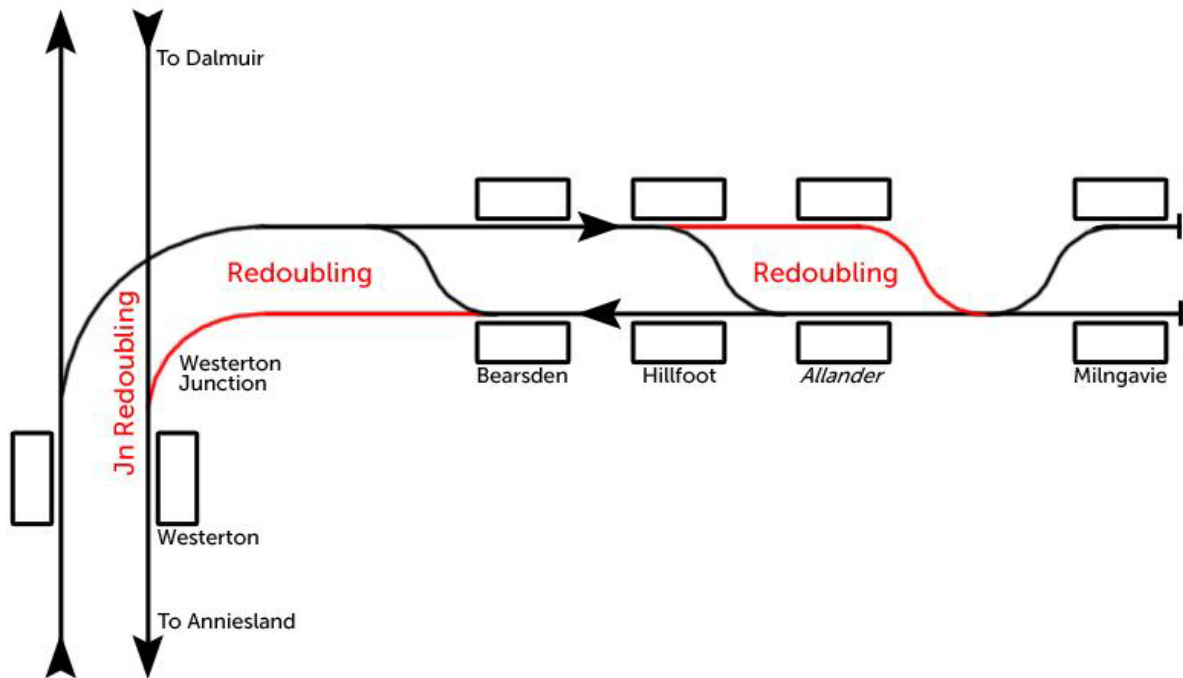
A detailed analysis of the nature of the causes of delays is beyond the scope of this report, but some of the delays from an initial sample include the impacts of late running trains on the WCML through the shared section around Cambuslang and general congestion in Partick to Westerton area, where any out of course running is likely to cause reactionary delays.

This has been illustrated by the observation that was made in the ScotRail commissioned report produced by Nick Donovan, who was asked to investigate ScotRail's Performance and to make recommendations. The only specific geographic recommendations relate to Whifflet and to Milngavie – where the importance of right time departures is stressed. These recommendations are included in Appendix B

5 Potential Solutions

The obvious solutions are:

- redouble Westerton Junction
- redouble one or both of the single track sections of the Milngavie branch.



5.1 Westerton Junction

Westerton Junction is a “single lead” junction which will only permit one movement onto or off the branch to be made at one time, which restricts the timetable that can be operated and introduces interactions between trains in opposite directions, which in turn increases the risk of further reactive delays. There is also a higher safety risk which has required considerable management in terms of signalling protections.

A number of single lead junctions across Scotland (Busby, Midcalder, Newton West, and Stirling Middle) have been redoubled in recent years, to improve capacity and flexibility in timetabling and this option is generally considered when a single lead junction requires renewal.

The redoubling of a junction only provides benefit if trains have the space to run onto the branch line even if another train is coming off it. So the redoubling of Westerton Junction will require a minimum about 250m of track between the junction points and the signal that would permit a train access onto the single track section towards Bearsden. Additionally a standard 200m overlap beyond that signal up to the points onto the single line is required. So broadly 450m of double track is required to convert Westerton Junction into a double junction, in what is only in total 64 chains (1,300m) of single track to Bearsden, i.e. about 1/3 of the Westerton – Bearsden section.

