Meecebrook Rail Study

Pre-Feasibility Report

V0.1 **March 2022**

Contents

SLC Rail

Executive Summary

Our approach at this stage has been to determine whether there are any high-level 'job-stoppers' which might frustrate the aspirations of creating value for money train service connectivity at Meecebrook. At this pre-feasibility stage our focus has not been on getting into the plethora of necessary detail entailed in developing a viable station scheme, but to provide the confidence that the project starts off with a firm footing.

Our early pre-feasibility assessment indicates that:

- Based on comparable evidence of passenger demand behaviour and the initial cost estimates for a station at the northern location (see below for details), SYSTRA has assessed that once Meecebrook is fully built there is a prospect of station revenue generating a medium level of value for money (BCR 1.5).
- There is a reasonable prospect of achieving a train frequency of two trains per hour at the station (although the HS2 scheme introduces a level of complexity in developing a future train plan specification which is discussed in more detail below).
- That a station can be constructed within the proposed Meecebrook development at sufficient cost that when combined with the demand analysis indicates that the investment could represent medium level value for money.

The table below indicates the current top-level status along with some of the principal risks and some of the steps which will be required in the next stage of developing the project viability.

Table 1- A table to show the current top-level status

Topic		Current Status	Main Risks	Next Steps
Demand Modelling	✓	Levels of demand are in line with similar existing stations	Only basic top-down modelling undertaken	Detailed demand and economic modelling
Train Service Planning	✓	Possible to accommodate 2 train-per-hour station calls	Impact of delays to existing services. Possible objections from rail industry & HS2 integration	Timetable performance modelling Industry engagement
Station Location	✓	A potentially viable location has been identified	Adverse ground conditions Impact on signalling	Site Visits, Desktop Studies, Surveys, CAD designs
Value-for-money	✓	A good prospect of obtaining an acceptable BCR	Increase in capital costs	Updated costs estimated. BCR updated.
Strategic Fit		Proposal is in line with sustainable transport aims of the development.	Main assessment still to be undertaken	Full stakeholder engagement. Policy review.

1. Introduction

The requirement has been to undertake a high-level pre-feasibility piece of work to inform the Meecebrook Programme Board on the potential viability of building a station at Meecebrook and to provide the evidence for a 'stage-gate' decision as to whether to commission further detailed work to develop the viability of the scheme and to build a business case.

This document asks a series of questions:

- is there evidence of demand to support the development of a station?
- is it possible to provide a train service?
- is it possible to build a station?
- what might the costs of the station be, and together with the demand would the investment in the station generate a value for money business case?

Each of these aspects are considered in more detail below.

To help inform our thinking SLC have utilised experts in their field: SYSTRA to advise on demand forecasting and Rail Aspects Limited to advise on the train planning and timetabling aspects. Their full reports are included within the appendices.

Following a decision to progress with the development of the business case additional work will be required to build on and further mature the results gained so far, essentially asking two strategic questions: the why and the how. These aspects are summarised as:

Table 2 - This table shows the topics considered for the why? element of the scheme - strategic fit, demand modelling and value for money - and covers the next steps associated with these.

Topic	Next Steps
Strategic Fit	Policy review. Develop a sound rational for why a station is required. Stakeholder engagement.
Demand Modelling	Detailed demand and economic modelling.
Value-for-money	Updated costs estimated. BCR updated.

Table 3 - This table shows the topics considered for the how? element of the scheme - train service planning and station location - and covers the next steps associated with these.

Topic	Next Steps
Train Service Planning	Timetable performance modelling. Industry engagement.
Station Location	Site Visits, Desktop Studies, Surveys, CAD designs.

2. Demand Forecasting

2.1. Purpose

The purpose of pre-feasibility demand work is to determine (without carrying out the much more detailed analysis which will be required at the next stage) the approximate level of demand required that would represent low, medium and high value for money when including the current top line development and operational costs of the proposed new station at Meecebrook, would represent low, medium and high value for money. For a full explanation of the process followed see the SYSTRA Demand Forecast (Appendix C).

2.2. Results

Although it has been necessary to make a number of assumptions, the results of this high-level pre-feasibility work are encouraging and are comparable with other stations in the region. The indication is that there is a prospect that the revenue generated by rail passengers from the Meecebrook villages would generate a positive business case.

This preliminary analysis indicates that a development of 6,000 homes could generate a medium level of VFM (BCR 1.5) at an average trip rate of 12.5 journeys p.a. and a high rate of VFM (BCR 2) at 16.6 journeys p.a. Conversely, a trip rate of 8.3 equates to low VFM (BCR 1). Trip rate is defined as the average of the total catchment population divided by the estimated annual patronage of the station. A trip being one journey on a train, so a return journey would equate to two trips.

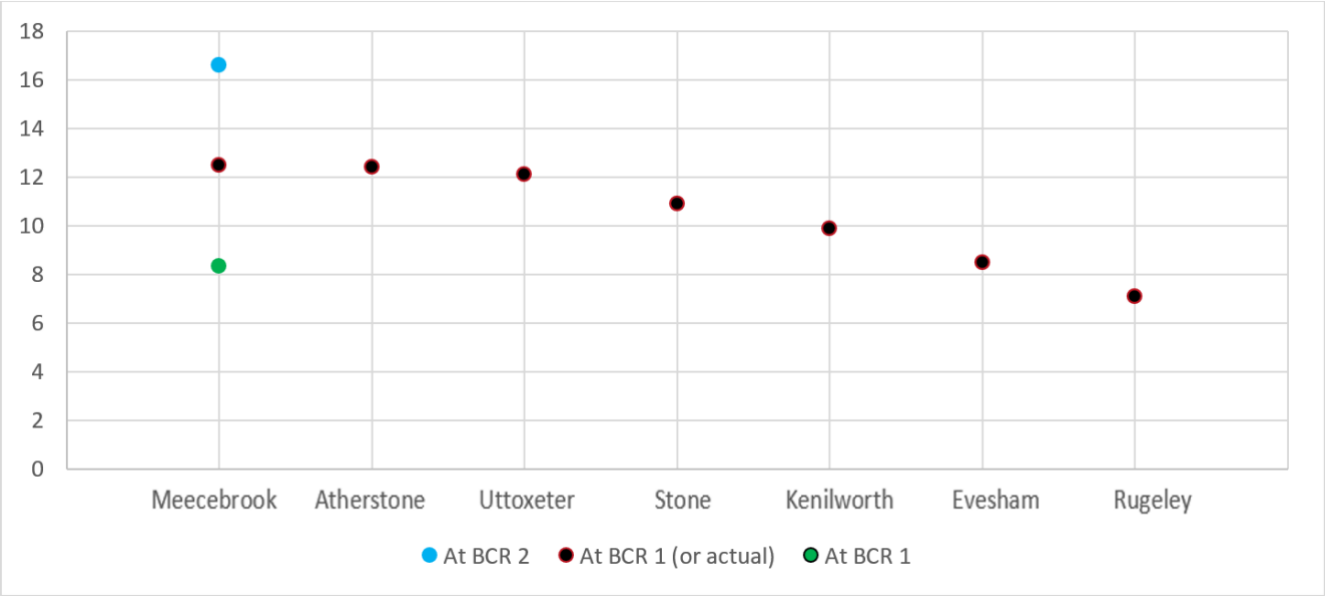
Table 4 - A table to show BCR and patronage

	BCR 1 Low VFM	BCR 1.5 Medium VFM	BCR 2 High VFM
Annual patronage	124,500	187,000	249,000
Daily patronage	399	599	798
Average trip rate per person p.a.	8.3	12.5	16.6

A medium level BCR could be achieved if every resident of Meecebrook travelled on the train 12.5 times per year. To put this another way, the annual patronage of the station (187,000 at Medium VFM) would be achieved (by these assumptions) if there were 398 residents of Meecebrook that used the railway every working day to commute to work. This would equate to 7% of residents of the new houses using the railway station daily (398 residents making two trips per day, 5 days per week for 47 weeks per year).

We then tested the estimated trip rate at Meecebrook against current (pre-COVID) trip rates at the following similar stations: Atherstone, Uttoxeter, Stone (which have very similar trip-rate levels as that suggested for Meecebrook at Medium, level VFM), Kenilworth, Evesham and Rugeley (Graph 1).

The fact that the estimated trip rate for Meecebrook is very similar to the actual level existing at Atherstone, Uttoxeter and Stone suggests that a trip rate of 12.5 for Meecebrook is not unrealistic. Graph 1 shows the trip rate at Meecebrook under the three BCR assumptions and the comparable stations actual trip rates.



Graph 1: Daily trip rate for Meecebrook at high, medium and low BCR and actual (pre-COVID) of similar stations

2.3. Principal Assumptions and Modelling

It is assumed that all demand for the station comes from the Meecebrook development (population 15,000 and 6,000 homes when fully built out).

SYSTRA calculated the distribution of passenger trips (single journeys) by analysing the number of trips within and outside of the West Midlands for Stone station, a proxy for Meecebrook. It is assumed that the distribution at Stone will be mirrored at Meecebrook. The finding was that 71% of trips occurred within the West Midlands and 29% to elsewhere. SYSTRA then used the Census 'travel to work' data to identify the top 10 destinations, which would be viable to undertake by rail, within the 71% of trips within the West Midlands (Stafford 54%, South Staffs (2%), Cannock Chase (2%), Wolverhampton (2%), Cheshire East (2%), Shropshire (3%), Birmingham (1%), Lichfield (1%), Other W Mids (4%)).

The average fare per ticket based upon assumed trip distribution has been calculated as £10.70. This figure takes into account the dominance of short distance flows to Stafford, but is offset by the higher ticket pricing of the 29% of longer journeys. The total revenue in the model was £14.44 which includes the £10.70 plus £3.74 as the assumed benefit from reduced congestion by the shift from car to rail.

On this basis, it would require 187,000 passengers per annum (12.5 trips per resident of Meecebrook) to generate a medium level of value for money based upon the present value of £32.8m for station costs (base cost of £22.2m with optimism bias and operating costs included and discounted, as per DfT TAG guidance).

This analysis provides a base case built upon low ticket yields attributable to the dominance of trips to Stafford. If in practice the trips are of longer duration, then the average ticket yield would increase which would reduce the number of trips required to achieve a medium level BCR.

3. Train Service Planning

The area of the West Coast Mainline between Stafford and Crewe where the proposed Meecebrook station will be sited is a heavily utilised strategic high-speed section of railway, conveying inter-city, regional and local trains as well as a considerable and growing number of freight services.

The introduction of new stations on such a heavily used section of railway can often be problematic as the additional journey time of the stopping train has an impact on the capacity and efficiency of the whole railway line. For this reason, there is often opposition to the creation of new stations along such an important rail corridor.

Nevertheless, the work carried out by Rail Aspects Limited, and based upon the pre-COVID timetable (the full report is at Appendix A) indicates that it is at least technically possible for the necessary station calls to be included. Although, the inclusion is not without some operational challenges, including the requirement to re-time some service around Liverpool, it is considered that it would be possible to overcome them. For that reason, at this stage we are advising that it would be possible for trains to call at Meecebrook.

For the purposes of this work, we have included the pre-COVID service between London and Liverpool/Crewe (shown below) as those which could provide the Meecebrook station calls.

Table 5 - Pre-COVID service between London and Liverpool / Crewe

Southbound trains Origin Destination	Approx. call	Northbound trains Origin Destination	Approx. call
Liverpool-Euston	XX:35	Birmingham International-Liverpool	XX:15
Liverpool-Euston	XX:05	Euston-Liverpool	XX:45
Crewe-Trent Valley-Euston	XX:46	Euston-Trent Valley-Crewe	XX:41

An added complication, though, is that HS2 will have a considerable impact on the capacity of this aspect of the West Coast Mainline and of future train service provision. This can be considered both an opportunity and a constraint. The first stage of HS2 will see HS2 trains running on the existing West Coast Mainline railway past the Meecebrook site. When the HS2 extension to Crewe is completed sometime in the 2026-2031 period the HS2 trains will shift off the existing line.

Until the HS2 line extension is completed it will be difficult, and may be impossible, to achieve capacity for additional calls at Meecebrook.

After the extension phase opens there will be released capacity which will increase the prospect of introducing additional station calls. The matter is further complicated, by the fact the Post HS2 conventional network railway timetable has not yet been developed.

In short, the current assumptions are based upon a train timetable which will not be in existence once HS2 (with Crewe extension) is completed. Whilst it appears possible to include additional calls at Meecebrook within the current timetable, it would require a significant amount of work to do so in both technical train planning but also in lobbying rail

stakeholders (DfT, Network Rail, Train Operators) for support. In any case, if the new station is not likely to open until after the HS2 extension, then the issue of the current timetable will be somewhat academic.

However, since it is not yet possible to lobby the rail industry for inclusion of Meecebrook within a post-HS2 rail timetable because it does not exist, there is a requirement to use the existing timetable as a proxy.

Despite these timetable uncertainties, it is important at the next stage to engage with the wider railway industry and carry out further timetable, punctuality, and performance work assurance. While some of this work might prove abortive because of the likely changes to timetables, it is an important part of the process of gaining acceptance across the rail industry of the benefits of the new station.

4. Station Location

4.1. Introduction

Three possible locations for a new station within the boundaries of the Meecebrook site (as known at time of writing) have been assessed both in terms of the topography and the compatibility with existing railway infrastructure.

4.2. Northern Option

- Space between the tracks is very wide at Swynnerton Road overbridge but reducing to the south.
- North end of station constrained by signals 90m south of bridge.
- There is room for a station between the signals and the next overbridge.
- Line looks approximately level with surrounding areas.
- There will be a requirement for additional signals due to the location of the platforms.

