

Feasibility of additional timetable paths on the West Highland Line: Summary of Findings and Recommendations



26 May 2025

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Glossary of Terms

ACRONYM/TERM	DESCRIPTION
EAS	Engineering Access Statement
LTP	Long Term Timetable Plan – typically updated twice every year in May and December
RETB	Radio Electronic Token Block
SRT	Sectional Running Time
TPR	Timetable Planning Rules

Version History

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1. PROJECT BACKGROUND

1.1 Background

Fort William is one of the largest towns in the Scottish Highlands, acting both as a major centre of tourism and as a regional centre for education and local economic activities. The town suffers from congestion issues especially during the summer tourist season. To help promote sustainable tourism, reduce congestion issues, and improve access to education, SYSTRA has been commissioned by HITRANS to assess at a very high-level the feasibility of operating additional rail services in the Fort William area.

A previous study completed by SYSTRA in 2021 investigated seven different service options that included both enhanced services for tourism, but also improved connectivity to local schools in the Fort William area. This also incorporated passive provision for the addition of two new stations (Carrs Corner and Torlundy Ben Nevis) into both existing Scotrail passenger services and any additional proposed services. This latest commission in March 2025 is no longer considering these two newly proposed stations, and instead prioritises options for operating more services between Fort William and Glenfinnan.

The contents of this report identify a series of timetable paths for Monday-Friday services that could be operated above and beyond the current service provided by Scotrail on the West Highland line, based on the current December 2024 LTP timetable that is in operation. Due to a significant amount of operational and infrastructure constraints on the route, it was prudent to just consider and present one variant timetable option across the week due to the short timescales of this project. This also aligns with providing HITRANS with a high-level understanding of the levels of additional capacity that can be expected and what the key limitations are which dictate the timings of additional paths provided. This work has been conducted on the assumption that the paths outlined in this report will operate during the busier summer months of the year and can then be scaled back as required during the quieter winter months. The timetable structure of Scotrail stays largely unchanged between summer and winter months, the fundamental difference is that in summer periods there are increased activities from operators such as West Coast Railways who operate the Jacobite steam train on a seasonal basis. However, the operation of these additional services makes a significant impact to the amount of available capacity particularly between Fort William and Mallaig. As such planning to a worst-case scenario summer timetable position is seen as the most appropriate method for this study.

Furthermore, the current Scotrail rolling stock diagrams that have been analysed as part of this study have been assumed to be the ones that operate from March 2025 onwards, reflecting enhanced capacity provided across summer months. Scotrail date-split their unit diagrams in both December and May timetable periods, in March and October respectively. Between March and October, unit diagrams on the West Highland Line provide enhanced capacity and as such, with limited timetable changes, it can be assumed that the diagrams used from March 2025 will reflect what operates across Summer 2025. This includes the usage of Class 153 rolling stock on the route which is one operational aspect that has changed since the previous study in 2021, however based on current diagrams, they only provide extra capacity between Crianlarich and Fort William. It is assumed that only one single Class 156 unit will be provided to operate the additional services, this is seen as realistic to ensure that the extra unit diagram can be incorporated more easily into the existing structure of Scotrail unit diagrams and also accounts for the limitations of Fort William and Mallaig as stabling locations away from depots and the need to ensure the additional unit has the ability to cycle back to the Glasgow depots (Corkerhill and Eastfield) for refuelling and maintenance.

Within the remainder of this report we set out details of the inputs, assumptions and methodology used to complete the work. Additionally, the operational constraints and limitations imposed by the existing infrastructure will be highlighted. The aim is to provide a summary of the findings that can prompt further discussions should HITRANS want to pursue this work in further depth.



2. INPUTS, ASSUMPTIONS AND METHODOLOGY

2.1 Inputs

The following inputs were used for the project work undertaken:

- The December 2024 LTP timetable data (reflecting the timetable currently in operation at the time of writing this report) was obtained from Network Rail for import into the ATTune timetabling software.
- The December 2024 LTP unit diagrams for Scotrail were obtained from the Scotrail website in PDF format. This information is now publicly available and released every six months.
- The geography, Sectional Running Times (SRTs), Timetable Planning Rules (TPRs) and Engineering Access Statement (EAS) used in the study correlate with the date of the timetable (December 2024) which is 2025 v2, as published by Network Rail.
- The National Electronic Sectional Appendix (NESA) was used where necessary to assist with the assessment of any infrastructure or operational constraints.

2.2 Assumptions

The following assumptions were made:

- The geographic boundaries for this study have been assumed as Rannoch to Mallaig inclusive. No retiming has been made to existing services outside of these areas (e.g. existing paths are assumed fixed at Crianlarich and southwards to/from Glasgow Queen Street).
- The study has investigated additional service provision for Monday to Friday only within the scope of this work. This was selected on the basis that these days of the week have the highest capacity utilisation. An extension of this study will be required to investigate the variation required at weekends.
- Where existing services needed to be amended, to facilitate passing additional services in loop locations, this was documented and was kept to a minimum as far as possible.
- Unit diagramming was setup in ATTune-RS for the current December 2024 LTP West Highland Line timetable only. Unit diagrams have not been produced for the variant timetable (including the extra paths) at this stage due to the time constraints of the project. A written summary of the estimated diagramming implications is provided and this can be used to conduct a thorough unit diagramming exercise for the entire week (including a unit cycling review) in future phases of work if required.
- Where minor amendments would be required to the hours where the line is currently closed to rail traffic in Section 4 of the Engineering Access Statement (EAS), this has been documented and kept to a minimum as far as possible. An alternative solution will be provided if an easement to the current Section 4 EAS hours is not possible.
- Train crew implications have not been considered whatsoever in this current phase of work. SYSTRA are aware that this will be a critical factor that needs to be investigated to determine the full operational feasibility of the additional services proposed. This is something that could be considered in a future iteration of the work, if desirable, once a full set of timetables and unit diagrams had been created for the entire week.
- Maximum fuel capacity of the Class 156 units is assumed at 1300 litres or 286 gallons. Based on an assumed fuel consumption of 3 miles per gallon for each 2-car Class 156 unit, it will be assumed that the maximum fuel range of each unit is 800 miles (286 x 3 rounded down to the nearest 100 miles).
- It has been assumed in this study that the siding at Glenfinnan is available for use by a 2-car Class 156 unit. This is a requirement to allow the unit providing additional services to clear the platform area at Glenfinnan for other services. No SRTs exist for the shunt move so an allowance of 5 minutes has been used.