The cost and complication of the extra pointwork and signalling to complete only the junction redoubling is likely to be similar to the cost of providing the second track over the remaining 2/3 of the section (850m), together with removing two sets of points and simplifying the signalling. This suggests that the additional timetable and reliability benefits of providing double track right through to Bearsden may not require much additional incremental cost above the redoubling of the junction.

5.2 Redoubling

The two single track sections are both relatively short: Westerton – Bearsden (64 chains – 1,300m) and Hillfoot – Milngavie (1 mile 5 chains – 1,700m). No extra platforms would be required although the existing pointwork would need to be removed (plain-lined) and whilst some new pointwork will be required, the existing points at each end of the current passing loop will be removed to leave the total number the same as now, but all in more concentrated locations, which should improve reliability.

5.2.1 Westerton – Bearsden

If this section was redoubled and Westerton Junction not remodelled as a double junction there would still be a pinch point at Westerton and the costs are likely to be similar, each requiring an additional set of points and changes to the signalling and interlocking. It would slightly increase the flexibility in timetabling and day to day operation, but still leave a considerable constraint at Westerton.

Consequently it is likely that the Westerton – Bearden section will be best considered as an integrated task of redoubling the junction and the route to Bearsden, as it is likely to be the most cost effective outcome.

5.2.2 Hillfoot – Milngavie

The need to and value in redoubling this section is less clear cut as it lacks the benefits that arise at Westerton Junction. The current timetable is constructed to avoid platform end conflicts at Milngavie because there is normally only one train beyond Hillfoot at any one time. So the only performance benefit would be to reduce the impact of trains that are late starting from Milngavie impacting on the following train approaching. This may not be sufficient benefit to justify the costs.

Extending the length of double track would give a greater degree of flexibility as the current timetable only permits a short five or six minute turn round time at Milngavie, which strongly links incoming and outgoing trains together. This five/six minute window is dictated by the placing of the double track section and extending it towards Milngavie might permit (with timetable alterations elsewhere, longer turn rounds, with the attendant performance benefits through a reduction in reactionary delay..

In the event of a wider timetable restructuring which would be designed so that trains pass at or near Westerton Junction a potential effect would be to make the incoming trains at Milngavie later, relative to the current timetable, thus breaking the turn round times. In this event it is probable that trains would need to cross on the approaches to Milngavie, which would require the Hillfoot – Milngavie section to be redoubled.

There are other single track sections on the Glasgow Suburban network are:

Helensburgh Central	1¼ miles
Balloch branch	3½ miles
Hamilton Central to Haughead Jn	1 mile
Larkhall branch	3 miles with one passing loop (Allanton)
Wemyss Bay branch	9½ miles with one passing loop (Dunrod)
Largs branch	12 miles

Redoubling has featured strongly in the investment in the Scottish rail network over the past ten years.

Previous and current Scottish redoubling schemes (Total mileage 39 miles):

- Gretna – Annan 9 miles also required one extra platform at Gretna Green station and Eastriggs pointwork and signalling. Completed 2008
- Lugton – Stewarton 6 miles also required two extra platforms (Stewarton and Dunlop). Completed 2009
- Airdrie – Drumgelloch 1¼ miles and Bathgate – Cawburn Junction 6¾ miles also required two platforms (Part of Airdrie-Bathgate project). Completed 2009/10
- Kittybrewster (Aberdeen) – Inverurie 16 miles (to be completed in two phases in summer 2018 & 2019)
- Forres new loop which is almost 1km long (2017)

It can be seen that there has already been considerable redoubling of existing routes

6 Issues to be considered with possible redoubling

The main issue with redoubling a formerly double track railway is the requirement to meet modern standards, which may mean widening the formation as modern standards require more space than was generally provided when the original railway was usually built. Frequently the track may have been moved or renewed in a different alignment so the existing track may require moving or renewal to make space for the reinstated track. However on the Milngavie branch most of the track seems to be in its original location on the wider solum, so leaving space for the additional track to be re-laid broadly where it was. It is thought the existing track was renewed in preparation for the singling, so took place in 1988/90. So it is about 30 years old, but it has only had relatively low speed, lightweight trains running over it, thus should have plenty of life left in it.