Figure 1 - Site considerations for northern option

4.3. Central Option

- Space between the signals for station although track slews would require some signals to be moved laterally.
- Station could be on reasonably straight track.
- Make use of curve at south end to slew slow lines to west. Fast lines do not need to be slewed.
- Signals should be visible from ends of platforms.
- Line is in cutting of potentially 3-4m so some excavation will be required.
- This will lead to a cost for removal of spoil - which could be mitigated if used elsewhere on the site.

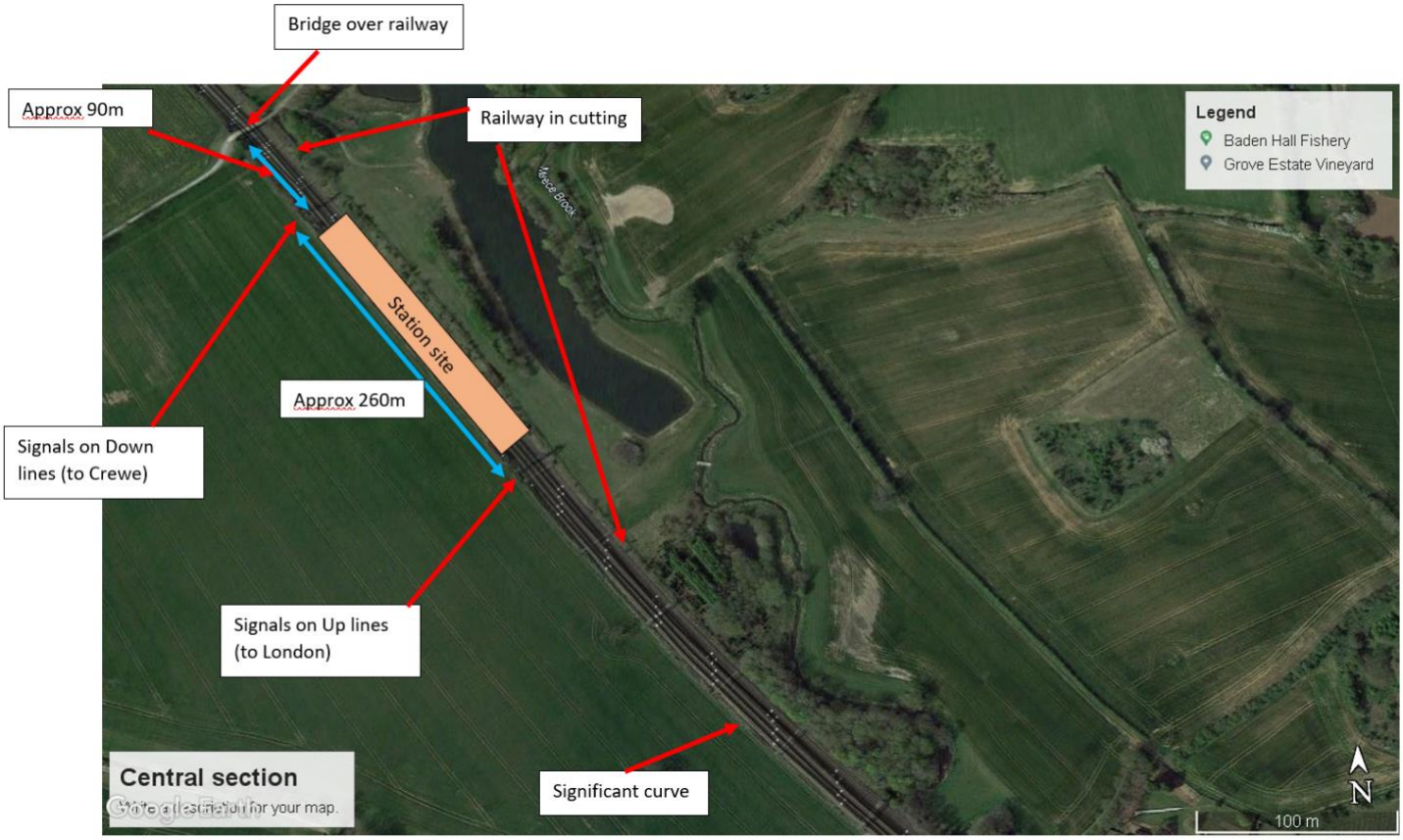


Figure 2 - Site considerations for central option

4.4. Southern Option

- Rails on a tight curve.
- Constrained by bridge over Meece Brook, road overbridge and junction layout to south.
- No signals in the area.
- Railway on embankment for part of this section.
- Possible flood plain issues.

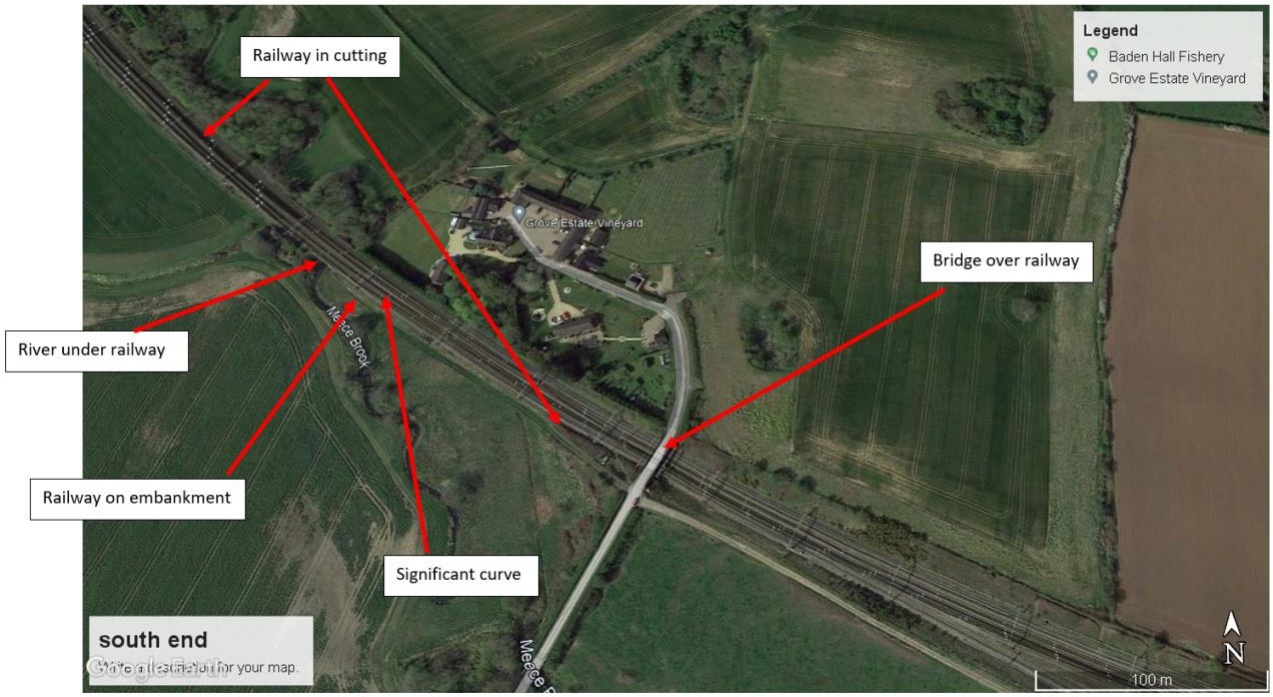


Figure 3 - Site considerations for Southern option

4.5. Summary

1. This early top-level assessment indicates that there would appear to be good prospects of building a station at both the North and Central locations.
2. South end difficult to construct and was not taken forward for cost estimation.

5. Cost Estimate

5.1. Introduction

A high-level cost estimate has been produced for the northern and central options described in Section 3, based on benchmarked costs from other similar projects.

5.2. Assumed Design Requirements

In order to obtain the best value-for-money assessment at this pre-feasibility stage the most basic facilities or 'minimum viable product' (MVP) have been assumed.

- 1 central island platform 250m long and 9m wide. Assume piled foundations and modular construction (for speed of construction in rail-locked site)
- Back of platform steel fence for flanking platforms
- Lighting, CCTV, PA on each platform
- 2 seats, one waiting shelter, one help point on each platform
- Footbridge across all lines – total length approx. 35m with central support on island platform
- 3 lifts, 3 sets of stairs
- Minimal car park – 10 spaces max
- No station building

There are also a number of site-specific requirement assumptions that have been made for the northern and central options and these are detailed in the full cost estimate contained in Appendix B.

5.3. Cost Estimate Results

Table 6 - Cost estimate results for Northern and Central Option

Item	Northern Option	Central Option
Base Cost Estimate	£22,190,272	£28,771,541
60% Risk Allowance	£13,314,436	£17,262,925
Total	**£35,505,163**	**£46,034,465**

6. Conclusion

Embarking on the process to deliver a new railway station onto the network is far from easy or straight-forward. The process is long and can be difficult. Successful schemes require not only a good business case, but also the energy, focus and determination of the promotor and a strong political champion to see the project through to fruition.

Fundamentally, though, there needs to be both a strong business case and the approval and acceptance of key stakeholders, notably the DfT and Network Rail, that the new station is the right solution in providing the forecast benefits and outcomes any infrastructure intervention is intended to deliver.

Being at the very start of that journey, the purpose of this document has been to provide the necessary reassurance that, at this stage, there are no 'job stoppers' which will derail the delivery of the long-term vision.

Our initial assessment has looked at demand modelling, train service planning, station construction and has determined that in each case the prospects appear positive and that based upon the assumptions there would appear to be a good prospect of a scheme of medium value for money which would deliver an acceptable BCR.

Table 7 - A table to show status of initial assessments

Topic		Current Status
Demand Modelling	✓	Levels of demand are in line with similar existing stations
Train Service Planning	✓	Possible to accommodate 2 train-per-hour station calls
Station Location	✓	A potentially viable location has been identified
Value-for-money	✓	A good prospect of obtaining an acceptable BCR

The next stage will be to develop the each of these themes along with an underpinning rational for the strategic case, that is, answering the Why and How questions which will lead towards the completion of a Strategic Outline Business Case (SOBC).

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21 February 2022

Issue 1.1

Dear Jeremy,

Rail Aspects Limited – Meecebrook Railway Station Timetable Review

SLC Rail has asked Rail Aspects Limited to conduct a high-level operational feasibility review, to support the proposed opening of a new station at Meecebrook, north west of Stafford.

The agreed scope of work is to review the current timetable and any known and committed forthcoming changes, and to review the local railway geography and local operating constraints, at a high level, and to identify risks and opportunities arising from inserting station calls at Meecebrook within the existing train service.

1 Executive Summary

Based on the analysis that has been conducted, and assuming a timetable baseline equivalent to the December 2019 (pre-COVID) service specification, station calls at Meecebrook could be accommodated in at least one of the two existing twice-hourly West Midlands Trains services between Liverpool Lime Street and Birmingham New Street/London Euston, by means of timing adjustments to these services and without undue consequences.

Station calls could also be inserted in the approximately-hourly West Midlands Trains services between Crewe and London Euston via the Trent Valley.

This approach would deliver approximately 24 Up (southbound) and 24 Down (northbound) calls at Meecebrook each day, providing direct through services to/from Birmingham, London and Liverpool, with the opportunity for to connect with other train services to reach a wider range of destinations or for faster journey times.

Insertion of calls in other passing services (predominantly Avanti West Coast high speed services) is likely to prove more problematic and has not been investigated in depth at this stage.

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Provision of station calls at Meecebrook is highly likely to require provision of a 4-platform station, i.e. platforms on the Fast Lines and on the Slow Lines. Although it would probably be possible to arrange for the majority of weekday stopping services to be timetabled on the Slow Lines, this would not be possible on Sundays owing to engineering access restrictions. It is also considered likely that services planned via the Slow Lines will be regularly run via the Fast Lines during periods of disrupted running, as a service recovery measure.

Introduction of the station calls within the existing service would likely have some performance implications, particularly in the form of risk of knock-on delays to other train services, as the route is congested, especially towards Liverpool, and towards Wolverhampton and Birmingham. These risks have not been quantified but are considered unlikely to be severe enough to prevent further development of the scheme at this stage.

The opening of HS2 Phase 2a, expected between 2029 and 2033, is likely to provide further opportunities for connectivity from Meecebrook. The Crewe Hub will allow interchange between conventional services and high speed services at Crewe, providing potentially-accelerated journey times to London and Birmingham. Also, with high speed services running predominantly via HS2 taking a share of long distance traffic, it may become viable to insert station calls at Meecebrook into other current long-distance services, e.g. those between London and Liverpool or between Birmingham and Scotland, which are likely to become more flexible in terms of journey time extensions.

2 Introduction

SLC Rail has been asked to conduct a feasibility study into the opening of a new railway station at Meecebrook, north west of Stafford and south east of Crewe. The railway station would serve new housing developments in the local area.

The feasibility study will investigate engineering considerations, the economic business case and the operational feasibility of stopping trains at the proposed station.

This report has been compiled by Rail Aspects Limited, in advance of the engineering and economic analyses, to provide SLC Rail with an initial view as to the railway operational feasibility.

2.1 Demand Considerations

Detailed demand estimates form part of the wider project, and are not yet available to inform this analysis. It is assumed for the purposes of this study that the principal markets would be to Birmingham, London, cities in the north west of England and other local population centres for the purposes of commuting, leisure and business travel, and to/from London, Birmingham, Manchester and Liverpool for business travel.

