



Melton Borough Council and Charnwood
Borough Council

RESTORING YOUR RAILWAYS MELTON TO NOTTINGHAM

Economic Appraisal Addendum Report





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APPRAISAL SUMMARY TABLES

1 INTRODUCTION

1.1 BACKGROUND

- 1.1.1. WSP was commissioned by Melton Borough Council and Charnwood Borough Council to undertake a Strategic Outline Business Case (SOBC) for the RYR121 Melton to Nottingham Connectivity Study. This Economic Appraisal Report (EAR) supports the development of the SOBC for investment in enhanced connectivity between Melton Mowbray, Melton Borough and Nottingham.
- 1.1.2. The Transport Connectivity Study carried out for Melton Borough Council by WSP in 2019 undertook a sifting process to identify favourable options. Through the sifting process, four potential Do Something scenarios were identified. These were:
- Highway Improvements to the A6006 corridor;
 - Highway and Bus Frequency Improvements to the A606 corridor;
 - Direct Rail Service between Melton Mowbray and Nottingham via Syston Curve and Loughborough; and
 - Rail Service to Edwalton linked with a NET extension.
- 1.1.3. The four options were run through the Leicester and Leicestershire Integrated Transport Model (LLITM) and compared against a Do Minimum option. Outputs from LLITM were used to appraise the scheme using Wider Impacts in Transport Appraisal (WITA) methodology.
- 1.1.4. The best performing option, both in terms of Public Transport metrics and WITA, was a direct rail service between Melton Mowbray and Nottingham via the Syston Curve and Loughborough.
- 1.1.5. In March 2020, DfT announced the 'Restoring Your Railway' fund. This EAR is part of the application to the Restoring Your Railways Ideas Fund to secure DfT and Network Rail support for this concept which has been further developed with additional rail connectivity options identified for inclusion in the economic appraisal.

1.2 ADDENDUM TO ECONOMIC APPRAISAL

- 1.2.1. Option 9 was identified by the Economic Appraisal Report as the preferred option. Firstly, Option 9 produced the best economic performance of three options offering a direct connection between Melton and Nottingham. Secondly, Option 9 was the option best aligned with the Scheme strategic objectives, as reported in the Option Assessment Report. As such, it was selected as the preferred option to take forward.
- 1.2.2. An additional stage of the economic evaluation was undertaken to enhance Option 9. An opportunity arose to consider an enhancement of the Option 9 timetable operated and a reduction in the capital cost requirement. The timetable was enhanced from a 6-hour operating period to a 12-hour operating period. A capital cost reduction was identified by removing the cost of an eighth platform at Nottingham which is considered a strategic rail investment benefitting a range of rail interventions in the area and not only the Melton to Nottingham connectivity enhancement.
- 1.2.3. This Addendum to the Economic Appraisal Report sets out the appraisal results for this enhancement of Option 9 described as 'Option 9 Enhanced'.



1.2.4. The Addendum structure follows that of the Economic Appraisal Report. After this Introduction the structure is as follow:

- Appraisal results;
- Sensitivity tests;
- Appraisal Summary Table;
- Value for Money assessment; and
- Conclusions.

2 RESULTS

2.1 INTRODUCTION

- 2.1.1. This chapter describes the benefits, appraisal impacts and capital and operating costs for the Option 9 Enhanced. All values are reported in 2010 prices and present values are used for comparing costs and benefits of the scheme in order to present the benefit-cost ratio (BCR) and value for money (VfM) of the scheme.
- 2.1.2. The outputs of the benefits assessment have been converted into a Present Value Benefit for a 60-year appraisal period, based on the standard parameters provided in TAG and the scheme assumptions presented in Table 2.1.

Table 2-1 – Economic Appraisal Parameters and Assumptions

Criteria	Assumption	Source
Opening Year	2026	Assumption in advance of further scheme development
Base Year	2010	DfT Base Year
Appraisal Years	60 years of benefits	HMT's Green Book
Value of Time (2010)	Rail users – Business: 17.69 £/hr Rail users – Commute: 9.95 £/hr Rail users – Other: 4.54 £/hr	TAG unit A1.3.1, July 2020
Marginal External Costs	Inner and outer conurbations, A roads	TAG unit A5.4, July 2020
Journey purpose split	Rail users – Commute: 26.27% Rail users – Business: 11.19% Rail users – Other: 62.55%	TAG unit A5.3.2, July 2020
Benefits growth	Value of time growth	TAG Annual Parameters, July 2020
Revenue growth	RPI (deflated by GDP deflator)	TAG unit A5.3.1, July 2020
Build-up rate	100% 2026	No build up is assumed as it is an enhancement to an existing service
Demand growth	1.25% average annual growth between 2026/27-2040/41	Based on PDFH elasticity-based forecasting Demand growth in line with general population growth thereafter (A5-3)
Discount Rate	3.5% 0-30 years 3.0% 31-75 years	HMT's Green Book
Market Price adjustment	19%	TAG unit A1.3.1, July 2020