There is a generous solum so no land take outside the railway boundary is likely to be required and in general earthworks along the route are limited so the costs associated with providing a safe cess (for walking access alongside the track) should be contained.

Signalling and power cables may require moving along with signalling equipment and signals.

Overbridges may not meet modern clearance standards and may require reconstruction. They are likely to require the parapets to be raised. There are potentially two structures:

- Canniesburn Road bridge on Westerton – Bearsden section
- Footbridge on the approach to Milngavie station

Additionally there is one underbridge on the Hillfoot – Milngavie section where the deck has been removed and which will need to be replaced.

However in comparison with the schemes that have been completed, or on which work is currently taking place in Scotland over the past decade (see above), there is nothing that appears to be insurmountable and the costs should come in below the average.

7 Benefits from possible redoubling

The key benefits from the complete redoubling would be:

- improved performance based on the existing timetable with a reduction in reactionary delays and late starts from Milngavie
- Removal of one of the biggest constraints in the Glasgow North electric timetable, west of Glasgow City centre, which in turn may give improved network performance.

It would potentially provide more paths so that additional trains could operate on the Milngavie branch. The most likely use of additional paths would be to enable to removal from service, in the off peak period, of strengthening units that are only required to carry peak loads. This cannot happen at present as there is nowhere available to stable the units at Milngavie and no paths to move them elsewhere. Redoubling might create paths to enable these additional sets to be operated to Yoker to lie over between the peak periods, which will save significantly on vehicle mileage, hence costs and energy.

Scottish Ministers have specified a slightly higher level of performance for the ScotRail franchise for Control Period 6 (2019-2024) specifying 92.5% PPM (which broadly requires 92.5% of trains to arrive within 5 minutes of the published times).

This extract from the High Level Output Statement published on 20 July 2017 refers:

6.20 The Scottish Ministers therefore require that the outputs of the network will be maintained in such a manner as to enable the operators of the ScotRail Franchise to deliver a PPM target of 92.5% for every year of CP6

To achieve such a high target, well above the current level of 89.3% the poorest performing routes will need to be transformed, as these are the ones that will be dragging the average down. So improving the performance of the Milngavie/Dalmuir group of the Glasgow North Suburban services should be a high priority.

HLOS: <https://www.transport.gov.scot/publication/the-scottish-ministers-high-level-output-specification-for-control-period-6/>

8 Potential Allander Station

There has been long-standing support for an additional station between Hillfoot and Milngavie at Allander. It offers an improved walk-in catchment area but also the opportunity to provide a significant park and ride facility to meet the unsatisfied demand at Milngavie.

However inserting an additional station into the current services and network is virtually impossible as it will break the current timetable structure.

It is generally accepted that an extra station call will add two minutes to the timetable compared with passing through non-stop. This is to take account of the deceleration and acceleration times and the station dwell. Given the relatively slow speeds on this particular section this might be reduced to 1½ minutes a call, which effectively adds three minutes to the time of a train from passing Hillfoot running into Milngavie and returning to Hillfoot. This would reduce the turn round times at Milngavie to around two or three minutes which are not achievable.

The alternative is to extend the turn rounds by having two trains north of Hillfoot with one arriving at Milngavie and the previous arrival departing from the other platform almost straight away afterwards. This would have resourcing implications as the services alternate between Edinburgh and the Argyle Line which use different types of rolling stock and different drivers.

This is also very restricting in that the departure would need to be within two or three minutes of the preceding arrival which creates a much higher risk of late departures.

Thus the only likely way in which Allander station can be added to the network would be as a result of a revised timetable which was facilitated by the redoubling of the Milngavie branch. This redoubling would almost certainly need to be for the whole of the line.

It should be noted that the same happened with the provision of Kintore station north-west of Aberdeen between Dyce and Inverurie where the key drivers for the redoubling are the operation of a half hourly frequency service all day and the re-opening of Kintore station as the extra time required to call at Kintore substantially disrupted the timetable.