3 Proposed Scheme

It is assumed that the station will be located on the Stafford-Crewe section of the West Coast Main Line (WCML) (Line of Route code NW1001, Engineers' Line Reference LEC4), see Figure 1:

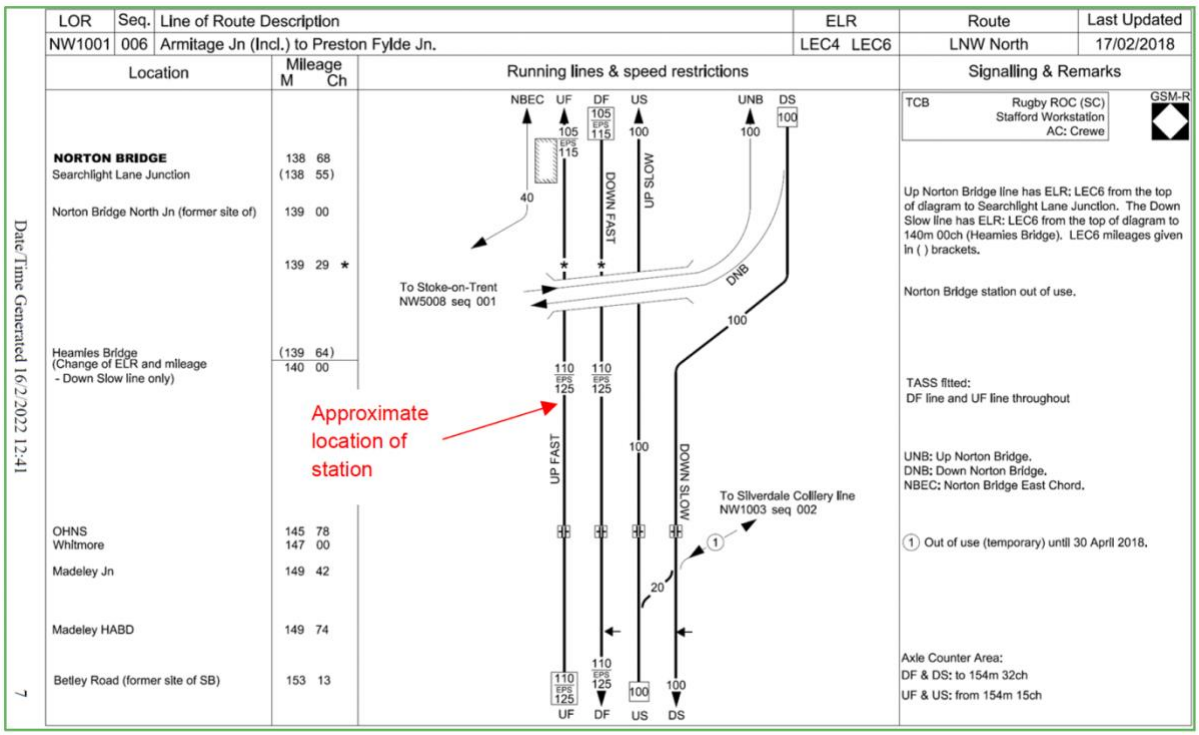


Figure 1: Sectional Appendix extract showing the approximate location of Meecebrook station. Sectional Appendix attached as Appendix II

For the purposes of the initial investigation, the assumption made is for a four-platform station, to accommodate Engineering Access requirements (see Section 8.4) as well as for maximum flexibility in scheduling.

It is assumed that the proposed location is north west of the Heamies Farm road-over-rail bridge (BR24):

Click here to view the map

The approximate route mileage of the station would be 140 miles 24 chains.

3.1 Engineering Factors

Engineering factors have not been considered in any detail at this stage. It is noted that the alignment is in a shallow cutting, on gently curved track with a gradient of 1:569 rising in the Down (north west) direction, and appears sufficient to accommodate platforms c. 240 metres in length, sufficient to accommodate any likely passenger train formation on the route.

The line speed at the location is 110 mph on the Fast Lines (125 mph Enhanced Permissible Speed for tilting trains) and 100 mph on the Slow Lines.

The location is controlled by Rugby Rail Operations Centre (ROC).

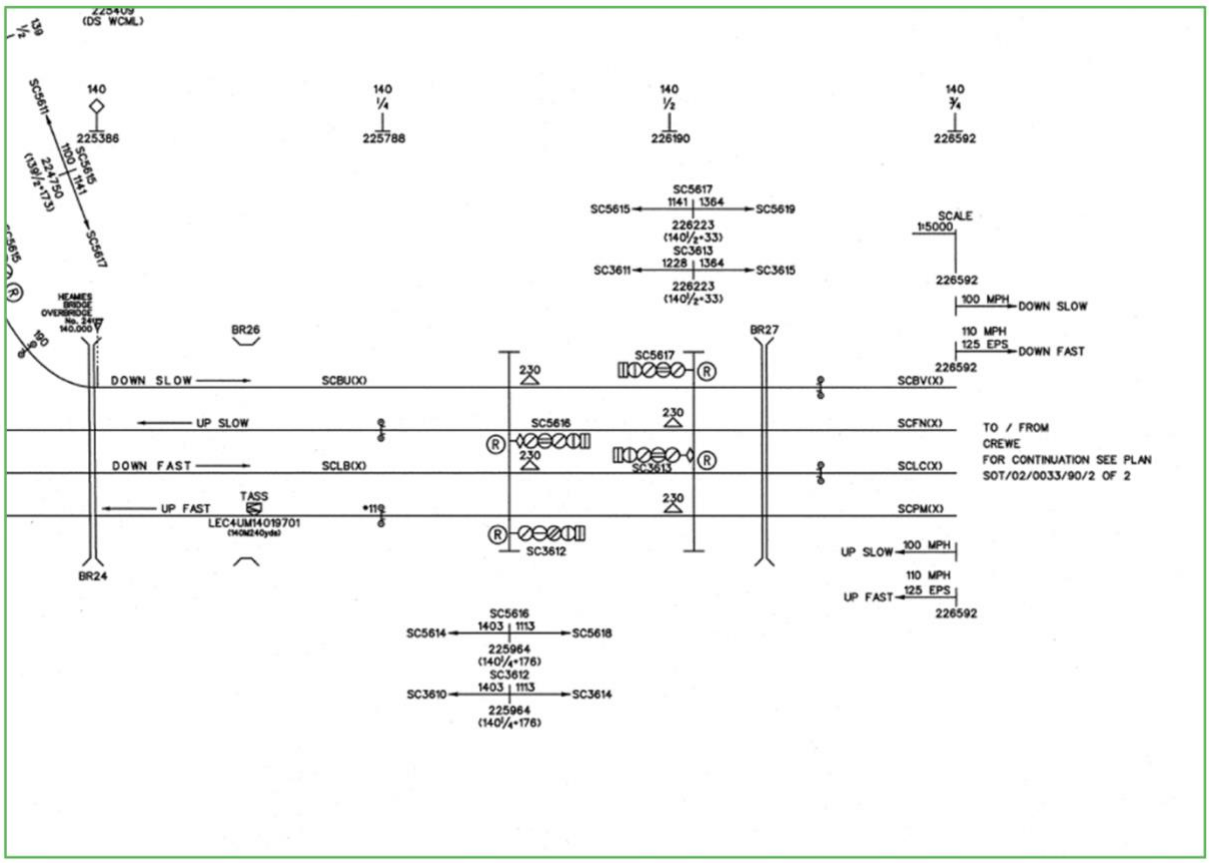


Figure 2: Extract from the local Signalling Plan. Full signalling plans attached as Appendix III

Local signalling is designed for high speed non-stop services, with block lengths of 1100m to 1400m (Figure 2) and the planning headway in the immediate vicinity is 3 minutes between following train services (up to a maximum of 13 trains per hour on the Fast Lines).

Consequently, it should be assumed that the current signalling would not be ideally suited to stopping of services within the signal blocks.

However, given the relatively anticipated level of service, together with the flexibility offered by the 4-track configuration, any alterations to existing signalling are considered likely to be necessary only if it is required to run consecutive stopping services at close headways or if the location of existing signals conflicts with other engineering considerations such as the location of station platforms.

There are no level crossings in the immediate vicinity.

4 Existing Train Service

The December 2019 timetable has been used as the basis for this assessment, representing a likely steady-state once COVID temporary timetables are withdrawn. The conclusions drawn below might vary were the train service specification to remain below December 2019 levels, either by easing planning constraints or, conversely, providing fewer paths that would be amenable to having station calls inserted.

The passenger train service passing through the proposed station site in the December 2019 timetable consists of:

- Twice-hourly West Midlands Trains (WMT) services (branded "London Northwestern Railway") from Liverpool Lime Street to Birmingham New Street and London Euston, with one train per hour continuing directly on to London Euston and one terminating at Birmingham New Street (although in practice, this train sometimes works though to London Euston as well). Unusually, in the December 2019 timetable, this service pattern was imbalanced with one Down (northbound) service currently starting from Birmingham International rather than London Euston
- Hourly WMT services between Crewe and London Euston via the Trent Valley.
- Hourly Avanti West Coast services between Glasgow and London Euston via the Trent Valley
- Hourly Avanti West Coast services between Manchester and London Euston via Crewe and the Trent Valley
- Hourly Avanti West Coast services between Liverpool and London Euston via the Trent Valley
- Hourly Avanti West Coast services between North Wales and London Euston via the Trent Valley
- Hourly Avanti West Coast services between Glasgow/Edinburgh and London Euston via Birmingham New Street
- Occasional Avanti West Coast services between Blackpool and London Euston via the Trent Valley

There is also intensive freight traffic along the WCML past the station site, typically 2-3 paths per hour in each direction.

Services between Birmingham and Stoke-on-Trent diverge from the WCML at Norton Bridge Jn., to the south east of the proposed station site.

4.1 Future changes to train services

There are no short-term significant changes planned to current train services at present other than some retiming anticipated as a result of HS2 stageworks (fewer platforms being available at Euston) and with replacement of Class 221 Diesel Multiple Units with Class 805 Bi-mode Multiple Units expected later in 2022. Note that services are currently running at reduced frequencies as COVID recovery continues, but a realistic assessment seems that the timetable will revert to the December 2019 pattern and frequencies in the medium term (1-2 years).

4.2 Impact of HS2

Longer-term, the opening of HS2 Phase 1 in c. 2026 will lead to substantial timetable changes on the WCML.

Once Phase 2a is open between Birmingham and Crewe, high speed services are expected to operate from London Euston via HS2 and Crewe Hub, to Glasgow, Edinburgh, Manchester, Liverpool and North Wales using classic-compatible high speed rolling stock.

In theory, this will remove most long-distance high-speed traffic from the WCML south of Crewe; however, it appears likely that at least some paths will be retained to maintain connectivity with intermediate stations such as Milton Keynes, Rugby, Coventry, Wolverhampton, the Trent Valley stations and Stafford. As end-to-end journey times will become less sensitive, it is also possible that these paths will be regularised, e.g. adding additional calls at Milton Keynes or Stafford, for example.

This would offer improved journey times from these locations whilst also reducing constraints on capacity on the Stafford-Crewe section, either by reducing the number of required paths or by increasing the flexibility of remaining paths (possibly also opening up the potential to introduce calls at Meecebrook in residual train services).

However, constraints on other routes (Crewe to/from Liverpool in particular, and between Wolverhampton and Birmingham to some extent) would probably remain in place post-HS2.

5 Principal timetabling/capacity constraints

The Stafford-Crewe section of the WCML is intensively utilised, although the segregation of Fast Lines and Slow Lines combined with the recent grade-separation of the junction at Norton Bridge provide some flexibility with the principal constraints being either side of Crewe, where the four-track alignment narrows to a three- or two-track alignment.

South of Stafford, the Trent Valley is a 2-track railway between Milford Jn. and Colwich Jn., then reverts to 4-track except for a short distance south of Nuneaton.

The route between Stafford and Wolverhampton is, by the current standards of the railway network, relatively lightly utilised with only six trains passing in each direction in most hours. Further to the south, this route becomes increasingly congested through Wolverhampton and at Birmingham New Street and the service is sufficiently intensive throughout the day that it is very difficult to find flexibility in train paths.

Onwards towards Liverpool, the route is fairly congested with a mixture of high-speed, regional and local services, although with some flexibility around individual train paths.

In summary, retiming of services to accommodate a station call at Meecebrook would probably need to take place away from Birmingham New Street and the WCML South, and also minimise any impact on high-profile, high-speed services on the WCML.

6 Options for serving Meecebrook station

Consideration has been given as to the most appropriate service(s) in which to insert station calls at Meecebrook.

Avanti West Coast services were discounted from further study at this stage owing to their sensitivity to additional journey time, combined with tight timings and the difficulty in managing knock-on impacts over such a wide area. Post-HS2 Phase 2a, this situation may change.

The WMT London-Birmingham-WCML-Crewe-Liverpool appeared to offer a viable option from a perspective of providing a regular service, with a potential 2 trains per hour, and direct connections and connection opportunities to Birmingham and Liverpool and other key local destinations, including via Crewe.

The WMT London-Trent Valley-Crewe services would provide a once-hourly service and direct connections to London with attractive journey times; these have also been reviewed.

Full extracts from the weekday public and working timetables are provided for information. See Appendix IV.

7 Timetable Study Assumptions

A timetable study has been conducted, to examine the viability of inserting station calls at Meecebrook into the current timetable. The following assumptions have been made:

- The Network Rail Working Timetable (WTT) valid from 14th December 2019 has been used as the basis of this analysis and has been downloaded as a timetable file from the Network Rail Open Data Feeds1;
- The state of the network is taken from the current Network Rail 'Sectional Appendix' and from Reference Data available from, the Open Data Feeds;
- Timetable changes have been constrained by Network Rail's Timetable Planning Rules (TPRs) for London North Western and Western and Wales for 2022, which set out the train planning rules that train operators must observe for the routes in question.

