System Operator

Wisbech-March Connection

Socio-Economic Appraisal Options Indicative Report

May 2024

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On the side of passengers and freight users

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1. Executive Summary

This is a socio-economic appraisal to compare the indicative costs and traditional transport benefits of a heavy and light rail isolated rail service between Wisbech and March located in North Cambridgeshire. Alternative options to connect Wisbech-March-Cambridge were examined in 2019 using a heavy rail solution with services that continued to Cambridge. This option was costly and operationally difficult to implement. An alternative more flexible option might be found in the use of heavy or light rail which is isolated from the main rail network.

This report aims at highlighting the methodology used, assumptions and findings that could feed into an economic case to support a future Strategic Outline Business Case (SOBC) made to the Department of Transport (DfT). The document aims to help inform Cambridgeshire and Peterborough Combined Authority (CPCA) about the size of benefits and costs associated with heavy to light rail options so that these possible alternatives can be better understood.

Four scheme options have been compared to meet the main objective of providing an isolated connection between Wisbech and March. These are Option 1 Heavy Rail; Option 2 Tram-Train; Option 3 Light Rail Vehicle (LRV); and Option 4 Very Light Rail (VLR). There are other alternative options that might be more cost effective, but this report focuses on solutions that involve heavy and/or light rail only.

Initial examination of the benefits and costs indicates that all the options represent poor value for money based on DfT value for money criteria. Option 1 Heavy Rail has a Benefit Cost Ratio (BCR) of 0.1 with a Net Present Value (NPV) of minus £120 million (PV 2010 prices). This option is the most expensive compared to the tram options. Option 4 VLR has the lowest capital and operating costs, it has a Benefit Cost Ratio (BCR) of 0.2. This represents poor value for money with a NPV of minus £53 million (PV 2010 prices). The results for Options 2 and 3 are between Option 1 and 4. Sensitivity tests indicate that if journey times were faster or if passenger demand were to double the value for money case would still struggle to move into a value for money category potentially acceptable to DfT.

If costs could be reduced further and road congestion examined more closely than this might improve the economic case, but benefits would need to increase considerably. Wider economic benefits could be included but these need to be re-examined as the number of passengers estimated to use a new Wisbech station is much lower than previous estimates in 2019 and so the estimate impact of these benefits would also be reduced. Any further work on connections to/from Wisbech could offer an opportunity to reassess the problem and identify potential public transport connections in the Wisbech area.

This socio-economic appraisal was carried out using the Department for Transport's (DfT) appraisal guidance, in particular the transport analysis guidance (TAG), available at gov.uk. Costs and benefits were assessed over a 60-year appraisal period.

2. Introduction

The purpose of this socio-economic appraisal is to contribute to an initial Network Rail investigation document detailing how heavy and light rail options might be implemented to connect Wisbech and March together using a section of Network Rail's disused track. The appraisal aims at setting out the methodology, assumptions, and indicative costs (capital and operating) against a traditional set of transport benefits generated when a new rail connection is made. The appraisal is not comprehensive and provides a high-level view ideally to guide decision makers by highlighting possible trade-offs between options.

The appraisal reflects the requirements as set out in DfT's Transport Business Case documents with the aim of demonstrating value for money as part of an initial 'economic case'. The report does not address the strategic, financial, commercial or management cases. The report follows DfT Transport Appraisal Guidance (TAG) in the estimation of benefits and costs but focuses on the providing a view with respect to traditional transport benefits whilst other potential benefits, such as, deeper understanding of road congestion and wider economic benefits, could also be included these are often harder to quantify and may need separate external estimation.

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3. Economic case

3.1. Introduction

This socio-economic appraisal follows DfT's appraisal guidance, in particular the transport analysis guidance (TAG), available at www.gov.uk/guidance/transport-analysis-guidance-tag. Costs and benefits were assessed over a 60-year appraisal period.

As described in Section 3.1 the main objective of scheme is to examine the costs and benefits associated with providing a heavy or light rail connection between Wisbech and March. Section 3.2 presents the scheme options and sets out the Base Case assumptions which options will be compared against.

Section 3.3 summarises appraisal assumptions methodology, addressing each cost and benefit in turn. Section 3.4 presents appraisal results and Section 3.5 the sensitivity analysis and appraisal risks. Section 3.6 details the conclusions of the economic case appraisal.

3.1. Scheme objectives and outputs

The main objective of the scheme is to improve connectivity between Wisbech and March by reducing public transport journey times, encouraging modal shift towards rail, and to help reduce traffic on competing roads.

It is assumed that a heavy or light rail link would provide a half hourly connection between Wisbech and March with an approximate average journey time of 15 minutes. The journey time could vary by a few minutes and the exact time would need to be confirmed if the scheme progresses.

3.2. Scheme options and Base Case

The Base Case (do-minimum) assumes that there is no heavy or light rail connection between Wisbech and March and that road and bus remain the main connections between these two places.

No committed infrastructure enhancements by road or rail are assumed to be delivered and any new rail/tram services would be timed to fit into key heavy rail current timetabled services departing/arriving at March as much as possible.

3.3. Economic appraisal methodology and assumptions

This section addresses the main costs and benefits in turn: capital costs, operating costs, and journey time benefits. Appraisal assumptions are presented in this section and in Table A.1 in the appendix.

3.3.1. Capital Costs

Indicative capital costs

Table 3.1 presents indicative capital costs which have been used for this appraisal. The capital costs shown are the point estimate for each option, this means they do not contain risk or general contingency and exclude escalation (inflationary impacts). These figures are not the Anticipated Final Costs (AFC) as estimated by the Network Rail cost estimator, for these figures please see the NR's main report. TAG guidance recommends that these elements are removed and replaced by optimism bias. This is a percentage uplift applied to the point estimate to reflect that on average costs are generally underestimated, particularly in the initial stages of a scheme's development.

It is assumed the funding source for this scheme is the Department for Transport but opportunities to seek third party funding are always recommended.