9 Summary

The performance data published clearly shows that the Milngavie branch has very poor punctuality. This is likely to impact on a much wider range of services in the Glasgow area and potentially further afield and this has been specifically recognised in the report produced for ScotRail by Nick Donovan.

Whilst the causes of this poor performance are not clear, it is clear that the Milngavie branch is operating at the limits of its capability for the bulk of the day. Furthermore the design of the infrastructure results in effectively only one timetable is capable of being operated and this is a severe constraint on the Glasgow suburban network where there are a large number of pinch points, single lines and interaction with other routes, all of which need to be managed.

Redoubling Westerton Junction and the single line from there to Bearsden appears to be an option which could result in improved performance and provide a degree of timetable flexibility.

Redoubling from Hillfoot to Milngavie is likely to increase the flexibility and punctuality offered by the redoubling south of Bearsden.

Delivery of the challenging CP6 92.5% PPM target will require significant improvement to the performance of the Milngavie/Dalmuir service groups.

Allander station cannot be opened without the additional timetable flexibility afforded by redoubling the whole branch.

10 Next Steps

In future the capital projects to enhance the Scottish rail network will be carried out in accordance with Transport Scotland's "Rail Enhancements and Capital Strategy" published in March 2018 <https://www.transport.gov.scot/publication/rail-enhancements-capital-investment-strategy/>. This sets out the process whereby new projects to upgrade and/or enhance the railway are developed and delivered.

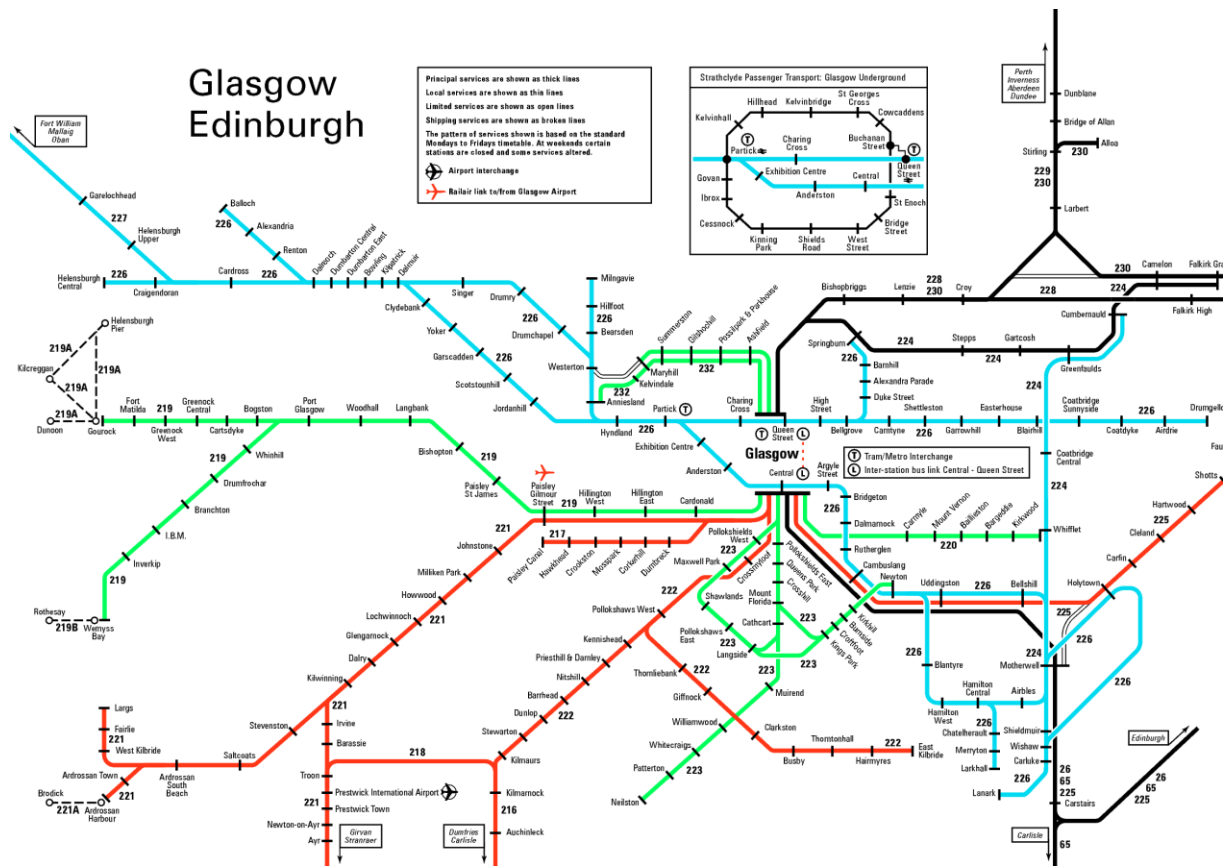
It is intended to develop a "pipeline" of projects which are only developed and taken to construction where there are robust Business Cases and the costs are well understood. This requires the parallel development of the justification – using Scottish Transport Appraisal Guidance (STAG) and Transport Scotland's Guidance on the Development of Business Cases. The design and cost aspects will go through Network Rail's GRIP (Governance for Rail Investment Projects) processes.