A station stop at Penkridge, as a proxy for Meecebrook, requires 2 additional minutes as specified in the TPRs, comprising of 1.5 minutes braking and acceleration time and 0.5 minute station dwell time. However, the linespeed in the vicinity of Meecebrook is higher than at Penkridge and station dwell times for WMT services generally alternate between 0.5 minutes and 1 minute. For these reasons, the journey time penalty for a station stop at Meecebrook has been estimated at 3 minutes for the purposes of this study. This assumption should be validated in due course using an industry-approved method as set out in the TPRs.

For the purposes of this study, it has been assumed that Avanti West Coast and Arriva CrossCountry paths are fixed as per the December 2019 timetable. Flexibility in other passenger service paths has been assumed provided that existing times can be maintained at key locations, notably Birmingham New Street and London Euston. Flexibility in freight paths has been assumed, provided that it appears reasonably likely that the path could be adjusted within the same half-hour period.

WMT services which stop at Meecebrook have been retimed at locations north of Meecebrook, or between Meecebrook and Birmingham New Street, with times at Birmingham New Street and on the WCML Trent Valley south of Stafford remaining fixed. Where possible, timing adjustments have been minimised by making use of existing timing allowances (pathing allowances) which would no longer be needed once the adjustments are made, or by reducing station dwell times where these are longer than required by the TPRs.

8 Findings and Conclusions

8.1 WMT London-Birmingham-WCML-Crewe-Liverpool services

1GXX Up services: These service call at Stafford at approximately XX:40 every hour and would pass the proposed Meecebrook station site approximately 5 minutes earlier. Many services have 1 minute pathing allowance approaching Wolverhampton and further pathing time between Wolverhampton and Birmingham New Street combined with a 2-minute dwell at Wolverhampton (1 minute minimum in the TPRs). Retiming each service 3 minutes later into Wolverhampton would generally require the WMT Crewe-Stoke-Euston service, which follows the Liverpool service, to be retimed but this is generally feasible as the Crewe services also have generous dwell times at Wolverhampton.

Alternatively, retiming backward from Liverpool may be feasible. Although the paths slot between a Liverpool-Crewe stopping service and a Liverpool-Chester service departing Liverpool Lime Street, they generally have pathing time inserted between Halton Jn and Weaver Jn which could be removed, with the paths then running slightly earlier and swapping with ECS / freight paths enroute to Crewe. Some paths also have extra dwell time at Crewe, which could be repurposed.

Between Crewe and Stafford, many of the 1GXX paths are scheduled to run on the Slow Lines and could accommodate the station call without impacting on other trains (freight paths are generally slower than passenger paths, and hence well clear at the potential station site). See Figure 3 in Appendix I for an illustration.

2YXX Up services: These services follow a similar pattern to the 1GXX services but on the opposite half hour, calling at Stafford at approximately XX:10. Again, most services have enough allowances between Meecebrook and Birmingham New Street to accommodate the station call by forward-timing. At Wolverhampton, this would require some adjustment to the following services, which in this case are either TfW Shrewsbury-Birmingham New Street services or Avanti West Coast Scotland-Birmingham-London paths (the exact ordering varies from hour to hour). Both of these services generally have excess dwell times at Wolverhampton and/or other allowances that could be used to localise the impact.

Alternatively, and in a similar fashion, backtiming from Liverpool may be possible, although more difficult in this case as the 2YXX paths run immediately behind the prime 1MXX Avanti West Coast Glasgow-Trent Valley-London paths between Halton Jn. and Winsford, meaning that any solution would require the 2YXX paths to run significantly earlier from Liverpool, in front of the 1MXX paths and with other consequential knock-on impacts.

Between Crewe and Stafford, most 2YXX paths are scheduled to run on the Fast Lines and could accommodate the station call without impacting on other trains as the following 1AXX Avanti West Coast North Wales-Euston services are clear behind and there are no paths immediately in front. See Figure 3 in Appendix I for an illustration.

1FXX Down services (XX:15 pattern): These service call at Stafford at approximately

XX:10 every hour and would pass the proposed Meecebrook station site approximately 3-5 minutes later.

These services generally originate at Birmingham International and depart Birmingham New Street on minimum headway ahead of the Birmingham-Wolverhampton stopping service which in turn is followed by Birmingham-Shrewsbury and Manchester-bound CrossCountry services at close to minimum headway, meaning that typically there is only c. 1 minute flexibility to back-time the services. Forward timing from Meecebrook is generally possible along the WCML, subject to some adjustment to freight paths, but between Halton Jn and Liverpool the 1FXX services generally run immediately in front of the down Chester-Liverpool service which in turn is immediately ahead of Avanti West Coast Euston-Liverpool services. The only solution that presented itself would require wholesale re-timing of Chester-Liverpool services.

1FXX Down services (XX:45 pattern): These services generally originate at London Euston and call at Stafford at approximately XX:40 every hour. Again, back-timing from Birmingham is problematic because of the proximity of the Birmingham-Wolverhampton service and the following Avanti West Coast Euston-Edinburgh paths. Forward timing along the WCML also presents a problem, as the current path runs immediately ahead of prime Avanti West Coast Euston-Glasgow high speed services on the Fast Lines.

However, diversion of the 1FXX path along the Slow Lines to Crewe would have, in practice, minimal journey time impact as the Slow Lines allow 100 mph running and, in any case, most 1FXX paths then have allowances either side of Crewe that can be used to recover the Meecebrook station stop time and any other adjustments. Finally, these services also have a more flexible path into Liverpool Lime Street.

1FXX paths would precede a regular freight path along the Slow Lines and it appears that the station call could be accommodated with minimal difficulty. Figure 5 and Figure 6 in Appendix I illustrate the current path and the potential to divert it onto the Slow Lines.

8.2 WMT London-Trent Valley-Crewe services

1UXX Up services: 1UXX Crewe-Euston paths generally depart Crewe at XX:33 and call at Stafford at XX:51, passing the potential Meecebrook Station site approximately 5 minutes earlier. Most paths are scheduled via the Fast Lines, where they slot between an Avanti 1AXX West Coast Manchester-Crewe-Euston path and the 1MXX Avanti West Coast Glasgow-Trent Valley-London paths (see Figure 4 in Appendix I), meaning that a station call on the Fast Lines would be very problematic to accommodate.

A potential solution would be to divert these paths via the Slow Lines between Crewe and Euston. Whilst there are regular freight paths along the Slow Lines, provided the 1UXX paths could precede out of Crewe earlier and ahead of a freight path, there would be sufficient flexibility to accommodate a call at Meecebrook and arrive at Stafford in front of the Arriva Cross Country Manchester-South West path.

1UXX Down services: 1UXX Euston-Crewe paths generally call at Stafford at approximately XX:36 and arrive at Crewe at XX:53, passing the potential Meecebrook Station site at approximately XX:41. Note that paths are different in peak hours.

Most paths are scheduled via the Fast Lines, where they run immediately in front of the 1FXX (XX:45 pattern) WMT path described above (see Figure 5 in Appendix I), meaning that a station call on the Fast Lines would again be very problematic to accommodate.

In a similar manner to the Up direction paths, diversion onto the Slow Lines appears feasible, arriving later into Crewe and with minimal apparent difficulty in this case.

8.3 Resourcing Considerations

WMT Euston-Birmingham-Liverpool services generally operate with turnround times of approximately 20-25 minutes at Liverpool. If both later arrivals at, and earlier departures from Liverpool were required for either the 1FXX/1GXX pattern or the 1FXX/2YXX pattern, then although the resulting turnround would remain compliant with Timetable Planning Rules (minimum value 4 minutes, or 10 minutes after consecutive short turnrounds), given the lengthy journey made by these services there may be a residual performance risk.

WMT Euston-Trent Valley-Crewe services generally operate with relatively generous 40 minute turnround times at Crewe and there are no obvious resource or disproportionate performance risks of retiming arrivals slightly later and departures slightly earlier.

All WMT services are currently formed of 4-car or (2x4) 8-car Class 350 rolling stock; future services may also be formed of 5-car or (2x5) 10-car Class 730/2 rolling stock which will replace the Class 350/2 sub-fleet.

8.4 Engineering Access considerations

The Engineering Access Statement (EAS, attached as Appendix V, in particular refer to page 138) makes provision for standard possession opportunities between Stafford and Crewe, with cyclical disruptive midweek opportunities and, more significantly, disruptive blocks of either the Fast or Slow lines at weekends.

Of particular note is that the Slow Lines may be blocked completely from 08:40 (when the route opens) to 16:30 on Sundays, with the EAS requiring that “Between Searchlight Lane/Little Bridgeford and Crewe South 0840 – 1630 SUN to be timetabled as a two-track railway over the Fast lines”.

Given that, as described above, any passenger service in the medium term is highly likely to be scheduled predominantly on the Slow Lines, this will de facto require any station at Meecebrook to have platforms provided on both the Fast and Slow lines, or else to have no scheduled Sunday service (with platforms provided on the Slow Lines only).

9 Summary

Service Pattern	Direction	Origin Destination	Approximate time at Meecebrook	RAG status
1GXX	Up	Liverpool-Euston	XX:35	G
2YXX	Up	Liverpool-Euston	XX:05	G
1UXX	Up	Crewe-Trent Valley-Euston	XX:46	G
1FXX	Down	Birmingham International-Liverpool	XX:15	R
1FXX	Down	Euston-Liverpool	XX:45	G
1UXX	Down	Euston-Trent Valley-Crewe	XX:41	G

By retiming services as described above, it would seem relatively straightforward, in terms of timetable construction to insert Meecebrook station calls in all three WMT Up direction service groups passing Meecebrook.

Inserting station calls in Down direction services is slightly more problematic, owing to lack of re-useable pathing and excess station dwell time combined with capacity constraints on the WCML and onwards towards Liverpool. Of the two service groups, the 1UXX Euston-Crewe services passing Meecebrook at approximately XX:41 appear the easier to adjust, owing to the ease of forward timing to Crewe.

One of the two 1FXX paths would also appear feasible. This path runs adjacent to the 1UXX path, meaning that both station calls at Meecebrook would occur within a few minutes of one another; however as the two service provide different journey opportunities, this may not be as problematic as it may first appear.

10 Risks

10.1 Performance risk

The issue of performance risk has been considered at a conceptual level. It is inevitable, when inserting additional station calls in existing services, that some level of performance risk is incurred. It is noted that the WMT London Northwestern service groups have recently performed below Operator target performance levels, and any proposals to modify the service are likely to have some degree of sensitivity around potential performance impacts.

In this case, the specific risks would be increases in “1st Order” reactionary delays along the Stafford-Crewe corridor and potentially on towards Rugby, Birmingham and Crewe, i.e. faster trains being delayed by the stopping services.

"2nd Order" reactionary delays, i.e. outbound services delayed by late arrival of the inbound service might also be a risk, in particular at Liverpool (see Section 8.3) and Birmingham New Street where some splitting and joining of services takes place.

These risks could be quantified by timetable performance modelling, for example using RailSys or Trenissimo, which are Network Rail's preferred tools for such purposes. timetable performance modelling could also be used to confirm the stated assumptions regarding the journey time penalty inherent in the additional station calls.

10.2 Other Risks and Issues

The timetable in the vicinity of Meecebrook appears likely to remain fairly stable in the medium term, prior to the opening of HS2 Phase 1 and probably until the opening of HS2 Phase 2, assuming that the pre-COVID timetable is reinstated in full.

Avanti West Coast have stated an objective of running a second hourly Euston-Liverpool path. Details of this service are not yet available; there is some risk that this would further complicate adjustments to the timetable.

Aside from performance risks, there may be complexities in the detail of retiming of services either locally (for example, diverting from the Fast to the Slow line) or more widely (for example, rigid timetable structures in the Liverpool area) that are not apparent from this initial overview.

10.3 Industry Engagement

No industry engagement has been undertaken at the time of writing.

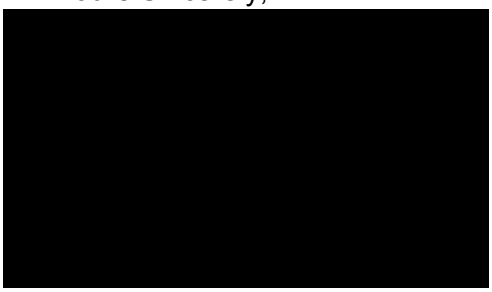
Train Operating Companies (TOCs), Freight Operating Companies (FOCs) and Network Rail will need to be engaged at the earliest opportunity.

11 Next Steps

The next steps of any operational assessment should include:

- Calculation of appropriate Sectional Running Times (SRTs) and Train Planning Rules (TPRs) using industry-agreed methodologies
- Preparation of details conceptual timetables
- Timetable performance modelling using industry-standard techniques
- More detailed reviews of resourcing requirements and constraints
- Industry engagement to support the above processes

Yours Sincerely,



Appendix I: Train Graphs

These graphs illustrate the December 2019 timetable between Crewe and Stafford or vice versa. WMT services are shown in green, and Avanti West Coast services in red, with other operators and freight paths in black.