2.2 MOIRA FORECASTS

- 2.2.1. Existing passengers on the rail network will experience a service enhancement as a result of the implementation of Option 9. An overall assessment of the top 5 revenue flows for Option 9 Enhanced is presented in this section. These changes reflect the impact of GJT changes from the extension of the timetable operational period from 6 hours to 12 hours. Table 2-2 shows the Option 9 top revenue flows whilst Table 2-3 shows the Option 9 Enhanced top revenue flows.
- 2.2.2. Option 9 MOIRA revenue and journey forecasts show that all five of the top revenue flows represent increases in rail demand between Oakham, Stamford and Peterborough and from Oakham and Stamford to London. Although not in the top five flows impacted by the improved connectivity for this service, Melton also benefits from the improved connectivity to Nottingham and the improved regional connectivity to the east towards Peterborough. Being on the East Coast Main Line,

Peterborough will offer potential onward journeys to Cambridge and Stansted, although there are potential capacity challenges at Ely Junction to be addressed.

- 2.2.3. Option 9 Enhanced MOIRA revenue and journey forecasts are shown in Table 2-3. As can be seen the top revenue flows reflect improved regional connectivity between Peterborough, Stamford, Oakham and Peterborough. It should be highlighted that a significant change in journeys is shown for the Beeston to Nottingham flow of 23,000 journeys, although as a low yield flow it is only the eleventh highest revenue flow. This demonstrates the service’s potential contribution to improved local connectivity.

Table 2-2 – Option 9: Top 5 Flows: Increased Revenue & Journeys

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Table 2-3 – Option 9 Enhanced: Top 5 Flows: Increased Revenue & Journeys

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2.3 RAIL USERS JOURNEY TIME BENEFITS

- 2.3.1. The change in Generalised Journey Time (GJT) as a result of the connectivity enhancements for key Melton bidirectional flows is shown in Table 2-4. Option 9 Enhanced results in an increase in GJT savings ranging between 17 and 58 minutes. As the Option 9 Enhanced timetable is for a 12-hour operating period the time saving benefits of the direct connection are extended to a greater number of passengers. The average time savings are very significant. The Melton to Nottingham and Melton to Loughborough flows shows a GJT reduction of over 40% compared to the Do-Minimum.

Table 2-4 Change in Generalised Journey Times

Bidirectional Flow	Do-Min GJT (mins)	Run GJT (mins)	Difference (mins)	% change
Option 9				
Melton - Nottingham	142	120	22	(15.25%)
Melton – Loughborough	110	89	11	(18.44%)
Melton – Peterborough	84	79	5	(6.68%)
Option 9 Enhanced				
Melton - Nottingham	142	84	58	(41.01%)

Melton – Loughborough	110	57	52	(47.65%)
Melton – Peterborough	84	67	17	(20.01%)

2.3.2. Table 2-5 details the annual demand impact and the change in annual total value of time impact by ticket type for Option 9 and Option 9 Enhanced. The enhance timetable results in a significant increase in numbers of annual passenger journeys from 58,000 to 204,000.

Table 2-5: Changes in Annual Demand Compared with the Do-Minimum

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2.3.3. Using steady state demand from MOIRA and rail demand forecasting principles presented in TAG Unit A5.4, the total value of time is calculated and appraised across a 60-year period and discounted and deflated and presented in Table 2-6 in 2010 values and prices for all options. Existing passengers benefit from the full value of time saving (Rail Mode), whilst the rule of a half is applied to the new users as outlined in TAG Unit A1.3. Option 9 Enhanced provides over three times more journey time savings as the 12-hour period of operation provides an improved train service to a greater number of passengers.