2.3 Methodology

The operational planning work, which included both timetabling the additional services and also observing at a high-level the likely unit diagramming impacts, was undertaken using ATTune and ATTune RS.

ATTune is a timetable planning tool used to construct timetables, with a background geography model of the entire UK rail network, containing:

- All running lines and timing point locations
- Sectional Running Times (SRTs)
- Most Timetable Planning Rules (TPRs)

ATTune validates that the timetable is compliant with the planning rules and reports non-compliances as you plan in real-time. Alongside this, the ATTune-RS unit diagramming module is adjoined to the timetable allowing for simultaneous timetable and unit diagram updates to occur with a live data link between the two modules.

The December 2024 LTP timetable was loaded into ATTune and filtered down to only show trains within the geographic boundaries being investigated. For completeness and reflecting the interaction of the unit diagrams, the boundaries were extended to include the line to Oban and down to Glasgow Queen St including the depots at Corkerhill and Eastfield. The timetable was loaded for Monday to Friday only. Where conflicts arose in the timetable, amendments were made to existing services where necessary and have been documented in this report. As far as possible, these amendments have been kept to a minimum and a level that can be acceptable to the operators involved.

The primary focus of the preferred timetabling solution was to provide as many additional paths between Fort William and Glenfinnan as possible to aid tourism demand and alleviate potential road congestion in the area during busy periods of the year. Where provision could also be made to also combine the timings of additional services with demand for local schools then this has been facilitated. At times of the day where capacity is unavailable between Fort William and Glenfinnan, services have been operated south of Fort William towards Rannoch to enable efficient utilisation of the rolling stock and also provide additional services that will improve service frequency on this corridor of the West Highland line.

The current December 2024 LTP Scotrail West Highland Line unit diagrams were constructed in ATTune RS for Monday to Friday only due to the time constraints of the project. Whilst there are some subtle differences to unit diagramming on the West Highland Line at weekends, these are reflected in the written summary of results in terms of how the diagramming would likely have to work across the entire week.

The end result was a timetable file which includes the amended existing services and the additional timetable paths provided between Rannoch and Mallaig. Additional outputs were also produced from ATTune and this included exports of the train graphs (PDF) and passenger timetables (Excel).



3. CURRENT TIMETABLE & CONSTRAINTS

When observing the total number of trains that operate across the West Highland Line it may appear to be a simple route to plan, however there are a number of challenges which limit capacity. Firstly, there is a diverse mixture of passenger, freight and tourism trains operating over the infrastructure. This is particularly apparent between Fort William and Mallaig where different characteristics in terms of type of train, stopping patterns and average speeds play a critical role in available paths for any enhanced level of service. This section provides a summary of the current timetable operations and the constraints that exist.

3.1 Existing Service Summary

Based on the December 2024 LTP timetable, Table 1 shows the current Monday to Friday arrivals and departures at Fort William station along with the formations (based on diagrams dated March 25 onwards).

Table 1: Passenger Services at Fort William: Dec2024 LTP Monday-Friday timetable (inc. summer services)

HEAD CODE	ORIGIN	ARR. TIME	DESTINATION	DEP. TIME	OPERATOR	ARR. COACHES	DEP. COACHES
1Y42	Mallaig	07:27	Glasgow QS	07:44	Scotrail	2	2
1Y53	Fort William	-	Mallaig	08:15	Scotrail	-	4
1Y11	London Euston	09:55	Fort William Sidings (5Y11)	11:00	Caledonian Sleeper	Loco + 5x Mk5 coach	Loco + 5x Mk5 coach
2Y61	Fort William	-	Mallaig	10:15	West Coast Railways	-	Steam + 6x Mk1 coach
1Y44	Mallaig	11:34	Glasgow QS	11:40	Scotrail	4	4
1Y41	Glasgow QS	12:12	Mallaig	12:18	Scotrail	4	4
2Y68	Fort William	-	Mallaig	12:50	West Coast Railways	-	Steam + 6x Mk1 coach
2Y62	Mallaig	16:03	Fort William	-	West Coast Railways	Steam + 6x Mk1 coach	-
1Y43	Glasgow QS	16:09	Mallaig	16:19	Scotrail	5	4
1Y48	Mallaig	17:28	Glasgow QS	17:37	Scotrail	4	5
2Y64	Fort William	-	Arisaig (Q path as required)	17:43	West Coast Railways	-	Steam + 6x Mk1 coach
2Y69	Mallaig	19:08	Fort William	-	West Coast Railways	Steam + 6x Mk1 coach	-
1Y58	Mallaig	19:39	Fort William	-	Scotrail	4	-
1B01	Fort William Sidings (5B01)	18:50	London Euston	19:50	Caledonian Sleeper	-	Loco + 5x Mk5 coach
2Y65	Arisaig	21:18	Fort William (Q path as required)	-	West Coast Railways	Steam + 6x Mk1 coach	-
1Y47	Glasgow QS	22:07	Mallaig	22:12	Scotrail	2	2

Table 1 illustrates the variability at Fort William station itself which results in an array of different train types and formations using the station with only two platforms available. This example illustrates one of a number of overall constraints which will be further discussed in Section 3.2.

Below is a further detailed overview, by operator, of the typical service level provided on Monday to Friday on this section of the West Highland Line. This may also mention some variability to the timings in Table 1 that exists throughout the week through ad hoc services that operate on specific days e.g. Royal Scotsman.

3.1.1 Scotrail

Scotrail is the main passenger operator on the West Highland Line providing a service on weekdays of three trains per day in each direction between Glasgow Queen Street and Mallaig, supplemented by one train in each direction between Fort William and Mallaig. The service is designed for long distance trips between the West Highlands and Central Belt rather than local movements within the Fort William area, and with a limited service frequency there are inevitably long gaps between trains.

Services on the route are operated by two or four car Class 156 units, with increased levels of four car operation in summer. Services are coupled to Glasgow – Oban services as far as Crianlarich, which whilst operationally efficient, presents a limitation on the retiming of services as any alternations Glasgow – Fort William/Mallaig services will also impact on the timing of services on the busier Crianlarich – Oban route.