Crewe to Stafford, Slow Lines

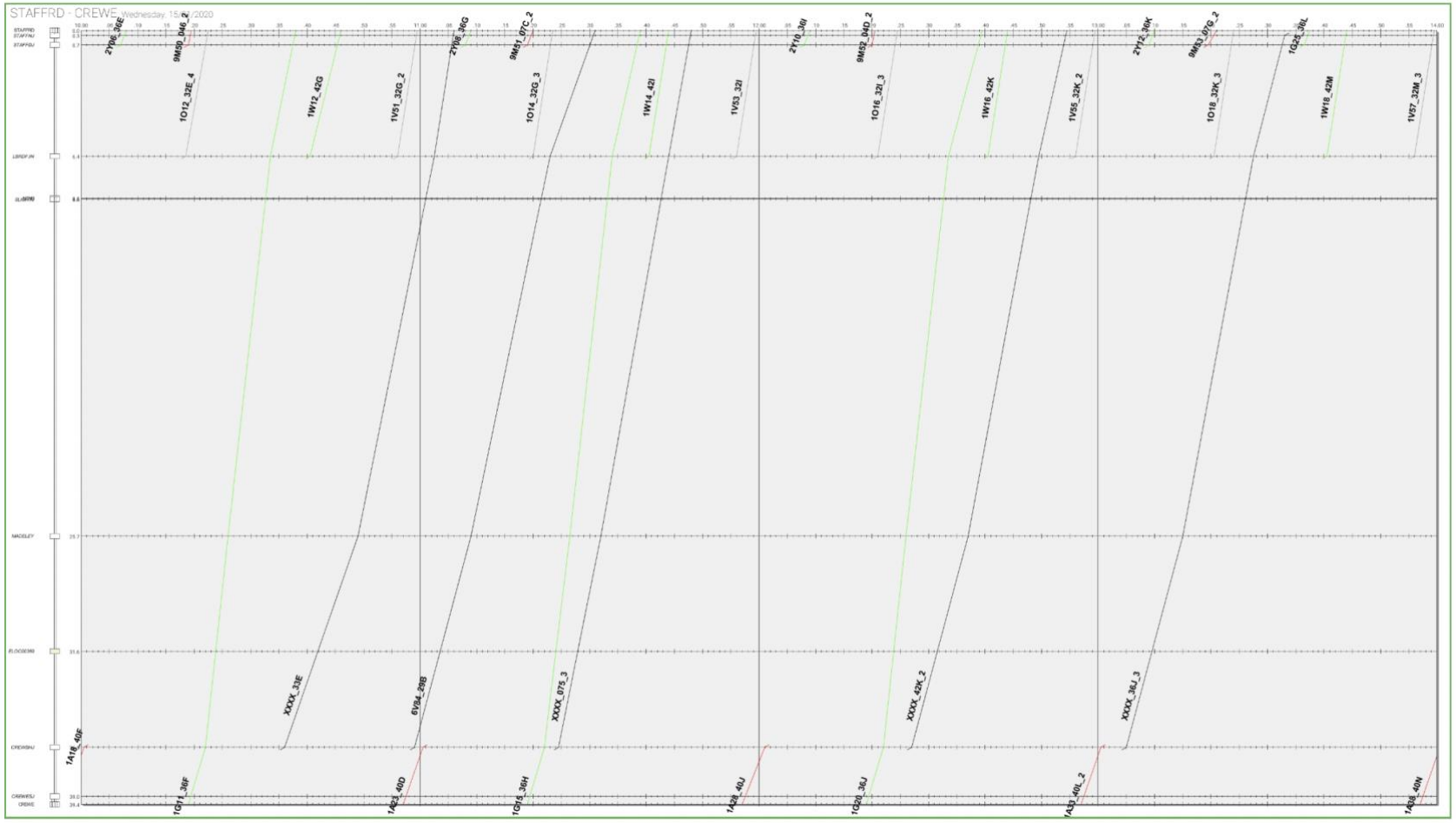


Figure 3: Crewe to Stafford Train Graph, showing trains on the Slow Lines, 10:00 to 14:00

Crewe to Stafford, Fast Lines

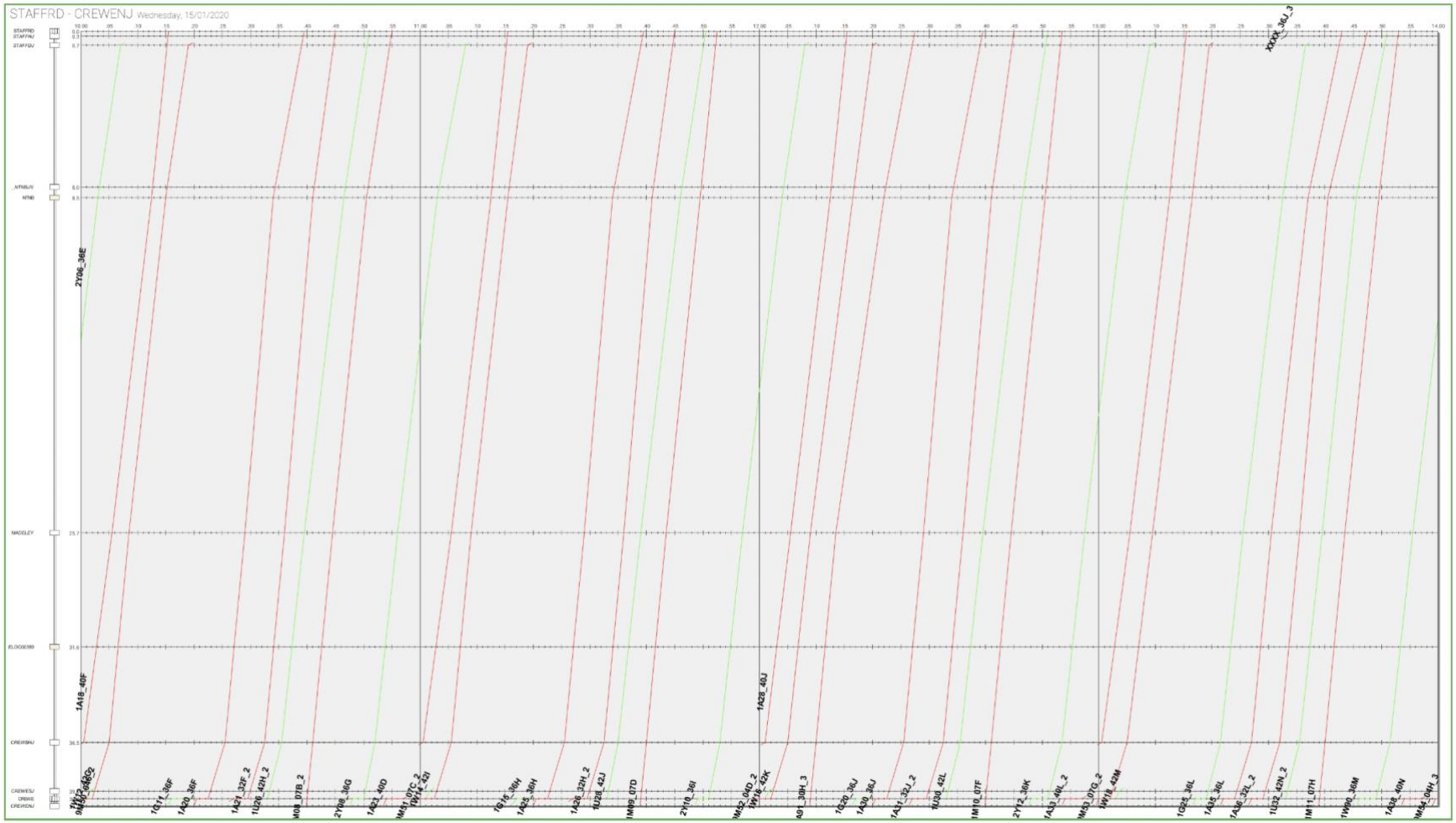


Figure 4: Crewe to Stafford Train Graph, showing trains on the Fast Lines, 10:00 to 14:00

Stafford to Crewe, Fast Lines

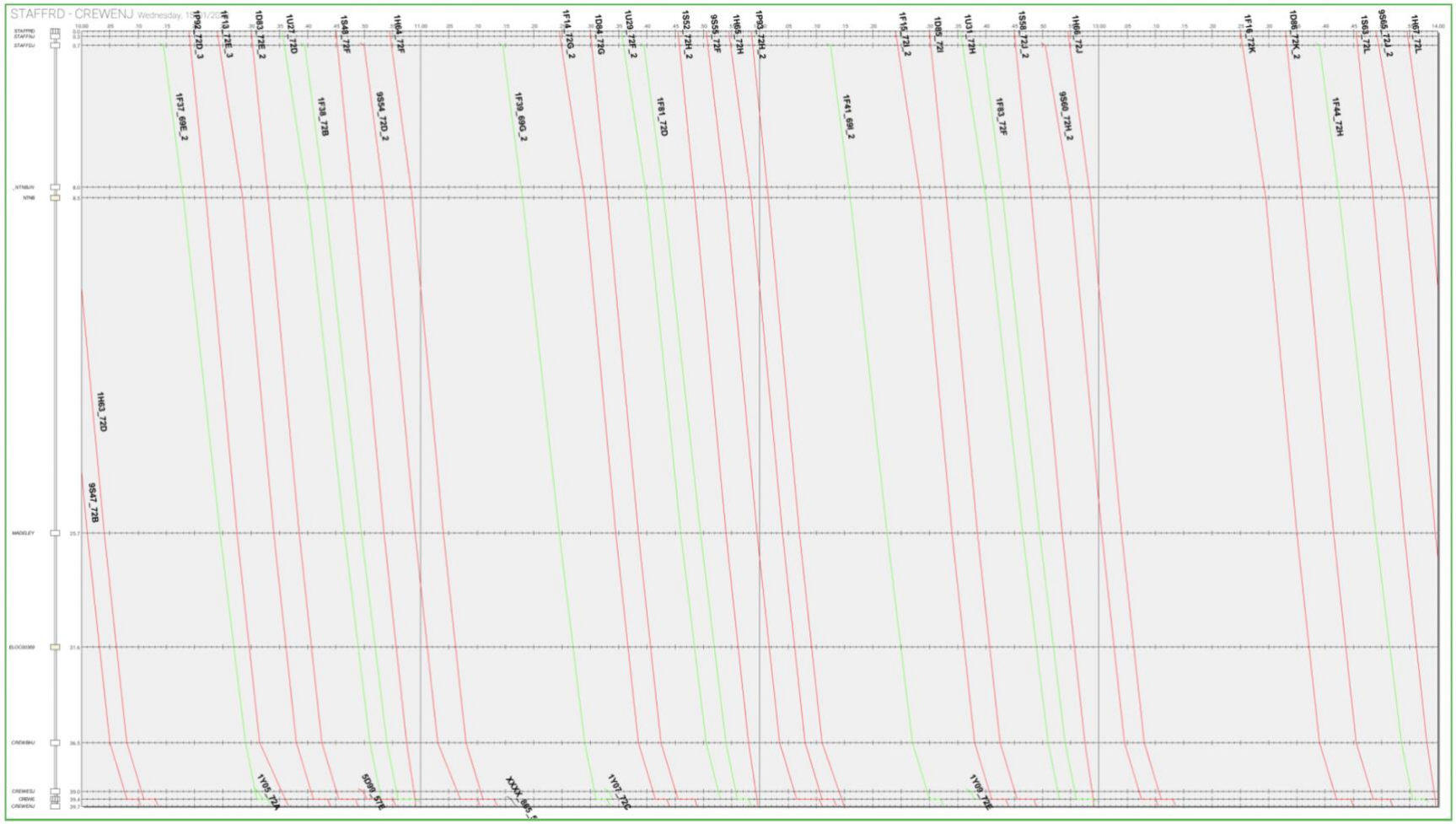


Figure 5: Stafford to Crewe Train Graph, showing trains on the Fast Lines, 10:00 to 14:00

Stafford to Crewe, Slow Lines

Figure 6: Stafford to Crewe Train Graph, showing trains on the Slow Lines, 10:00 to 14:00

Meecebrook Station

17 February 2022
1Q22 Rev 1

SLC Rail

Estimate Date	17-Feb-22
Revision	Rev 1
Project Title	Meecebrook Station
Price Base date	1Q22

Ref	Estimate Breakdown		North Option	Central Option	Car Parking
1	**Direct Construction Works Costs**		**Value (£)**	**Value (£)**	**Value (£)**
1.01	Signalling		£234,000	£284,000	£0
1.02	Overhead Line		£715,000	£715,000	£0
1.03	Power		£50,000	£50,000	£0
1.04	Permanent Way		£1,309,500	£1,309,500	£0
1.05	Telecoms		£929,775	£927,935	£0
1.06	Platforms		£6,866,950	£6,866,950	£0
1.07	Civils		£199,800	£1,921,300	£1,481,500
1.08	Enabling Works		£71,250	£71,250	£22,000
1.09	Access Road and Drop Off Area		£233,400	£1,651,300	£0
	Direct construction works cost total		**£10,609,675**	**£13,797,235**	**£1,503,500**
2	**Indirect Construction Works Costs**		**Value (£)**	**Value (£)**	**Value (£)**
2.01	Preliminaries	40%	£4,243,870	£5,518,894	£601,400
2.02	Contractors Overhead and Profit	9%	£1,336,819	£1,738,452	£189,441
2.03	Traffic Management – Allowance		£0	£0	£5,000
2.04	Temporary Works – Allowance		£50,000	£50,000	£10,000
	Indirect construction works cost total		**£5,630,689**	**£7,307,346**	**£805,841**
	Total Construction Cost		**£16,240,364**	**£21,104,581**	**£2,309,341**