Table 3.1: Capital cost assumptions (Point Estimate)

Capital costs	Funding source and price base	Total	Spend profile	Optimism bias	Risk included
Opt1 Heavy Rail	Central government (100%, 2024 prices)	£138.6m	40% in 2027 60% in 2028	56%	☐
Opt2 Tram Train	Central government (100%, 2024 prices)	£106.4m	40% in 2027 60% in 2028	56%	☐
Opt3 Tram LRV	Central government (100%, 2024 prices)	£108.5m	40% in 2027 60% in 2028	56%	☐
Opt4 VLR	Central government (100%, 2024 prices)	£103.0m	40% in 2027 60% in 2028	56%	☐

Notes
Costs are in factor prices in the price base shown. Opening year 2029

Early stage schemes (GRIP/Level 1-2) are appraised with no risk and 56% optimism bias. Later stage schemes are appraised with risk and a lower optimism bias.
Capital cost inflation assumptions (note also applied to renewals) assume GDP deflator +2.1% until cap year as per TAG guidance Unit A1.2 para 2.2.2.
The PV of the initial capital costs is shown in the Results table. This includes optimism bias, factor to market price adjustment, and is discounted.
Costs include Schedule 4 possession costs if included in the cost estimators report.

Costs are relative to the Base Case. Initial capital costs only (renewal costs are excluded). Costs are shown as positive.

Source: Project Team.

Renewal costs

Renewals costs are included to allow for life expired assets within a 60-year appraisal to be replaced as part of the scheme. Ideally costs estimators would identify the whole life costs of assets so that the correct renewal plan can be included in the appraisal. Given the early stage of development of these options this exercise has not been done. Instead, capital expenditure associated renewals have been assumed to be 20% of the point estimate after 30 years based on other internal projects. Not all elements of point estimate will need to be renewed, for example, project design would not be necessary, buildings have a much longer asset life, so this estimate is a judgement. Usually, items such as communications assets would need to be replaced twice or three times within the 60-year appraisal. Renewal costs and assumptions are shown in Table 3.2.

Table 3.2: Renewal cost assumptions

Renewal costs	Price base	Total	Spend profile	Optimism bias
Opt1 Heavy Rail	2024 prices	£27.7m	100% in 2058	56%
Opt2 Tram Train	2024 prices	£21.3m	100% in 2058	56%
Opt3 Tram LRV	2024 prices	£21.7m	100% in 2058	56%
Opt4 VLR	2024 prices	£20.6m	100% in 2058	56%

Notes
Costs are in factor prices in the price base shown.

As per the July 2021 update to the TAG databook, the costs are appraised without risk.

Capital cost inflation assumptions (note also applied to renewals) assume GDP deflator +2.1% until cap year as per TAG guidance Unit A1.2 para 2.2.2.
Costs (or cost savings) are relative to the Base Case. Costs are shown as positive; cost savings as negative.

Source: Project Team.

3.3.2. Operating costs

Network Rail does not operate trains which means that operating costs assumptions are based on agreed generic values with DfT unless a Train Operator directly shares operating costs for a specific project. For this project Eversholt Rail Ltd has reviewed the operating cost assumptions for Option 4, and so, there is a higher degree of confidence associated with this estimate of operating costs. We can only provide a total annual and net present value figure as the individual breakdown is commercially confidential. However, these costs could be revised if this option were to be progressed. Table 3.3 shows the indicative costs for each option. The most expensive operating cost is associated with Option 1, which assumes a generic diesel multiple unit (DMU) consisting of two cars. Option 2 is a tram-train which is slightly heavier than Option 3 or 4. It assumes a Class 399 tram would be in operation, this is similar to vehicles used on Sheffield's tram network. Option 3 Light Railway Vehicle (LRV) are based on recent tram costs associated with the Fleetwood project. Option 4 Very Light Railway operating costs, as discussed above, were provided by Eversholt Rail. Some operating costs were provided with ranges, high and low, for the purpose of this report, where ranges were available, an average figure between the range has been used, this means that these operating costs could vary.

Additional key assumptions relating to the estimation of operating costs are as follows:

- Monday-Saturday - A two hourly service between 0700-2000 is provide, except between 0600-0700 and 2000-2200 where an hourly service is provided. An hourly service is assumed to operate on Sundays between 0600 and 2200. Adjustments have been made for Bank Holidays (8 days per year); on these days a Sunday service is assumed to operate.
- 2 diagrams are assumed to be required to operate the service per day, with an assumption of 4 drivers per diagram. 4 guards per diagram are assumed to be required only for Option 1, trams services do not have guards.
- The distance between Wisbech and March is 8 miles (12.8 Kms)
- There are differences between options relating to how any rolling stock is procured, financed, and maintained. For example, there are non-capital lease costs covering maintenance as well as additional track maintence charges, rolling stock can be

purchased outright (Option 2 and 3) and financed over 15 years which leaves a gap of 15 years where no lease costs are assumed until the rolling stock is purchased again. Rolling stock for Options 1 and 4 are assumed to leased on an annual basis. Assumptions for operating costs have been based on other similar type Tram or Train schemes. This means in some years Option 2 and 3 cost will be lower than those shown in Table 3.3. Only as a scheme is finalised can operating costs be fully understood.

Table 3.3: Indicative operating costs for each option

Operating costs	Price base	Indicative year	Total	Optimism bias
Opt1 Heavy Rail	2024 prices	2033	£4.3m	41%
Opt2 Tram Train	2024 prices	2033	£3.3m	41%
Opt3 Tram LRV	2024 prices	2033	£2.9m	41%
Opt4 VLR	2024 prices	2033	£1.6m	41%

Notes
Costs are in factor prices in the price base shown, including optimism bias.