In recent years, the route has also seen the introduction of refurbished Class 153 units to work in combination with Class 156 units. These units have been converted to provide cycle accommodation and operate under the Highland Explorer brand. As part of the summer timetable, this now sees 7-car formations in operation on some services between Glasgow and Crianlarich, with 5-car formations operating on the portion between Crianlarich and Fort William. As can be seen in Table 1, an example of this is the 1Y43 16:09 arrival from Glasgow at Fort William where a Class 153 detaches off the front of this service to then reattach the 1Y48 17:28 arrival from Mallaig to head back south towards Glasgow as a 5-car formation (7-car from Crianlarich attaching to a portion from Oban).

ScotRail has two train crew bases in the area at Fort William and Mallaig. Currently one train stables at each location overnight. Drivers and conductors at both depots operate services between Crianlarich and Mallaig. Both depots have a similar workload and each depot has four pairs of drivers and guards based at them. As stated in the assumptions, no consideration of train crew issues has been given in this current phase of work. The work has simply looked at the likely timetable and rolling stock implications of extra service provision between Rannoch and Mallaig.

3.1.2 Caledonian Sleeper

Caledonian Sleeper operate the overnight Sleeper service from Fort William to London Euston via Edinburgh. The evening service to London departs Fort William at 19:50 whilst the service from London arrives in Fort William at 09:55. No substantial retiming of this service is possible as the train is one of three portion of the Highlander Sleeper service that are combined at Edinburgh, and thus any alterations to the service may create problem with the operation of the combined train.

It should be noted that this services has a 5-minute public differential applied on arrival at Fort William meaning that the train can arrive up to 5 minutes later at Fort William without an change to the timings advertised to passengers. SYSTRA have assumed this is something that can be utilised where necessary to aid with the provision of additional services.

Upon arrival, and once the train has been cleaned, the locomotive and coaching stock are moved to the station sidings at approximately 11:00 rather than occupying a platform during the day, returning at 18:50.



3.1.3 West Coast Railways

West Coast Railways are an Open Access operator who operate the Jacobite steam service between Fort William and Mallaig. A service of two trains per day in each direction is provided for much of the operating season between Easter and the end of October.

The two services absorb much of the daytime capacity on the Fort William – Mallaig line and is restricted to 45mph operation making it much slower than Scotrail services on the route. The need for the locomotive to run round its train, particularly at Mallaig, also absorbs capacity due to the limitations of the current signalling system as a train cannot depart Arisaig whilst run round or shunting at Mallaig is taking place.

3.1.4 Freight Traffic

Freight traffic on the West Highland Line has fluctuated in recent years. Currently the most regular flow is the North Blyth – Fort William Alcan trains. This service operates on alternate days. On Mondays, Wednesday and Fridays the service departs from Fort William at around 08:30 and returns on Tuesdays and Thursday at around 20:45 or 21:45 on a Saturday.

For a number of years trains paths for timber trains to and from Corpach were included in the timetable. These have been withdrawn, however it is possible that they may return in future years.

Whilst there may be some scope for amending the timing of this service in the Fort William area to provide paths for passenger services, this is not necessary in the current timetable option presented in this work.

3.1.5 Royal Scotsman

The Royal Scotsman luxury charter train arrives from Edinburgh into Spean Bridge at 20:53 Fridays Only in summer, and stables overnight. The service also operates between Spean Bridge and Mallaig on Saturdays Only during summer, before stabling overnight at Bridge of Orchy. It has been assumed that the timings for this service cannot be altered as part of this timetabling exercise. This therefore provides a variable, particularly on Saturday's, around the additional local service timings that are viable relative to those selected for Monday to Friday.

3.2 Timetabling Constraints

This section details the constraints that have guided the development of the timetable including the availability of additional units, the paths occupied by existing services, infrastructure constraints and the timetable planning rules.

3.2.1 Infrastructure and Operational Constraints

One of the major constraints to operating additional services in the Fort William area (bounded by Mallaig and Rannoch) is the rail infrastructure. The line is single track with a limited number of passing loops. The location of these passing loops is shown in Figure 1.

There are two passing loops between Mallaig and Fort William, additionally services can pass during reversals in Fort William station. This, in combination with comparatively slow running freight and steam services in both directions, imposes considerable constraints on the operation of additional services. The Fort William – Mallaig route in particular is severely limited by the lacking of passing loops between Fort William and Glenfinnan. This is especially limiting when the Jacobite steam service is operating as this is



timed with a maximum speed of 45mph increasing its single line occupancy time relative to Scotrail services which travel at a higher speed.

A small amount of relief to these capacity issues is provided by Token Exchange Points at Loch Eil Outward Bound on the Fort William to Mallaig route, and Roy Bridge on the Fort William to Rannoch route. At these locations passing loops are not provided but they do allow services to follow each other in the same direction providing a degree of additional capacity.