Ref	Estimate Breakdown		North Option	Central Option	Car Parking
3	**Design, Project Management and Other Project Costs**		**Value (£)**	**Value (£)**	**Value (£)**
3.01	Design	15%	£2,436,055	£3,165,687	£346,401
3.02	Project Management	12%	£1,948,844	£2,532,550	£277,121
3.03	TOC PMO Costs (Assumed 24		£48,000	£48,000	
3.04	TOC Compensation	0.5%	£53,048	£68,986	
3.05	NR BAPA		£150,000.00	£150,000.00	
3.06	NR APA Costs	7.5%	£795,726	£1,034,793	
3.07	Network Rail Fee Fund	10%	£79,573	£103,479	
3.08	Network Rail Industry Risk Fund	2%	£419,118	£543,466	
3.09	Surveys and Assessments – Allowance		£20,000	£20,000	£20,000
	Design, Project Management and other project cost total		**£5,950,363**	**£7,666,960**	**£643,522**
	Base Cost Estimate		**£22,190,727**	**£28,771,541**	**£2,952,863**
4	**Risk**		**Value (£)**	**Value (£)**	**Value (£)**
4.01	Risk - Allowance	60%	£13,314,436	£17,262,925	£1,771,718
5	**Land**		**Value (£)**	**Value (£)**	**Value (£)**
5.01	Land Costs - Excluded		Excluded	Excluded	Excluded
	LAND COST TOTAL		**£0**	**£0**	**£0**
	Anticipated Final Cost (excluding Inflation)		**£35,505,163**	**£46,034,466**	**£4,724,581**

Assumptions – 17/02/2022

Project Generally Assumptions

1. Base date is 1Q22
2. No environmental work is required (e.g. treatment of Japanese knotweed, protection to species etc.) in absence of an Environmental Assessment
3. No allowance for environmental application costs, highway application costs
4. No allowance for noise and vibration
5. Works based on continuous working
6. No allowance for ground stabilisation
7. No underground services or utilities require diversion
8. Site does not require levelling other than for the car park access road
9. North and South Options include for a 5 m wide access road which will connect to Swynnerton Road (approx. 100 m long for North option and 1000 m long for Central Option)
10. North and South Options also include for a 100m2 drop off/turning circle area outside the station
11. Car Parking for 250 spaces is calculated separately as an "add-on" option
12. Excavated material will be disposed off site, there may be an opportunity in the future to re-use some excavated material as fill

Car Park

1. Car park size is assumed to be 6500 m2
2. 10 nr trees require removal
3. Car park power and telecoms systems will connect to the station telecoms and power
4. 14 nr EVC points are required to the car park

North Site

1. 2 piled crosswall and plank flanking platforms 250m long and 3.5m wide are required.
2. 1 central island platform will be 250m long and 9m wide. Assume piled foundations and modular construction
3. Track slew of Slow lines approx. 200m each side of station plus 250m for station – say 650m of new track x 2
4. Site clearance is 650m long x 15m wide, assume line is at grade
5. Removal of 13no. OLE 4-track portals is required
6. 26 nr new 2-track portals are required

7. 2 single post signals require relocation laterally to new site at same mileage
8. 4 no. banner repeater signals and SPTs are required
9. Relocation of 3no. lineside location cases laterally to allow track slew.
10. 650 m of existing lineside cabling will be removed and replaced with new, 700 m x 10 nr new 48-pair cables and 700 m x 3 nr new fibre optic cables are required to replace
11. Move east side cable route into platform duct - assume sufficient slack in cable for this
12. Provide soakaways for platform drainage on each side and cross-track drains from island platform
13. 2 nr new location cases are required at each end of the 650m new cable section so they can do “plug and play”.
14. 50 nr piles are required to each facing platform and 50 nr to the central platform
15. 650m of new track drainage is required
16. 4 nr new catchpits are required to the track drainage
17. No station building is required
18. An allowance of £50,000 has been included for a new power supply
19. 2 nr help points are required to each facing and island platform
20. 4 nr TVM's are required
21. 10 nr CCTV cameras are required to each facing platform and 15 nr to the island platform
22. 4 nr CIS and 1 nr SOD screens are required to each platform
23. 12 nr piles are required to the footbridge
24. 3 lifts and 3 stairs are required to the footbridge
25. Drop off area and turning circle costs are included but car parking is covered in the Car Parking section
26. No telecoms equipment are required to the footbridge other than 4 nr CCTV cameras
27. 12 nr PA speakers are required to each facing platform and 15 nr to the island platform
28. 3 nr ramp accesses are required to the West facing platform

Access Road for North Site

1. An access road is required and is 100m long x 5 m wide
2. 20 nr trees require removal
3. 90% of excavated material is inert, 10% is contaminated non-hazardous

4. Gullies and manholes to access road drainage are at 30 m centres
5. A petrol interceptor is required
6. New drainage will drain into existing highway drainage
7. 12 nr single head lighting columns are required to the access road and drop off area
8. Station car park costs are calculated on a cost per space which includes surfacing, kerbing, lighting, telecoms, landscaping and drainage
9. A new cycle shelter is required
10. Access road connects to Swynnerton Road, no signalised junction is required
11. A drop off area of approximately 100m2 is required

Central Site

1. 2 piled crosswall and plank flanking platforms 250m long and 3.5m wide are required.
2. 1 central island platform will be 250m long and 9m wide. Assume piled foundations and modular construction
3. Track slew of Slow lines approx. 200m each side of station plus 250m for station – say 650m of new track x 2
4. Site clearance is 650m long x 15m wide, assume line is at grade
5. Removal of 13no. OLE 4-track portals is required
6. 26 nr new 2-track portals are required
7. Existing private road bridge over 4 tracks will be demolished and rebuilt to span approximately 5 track distance (as tracks are diverging before platform)
8. Remove 13no. OLE 4-track portals
9. Relocation of 3no. lineside location cases laterally to allow track slew.
10. 650 m of existing lineside cabling will be removed and replaced with new, 700 m x 10 nr new 48-pair cables and 700 m x 3 nr new fibre optic cables are required to replace
11. Move east side cable route into platform duct - assume sufficient slack in cable for this
12. Provide soakaways for platform drainage on each side and cross-track drains from island platform
13. 2 nr new location cases are required at each end of the 650m new cable section so they can do “plug and play”.
14. 50 nr piles are required to each facing platform and 50 nr to the central platform
15. 650m of new track drainage is required

16. 4 nr new catchpits are required to the track drainage
17. No station building is required
18. An allowance of £50,000 has been included for a new power supply
19. 2 nr help points are required to each facing and island platform
20. 4 nr TVM's are required
21. 10 nr CCTV cameras are required to each facing platform and 15 nr to the island platform
22. 4 nr CIS and 1 nr SOD screens are required to each platform
23. 12 nr piles are required to the footbridge
24. 3 lifts and 3 stairs are required to the footbridge
25. Drop off area and turning circle costs are included but car parking is covered in the Car Parking section
26. No telecoms equipment are required to the footbridge other than 4 nr CCTV cameras
27. 12 nr PA speakers are required to each facing platform and 15 nr to the island platform
28. 3 nr ramp accesses are required to the West facing platform
29. Remove 2no 4-track signal gantries and replace with 4no. two track gantries or cantilevers at same location
30. Move 4no. SPTs to new posts on platforms
31. 3 m deep x 3.5 m wide excavation is required to both sides of the cuttings for the new platforms
32. A 3 m high gravity retaining wall is required to the back of the platforms

Access Road for North Site

1. An access road is required and is 1000m long x 5 m wide
2. 20 nr trees require removal
3. 90% of excavated material is inert, 10% is contaminated non-hazardous
4. Gullies and manholes to access road drainage are at 30 m centres
5. A petrol interceptor is required
6. New drainage will drain into existing highway drainage
7. 70 nr single head lighting columns are required to the access road and drop off area
8. Station car park costs are calculated on a cost per space which includes surfacing, kerbing, lighting, telecoms, landscaping and drainage
9. A new cycle shelter is required

10. Access road connects to Swynnerton Road, no signalised junction is required
11. A drop off area of approximately 100m2 is required
12. An allowance for works to the private road crossing is included

Exclusions

1. Excludes VAT
2. Excludes 3rd party compensation charges
3. Excludes planning and approval charges
4. Costs associated with Statutory Fees (e.g. HMRI, Local Authority, etc.)
5. Costs associated with taxes and levies, including VAT
6. Costs associated with licences and all associated costs and fees
7. Costs associated with changes in legislation and any form of applicable standards
8. Costs associated with changes in regulation and interpretation covering discriminatory, specific and general issues that may lead to design and cost changes
9. Costs associated with ground investigation
10. Allowances for adverse ground conditions / provisions for ground stabilisation unless specifically identified
11. Costs associated with phasing of works
12. Inflation
13. Costs associated with remediation works to mine workings
14. Costs in relation to any interfaces with other Projects
15. Client's costs and legal costs for Level Crossing Consent Order, Compulsory Purchase Order, Planning Consent and other statutory powers
16. Land costs
17. Any highway works to the general road network to take additional traffic as a result of the new car park

Sources of Information

Google maps
Meecebrook station site options overview
Summary of works at Meecebrook

North Option

Group Element 1.01: Signalling

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
01			**Signalling Systems**				
	04		**Signals and indicators**				
		01	Banner repeaters	4	nr	5 ,000	20,000.00
	08		**Cables and containment**				
		01	New 48 pair cabling	7,000	m	15	105,000.00
		01	New fibre optic cabling	2,100	m	15	31,500.00
		01	Slewing existing cabling into platform ducting	250	m	8	2,000.00
	10		**Equipment Housing**				
		09	Location cases at end of cable run slew	2	nr	10,000	20,000.00
	16		**Abandonment and recovery of redundant equipment**				
		08	Removal of lineside cabling	650	m	10	6,500.00
		08	Relocation of troughing route to East side	250	m	10	2,500.00
		08	Relocation of troughing route to West side	650	m	10	6,500.00
		09	Relocation of single post signals	2	nr	5,000	10,000.00
		10	Relocation of Location cases	3	nr	10,000	30,000.00
			Carried Forward				**£234,000.00**

Group Element 1.02: Train Power Systems

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
02			**Overhead Line Equipment**				
	02		**OLE Support Structures**				
		01	New 2 track portals	26	nr	25,000	650,000.00
	08		**Abandonment and recovery of redundant equipment**				
		09	Removal of 4 track OLE portals	13	nr	5 ,000	65,000.00
			Carried Forward				**£715,000.00**

Group Element 1.03: Power and Plant

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
02			**Primary Power Supply**				
	02		**DNO Substation**				
		01	For new platforms	1	Sum	50,000	50,000.00
			Carried Forward				**£ 50,000.00**

Group Element 1.04: Permanent Way

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
01			**Plain Line**				
	01		**Track bed**				
		01	Ballast	1,950	m3	50,000	97,500.00
	02		**Track**				
		01	New track and sleepers	1,300	m	800.00	1,040,000.00
	04		**Tamping**				
		01	To new track	1	Sum	1,500.00	1,500.00
	05		**Abandonment and recovery of old materials**				
		01	Removal of existing track; for new platforms	1,300	m	50.00	65,000.00
04			**Track Drainage**				
	01		**Pipework**				
		01	New track drainage pipe	650	m	150.00	97,500.00
	02		**Inspection chambers**				
		01	Catchpits	4	nr	2,000.00	8,000.00
			Carried Forward				**£1,309,500.00**

Group Element 1.05: Operational Telecoms Systems

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
01			**Information Transmission Systems**				
	09		**Cabinets**				
		09	Telecoms cabinet	1	Sum	40,000	40,000.00
02			**Telephone Systems**				
	01		**Telephone equipment**				
		09	Signal Post telephone to banner repeaters	4	nr	650	2,600.00
03			**Station Information and Surveillance Systems (SISS)**				
	02		**Customer Information Systems (CIS)**				
		03	Help points to facing platforms	4	nr	2,000.00	8,000.00
		03	Help points to island platforms	2	nr	2,000.00	4,000.00
		09	Ticket Vending Machines	4	nr	35,000.00	140,000.00
		09	PA speakers to facing platforms	24	nr	7,000.00	168,000.00
		09	PA speakers to island platform	15	nr	7,000.00	105,000.00
		09	CIS Screens to facing platforms	8	nr	7,000.00	56,000.00
		09	CIS Screens to island platform	4	nr	7,000.00	28,000.00
		09	SOD Screens to facing platforms	2	nr	9,000.00	18,000.00
		09	SOD Screens to island platform	1	nr	7,000.00	7,000.00
	03		**Closed Circuit Television (CCTV)**				
		01	CCTV cameras to facing platforms	20	nr	2,100.00	42,000.00
		01	CCTV cameras to island platforms	15	nr	2,100.00	31,500.00
		01	CCTV cameras to footbridge	4	nr	2,100.00	8,400.00

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
	04		**Cables and Containment**				
		01	Cables and ducts for telecoms equipment	1	Sum	150,000.00	150,000.00
	05		**Testing and Commissioning**				
		04	Commissioning and handover	1	Sum	121,275.00	121,275.00
			Carried Forward				**£929,775.00**