Capital cost inflation assumptions (note also applied to renewals) assume GDP deflator +2.1% until cap year as per TAG guidance Unit A1.2 para 2.2.2. This leaves aside the issue of optimism bias.
The PVs are shown in the Results Table and include optimism bias where relevant, factor to market price adjustmentand are discounted.
The PVs in the Results Table are shown separately for operating costs/cost savings retained by the private sector and costs/cost savings transferred to government. Operating cost transfer assumptions are shown in Table A.1.
Costs (or cost savings) are relative to the Base Case. Costs are shown as positive; cost savings as negative.

Source: Project Team.

No changes in NR or TOC maintenance costs per annum have been assumed. It is likely that some additional costs will be incurred should NR and/or a TOC need to maintain a new station or upgraded assets. This cost would need to be estimated if the scheme is progressed. For example, there are incremental costs associated with maintaining facilities at March or for maintaining a new Wisbech station, platforms, lighting etc. It is unclear yet how or who would operate any heavy or light rail scheme and so additional maintenance costs will need to be included if the scheme is progressed.

3.3.3. Passenger Demand

Passenger demand for a new connection can be difficult to estimate because there is no existing base level of rail demand to pivot from. We have used a trip-rate modelling approach to estimate the potential passenger demand for a station at Wisbech.

For simplicity, we have assumed that demand at Wisbech would be very similar to those people who live and work in the March area. The following approach has been used to estimate demand:

- **Step 1 Estimate Rail Trip Rate**: This is based on a LSOA[1] analysis of catchments and station entries/exists for nearby stations, around 30 stations were examined including March.

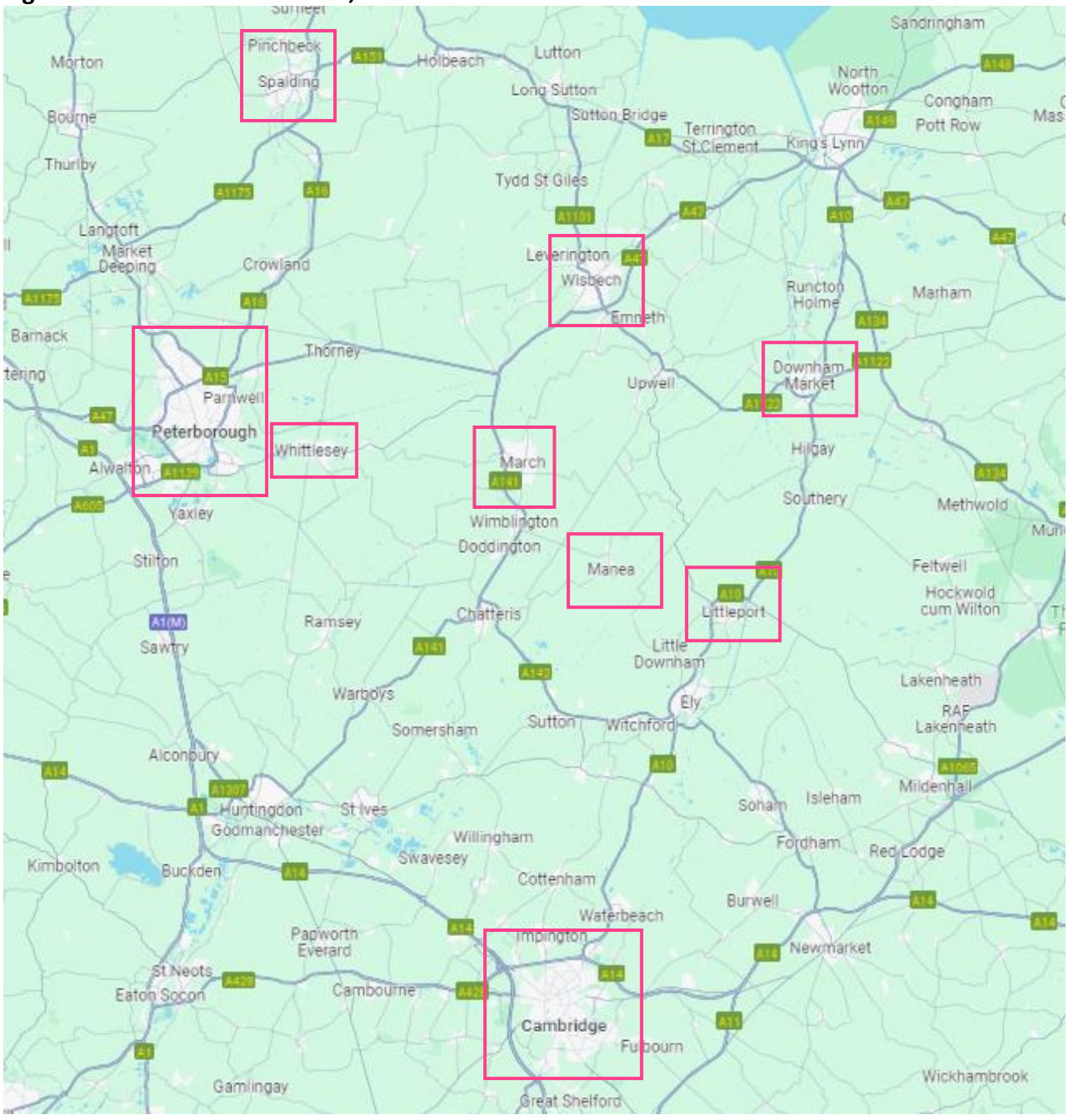
[1] Lower Super Output Area, a census geography typically containing 1000-3000 people.