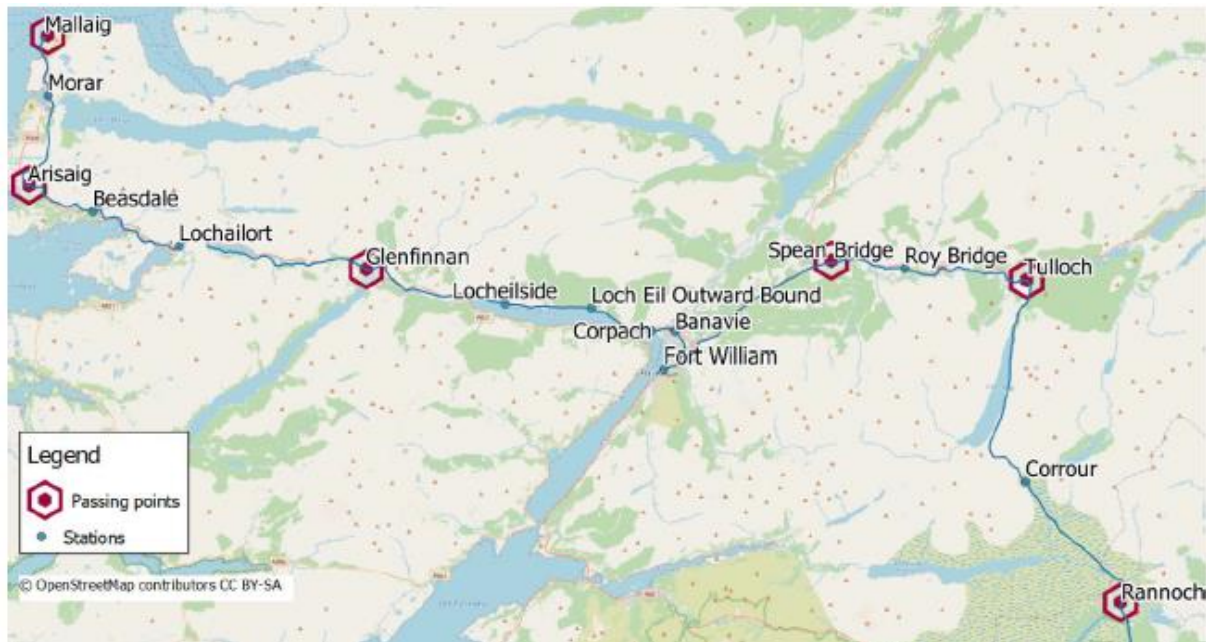


Figure 1: Location of Passing Loops and Stations: Mallaig to Rannoch

3.2.2 Rolling Stock

The proposed additional services will be provided by an additional two-car Class 156 train. This is consistent with other services on the route and would allow the train to be incorporated into wider rolling stock workings for the West Highland Line, which would provide a mechanism for the train to be returned to Glasgow for fuelling and maintenance. It is anticipated that electrification of the Barrhead and East Kilbride lines will release provide spare units based at Glasgow Cokerhill depot to resource the service.

As can be seen from the current Monday-Friday summer service in Table 1, the majority of Scotrail services (with the exception of the first and last services of the day) are operated as a minimum of 4-car Class 156 formations between Crianlarich and Mallaig. Services are unable to run in excess of 4-car or 5-car formations due to platform and loop lengths at intermediate stations where trains are planned to pass. As such, apart from the ability to strengthen the first or last services of the day from 2-car to 4-car to either provide an additional unit up to Fort William or return a unit to Glasgow, the 2-car Class 156 unit provided for the additional planned services will need to interwork with the existing unit diagrams to ensure it gets regular depot visits without exceeding the assumed maximum fuel range of 800 miles between refuelling.

Furthermore, whilst the platforms at Fort William are in excess of 200m and permissive working does allow more than one unit type in the platform at any one time, the presence of longer formation such as the Jacobite steam train services and the Caledonian Sleeper provides certain times of day where platforming capacity is at a premium and operating any additional services in addition of a single 2-car Class 156 would limit the ability to utilise the allowable permissive working.

3.2.3 Train Crew

As stated in the assumptions, train crew implications of extra service provision on the West Highland Line has not been considered within the scope of this current phase of work. Scotrail have train crew depots at Fort William and Mallaig. Both of these depots are small with four pairs of drivers and conductors based at each. Weekday services only require two crew diagrams from each depot. In the absence of any detailed investigation into the implications of the extra services proposed in this study, it would be sensible to assume that at a minimum of two more crew diagrams each day would be required.

In developing the extra timetable paths, it has been assumed that any additional train crew would be based at Fort William as recruitment in this location is likely to be easier, and in most options this allows the optimal use to be made of both train crew and rolling stock resources. The small number of train crew working from the depots means that care has to be taken to develop services that deploy crew efficiently maximising the utilisation of any additional staff and avoiding short inefficient shifts. This will require the timetable and rolling stock diagrams in this study to be further developed and fed through train crew optimisation to get an understanding of compromises in the planning of commercially attractive services.

3.2.4 Timetable Planning Rules

The final set of constraints to timetabling a new service in this area are the restrictions imposed by the Network Rail Timetable Planning Rules (TPR). These include any RETB signalling related restriction.

- **Dwell Times:** the rules specify a minimum dwell time of 30 seconds for Class 156 or 1 minute at Token Exchange Points.
- **Token Exchange Points:** at several locations along the route a token exchange must be carried out in order for the train to pass through to the next section of route. This has been accounted for in the timetabling work. The standard rules for trains passing at a Token Exchange Point is shown in Figure 2.
- **Turnaround Times:** the rules specify a minimum turnaround time of 5 minutes with 7 minutes required if a train crew change is being made. 8 minute is required if an attachment or detachment is planned.



- **Junction Margins:** where relevant, junction margins have been accounted for as specified in the TPRs.

General Restriction

At all Token Exchange Points where a token exchange has to be carried out, a minimum dwell of 1 minute is required. At a number of TEPs along this route, it is possible to receive a Long Section Token, allowing the train to traverse the next two sections without an intermediate token exchange stop. A Long Section Token can only be issued if both sections are clear.

The whole RETB area north of Helensburgh Upper is under the control of two consoles at Banavie PSB, covering (a) Helensburgh Upper to Oban, and (b) Upper Tyndrum to Mallaig. Therefore token exchanges within each area cannot take place simultaneously. Arrivals at any two separate locations within the same console area must be a minimum of 1 minute apart. However, trains passing at the same location can take place as shown below:-

Dwell Time		
Where a token exchange takes place	1	
Crossing Margins		
When both trains are able to fit into the crossing loop, the train that arrives first departs after the second train to arrive has departed.		
When one of the trains is longer than the crossing loop, the train longer than the crossing loop always departs first.		
Except when the first train is longer than the loop	No crew change	With crew change
First train arrive	xx00	xx00
Second train arrive	xx01	xx01
Second train depart	xx02	xx04
First train depart	xx03	xx05
When the first train is longer than the loop	No crew change	With crew change
First train arrive	xx00	xx00
Second train arrive	xx01	xx01
First train depart	xx02	xx04
Second train depart	xx03	xx05

Figure 2: RETB General Restrictions as stated in 2025 v2 TPRs

3.2.5 Engineering Access Statement

Another crucial consideration is the times stated within the Engineering Access Statement specifically the Section 4 times which state when the lines on the West Highland Line should be assumed blocked overnight.

SYSTRA have proposed one minor amendment to the times listed below which is that the Fort William Jn to Locheilside Section 4 block is lifted at 06:35 vice 06:50 to allow the first proposed 2Z01 06:32 Fort William to Mallaig to operate.