Any party can initiate and progress enhancements to the railway providing they have the funds.

The Local Rail Development Fund was established as a result of the Green MSPs input to the 2018/9 Scottish Government Budget processes whereby parties could bid for funds to appraise and develop projects at the "pre-pipeline" stage, effectively to proof of concept, after which implementation is expected to pass to Transport Scotland. (Bids were required by Friday 8 June.)

The Milngavie branch performance is part of the current railway and it could possibly be argued it is a project that ScotRail and Network Rail should be bringing forward in their own right rather than relying on outside pressure and funding. However a joint approach with all interested stakeholders actively playing their part is likely to result in a more satisfactory outcome.

Appendix A Glasgow Area Network Map



Appendix B**Nick Donovan Report Recommendations****11 – Urgently put in measures for right-time departures at Whifflet station.**

I recommend that measures be put in place to ensure confidence in right time departures from Whifflet in an operation free from major incident.

Consideration should be given to:

- Ensuring there are no pathing conflicts in the plan, or realised in real life, for the empty stock turn back moves at Wishaw
- Turning back this service closer to Whifflet, perhaps in Mossend Yard
- Running from Whifflet to Wishaw in passenger service, removing the requirement for a 6-minute task (CHK6), taking the train out of service at Wishaw and running ECS from Wishaw to Whifflet to respect the signalling limitations at Wishaw and absence of Driver Only Operation equipment for sending a Glasgow-bound service from the Carstairs-bound platform

12 – Urgently put in measures for right-time departures at Milngavie station

An urgent study should be completed and set of actions put in place to support right time departure of trains from Milngavie in an unperturbed operation. Milngavie is selected as a priority location for this piece of work as the data, so far as it can be disaggregated, together with site observations and evidence from front line discussions, points to this being the most likely location for benefits to network-wide PPM to accrue. This is due to the complexity and interaction within the North-Electric services and also due to the Edinburgh destination for 2 trains per hour which carry delay across to the East Coast Suburban network.

13 – Undertake a systematic review of planning and activity times and local infrastructure design limitations

A systematic review of activity times should be undertaken. It must consider activities included in the Timetable Planning Rules and the other activities that come together to build the operational plan. The available time to carry out activities needs to take into account the planned tolerance in train running and should include that tolerance as a float. That tolerance should be regarded as +4'59" / -0'00" in the context of PPM being set at a time-to-five railway. Activity times that are not recorded in controlled documents must be recorded with suitable governance arrangements put in place to ensure the retention of corporate memory and to ensure the consequences of future change can be properly assessed.

To complement the review of activity times, consideration must be given to limitations on system capability that arise from local design configurations. The aim of this work should be to identify proportionate infrastructure investment that might improve system capacity, resilience or journey time outcomes.

As a consequence of these reviews, there may be opportunities for speeding up some timetable elements and this must be considered in the context of delivery of the improving journey time metric described within the Franchise Agreement.

In the context of this recommendation, I am aware that, in parallel to my study, the ScotRail Head of Performance had secured support from Network Rail's National Performance Analysis team to examine the performance of sector HA06, particularly in the Partick-Hyndland corridor. I have seen some of the early outputs of this detailed piece of work which lends itself very well to forming a key workstream within this recommendation, particularly with respect to understanding the timing of interactions at junctions.