- **Step 2 Determine a Distribution of Trips:** We have assumed that the distribution of rail trips will align with those observed at March station, with an adjustment to reflect the Generalised Journey Times (GJTs) offered at Wisbech. This adjustment is based on a regression analysis of the demand for flows to/from March (with dummy variables for 3 stations to reproduce observed rates. GJT is made up of three parts: (i) the journey time (sometimes referred to as in-vehicle time (IVT)); (ii) frequency of a service (i.e., one train per day each way etc); and (iii) an interchange penalty (frequency of services and interchange are translated into a time penalty based on passenger surveys commissioned by the Passenger Demand Forecasting Council (PDFC) and using values recommended in the Passenger Demand Forecasting Handbook v6 (PDFH). These time penalties try to reflect passengers' perceptions and preferences. For example, the time penalty added to in-vehicle time is reduced the more frequent train services are per hour. Passengers generally prefer fewer or no interchanges so a time penalty is added to reflect that passengers will have to interchange at March to connect to national rail services, taken from values in PDFH.
- **Step 3 Estimate Base Demand (Do-Minium) for Wisbech**: Analysis of Census Travel to Work (TTW) data for Commuting trips by train originating in Wisbech area. This is to understand to what extent existing rail trips originate in the Wisbech area. The fact that the Census data only covers commuting trips is an acknowledged weakness.
- **Step 4 Estimate Base Demand and Do-Something (Option) GJTs**: Do-Something GJTs are based on data from the rail industry model. This model contains passenger ticket, timetable, and revenue data, it also provides GJTs between various station to station flows. The Base GJT calculation is supplemented with bus access times and the time penalties described in Step 2, as applicable. This allows Base demand GJTs and Do-Something (option) GJTs to be calculated for each flow. The difference between the two derived values represents the incremental rail passengers at Wisbech that are estimated to be attracted if the new service was introduced. They are attracted because their journey time, on some flows, would be reduced compared to other modes of transport.
- **Step 5: Estimate DM and DS demand and revenue, user and non-user benefits at Wisbech:** The Do-Something (Option) demand is based on the distribution at March adjusted for GJTs (as per Step 2) and then uplifted based on population catchments (as per Step 1) around Wisbech. Base demand (Do-Minimum) demand is determined from demand at March station and assumptions sourced from Step 3. The user benefits are estimated based on Step 4. A manual adjustment has been made to the estimate of passenger demand between Wisbech and Peterborough. If this flow was replicated at Wisbech, it is likely that people making this particular journey may still find it quicker to do so by bus because they would need to interchange at March for an onward connection to Peterborough but geographically the road connection (by car or bus) may still be preferred for this specific flow. We have reduced this estimate by half. Further consideration might be needed to check this assumption and the other flows assumed to originate at Wisbech.

Incremental rail passenger demand estimated at Wisbech in a Base Year (2023) before growth is applied is 148,500 passenger per annum. This figure will vary if the train/tram journey time between Wisbech and March changes. The journey time will need to be confirmed if the

scheme progresses. Figure 3.1 shows the location and urban density around stations in the Wisbech and March area and Table 3.4 compares current footfall, distances, bus/train, and car times for journeys to/from Wisbech and these stations, and the number of trains per week. Examining this table and the number of passengers at other stations in the area. The estimate for passenger usage at Wisbech seems reasonable given the services that Wisbech would connect to and the level of service frequency available at March.

Figure 3.1: Location of Wisbech, March and other stations



Source: Google Maps 2024

Table 3.4: ORR Passenger footfall at stations, Wisbech NR footfall estimate, with distances and current journey times by bus/rail/car

Station	Distance	Time	2018/19 Footfall	2022/23 Footfall	Trains Weekday	2023/24	Sample of Key Services
	miles	mins	000s	000s	Per day	000s	
Wisbech (NR estimate)	n/a	n/a	n/a	n/a	58	148	Birmingham N St – Cambridge Stansted Airport-Birmingham N St Ipswich-Peterborough
March	10	C 18-30 B 35-50	408	305	56	n/a	Birmingham N St – Cambridge Stansted Airport-Birmingham N St Ipswich-Peterborough
Downham Market	12	C 27 B 30	550	390	54	n/a	Kings Lynn-London Kings X
Littleport	20	C 37 B/T 111	250	190	54	n/a	Kings Lynn-London Kings X
Spalding	22	C 40 B/T 101	195	170	28	n/a	Lincoln Central-Peterborough Doncaster-Peterborough
Whittlesea	16	C 34 B 70	32	34	22	n/a	Ipswich-Peterborough
Manea	17	C 33 T/B 110	19	21	24	n/a	Ipswich-Peterborough Stansted Airport-Birmingham N St
Peterborough	23	C 49 B 49	6,000	5,300	293	n/a	Gatwick Airport-Peterborough London Kings X-Leeds London Kings X-York London Kings X-Edinburgh Norwich-Liverpool L St Stansted Airport-Birmingham N St Liverpool Lime St-Norwich Birmingham N St -Cambridge
Cambridge	40	C 97 B/T 87	12,540	9,820	399	n/a	Brighton-Cambridge Cambridge-Ipswich Cambridge-London Kings X Cambridge-London Livrpl St London Kings X-Kings Lynn London Livrpl St-Cambridge North Cambridge-Ipswich Stansted Airport-Birmingham N Norwich-Stansted Airport

Source: Google Maps 2024 Directions from Wisbech to these rail station, at 1730pm typical Friday, C = Car, B = Bus, B/T= Bus and train combination

Table 3.5: Do-minimum and Do-Something Passenger Growth Assumptions

	2023-24	2024-25	2025–30	2030-40	2040-2044	2044 and beyond
CAGR (DS)	3.7%	2.4%	1.1%	2.1%	1.3%	UK Pop growth

Table 3.5 describes the passenger growth forecasts used for this appraisal. These have been derived from a DfT tool called EDGE (Economic Demand Generator Estimate) last issued in January 2024 and based on a 2022/23 data set and timetable. This model can be used to estimate rail demand on a flow-by-flow as it contains forecasts of exogenous data related to changes to rail demand. Such as, Gross Domestic Product (GDP), population and employment data and information on how rail demand changes as these variables change over time.

Scheme benefits and rail demand is assumed to be phased in from the opening year, assumed to be 2029 for this appraisal, a new station/connection usually takes about five years before reaching its full estimated demand level. This assumption is taken from the PDFH guidance.