It can be seen in Figure 3 how the times vary across the week and that Saturday night and Sunday morning is commonly more restrictive should paths on these days of the week be investigated as part of any additional future work. The sections either side of Fort William are shown below as an example.

SECTION		Periods A & B 15.12.2024 - 09.02.2025	Period C 10.02.2025 - 30.03.2025	Period D 31.03.2025 - 17.05.2025	Periods E to G 18.05.2025 - 14.09.2025	Periods H & J 15.09.2025 - 13.12.2025	REMARKS
Spean Bridge to Fort William 57.7 (Refer 59.1 for Lochellside)	WEEK END	Single BLOCKED 2215 Sat –1125 Sun	Single BLOCKED 2215 Sat –1125 Sun	Single BLOCKED 2215 Sat –1125 Sun	Single BLOCKED 2215 Sat –1125 Sun	Single BLOCKED 2215 Sat –1125 Sun	Possessions must permit ECS moves for the Jacobite between Fort William Yd and Fort William Station and the departure of 5Y61 (0905 to 0920) which forms 2Y61 from Fort William @1015. ScotRail stabling at Fort William Station overnight on platform 1 *Fort William Jn signal box open 0845 Summer/1045 Winter -2246 2300.
	SUN / MON	Single BLOCKED 2220 Sun –0720 MO	Single BLOCKED 2220 Sun –0720 MO	Single BLOCKED 2220 Sun –0720 MO	Single BLOCKED 2220 Sun –0720 MO	Single BLOCKED 2220 Sun –0720 MO	ScotRail stabling at Fort William Station overnight on platform 2. *Fort William Jn signal box open 0645-0045 *Fort William Jn signal box closes 2300 Sun and opens 0645 Mon.
	MID WEEK	Single BLOCKED 2220 MWF – 0715 MX 2245 TTh - 0715 MX ①	Single BLOCKED 2220 MWF – 0715 MX 2245 TTh - 0715 MX ①	Single BLOCKED 2220 MWF – 0715 MX 2245 TTh - 0715 MX ①	Single BLOCKED 2220 MWF – 0715 MX 2245 TTh - 0715 MX ①	Single BLOCKED 2220 MWF – 0715 MX 2245 TTh - 0715 MX ①	Must permit passage of 6Y01 to Rannoch and 6Y02 return to Fort William on Tue/Wed & Thu/Fri. *Agreement between DU and GBRF once timber traffic starts finish time will revert to 0605 WF (vice 0715) * & 2230 TTh (vice 2245) * ScotRail stabling at Fort William Station overnight on platform 2. *Fort William Jn signal box open 0645-0045
SECTION		Periods A & B 15.12.2024 - 09.02.2025	Period C 10.02.2025 - 30.03.2025	Period D 31.03.2025 - 17.05.2025	Periods E to G 18.05.2025 - 14.09.2025	Periods H & J 15.09.2025 - 13.12.2025	REMARKS
Fort William Jn to Lochellside 59.1 (Refer 57.7 for Fort William)	WEEK END	Single BLOCKED 2240 Sat –1010 Sun	Single BLOCKED 2240 Sat –1010 Sun	Single BLOCKED 2240 Sat –1010 Sun	Single BLOCKED 2240 Sat –1010 Sun	Single BLOCKED 2240 Sat –1010 Sun	ScotRail stabling at Fort William Station overnight on platform 1
	SUN / MON	Single BLOCKED 2240 Sun - 0650 MO	Single BLOCKED 2240 Sun - 0650 MO	Single BLOCKED 2240 Sun - 0650 MO	Single BLOCKED 2240 Sun - 0650 MO	Single BLOCKED 2240 Sun - 0650 MO	ScotRail stabling at Fort William Station overnight on platform 2.
	MID WEEK	Single BLOCKED 2240 SX - 0650 MX ①	Single BLOCKED 2240 SX - 0650 MX ①	Single BLOCKED 2240 SX - 0650 MX ①	Single BLOCKED 2240 SX - 0650 MX ①	Single BLOCKED 2240 SX - 0650 MX ①	ScotRail stabling at Fort William Station overnight on platform 2.
Lochellside to Glenfinnan 59.2	WEEK END	Single BLOCKED 2250 Sat –1035 Sun	Single BLOCKED 2250 Sat –1035 Sun	Single BLOCKED 2250 Sat –1035 Sun	Single BLOCKED 2250 Sat –1035 Sun	Single BLOCKED 2250 Sat –1035 Sun	
	SUN / MON	Single BLOCKED 2250 Sun - 0645 MO	Single BLOCKED 2250 Sun - 0645 MO	Single BLOCKED 2250 Sun - 0645 MO	Single BLOCKED 2250 Sun - 0645 MO	Single BLOCKED 2250 Sun - 0645 MO	
	MID WEEK	Single BLOCKED 2250 SX - 0645 MX ①	Single BLOCKED 2250 SX - 0645 MX ①	Single BLOCKED 2250 SX - 0645 MX ①	Single BLOCKED 2250 SX - 0645 MX ①	Single BLOCKED 2250 SX - 0645 MX ①	

Figure 3: Example of EAS Section 4 between Spean Bridge and Glenfinnan



4. RESULTS: FEASIBILITY OF ADDITIONAL SERVICES

This section summarises the results from the timetabling work undertaken to identify additional paths that can be added to the existing December 2024 structure for Monday-Friday services only. It is worth noting that the unit diagramming implications of resourcing the extra 2-car Class 156 unit required to operate the extra services have also only been summarised at a high-level based on the Monday-Friday amendments proposed. It should be noted that it can be expected that Saturday and Sunday service provision will differ to the amendments listed below for Monday to Friday due to factors such as additional services running Saturday only (Royal Scotsman) and later service start up on the Sunday due to EAS Section 4 restrictions. It is expected that minor variations to the unit diagramming solution will be required to resource the Saturday and Sunday services.

4.1 Feasibility of Additional Services: Monday to Friday

The study of the Monday to Friday timetable has concluded that a total of twelve additional services can operate bound by the geographic study limits of Rannoch and Mallaig. To accommodate these additional services a number of minor consequential retimings have been required to other services which are listed below. SYSTRA believe these to be at a level acceptable to other operators however further discussions would be required to ascertain that this view is correct.