Group Element 1.06 Buildings

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
01			**Substructure**				
	01		**Piling**				
		01	Mobilisation and demobilisation of piling rig	1	Sum	30,000.00	30,000.00
		01	To facing platforms	100	nr	2,500.00	250,000.00
		01	To island platforms	50	nr	2,500.00	125,000.00
	04		**Stairs and ramps**				
		01	Ramp to platform from car park/drop off area	3	nr	10,000.00	30,000.00
		01	End of platform steps	6	nr	1,500.00	9,000.00
02			**Platforms**				
	01		**Crosswall and Plank**				
		01	Facing platforms	1,750	m2	800.00	1,400,000.00
	02		**Modular**				
		01	Island Platform	2,250	m2	1,200.00	2,700,000.00
04			**Fittings, Furnishings and Equipment**				
	01		**To platforms**				
		01	Benches to facing platforms	4	nr	150.00	600.00
		04	Benches to island platforms	4	nr	150.00	600.00
		01	Waiting shelters to facing platforms	2	nr	5,000.00	10,000.00
		01	Waiting shelters to island platforms	1	nr	5,000.00	5,000.00
		01	Signage to facing platforms	1	Sum	5,000.00	5,000.00
		01	Signage to island platforms	1	Sum	5,000.00	5,000.00
05			**Services**				
	08		**Electrical installations**				

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
		01	Lighting columns to facing platforms	40	nr	2,500.00	100,000.00
		01	Lighting columns to island platform	30	nr	2,500.00	75,000.00
		01	Cabling and containment to lighting columns on facing platforms	700	m	30.00	21,000.00
		01	Cabling and containment to lighting columns on island platform	400	m	30.00	12,000.00
06			**Footbridges**				
	01		**Foundations**				
		01	Piles	12	nr	2,500.00	30,000.00
	03		**Footbridge**				
		01	Footbridge	88	m2	4,500.00	393,750.00
	04		**Stairs**				
		01	Stairs to footbridge	3	nr	225,000.00	675,000.00
	05		**Lifts and conveyor installations**				
		01	Lifts to footbridge	3	nr	330,000.00	990,000.00
			Carried Forward				**£6,866,950.00**

Group Element 1.07 Civils Works

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
8			**Fencing and Railings**				
	01		**Fencing and railings**				
		01	New trackside fencing	700	m	150.00	105,000.00
		01	To back of facing platforms	500	m	150.00	75,000.00
9			**General Drainage**				
	01		**Surface water drainage**				
		01	Under track crossing for pipe drainage from Island platform	10	m	180.00	1,800.00
		02	Connection of platform drainage to drainage system	2	nr	4,000.00	8,000.00
	04		**French drains, rubble drains, ditches and trenches**				
		01	Soakaways to facing platforms	2	nr	5,000.00	10,000.00
			Carried Forward				**£199,800.00**

Group Element 1.08: Enabling Works

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
02			**Site Clearance and Preparation Works**				
	01		**Site Clearance**				
		01	General clearance	9,750	m2	5.00	48,750.00
		01	Removal of trackside fence	700	m	25.00	17,500.00
		01	Removal of trees	20	nr	250.00	5,000.00
			Carried Forward				**£ 71,250.00**

North Option Total	**£ 10,376,275.00**

Central Option

Group Element 1.01: Signalling

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
01			**Signalling Systems**				
	04		**Signals and indicators**				
		01	2 track signal gantries	4	nr	15,000	60,000.00
	08		**Cables and containment**				
		01	New 48 pair cabling	7,000	m	15	105,000.00
		01	New fibre optic cabling	2,100	m	15	31,500.00
		01	Slewing existing cabling into platform ducting	250	m	8	2,000.00
	10		**Equipment Housing**				
		09	Location cases at end of cable run slew	2	nr	10,000	20,000.00
	16		**Abandonment and recovery of redundant equipment**				
		08	Removal of lineside cabling	650	m	10	6,500.00
		08	Relocation of troughing route to East side	250	m	10	2,500.00
		08	Relocation of troughing route to West side	650	m	10	6,500.00
		09	Removal of 4 track siggnal gantires	4	nr	5 ,000	20,000.00
		10	Relocation of Location cases	3	nr	10,000	30,000.00
			Carried Forward				**£284,000.00**

Group Element 1.02: Train Power Systems

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
02			**Overhead Line Equipment**				
	02		**OLE Support Structures**				
		01	New 2 track portals	26	nr	25,000	650,000.00
	08		**Abandonment and recovery of redundant equipment**				
		09	Removal of 4 track OLE portals	13	nr	5,000	65,000.00
			Carried Forward				**£715,000.00**

Group Element 1.03: Power and Plant

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
01			**Primary Power Supply**				
	02		**DNO Substation**				
		01	For new platforms	1	Sum	50,000	50,000.00
			Carried Forward				**£ 50,000.00**

Group Element 1.04: Permanent Way

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
01			**Plain Line**				
	01		**Track bed**				
		01	Ballast	1,950	m3	50.00	97,500.00
	02		**Track**				
		01	New track and sleepers	1,300	m	800.00	1,040,000.00
	04		**Tamping**				
		01	To new track	1	Sum	1,500.00	1,500.00
	05		**Abandonment and recovery of old materials**				
		01	Removal of the existing track; for new platforms	1,300	m	50.00	65,000.00
04			**Track Drainage**				
	01		**Pipework**				
		01	New track drainage pipe	650	m	150.00	97,500.00
	02		**Inspection chambers**				
		01	Catchpits	4	nr	2,000.00	8,000.00
			Carried Forward				**£1,309,500.00**

Group Element 1.05: Operational Telecoms Systems

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
01			**Information Transmission Systems**				
	09		**Cabinets**				
		09	Telecoms cabinet	1	Sum	40,000	40,000.00
02			**Telephone Systems**				
	01		**Telephone equipment**				
		09	Move Signal Post telephones to platforms	4	nr	250	1,000.00
03			**Station Information and Surveillance Systems (SISS)**				
	02		**Customer Information Systems (CIS)**				
		03	Help points to facing platforms	4	nr	2,000.00	8,000.00
		03	Help points to island platforms	2	nr	2,000.00	4,000.00
		09	Ticket Vending Machines	4	nr	35,000.00	140,000.00
		09	PA speakers to facing platforms	24	nr	7,000.00	168,000.00
		09	PA speakers to island platform	15	nr	7,000.00	105,000.00
		09	CIS Screens to facing platforms	8	nr	7,000.00	56,000.00
		09	CIS Screens to island platform	4	nr	7,000.00	28,000.00
		09	SOD Screens to facing platforms	2	nr	9,000.00	18,000.00
		09	SOD Screens to island platform	1	nr	7,000.00	7,000.00
	03		**Closed Circuit Television (CCTV)**				
		01	CCTV cameras to facing platforms	20	nr	2,100.00	42,000.00
		01	CCTV cameras to island platforms	15	nr	2,100.00	31,500.00

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
		01	CCTV cameras to footbridge	4	nr	2,100.00	8,400.00
	04		**Cables and Containment**				
		01	Cables and ducts for telecoms equipment	1	Sum	150,000.00	150,000.00
	05		**Testing and Commissioning**				
		04	Commissioning and handover	1	Sum	121,035.00	121,035.00
			Carried Forward				**£ 927,935.00**

Group Element 1.06 Buildings

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
01			**Substructure**				
	01		**Piling**				
		01	Mobilisation and demobilisation of piling rig	1	Sum	30,000.00	30,000.00
		01	To facing platforms	100	nr	2,500.00	250,000.00
		01	To island platforms	50	nr	2,500.00	125,000.00
	04		**Stairs and ramps**				
		01	Ramp to platform from car park/drop off area	3	nr	10,000.00	30,000.00
		01	End of platform steps	6	Nr	1,500.00	9,000.00
02			**Platforms**				
	01		**Crosswall and Plank**				
		01	Facing platforms	1,750	m2	800.00	1,400,000.00
	02		**Modular**				
		01	Island Platform	2,250	m2	1,200.00	2,700,000.00
04			**Fittings, Furnishings and Equipment**				
	01		**To platforms**				
		01	Benches to facing platforms	4	Nr	150.00	600.00
		04	Benches to island platforms	4	nr	150.00	600.00
		01	Waiting shelters to facing platforms	2	nr	5,000.00	10,000.00
		01	Waiting shelters to island platforms	1	nr	5,000.00	5,000.00
		01	Signage to facing platforms	1	Sum	5,000.00	5,000.00
		01	Signage to island platforms	1	Sum	5,000.00	5,000.00
05			**Services**				
	08		**Electrical installations**				

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
		01	Lighting columns to facing platforms	40	nr	2,500.00	100,000.00
		01	Lighting columns to island platform	30	nr	2,500.00	75,000.00
		01	Cabling and containment to lighting columns on facing platforms	700	m	30.00	21,000.00
		01	Cabling and containment to lighting columns on island platform	400	m	30.00	12,000.00
06			**Footbridges**				
	01		**Foundations**				
		01	Piles	12	nr	2,500.00	30,000.00
	03		**Footbridge**				
		01	Footbridge	88	m2	4,500.00	393,750.00
	04		**Stairs**				
		01	Stairs to footbridge	3	nr	225,000.00	675,000.00
	05		**Lifts and conveyor installations**				
		01	Lifts to footbridge	3	nr	330,000.00	990,000.00
			Carried Forward				**£6,866,950.00**

Group Element 1.07 Civils Works

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
1			**Earthworks**				
	01		**Cutting**				
		01	Excavation for platforms	3,500	m3	7.00	24,500.00
		01	Disposal of excavated material; inert	3,150	m3	30.00	94,500.00
		01	Disposal of excavated material; contaminated non-hazardous	350	m3	150.00	52,500.00
05			**Bridges**				
	09		**New bridge**				
		01	New road bridge	125	m2	1,000.00	125,000.00
	09		**Abandonment and recovery of redundant equipment**				
		01	Removal of private road bridge	150	m2	4,000.00	600,000.00
07			**Retaining Walls**				
	09		**Gravity type**				
		01	To back of platforms	1,500	m2	550.00	825,000.00
8			**Fencing and Railings**				
	01		**Fencing and railings**				
		01	New trackside fencing	700	m	150.00	105,000.00
		01	To back of facing platforms	500	m	150.00	75,000.00
9			**General Drainage**				
	01		**Surface water drainage**				
		01	Under track crossing for pipe drainage from Island platform	10	m	180.00	1,800.00
		02	Connection of platform drainage to drainage system	2	nr	4,000.00	8,000.00
	04		**French drains, rubble drains, ditches and trenches**				

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
		01	Soakaways to facing platforms	2	nr	5,000.00	10,000.00
			Carried Forward				**£1,921,300.00**

Group Element 1.08: Enabling Works

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
02			**Site Clearance and Preparation Works**				
	01		**Site Clearance**				
		01	General clearance	9,750	m2	5.00	48,750.00
		01	Removal of trackside fence	700	m	25.00	17,500.00
		01	Removal of trees	20	nr	250.00	5,000.00
			Carried Forward				**£ 71,250.00**

Central Option Total	**£ 12,145,935.00**

North Option Access Road and Drop off

Group Element 1.07 Civil Engineering

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
1			**Earthworks**				
	01		**To access road**				
		01	Allowance for levelling ground for access road	600	m2	10.00	6,000.00
8			**Fencing**				
	01		**Fencing and railings**				
		01	Fence to new access road boundary	240	m	125.00	30,000.00
9			**General Drainage**				
	01		**Surface water drainage**				
		01	Pipes to new access road	110	m	180.00	19,800.00
		03	Gullies to drainage for access road	4	nr	650.00	2,600.00
		04	Manholes to drainage to access road	4	Nr	2,000.00	8,000.00
		05	Petrol interceptor to drainage to new access road	1	nr	2,500.00	2,500.00
		06	Connection of new drainage to existing drainage	1	nr	2,000.00	2,000.00
11			**Roads, Pavings and Hardstandings**				
	01		**Access road**				
		01	Excavation for surfacing to access road	550	m3	10.00	5,500.00
		01	Disposal of excavated material; inert	495	m3	30.00	14,850.00
		01	Disposal of excavated material; contaminated nonhazardous	55	m3	150.00	8,250.00
		03	New highway surfacing to access road	600	m2	80.00	48,000.00
		06	Kerbs to access road	240	m	25.00	6,000.00

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
		09	White lining to access road	1	Sum	500.00	500.00
	06		**Lighting systems**				
		01	Lighting columns; single head to access road	12	nr	2,000.00	24,000.00
		01	Duct and cabling to new lighting columns	150	m	150.00	22,500.00
		01	Connection of lighting to station power supply	1	Sum	5,000.00	5,000.00
	09		**Miscellaneous**				
		01	Signage to highways	4	nr	250.00	1,000.00
		02	Cycle shelter	1	Sum	20,000.00	20,000.00
			Carried Forward				**£226,500.00**

Group Element 1.08: Enabling Works

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
02			**Site Clearance and Preparation Works**				
	01		**Site Clearance**				
		01	General clearance for access road	600	m2	3.00	1,800.00
		01	Removal of trees	20	nr	250.00	5,000.00
		01	Removal of kerb to highway for access road connection	10	m	10.00	100.00
			Carried Forward				**£ 6,900.00**

North Option Access Road and Drop Off Total	**£ 233,400.00**

Group Element 1.07 Civil Engineering

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
1			**Earthworks**				
	01		To access road				
		01	Allowance for levelling ground for access road	5,100	m2	10.00	51,000.00
8			**Fencing**				
	01		**Fencing and railings**				
		01	Fence to new access road boundary	2,040	m	125.00	255,000.00
9			**General Drainage**				
	01		**Surface water drainage**				
		01	Pipes to new access road	1,010	m	180.00	181,800.00
		03	Gullies to drainage for access road	30	nr	650.00	19,500.00
		04	Manholes to drainage to access road	30	nr	2,000.00	60,000.00
		05	Petrol interceptor to drainage to new access road	1	nr	2,500.00	2,500.00
		06	Connection of new drainage to existing drainage	1	nr	2,000.00	2,000.00
11			**Roads, Pavings and Hardstandings**				
	01		**Access road**				
		01	Excavation for surfacing to access road	5,050	m3	10.00	50,500.00
		01	Disposal of excavated material; inert	4,545	m3	30.00	136,350.00
		01	Disposal of excavated material; contaminated nonhazardous	505	m3	150.00	75,750.00
		03	New highway surfacing to access road	5,100	m2	80.00	408,000.00
		06	Kerbs to access road	2,040	m	25.00	51,000.00