3.3.4. Journey time

The new connection at Wisbech to March takes approximately 15 minutes by train or tram compared to road journeys which might take around 18-30 minutes by car or 35-50 minutes by bus depending on traffic levels and routing.

Based on the estimated change in journey time and the methodology described in Section 3.3.3 we estimate revenue, user benefits, and non-user benefits of the scheme. Table 3.6 provides an example of values estimated for the Wisbech-Cambridge flow which are then used to generate benefits. This method is used to estimate the total value for typical flows to/from Wisbech identified in Table 3.7.

Table 3.6: Estimate of demand and assoicated benefits for Wisbech – Cambridge flow

Wisbech to Cambridge Flow per annum										
DM[i] GJT	DS[ii] GJT	VOT Saved	DM Demand	DS Demand	DS Demand Adjusted[iii]	Change in Demand	Net Revenue[iv]	Existing User VoT[v] Benefit	New User VoT Benefit	Change in Pax Rail Miles[vi]
mins	mins	Mins	Pax p.a.	Pax p.a.	Pax p.a.	Pax p.a.	£ 000s p.a.	mins	mins	Million p.a.
132	111	21	8,000	34,000	60,000	52,000	550	160	530	1.6

(i) DM is the do-minimum or base case; the DM is an estimate for Wisbech based on current rail trips to/from March before the new connection is made. (ii) DS is the do-something or the option. GJT is the generalised journey time per trip, this is the sum of three components, journey time of the new service, the frequency and the number of interchanges required. (iii) DS estimate is adjusted to reflect Wisbech's wider potential catchment area compared to March (iv) Rail/tram revenue is net of bus revenue abstraction from journeys that are currently made by bus to March (v) VoT is Value of Time. The incremental VoT saved for both existing and new passengers can be monetised and included in an economic appraisal by multiplying the time saving generated by values of time provided by DfT TAG. These monetary values are for business, commuting and leisure passengers, they represent how people value their time, time which could be spent doing other things rather than travelling. (vi) The incremental change in passenger rail/tram miles is based on adjusted DS demand and the assumed journey length taken. It is assumed that a proportion of passenger demand is abstracted from road, based on DfT guidance and

values, this estimate is used to estimate non-user benefits such as the road decongestion benefits, improvements in air quality etc based on values provided by DfT TAG.

A new rail or tram connection between Wisbech and March will generate:

- **User benefits:** Passengers that switch to rail/tram will save time and this value is translated into a value using DfT's values of time rates and guidance as set out in TAG.
- **Rail/Tram revenue:** Revenue is generated as passengers transfer to the new rail/tram connection, there will be some abstraction of revenue from bus and other rail stations. Bus revenue abstraction has been factored into this appraisal, but no adjustment/estimation has been made for passengers who currently use other rail stations.
- **Benefits to non-users:** These benefits are assumed to be generated when people switch to rail, those that continue to use road will experience road decongestion and so an improvement to their journeys as fewer vehicles area assumed to be on the roads. Fewer vehicles lead to a reduction of road accidents and environmental pollution. The key assumption to estimating non-user benefits is through use of DfT's Marginal External Costs (MECs) values, these benefits have been included in our appraisal.

User benefits

The value of time saved on flows to/from Wisbech is estimated to be around 21 mins and an estimate of around 148,500 passengers per annum would be attracted to the new rail/tram link. Typical flows between Wisbech are shown in Table 3.7 with a description of the estimated values for Wisbech-Cambridge shown in Table 3.6

Table 3.7: Typical flows and estimated demand to/from Wisbech

Passenger flows to/from Wisbech			
Key Flows p.a.		**Between 3,000 to 2,000 trips p.a. on each flow**	**Less than 2,000 trips p.a. on each flow**
Cambridge	52,000	Huntingdon	Leeds
Peterborough	25,500	St Neots	York
London BR	23,000	Bury St Edmunds	Manchester BR
March	14,000	Bishops Stortford	Birmingham BR
Whittlesea	4,500	Grantham	Nottingham
		Leicester	Lincoln Central
		Ely	Stansted Airport
		Kings Lynn	Norwich
		Ipswich	

Rail/Tram Revenue

Revenue is based on the passenger rail miles between each new flow (listed in Table 3.8) and Wisbech multiplied by a pounds per passenger mile estimate of £0.28 (2023/24 prices). An adjustment is made to reflect that some of this revenue is abstracted from public buses.

Non-user benefits

Table 3.8 shows the benefits for a typical year 2033, at this point benefits should be fully ramped up. The amount of transfer from road to rail (car diversion) has been estimated as

33%. This figure is calculated on a flow-by-flow basis using assumptions provided by DfT TAG and on current March passenger rail flows. The proportion is a function of distance, the area of the country and where flows go to and from. Values for decongestions benefits are based on averages value for the East of England taken from DfT's TAG (Unit A5.4.5) Marginal External Costs data. Further work could be done if traffic in the area is unusual compared to the average and supporting evidence can be provided to DfT. Noting that the value of decongestion benefits vary by time of day, road type and level of congestion, so the benefits throughout the day will equally vary, it does not always mean a bespoke estimation decongestion benefit estimate will be higher than the assumed average. Time and effort taken in this area needs to be proportional to the problem and scheme costs.