4.1.1 List of Additional Services: Monday to Friday

The data in Table 2 below illustrates the extra paths that have been added to the Monday to Friday. Whilst there is some negotiation that could be had around the timings and utilisation of available capacity, this list of services is seen to provide a balance between alleviating high tourism demand whilst also providing some support to local school traffic in the Fort William area through the provision of an afternoon 15:50 departure from Banavie towards Rannoch for the nearby Lochaber High School which is an approximate 20 minute walk from the station. Capacity constraints make it extremely difficult to provide any more than this one additional school service in one direction. To supplement the data in Table 2, SYSTRA will have provided appendices including train graph screenshots and public timetable exports of the revised Monday to Friday services including the additional services.

The new services, as well as supporting access to Glenfinnan, also provide wider connectivity benefits to the area. For example 07:52 arrival in Mallaig would provide a new ferry connection to Armadale (09:00 Monday and Thursdays, 08:30 Tuesday and Wednesday, 09:30 Friday), and to Lochboisdale (09:45 Monday/09:50 Saturday).

The timing of the services fits well with the passage of steam hauled services through Glenfinnan which adds to the attraction of the area for visitors. The 10:01 arrival gives time to reach the viaduct before the first steam service arrives at 10:59 (departing 11:21). The 13:07 arrival is only 20 minutes ahead of the following steam service which arrives at 13:31 (depart 13:56), whilst the 15:17 arrival at Glenfinnan is met by a steam service arriving from Mallaig at 15:19. Only the 18:08 steam arrival at Glenfinnan is not associated with a ScotRail passenger service.



Table 2: Summary of Additional Services: Monday to Friday only

HEAD CODE	ORIGIN	ORIGIN DEP TIME	DESTINATION	DEST ARR TIME	NOTES
2Z01	Fort William	06:32	Mallaig	07:52	Requires EAS Section 4 easement of 15 minutes between Fort William and Locheilside (06:35 vice 06:50 current)
2Z02	Mallaig	07:59	Fort William	09:22	Passes existing 08:15 Fort William to Mallaig service at Glenfinnan
2Z96	Fort William	09:29	Glenfinnan	10:01	Services forms 5Z96 10:16 shunt move to Glenfinnan siding. Must vacate platform to allow first Jacobite service to pass
2Z97	Glenfinnan	11:33	Fort William	12:05	Formed from 5Z97 shunt move from Glenfinnan siding which departs at 11:23, two minutes after the Jacobite service has left the station at 11:21
2Z98	Fort William	12:35	Glenfinnan	13:07	Services forms 5Z98 13:12 shunt move to Glenfinnan siding. Must vacate platform to allow second Jacobite service to pass
2Z99	Glenfinnan	14:06	Fort William	14:38	Formed from 5Z99 shunt move from Glenfinnan siding which departs at 13:56, two minutes after the Jacobite service has left the station at 13:54
2Z05	Fort William	14:45	Glenfinnan	15:17	Turnaround at Glenfinnan to provide school time train back to Fort William. No shunt move required.
2Z06	Glenfinnan	15:22	Rannoch	17:08	3 minute dwell at Banavie to depart at 15:50 for Lochaber High School train
2Z07	Rannoch	17:39	Fort William	18:40	No path north of Fort William due to Jacobite arrival from Glenfinnan
2Z09	Fort William	19:39	Glenfinnan	20:11	
2Z10	Glenfinnan	20:16	Spean Bridge	21:07	
2Z11	Spean Bridge	21:13	Fort William	21:27	Berth overnight in platform at Fort William for 06:32 departure on Tuesday-Friday mornings

4.1.2 Amendments to other services: Monday to Friday

To achieve full TPR compliance for the extra paths that have been added to the Monday to Friday as shown in Table 2, this has required some minor amendments to be made to other services. Whilst this has been kept to a minimum as far as possible, the changes that have been required are listed below:



4.1.2.1 Scotrail

- **1Y42 06:03 Mallaig to Glasgow Queen St:** service held at Glenfinnan for 12 minutes (07:06 departure vice 06:55) to allow additional 2Z01 06:32 Fort William to Mallaig to pass. Arrives Fort William at 07:38 (vice 07:27). 7 minute reversal planned to protect any train crew change requirement. Departs Fort William 1 minute late at 07:45, dwells reduced from 1.5 minutes to 1 minute at both Spean Bridge and Tulloch to return train to booked LTP departure time from Tulloch. An alternative to the long dwell at Glenfinnan would be to depart Mallaig at 06:12 and arrive into Glenfinnan at 07:03 (vice 06:54).
- **1Y44 10:10 Mallaig to Glasgow Queen St:** extra 1 minute dwell at Glenfinnan. Loch Eil Outward Bound dwell reduced from 1.5 minutes to 1 minute. Dwell at Fort William increased to 7 minutes to allow for train crew relief (when accounting for additional services) if required. Departs Fort William 1 minute later and dwell time reduced at Spean Bridge to depart at booked LTP time.
- **1Y41 10:21 Crianlarich to Mallaig:** departs Spean Bridge 2 minutes earlier at 11:57 (3.5 minute dwell vice 5.5 minute dwell). Arrives Fort William 2 minutes earlier at 12:10 to allow for 8 minute reversal to include detachment (see rolling stock diagramming implications) and depart booked time at 12:18.
- **1Y43 14:24 Crianlarich to Mallaig:** departs Fort William 2 minutes later at 16:21 (12 minute dwell vice 10 minute dwell). This is allow for delayed arrival of retimed 2Y62 service (arrives Fort William 16:20). Dwell time reduced by 30 seconds at Loch Eil Outward Bound and 1.5 minutes at Glenfinnan to get back to booked departure time at Glenfinnan.

4.1.2.2 West Coast Railways

- **2Y68 12:50 Fort William to Mallaig:** dwell extended at Loch Eil Outward Bound to 9 minutes (departs 13:18) to allow additional 5Z98 shunt move to clear the platform at Glenfinnan into the siding. Dwell reduced at Glenfinnan to 16 minutes to depart Glenfinnan two minutes earlier than booked LTP time towards Mallaig to allow 5Z99 shunt move to depart sidings two minutes after this train departs.
- **2Y62 14:10 Mallaig to Fort William:** increased dwell by 2 minutes at Arisaig and 15 minutes at Glenfinnan. This is to allow this train to follow behind additional 2Z06 from Glenfinnan to Rannoch. Arrives at Fort William 17 minutes later at 16:20.
- **5Y63 16:24 Fort William to Tom Na Faire Depot:** departs Fort William 16 minutes later at 16:40 to account for later arrival of 2Y62 service.