Table 2-6 - Journey time benefits for new and existing rail users (£000s)

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2.4 DECONGESTION AND ENVIRONMENTAL BENEFITS

2.4.1. The journey time savings and service connectivity for stations between Melton and Nottingham would result in a modal shift to rail, which has been calculated using outputs from MOIRA. These calculations show that the Melton-Nottingham rail corridor network and service enhancements will reduce car-kilometres by 58 million for Option 9. Option 9 Enhanced will result in a greater reduction in car-kilometres of 184.3 million over the 60-year appraisal period. This reflects more modal switch to rail as a result of the enhanced level of service.

2.4.2. The decongestion benefits are monetised using a marginal external cost (MEC) approach, using values provided in TAG.

2.4.3. The MEC results provide significant decongestion and environmental benefits to society compared to the Do-Minimum are broken down in Table 2-7.

Table 2-7 - Decarbonisation and environmental benefits in 2010 Prices and Values (£s)

	Change Compared to Do-Minimum
--	--------------------------------------

	Option 9	Option 9 Enhanced
Car-kms removed during appraisal period	58,504,046	184,248,346
Congestion	4,305,892	13,560,659
Accident	809,702	2,550,015
Local Air Quality	87,300	274,937
Noise	53,980	170,001
Greenhouse Gases	174,588	549,833
Indirect Taxation	(233,934)	(736,734)
TOTAL	5,224,518	16,453,712

2.5 REVENUE IMPACTS

- 2.5.1. This section sets out the revenue impacts for each of the options. Table 2-8 shows the incremental change in annual revenue compared with the Do Minimum.
- 2.5.2. The total revenue impact is reported as a negative cost of the scheme given it will return to the public accounts as a result of the rail franchise. Revenues were converted to 2010 prices and values across the lifespan of the scheme (60-year period).
- 2.5.3. The greater the extent of regional connectivity enhancement the larger the increase in revenues compared to the baseline. Option 9 shows a revenue impact of an additional [Redacted] in the base year, whilst Option 9 Enhanced shows a revenue impact of an additional [Redacted] in the base year.

Table 2-8 - Annual Revenue Impact

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2.6 COSTS

- 2.6.1. A Costs Report was produced by WSP in support of the Strategic Outline Business Case (SOBC) supporting investment in transport improvements between Melton Mowbray, Loughborough and Nottingham. This report provides the Option 9 cost estimates used in this appraisal. The Costs Report sets out the potential infrastructure interventions to deliver the indicative train service specification (ITSS) for the short-listed options. An assessment was also made of the operating costs for Option 9 and Option 9 Enhanced.

Capital Cost Estimate

- 2.6.2. Capital costs are construction costs, land costs, preparation costs (planning and designing the scheme) and supervision costs during the scheme construction.

- 2.6.3. The approach to capital costs was to use existing estimates where available to build-up costs. If this data was unavailable other schemes have been used as a benchmark. Given the early stage of work, a high-level lower and upper cost range was produced for each intervention and a median value produced for input into the appraisal.
- 2.6.4. Table 2-9 shows costs in pounds sterling in Q2, 2021 prices with rates derived from in-house data from previous schemes and industry recognised sources. The indirect costs have been assessed on a percentage basis of the direct costs in accordance with the GRIP level of detail. Client costs have also been assessed on a percentage basis of the direct costs in accordance with the GRIP level of detail. Risk is included at 30% and Optimism Bias is included at 60%.

Table 2-9 – Capital Cost Estimates, Q2 2021 prices

	Rationale	Lower (£m)	Upper (£m)
Loughborough 4th Platform	Enables southbound slow line trains to stop at Loughborough	4.20	6.30
Nottingham 8th Platform	To offer extra capacity and flexibility within the station	4.20	6.30
Total		8.40	12.60

- 2.6.5. The capital cost totals for Option 9 Enhanced excluding the eighth platform at Nottingham are shown in Table 2.10.

Table 2-10 – Capital Cost Totals by Option (£m, Q2 2021 prices)

Option	Description	Lower Capex Estimate (£m)	Upper Capex Estimate (£m)	Median Capex Estimate (£m)
9	Do-Minimum plus an extra tph between Nottingham and Peterborough semi-fast	8.40	12.60	10.50
9 Enhanced	Excl. Notts 8 th platform	4.20	6.30	5.25

- 2.6.6. It is important to note that while combinations of the infrastructure interventions may be required for the connectivity enhancement, they may also address existing wider capacity and infrastructure

issues for the rail network in the region. The attribution of these costs to separate schemes will be considered at the next stage.