Table 3.8: Typical benefits generated by the scheme

Value of Time Saving	Price base	Indicative year	Total
Opt1 Heavy Rail	2024 prices	2033	£0.6m
Opt2 Tram Train	2024 prices	2033	£0.6m
Opt3 Tram LRV	2024 prices	2033	£0.6m
Opt4 VLR	2024 prices	2033	£0.6m
Revenue*	**Price base**	**Indicative year**	**Total**
Opt1 Heavy Rail	2024 prices	2033	£3.3m
Opt2 Tram Train	2024 prices	2033	£3.3m
Opt3 Tram LRV	2024 prices	2033	£3.3m
Opt4 VLR	2024 prices	2033	£3.3m
Non-User Benefits	**Price base**	**Indicative year**	**Total**
Opt1 Heavy Rail	2024 prices	2033	£0.7m
Opt2 Tram Train	2024 prices	2033	£0.7m
Opt3 Tram LRV	2024 prices	2033	£0.7m
Opt4 VLR	2024 prices	2033	£0.7m

Notes
Indicative values are in market prices, undiscounted in the price base shown
*Revenue is net of revenue abstracted from buses
Non-User Benefits include inpact on congestion, infrastructure, accidents, air and noise pollution, impact on climate change (greenhouse gases) and indirect tax lost to Government due to lower road associated tax
2033 is the first full year of benefits
Source: Project Team.

3.3.5. Wider Economic Benefits

There may be a case to argue that for people living in the Wisbech area a rail/tram connection to March could be transformational and so including wider economic benefits (WEBs) could be justified. This benefit could be investigated further if the scheme progresses. Any WEBs estimate would be presented alongside the central case BCR, as an adjustment. Previous work estimated benefits of WEBs to be around £38m-£40m (in 2010 prices and values) but this figure would need to be recalculated to match the latest work, assumptions, and passenger estimates. In particular, the previous modelling work undertaken by Mott Macdonald assumed that Wisbech would benefit from new direct services to Cambridge (which would also provide benefits to existing stations through increase frequency). Previous passenger estimates of rail demand at Wisbech (in 2014 and 2019 by Motts) are higher than those

calculated and used in this appraisal. There is a need for proportionality, and it is likely the WEBs would be much lower given the options being appraised as part of this economic case.

3.4. Appraisal results

Table 3.9 presents the economic appraisal results under the central case for each option. The indicative economic appraisal is that all options are poor value for money based on DfT TAG guidance with Benefit Cost Ratios (BCR) ranging between 0.1 (Option 1) to 0.2 (Option 4), all options have negative Net Present Value (NPV). A negative NPV indicates that costs outweigh benefits. Option 1 Heavy Rail is the most expensive to construct and operate compared to the different types of tram options examined. The capital expenditure associated with the tram options is similar, but operating costs, particularly those validated by Eversholt Rail, are between 40-60%cheaper than heavy rail. Journey times for each option are assumed to be the same, so there is no difference in rail user benefits between the different options. If the scheme is progressed more investigation could be taken to understand if different rolling stock resulted in different journey times.

Table 3.9 Economic Appraisal Central Case Results (over 60 Years)

Option	1	2	3	4
Socio-economic appraisal (£m PV, 2010 prices)	**Opt1 Heavy Rail**	**Opt2 Tram Train**	**Opt3 Tram LRV**	**Opt4 VLR**
Net benefits to consumers and private sector (plus tax impacts)				
Rail user journey time benefits	9.07	9.07	9.07	9.07
Non user benefits - road decongestion	9.21	9.21	9.21	9.21
Non user benefits - noise, air quality, greenhouse gases & accident benefits	0.50	2.00	2.00	2.00
Rail user and non user disruption disbenefits during possessions	-1.42	0.00	0.00	0.00
Benefits to society and the private sector	0.06	0.34	0.25	0.15
Indirect taxation impact on government	-5.51	-5.68	-5.68	-5.68
sub-total (a)	**11.91**	**14.94**	**14.85**	**14.76**
Costs to government (broad transport budget)				
Initial capital costs	110.79	85.08	86.73	82.33
Renewal costs	7.16	5.49	5.60	5.32
Non user benefits - road infrastructure cost changes	-0.06	-0.06	-0.06	-0.06
Revenue transfer*	-38.67	-38.67	-38.67	-38.67
NR operating costs and TOC operating costs transfer**	53.06	31.10	26.12	18.78
sub-total (b)	**132.27**	**82.93**	**79.71**	**67.70**
Net Present Value (NPV) (a-b)	**-120.36**	**-67.99**	**-64.86**	**-52.95**
Benefit Cost Ratio to Government (BCR) (a/b)	**0.09**	**0.18**	**0.19**	**0.22**

Reliability appraisals only: add note to say results refer to the "adjusted BCR" results. If the benefits include rail user reliability benefits, the "initial BCR" results will be lower than those shown, since these benefits should be excluded from the initial BCR. The appraisal and the value for money assessment focuses on the adjusted BCR results.

*Total revenue benefits = revenue benefits to private sector + revenue transfer to government (d)
**Total change in operating costs = change in operating costs to private sector sector + change in operating cost transfer to government (e)
Present Values (PVs) are in 2010 market prices and are discounted to 2010 using Social Time Preference discount rates: see Table A.1. The appraisal is in accordance with the DfT's TAG appraisal guidance. Results are shown for the relevant option/scenario etc relative to the Base Case.
For net benefits etc, benefits are shown as positive. For costs to government etc, costs are shown as positive.
This is a summary version of the TEE tables.

The Transport Economic Efficiency (TEE) table(s) are shown in the Section 4 A1.

3.6. Sensitivity analysis and appraisal risks

High-level sensitivity tests have examined the uncertainties around journey times and test the impact of doubling passenger forecasts on the central case results. These are shown in the Tables 3.10-3.12.

At this stage there is some uncertainty about the exact journey time, so a variance of five minutes has been tested to help understand the impact on the central case results. Tables 3.10 and 3.11 shows that the BCR varies by about 25% if we increase of decrease journey time by 5 minutes. The central case assumption is that journey time takes 15 minutes.