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
		09	White lining to access road	1	Sum	1,500.00	1,500.00
	06		**Lighting systems**				
		01	Lighting columns; single head to access road	70	nr	2,000.00	140,000.00
		01	Duct and cabling to new lighting columns	1,100	m	150.00	165,000.00
		01	Connection of lighting to station power supply	1	Sum	5,000.00	5,000.00
	09		**Miscellaneous**				
		01	Signage to highways	4	nr	250.00	1,000.00
		02	Cycle shelter	1	Sum	20,000.00	20,000.00
		02	Allowance for works to Private Road crossing	1	Sum	5,000.00	5,000.00
			Carried Forward				**£1,630,900.00**

Group Element 1.08: Enabling Works

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
02			**Site Clearance and Preparation Works**				
	01		**Site Clearance**				
		01	General clearance for access road	5,100	m2	3.00	15,300.00
		01	Removal of trees	20	nr	250.00	5,000.00
		01	Removal of kerb to highway for access road connection	10	m	10.00	100.00
			Carried Forward				**£ 20,400.00**

Central Option Access Road Total	**£ 1,651.300.00**

250 Space Car Parking

Group Element 1.07: Civil Engineering

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
11			**Roads, pavings and hardstandings**				
	01		**Access road and car park**				
		01	New car parking for 250 spaces	250	nr	5,500.00	1,375,000.00
	09		**Miscellaneous**				
		02	Duct and cabling to new charging points	150	m	150.00	22,500.00
		02	Electric vehicle charging points	14	nr	6,000.00	84,000.00
			Carried Forward				**£1,481,500.00**

Group Element 1.08: Enabling Works

E	SE	C	Description	Amount	Unit	Unit Cost	Cost
02			**Site Clearance and Preparation Works**				
	01		**Site Clearance**				
		01	General clearance for car park	6,500	m2	3.00	19,500.00
		01	Removal of trees	10	nr	250.00	2,500.00
			Carried Forward				**£22,000.00**

TOTAL	**£ 1,503,500.00**

28/02/2022
Meecebrook Station
Reference number GB01T21E91

Meecebrook Station Pre-Feasibility

SLC Rail SYSTRA

Meecebrook station

Meecebrook Pre-Feasibility Demand Forecasting

Identification Table

Client/Project owner	SLC Rail
Project	Meecebrook
Study	Meecebrook Station Pre-Feasibility
Type of document	Report
Date	28/02/2022
Reference number	GB01T21E91

Approval – Version 1

	Name	Position	Date	Modifications
Author	Liv Hockney	Principal Consultant	28/02/2022	
Checked by	James Jackson	Associate Director	28/02/2022	
Approved by	James Jackson	Associate Director	28/02/2022	

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1. Introduction

1.1.1 In early 2022, SYSTRA was appointed to support SLC Rail to undertake a pre-feasibility assessment of the viability of a new station to serve the new garden settlement of Meecebrook in Staffordshire. The station would be located on the West Coast Mainline between Stafford and Crewe stations.

1.1.2 SYSTRA were asked to undertake an initial market assessment to understand what level of demand would be required for the station to be viable and in turn identify if the Meecebrook settlement would be of sufficient size to support this. To achieve this we have generated an average 'benefit per trip' based on revenue and marginal external costs. Then, using cost information provided by SLC Rail, we have estimated how many passengers would be required to generate a Benefit Cost Ratio of 1.00, 1.50 and 2.00. This represents a top down approach to considering the station and has been developed to understand the order of magnitude of benefits and costs of the station with a view to understanding if a more detailed feasibility study should be completed.

1.1.3 The following sections present our approach to this pre-feasibility work.

2. Calculation of Benefits

2.1.1 Our calculation of benefits has been developed in two parts: revenue generated per trip and marginal external cost savings per trip. The sections below discuss how these have been calculated. All calculations have been based on publicly available information, future work would ideally be based on data provided by rail operators and supported by datasets such as the National Rail Travel Survey (NRTS).

2.2 Trip distribution

2.2.1 Given that the proposed station is to be located between Stafford and Crewe and there are no other smaller stations between these two destinations, there is no suitable proxy to be used for trip distribution. Therefore a two-stage approach was undertaken as outlined below:

1. Estimate percentage of external (outside of West Midlands trips) based on rail mode Census travel to work distribution from Stone station
2. Estimate distribution of local trips (within the West Midlands) based on Census travel to work data for car

External trip distribution

2.2.2 To estimate the percentage of external trips, method of travel to work data by rail was acquired for Stone. This used the MSOAs representing the town of Stone as the 'usual residence' and all government office regions as the destination workplace. The results of this are presented below.

Table 1 - Stone regional distribution (Census 2011 – Method of Travel to Work)

REGION	% DISTRIBUTION
West Midlands	71%
North West	14%
London	7%
South East	4%
East Midlands	2%
South West	1%
North East	0%
Yorkshire and The Humber	0%
East	0%

2.2.3 It was assumed, for this early stage of work, that the external distribution percentages for Meecebrook station would match Stone. With 29% of trips being made outside of the West Midlands.

Local trip distribution

2.2.4 The distribution of local trips was also estimated based on Census Travel to Work data for 2011 for those travelling by car. In this case, the MSOA in which the station will be located (Stafford 005) was selected as the 'usual residence' (origin). The destinations selected were all Local Authorities in England and Wales.

2.2.5 From this list the top 10 destinations which could reasonably use Meecebrook station were taken forward to be used in the trip distribution. This meant that destinations such as Stoke, which form a considerable amount of car demand, were removed as the rail journey time from Meecebrook to Stoke by rail would not be attractive.

2.2.6 The distribution of local trips, allocated to the remaining 71% of demand after the 29% external trips are excluded, is given below

Table 2 - Estimated local distribution based on Census Travel to Work data for Stafford 005.

LOCAL AUTHORITY	% DISTRIBUTION
Stafford	54%
South Staffordshire	2%
Cannock Chase	2%
Wolverhampton	2%
Shropshire	3%
Cheshire East	2%
Birmingham	1%
Lichfield	1%
Tamworth	0%
Coventry	0%
Other West Midlands	4%
TOTAL	**71%**

2.2.7 The trip distribution is dominated by trips to Stafford, in practice is likely that there would be more movements towards Birmingham and Wolverhampton, but this provides us with a robust assessment at this stage as yields to Stafford will be comparatively low.

2.3 Revenue

2.3.1 To estimate an average revenue per passenger a rail station proxy was chosen for each of the regions in Table 1 and each of the local authorities in Table 2. Fares between Stone and each of the proxy stations were then extracted from BR Fares.

The estimated average fare per passenger used in the analysis is £10.70. This relatively high average is dominated by the longer distance trips outside the West Midlands area.

2.3.2 All values were inflated using values from TAG Table A5.3.1, then deflated to 2010 prices using the GDP deflator values from the TAG databook.

2.4 Marginal External Costs of Congestion

2.4.1 Marginal external cost savings were calculated using the same station proxies as the revenue calculation. An average diversion factor of 30% was used to estimate the proportion of people expected to transfer from car to rail. Marginal external cost values were acquired from TAG Table A5.4.2 Marginal External Costs and Indirect Tax – core scenario. A weighted average for all road types forecast to 2050 was applied. It is predicted that an **average of £3.84 will be saved per trip.**

2.5 Exclusions

2.5.1 Given the pre-feasibility nature of this work a number of impacts have been excluded as outlined below:

- There has been no calculation of the impact on existing passengers as a result of the station call, the addition of these impacts will bring a dis-benefit to the case for the station
- We have assumed no benefit / disbenefit associated with abstraction given the primary purpose of the station is to serve a new development
- When estimating the number of passengers predicted to be required for the station to be viable, we have not considered background growth and instead assumed a flat profile of station demand. Inclusion of background growth would further improve the case for the station
- We have not considered the long term impacts of COVID-19 as this would require detailed work on background growth.

3. Present Value of Costs

3.1.1 The sections below describe how the present value of operating and capital costs have been derived.

3.2 Capital costs

3.2.1 Capital cost estimates were provided by SLC Rail. This included the 'North Option' with a base cost of £22.19m plus an optional 250 space car park of £2.95m. The table below outlines how these costs were processed to calculate a PVC.

Table 3 - PVC Calculation

	NORTH OPTION	CAR PARK	NORTH OPTION + CAR PARK
Base cost	£22.19m	£2.95m	£25.14m
Optimism Bias	£37.72m	£5.02m	£42.74m
Market Price Conversion	£44.89m	£5.97m	£50.86m
Deflate to 2010	£35.19m	£4.68m	£39.87m
Discounted	£23.29m	£3.10m	£26.39m

3.3 Operating costs

3.3.1 Our estimate of operating costs is based on costs for a station of similar size and characteristics. We have estimated the Present Value of Costs to be £9.5m over 60 years.

3.3.2 This results in a total PVC of £32.79m without the car park and £35.89m with the car park.

4. Results

4.1.1 All of the costs and benefits referenced above were appraised over 60 years following TAG guidance, including using appropriate discount rates.

4.1.2 As referenced previously, the overall aim of this work was to estimate the number of trips required to generate low, medium and high value for money. For ease of interpretation this has been presented in three ways:

- An annual demand value
- A daily demand value (assuming an annualisation factor of 312)
- A trip rate per person per year*

*The trip rate presented is based on the assumption that all demand for the station will be generated by the Meecebrook development. This has been calculated by dividing the annual demand by the predicted population. The estimated population of the development is 15,000 people (based on 6,000 homes with an average occupancy of 2.5 people per household). The trip rates presented are the number of trips per person per year.

4.1.3 The results for the **North Option** costs are summarised below.

Table 4 - Estimated demand requirements (North Option – no car park)

	BCR 1.00 (LOW VFM)	BCR 1.50 (MEDIUM VFM)	BCR 2.00 (HIGH VFM)
Annual patronage	124,500	187,000	249,000
Daily patronage	399	599	798
Average trip rate per person	8.30	12.47	16.6

4.1.4 The results for the North Option with the car park are summarised below.

Table 5 - Estimated demand requirements (North Option – no car park)

	BCR 1.00 (LOW VFM)	BCR 1.50 (MEDIUM VFM)	BCR 2.00 (HIGH VFM)
Annual patronage	136,500	204,500	272,500
Daily patronage	438	655	873
Average trip rate per person	9.10	13.63	18.17

*It should be noted that if a car park was included then it would be expected that a proportion of the trips at the station would be generated outside of the

development. However, without additional analysis it is not known that the extent of this catchment would be and therefore not possible to estimate a trip rate.

4.2 Benchmarking

4.2.1 To contextualise these results, an assessment has been undertaken for West Midlands stations of a similar size or locality to the demand estimates outlines above. For simplicity the trip rate for these stations assumes that all station demand has been generated by the town in which the station is located (e.g. all of Stone's rail demand is assumed to be generated by the town of Stone). In reality at some of these stations a proportion of demand may be expected to originate outside of this local station catchment.

4.2.2 Stations were chosen with an annual usage between 150,000 – 250,000 which were located in the West Midlands and had a clearly defined Census 'Built up Area'.

Table 6 - Benchmarking (ORR Station Usage 2019/20 and Census population estimates)

STATION	ANNUAL TRIPS	DAILY TRIPS	POPULATION*	TRIP RATE
Meecebrook	**187,000****	**599**	**15,000**	**12.47**
Alvechurch	179,964	577	3,906	46.07
Atherstone	151,174	485	12,152	12.44
Cannock	197,732	634	89,656	2.21
Evesham	245,990	788	28,701	8.57
Gobowen	218,970	702	3,390	64.59
Kenilworth	211,896	679	21,532	9.84
Ledbury	218,858	701	9,025	24.25
Leominster	243,770	781	11,623	20.97
Rugeley Trent Valley	176,120	564	24,765	7.11
Shenstone	178,698	573	2,234	79.99
Shifnal	206,674	662	7,946	26.01
Stone (Staffs)	184,500	591	17,011	10.85
Uttoxeter	165,784	531	13,668	12.13

*Census population forecasts by 'Built up Area' – 2020

**North Option, no car park, medium VfM

4.2.3 The table above shows considerable variation in trip rates, but that a number of stations including Stone, Uttoxeter, Atherstone and Kenilworth share similar trip rates to those estimated for Meecebrook. Stone and Atherstone are both of

relevance as they share similar services to those which will call at Meecebrook, with London North Western services either to Birmingham or London.

5. Summary

5.1.1 This summary note has provided a pre-feasibility assessment of the demand case for a station at Meecebrook. Based on our approach, which contains a number of caveats described above we conclude the following:

- The level of demand required to achieve a BCR of 1.50 or 2.00 appears to be proportionate to the estimate population of 15,000 when Meecebrook is fully built out
- More work is required to understand the impact on existing rail users (which is sensitive to train service specification). The impact on demand options with a BCR of 1.50 or 2.00 would be likely to still allow a BCR above 1.00 to be achieved.
- The trip rates required to achieve a BCR of 1.50 are comparable to other similar stations in the area

5.1.2 Overall the work would suggest that from an economic appraisal perspective the proposed station should be considered for further detailed examination.

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