- 2.6.7. An indicative spend profile applied in the appraisal is shown in Table 2-11. The spend profile assumption is 2% spend in Year 1, 8% spend in Year 2, 8% spend in Year 3 and 82% spend in Year 4. The opening year is assumed to be 2026.

Table 2-11 – Indicative Spend Profile (£m, 2Q 2021)

			GRIP 1-2	GRIP 3-4	GRIP 5	GRIP 6-7
Option	Description	Median Capex Estimate £m	Year 1	Year 2	Year 3	Year 4
9	Do-Minimum plus an extra tph between Nottingham and Peterborough semi-fast	10.50	0.210	0.840	0.840	8.610
9 Enhanced	Excl. Notts 8 th platform	5.25	0.105	0.420	0.420	4.305

Operating Costs

- 2.6.8. Operating costs and maintenance costs are the cost of people, machinery and materials required to maintain the rail infrastructure and the new rail services.
- 2.6.9. A unit operating cost of £10 per vehicle-mile has been assumed for operating costs. This is based on professional judgment. This cost is a notional figure for a diesel multiple unit of the type which currently operates on these routes. This unit cost rate covers the approximate cost of leasing, track access, fuel, staff costs and maintenance and is a reasonable assumption, considering the early stage of scheme development. The mileage for each option was extracted from MOIRA. The indicative operating costs for Option 9 and Option 9 Enhanced are shown in Table 2-12. The additional train-kms operated in Option 9 Enhanced has increased indicative daily operating costs.

Table 2-12 – Daily Operating Costs (£s)

Option	Indicative new mileage/day	Indicative operating cost/day £
Option 9	1,391	13,910
Option 9 Enhanced	2,450	24,500

It should be noted that with regard to the government’s traction decarbonisation strategy, if the costs of electrification are not attributed to the operating cost, and it became possible to operate electric multiple units on the route it is considered that the cost per mile would decrease to approximately £7-£8 per vehicle mile.

3 VALUE FOR MONEY

- 3.1.1. The Value for Money assessment is summarised in Table 5-1. The appraisal results are shown in 2010 prices and are shown as Present Values (PV). The TEE, AMCB and PA tables are shown in Appendix A.
- 3.1.2. Option 9 was identified as the option which was best aligned with the strategic objectives set for the Scheme in the Option Assessment stage. The initial BCR for Option 9 was 0.3:1.
- 3.1.3. Subsequently, an opportunity to reduce Option 9 capital costs was identified. Additionally, the Option 9 timetable was extended to cover a 12-hour period offering a potentially more attractive service for commuters. Given the importance of direct connectivity and alignment with the Scheme strategic objectives, a further economic appraisal of an Option 9 Enhanced option was undertaken.
- 3.1.4. Option 9 Enhanced further improves regional connectivity between Peterborough, Stamford, Oakham and Peterborough resulting in additional user and non-user benefit as shown in Table 2.8. The enhanced Option 9 improves the BCR to 0.5:1 which is still categorised as poor value for money.
- 3.1.5. Given that Option 9 is aligned with the Scheme objectives set out in the Strategic Case for supporting economic growth, and that there is potential scope to realise more benefits, Option 9 Enhanced is the preferred option to be taken forward to the next stage of the business case.

Table 3-1 – Economic Appraisal Results (£000s, 2010 PV)

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£k 2010 prices and values, market prices	Option 9	Option 9 Enhanced
Benefit:Cost Ratio	0.3:1	0.5:1

4 APPRAISAL SUMMARY TABLE

- 4.1.1. In addition to the quantification of the benefits associated with the travel time savings for rail users, and indirect benefits for highway users, an initial qualitative assessment of other impacts was undertaken. Economic, environmental and social impacts are presented in the Appraisal Summary Table (AST). The ASTs for Option 9 and Option 9 enhanced are included in Appendix B. A summary of the overall findings is presented below.
- 4.1.2. Option 9 extends the additional 1tph service via the Syston Curve beyond Melton Mowbray to Peterborough serving Oakham and Stamford. This extension accrues additional user time savings benefits and greater potential for mode shift. This is reflected in more benefits, particularly for the economy, and the environment as regional connectivity is enhanced both in direct connections between Melton and Nottingham, but also as a result of the frequency enhancement between Melton and Peterborough and the intermediate stations of Oakham and Stamford.
- 4.1.3. Option 9 Enhanced provides an improved level of service by increasing to a 12-hour operating period which is reflected in additional economic benefits. Capital costs also reduced with removal of the costs for an eighth platform at Nottingham as the costs of this platform capacity improvement benefits wider strategic rail capacity.