4.1.3 Rolling Stock Diagramming implications: Monday to Friday

The rolling stock diagramming implications of the additional services outlined in Table 2 has been investigated at a high level based on Monday to Friday diagrams only. Further details of the implications on Saturday and Sunday diagrams would be needed once further investigation of the variations in additional train path provision for these individual days has been completed. It is expected that there will be some variation to the solution required and further analysis would be needed to ensure there would be no concerns with the ability to get the units back to depot locations without exceeding maximum fuel range.



As a result of the additional twelve services planned to operate in Table 2, these will all be covered by an additional unit diagram CK211 shown below in Figure 4.

Diagram CK	211	MO	FROM -	28/04/2025	UNTIL -	28/04/2025	LTP	Fleet: 156/0
	ARR		DEP		Route	Mileage		
Fort William			06.32.00		2Z01WB	39.7		
Mallaig	07.52.00		07.59.00		2Z02WB	79.4		
Fort William	09.22.00		09.29.00		2Z96WB	94.34		
Glenfinnan	10.01.00		10+16+00		5Z96WB	94.45		
Glenfinnan C.E.	10+21+00		11+23+00		5Z97WB	94.57		
Glenfinnan	11+28+00		11.33.00		2Z97WB	109.51		
Fort William	12.05.00		12.35.00		2Z98WB	124.45		
Glenfinnan	13.07.00		13+12+00		5Z98WB	124.56		
Glenfinnan C.E.	13+17+00		13+56+00		5Z99WB	124.68		
Glenfinnan	14+01+00		14.06.00		2Z99WB	139.62		
Fort William	14.38.00		14.45.00		2Z05WB	154.56		
Glenfinnan	15.17.00		15.22.00		2Z06WB	169.49		
Fort William	15.57.00		16.11.00		2Z06WB REVRSE	205.63		
Rannoch	17.08.00		17.39.00		2Z07WB	241.77		
Fort William	18.40.00		19.39.00		2Z09WB	256.7		
Glenfinnan	20.11.00		20.16.00		2Z10WB	271.64		
Fort William	20.48.00		20.55.00		2Z10WB REVRSE	280.4		
Spean Bridge	21.07.00		21.13.00		2Z11WB	289.17		
Fort William	21.27.00							
Mileage:		(Loaded)	288.69	(Empty)	0.47	(Total)	289.17	

Figure 4: Additional Diagram CK211 example with additional services as self-contained diagram

As can be seen from Figure 4, the total mileage of the additional diagram CK211 is 289 miles. As the diagram is self-contained, a solution would need to be investigated as to how this diagram could interwork with the existing Scotrail unit diagrams to ensure the unit was able to be return to the Glasgow based depots for refuelling at suitable intervals.

One solution that could be explored further, which SYSTRA has identified, is the following:

- 1Y41 10:21 Crianlarich to Mallaig departs Spean Bridge earlier at 11:55 (1 minute dwell) to arrive earlier into Fort William at 12:08 in Platform 1.
- Additional 2Z97 11:33 Glenfinnan to Fort William is retimed to depart 7 minutes later at 11:40 to arrive after 1Y41 in Platform 1 at Fort William at 12:13. Currently these trains arrive in the opposite order. 1 minute adjustment allowance added to 2Z97 approaching Fort William to reflect a train already in the platform.
- The front portion of 1Y41 10:21 Crianlarich to Mallaig can detach on the buffer stops at Fort William (Diagram CK208) and this 2-car unit can then form the remaining additional services to Glenfinnan starting with 2Z98 12:35 Fort William to Glenfinnan.
- 2Z97 11:40 Glenfinnan to Fort William on arrival at 12:13 to attach to rear portion of 1Y41 10:21 Crianlarich to Mallaig. This would depart 3 minutes later at 12:21 to allow for an 8 minute reversal including an attachment as specified in the TPRs. The dwell time of 1Y41 at Glenfinnan can be reduced and would result in the service arriving 1 minute later at Mallaig at 13:41.

Figure 5 below shows an example of above solution Diagram CK208 on Day 1 would form Diagram CK211 on Day 2 resulting in a total mileage between refuelling of 633 miles, within the assumed 800 mile limit.