Table 3.10: Economic Appraisal Results (over 60 Years) Journey time 5 mins faster

Option	5	6	7	8
Socio-economic appraisal (£m PV, 2010 prices)	**S1-Opt1_JTFaster**	**S1-Opt2_JTFaster**	**S1-Opt3_JTFaster**	**S1-Opt4_JTFaster**
Net benefits to consumers and private sector (plus tax impacts)				
Rail user journey time benefits	12.11	12.11	12.11	12.11
Non user benefits - road decongestion	9.37	9.37	9.37	9.37
Non user benefits - noise, air quality, greenhouse gases & accident benefits	0.53	2.04	2.04	2.04
Rail user and non user disruption disbenefits during possessions	-1.42	0.00	0.00	0.00
Benefits to society and the private sector	0.06	0.34	0.25	0.15
Indirect taxation impact on government	-5.96	-6.13	-6.13	-6.13
sub-total (a)	**14.69**	**17.72**	**17.63**	**17.54**
Costs to government (broad transport budget)				
Initial capital costs	110.79	85.08	86.73	82.33
Renewal costs	7.16	5.49	5.60	5.32
Non user benefits - road infrastructure cost changes	-0.06	-0.06	-0.06	-0.06
Revenue transfer*	-41.70	-41.70	-41.70	-41.70
NR operating costs and TOC operating costs transfer**	53.06	32.35	27.78	18.78
sub-total (b)	**129.24**	**81.16**	**78.34**	**64.67**
Net Present Value (NPV) (a-b)	**-114.54**	**-63.43**	**-60.71**	**-47.13**
Benefit Cost Ratio to Government (BCR) (a/b)	**0.11**	**0.22**	**0.23**	**0.27**

Table 3.11: Economic Appraisal Results (over 60 Years) Journey time 5 mins slower

Option	9	10	11	12
Socio-economic appraisal (£m PV, 2010 prices)	**S2-Opt1_JTslower**	**S2-Opt2_JTslower**	**S2-Opt3_JTslower**	**S2-Opt4_JTslower**
Net benefits to consumers and private sector (plus tax impacts)				
Rail user journey time benefits	6.45	6.45	6.45	6.45
Non user benefits - road decongestion	8.67	8.67	8.67	8.67
Non user benefits - noise, air quality, greenhouse gases & accident benefits	0.38	1.89	1.89	1.89
Rail user and non user disruption disbenefits during possessions	-1.42	0.00	0.00	0.00
Benefits to society and the private sector	0.06	0.34	0.25	0.15
Indirect taxation impact on government	-5.14	-5.31	-5.31	-5.31
sub-total (a)	**9.01**	**12.04**	**11.95**	**11.85**
Costs to government (broad transport budget)				
Initial capital costs	110.79	85.08	86.73	82.33
Renewal costs	7.16	5.49	5.60	5.32
Non user benefits - road infrastructure cost changes	-0.06	-0.06	-0.06	-0.06
Revenue transfer*	-36.06	-36.06	-36.06	-36.06
NR operating costs and TOC operating costs transfer**	53.06	32.35	27.78	18.78
sub-total (b)	**134.88**	**86.80**	**83.99**	**70.32**
Net Present Value (NPV) (a-b)	**-125.87**	**-74.76**	**-72.04**	**-58.46**
Benefit Cost Ratio to Government (BCR) (a/b)	**0.07**	**0.14**	**0.14**	**0.17**

Table 3.12: Economic Appraisal Results (over 60 Years) Passenger Demand Doubled

Option	13	14	15	16
Socio-economic appraisal (£m PV, 2010 prices)	**S3-Opt1_double demand**	**S3-Opt2_double demand**	**S3-Opt3_double demand**	**S3-Opt4_double demand**
Net benefits to consumers and private sector (plus tax				
Rail user journey time benefits	18.14	18.14	18.14	18.14
Non user benefits - road decongestion	18.43	18.43	18.43	18.43
Non user benefits - noise, air quality, greenhouse gases &	2.50	4.01	4.01	4.01
Rail user and non user disruption disbenefits during	-1.42	0.00	0.00	0.00
Benefits to society and the private sector	0.06	0.34	0.25	0.15
Indirect taxation impact on government	-11.20	-11.37	-11.37	-11.37
sub-total (a)	**26.51**	**29.54**	**29.45**	**29.36**
Costs to government (broad transport budget)				
Initial capital costs	110.79	85.08	86.73	82.33
Renewal costs	7.16	5.49	5.60	5.32
Non user benefits - road infrastructure cost changes	-0.12	-0.12	-0.12	-0.12
Revenue transfer*	-77.34	-77.34	-77.34	-77.34
NR operating costs and TOC operating costs transfer**	48.21	30.47	25.89	17.28
sub-total (b)	**88.69**	**43.57**	**40.76**	**27.47**
Net Present Value (NPV) (a-b)	**-62.18**	**-14.03**	**-11.30**	**1.89**
Benefit Cost Ratio to Government (BCR) (a/b)	**0.30**	**0.68**	**0.72**	**1.07**

Table 3.12 shows the results of doubling passenger demand, this tests the sensitivity of the passenger usage estimate on the central case results. In this test, Option 1-3 would still be considered poor value for money, but Option 4 now borders the DfT low value for money category, moving to a BCR of 1.07 from 0.22.

These sensitivities show that on their own varying some of the key assumptions does not change the DfT value for money category. There are other risks which have not fully been tested. For example,

- Had high or low average estimates for operating costs been used this would have produce a range around the central case values for risks relating to operating costs estimates.
- Capital and operating costs could be reduced and tested as a sensitivity, but the reduction would have to be significant to improve the business case and this seems unlikely at this stage.
- Decongestion benefits could be increased but again the change would need to be significant to move the value for money categories.
- Impact of any incremental maintenance costs should have been included in the central case results, but has not been estimated for this appraisal, inclusion of these costs would reduce the BCRs.
- Bus and road competition on certain assumed flows from Wisbech should be assessed further to get a better understanding of how these might impact passenger demand. For this analysis only one flow (Wisbech-Peterborough) has been adjusted to reflect the uncertainty that passengers are likely to remain on buses when faced with an interchange at March to get to/from Peterborough but similar consideration is needed to examine other flows which may not be as advantages to go via March, such as Wisbech to Kings Lynn.