5 OPTION SENSITIVITY TESTING

- 5.1.1. Sensitivity testing was undertaken to assess the sensitivity of the results to key variables within the economic appraisal.
- 5.1.2. Sensitivity tests undertaken were, as follows:
- DfT Covid-19 sensitivities (Low, Medium and High demand scenarios);
 - Higher local demand growth derived from local plan/housing allocation plans up to 2035/36; and
 - Switching Values test to gauge the extent to which PVB would need to be increased to achieve a BCR of 1.5:1 (Medium VfM).
- 5.1.3. The results of the economic appraisal using DfT Covid-19 sensitivities is presented in Table 5-1 to Table 5-3. With the Low demand forecast which represents 68% of pre-Covid demand, the outcomes show Option 9 Enhanced represents poor value for money. A similar outcome is experienced for the Medium demand forecast which represents 86% of pre-Covid demand levels.
- 5.1.4. A sensitivity test was undertaken substituting PDFH national population growth with locally specific population growth derived from local plan/housing allocation plans up to 2035/36. This represented a significantly higher basis for growth in demand with an average growth rate of 2.86% per annum compared with a PDFH forecast of 0.43% per annum for the period 2020/21 to 2035/36. The results are shown in Table 5-4. Option 9 is poor value for money. However, Option 9 Enhanced offers an improved economic performance with a BCR of 0.8:1. Although considered poor value for money, it is to be acknowledged that the BCR does not include the potentially significant wider economic impacts. Option 9 is the preferred option as it best aligns with the strategic objectives for the Scheme which are to promote connectivity to support economic growth and housing development.
- 5.1.5. A switching test was carried out to determine the level of benefits required to produce a Medium value for money BCR of 1.5:1. Option 9 would need to achieve benefits over six times greater than in the core scenario to achieve Medium value for money. Option 9 Enhanced would require £31 million additional benefits to achieve Medium value for money.

Table 5-1 - DfT Covid-19 sensitivities - Low Covid Demand (£000s, 2010 PV)

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Benefits / Costs	Option 9	Option 9 Enhanced
BCR	0.2:1	0.3:1

Table 5-2 - DfT Covid-19 sensitivities - Medium Covid Demand (£000s, 2010 PV)

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Benefits / Costs	Option 9	Option 9 Enhanced
BCR	0.2:1	0.4:1

Table 5-3 - DfT Covid-19 sensitivities - High Covid Demand (£000s, 2010 PV)

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Benefits / Costs	Option 9	Option 9 Enhanced
BCR	0.3:1	0.5:1

Table 5-4 – Sensitivity Test Results: Higher Local Growth (£000s, 2010 PV)

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Benefits / Costs	Option 9	Option 9 Enhanced
BCR	0.5:1	0.8:1

6 CONCLUSION

Option 9 Enhanced represents a progression of the preferred option development based on a timetable enhancement and reduced capital costs. Option 9 Enhanced produces an improved BCR of 0.5:1.

Moreover, the Option 9 Enhanced sensitivity test using higher local demand growth shows a further improved BCR of 0.8:1, demonstrating the Scheme is approaching a low value for money situation where the benefits out-weigh the costs.

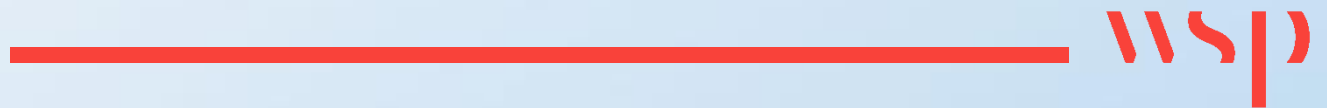
Given that Option 9 is aligned with the Scheme objectives set out in the Strategic Case for supporting economic growth, and that there is potential scope to realise more benefits, Option 9 Enhanced is the preferred option to be taken forward to the next stage of the business case.

Appendix A

TEE, AMCB AND PA TABLES

Appendix B

APPRAISAL SUMMARY TABLES





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