Diagram CK 208 MO	FROM - 28/04/2025	UNTIL - 28/04/2025	LTP	Fleet: 156/0	
	ARR	DEP	Route		Mileage
Corkerhill C.S.M.D.		05+18+00	5W73LA	CK206(F)/CK208(M)/CK201(R)	7.38
Eastfield H.S.	05+43+00	06+02+00	5W74LB	CK201(F)/CK208(M)/CK206(R)	9.51
Glasgow Queen St High Lev	06+09+00		(5W74LB)	ATTACH	
Glasgow Queen St High Lev	(06+09+00)		(2W52LA)	ATTACH	
Glasgow Queen St High Lev	(07.21.00)	(08.22.00)	(1Y21LS)	DETACH	
Glasgow Queen St High Lev		08.22.00	1Y21LS	CK206(F)/CK208(M)/CK201(R)	69.33
Crianlarich	10.07.00	(10.15.00)	(1Y21LS)	DETTT	
Crianlarich		10.21.00	1Y41LA	CK208(F)/CK201(R)	133.03
Fort William	12.07.30	(12.21.00)	(1Y41LA)	DETACH	
Fort William		12.35.00	2Z98WB		147.97
Glenfinnan	13.07.00	13+12+00	5Z98WB		148.09
Glenfinnan C.E.	13+17+00	13+56+00	5Z99WB		148.21
Glenfinnan	14+01+00	14.06.00	2Z99WB		163.14
Fort William	14.38.00	14.45.00	2Z05WB		178.08
Glenfinnan	15.17.00	15.22.00	2Z06WB		193.02
Fort William	15.57.00	16.11.00	2Z06WB	REVRSE	229.15
Rannoch	17.08.00	17.39.00	2Z07WB		265.29
Fort William	18.40.00	19.39.00	2Z09WB		280.23
Glenfinnan	20.11.00	20.16.00	2Z10WB		295.16
Fort William	20.48.00	20.55.00	2Z10WB	REVRSE	303.93
Spean Bridge	21.07.00	21.13.00	2Z11WB		312.69
Fort William	21.27.00				
Mileage: (Loaded) 302.94	(Empty) 9.75	(Total) 312.69			
Diagram CK 211 MO	FROM - 28/04/2025	UNTIL - 28/04/2025	LTP	Fleet: 156/0	
	ARR	DEP	Route		Mileage
Fort William		06.32.00	2Z01WB		39.70
Mallaig	07.52.00	07.59.00	2Z02WB		79.40
Fort William	09.22.00	09.29.00	2Z96WB		94.34
Glenfinnan	10.01.00	10+16+00	5Z96WB		94.45
Glenfinnan C.E.	10+21+00	11+23+00	5Z97WB		94.57
Glenfinnan	11+28+00	11.40.00	2Z97WB		109.51
Fort William	12.13.00		(1Y41LA)	ATTACH	
Fort William	(12.07.30)	12.21.00	1Y41LA	REVRSE	CK211(F)/CK201(R)
Mallaig	13.41.00	16.05.00	1Y48LB	CK201(F)/CK211(R)	188.91
Fort William	17.27.30		(1Y43LA)	ATTACH	
Fort William	(16.09.00)	17.37.30	1Y48LB	REVRSE	CK211(F)/CK201(M)/CK103(R)
Crianlarich	19.22.30		(1Y28LB)	ATTATT	
Crianlarich	(19.26.30)	19.34.00	1Y48LB	CK211(F)/CK201(M1)/CK103(M2)/CK202(R)	312.43
Glasgow Queen St High Lev	21.25.00	21+55+00	5Y48LC	CK202(F)/CK103(M1)/CK201(M2)/CK211(R)	320.75
Corkerhill C.S.M.D.	22+36+00				
Mileage: (Loaded) 312.19	(Empty) 8.56	(Total) 320.75			

Figure 5: Revised diagramming solution interworking CK208 and CK211

Whilst the amendments to the existing unit diagrams may result in changes to the unit cycling throughout the week that is currently planned, this is something that can be reviewed as part of any future phases of this work if required. Alongside this, timetabling and unit diagramming solutions can be fully investigated for the Saturday and Sunday to provide a throughout weekly unit cycling assessment that meets the requirements of Scotrail's current fleet maintenance plan for the Class 156 units.



5. CONCLUSIONS AND NEXT STEPS

5.1 Conclusions

To conclude, it has been identified that ten additional passenger services can operate Monday to Friday within the geographic boundaries of Rannoch and Mallaig, with a focus on services between Fort William and Glenfinnan. This has provided a balance of additional capacity for tourism demand between these locations whilst also providing an extra afternoon departure from Banavie at 15:50 to cater for school traffic from the nearby Lochaber High School.

To enable these extra services to operate a number of minor amendments to existing services are required which have been highlighted in this report. Furthermore, the first service 2Z01 06:32 Fort William to Mallaig would require a 15 minute easement to current EAS Section 4 times between Fort William Junction and Locheilside (currently ends at 06:50 but would need to be brought forward to 06:35). If this easement could not be granted then the alternative would involve having to berth the unit overnight at Mallaig where the last departure from Fort William (currently formed of 2 coaches) would have to attach and collect the unit that is currently planned to berth overnight at Fort William. This would then require either a detachment at Mallaig on arrival before the train crew sign off or the following morning after train crew sign on and would mean that the first service to operate in this alternative scenario would be 2Z02 07:59 Mallaig to Rannoch. This is not seen as ideal as, despite train crew not being considered in the scope of this study, resourcing additional train is assumed to be easier at Fort William and therefore berthing overnight at Mallaig could involve the use of taxis.

There are several factors which have dictated the structure of the additional services proposed in this study. As can be seen from Figure 3, the EAS Section 4 restrictions mean that southbound departures from Fort William can't commence until 07:15. A southbound departure at this time would have to run as far south as Upper Tyndrum before it would be able to reverse and pass both other following southbound traffic as well as following behind the northbound Caledonian Sleeper back to Fort William. Consequently the decision is made to run the first service northbound towards Mallaig. Through prioritising as many additional return trips between Fort William and Glenfinnan as possible, the solution proposed is fundamentally underpinned by the assumption that the siding at Glenfinnan can be used by a 2-car Class 156 unit to shunt clear of the platform at Glenfinnan to allow other traffic to pass.

From a unit diagramming perspective, the additional diagram required to resource the twelve proposed additional services requires interworking with an existing diagram to ensure the unit can cycle back to one of the depots in Glasgow for refuelling throughout the week. It is evident from the outputs of Figures 4 and 5 that the additional services can be operated across both diagrams CK208 and CK211 within the maximum fuel range of the units before returning to depot for refuelling.



5.2 Next Steps

The SYSTRA team have the expertise and capability to progress the high-level findings of this study into a next phase which could involve detailed timetable and rolling stock diagram production across a full week. From a timetabling aspect, it is evident that there will be variations in both the number and type of services that can operate on Saturdays and Sundays relative to those presented in this report for Monday to Friday. This is due to additional services that operate at weekends only (e.g. Royal Scotsman) and also extended EAS Section 4 hours on Saturday nights and Sunday mornings which dictate a later service startup on a Sunday relative to other days of the week. The unit diagramming work completed for Monday to Friday as part of this study can be expanded upon to create amended diagrams for Saturday and Sunday which will allow for a unit cycling review to take place across the week to ensure the sequencing of unit diagrams throughout the week is satisfactory based on Scotrail's current fleet maintenance planning and requirements. Where this identifies any potential problems then solutions can be proposed.

Other areas that have not currently been investigated at this stage are the implications and requirements from a train crew perspective. Though obtaining the Scotrail train crew route knowledge and compendium, the SYSTRA team could look to create some indicative train crew diagrams that match the current rules, parameters and terms and conditions. This would give a more accurate estimate of how many additional drivers and conductors would be required to provide the extra timetabled passenger services. Furthermore, the details of the enhanced set of timetables and rolling stock diagrams could feed into revenue modelling.



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