System Operator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3.7. Conclusions on economic case

The economic case for each of the options examined as part of this report would indicate that a tram solution is considerably cheaper to operate and construct than a heavy rail option. The value for money case is low and it would take a considerable change in passenger demand or decongestion benefits to make the scheme viable. This is, in part, due to the need to interchange at March which introduces a time penalty and risk into a passenger's journey. Previous studies have examined a connection between Wisbech and March that is not isolated, but this costs more and would be operational difficult to achieve.

There are many risks associated with estimating passenger demand from a new station. Further work could be done to try to understand the flows and where people in Wisbech are travelling to and from, where they might want to travel in the future and how this might translate into rail/tram demand, but this takes time, is complicated and may not necessarily lead to an increase rail/tram demand estimate. The stations people want to travel to is likely to also be related to the destination and frequency at March. For example, if people are trying to get to Edinburgh or London, they would be better off going to Peterborough station, if only to London, then, Peterborough, Downham or Littleport. If passengers are trying to get to Peterborough itself, then potentially they would be better off on the bus as this route would involve fewer interchanges than going to March.

Estimation of wider economic benefits might be appropriate for this scheme although the value maybe much lower than previous estimates if these were based on high number of passengers travelling between March and Wisbech compared to our current estimate.

4. Appendix

This section includes the following further information:

- Table A.1, further appraisal assumptions are shown in Table 4.1;
- Transport and Economic Efficiency (TEE) tables are provided for Options 1 to 4 in Tables 4.2 to 4.5;

Table 4.1: Economic assumptions used for the central case appraisal

Further appraisal assumptions			
These assumptions apply to the socio-economic appraisal, unless stated. They apply to the financial appraisal only where stated. Assumptions apply to central case unless stated. Further assumptions are in tables in main text. All years refer to financial years e.g. 2017 refers to 2017-18.			
Appraisal parameters			
Assumption	**Value**	**Source**	**Comment**
Current year and model base year	2024	TAG	Current year at the time of appraisal is the model base year
First year of benefits	2029	Project Team	
Benefits profile by year	53% in 2029 78% in 2030 90% in 2031 98% in 2032 100% in 2033	Project Team	
Appraisal period (years)	60	Project Team	The maximum is 60 years under TAG.
Price base year	2010	TAG (Unit A1.1, Para 2.6.3)	Values converted from model base year to price base year using GDP deflator.
Base year for discounting	2010	TAG (Unit A1.1, Para 2.7.6)	
Discount rate (Social Time Preference Rate)	3.5% for 30 years from the current year, 3.0% for the next 45 years and 2.5% thereafter.	TAG (July 2020 v1.14 - sensitivity test data book) and HM Treasury Green Book	
Unit of account	Market prices	TAG (July 2020 v1.14 - sensitivity test data book, Table A1.3.1)	19% added to convert factor prices to market prices
Capital and operating cost assumptions			
Assumption	**Value**	**Source**	**Comment**
Changes in capital costs in real terms during appraisal period	Not applied		
Changes in operating costs costs in real terms during appraisal period	Real earnings growth for wages; leasing cost growth for rolling stock, RPI against GDP deflator for others	DfT advice	
Cost of TOC profit as percentage of any change in operating costs	4%	DfT advice	
Capital cost optimism bias	Central government: 56% at GRIP stage 1	TAG (Unit A5.3, May 2018, Table 3)	Optimism bias is not applied to cost savings
Operating cost optimism bias	41% at GRIP stage 1	TAG (Unit A5.3, May 2018, Table 3). All rates treated as per annum	Optimism bias is not applied to cost savings
Schedule 4 costs as a proportion of investment cost	2.0%	Project team	
User disbenefits as a proportion of revenue disbenefits	100.0%	Economic Analysis Team assumption	User and non-user benefits are increased to allow for factor to market price adjustment.
Non user disbenefits as a proportion of revenue disbenefits	0.0%	Economic Analysis Team assumption	

Table 4.2: TEE table for Option 1

Passenger benefit-related assumptions			
Assumption	**Value**	**Source**	**Comment**
Growth rate for Benefit Set: Untitled	0.0% p.a. in 2010 to 2022 inclusive; and 3.7% p.a. in 2023 to 2023 inclusive; 2.4% p.a. in 2024 to 2024 inclusive; 1.1% p.a. in 2025 to 2029 inclusive; 2.1% p.a. in 2030 to 2039 inclusive; 1.3% p.a. in 2040 to 2044 inclusive; 0.0%		Growth rates are all relative to the previous financial year.
Final forecast year, and from which benefits increase with population growth	2044	TAG (Unit A5.3, 3.3.1)	This cap year also applies to fare increases applied (see below) and any real terms cost increases applied (see above).
Values of time per hour (2010 prices)	Business (work): £16.21 Commuters: £9.95 Other: £4.54	TAG (July 2020 v1.14 - sensitivity test data book, Table A1.3.1)	Market prices
Rule of the half'	50%	TAG (Unit A.1.3 Para 2.1.6)	Time savings applied to new users at half the rate applied to existing users
Valuation of Time growth by user type	Work: real GDP per person Non-work real GDP per person	TAG Databook v1.21 May 23 1.0 Tab "Annual Parameters" Column O	
Average fare increases (% per annum above RPI)	1.0%	DfT advice	Revenue growth includes increase in RPI relative to GDP deflator until final forecast year.
Average fare increases after final forecast year	0.0%	DfT advice	
Car diversion rate: Untitled	26.0%	TAG (July 2020 v1.14 - sensitivity test data book, Table A.5.4.5)	Calculates marginal external costs of car use. May be a flow-weighted average.
Split of road decongestion benefits	Business: 50% Commute: 25% Other: 25%	DfT advice	
Indirect tax costs	(1) Based on current fuel duty rates, resource costs of fuel and average fuel efficiency, and forecast changes in these parameters over the appraisal period. (2) Based on diversion from taxable goods to non-taxed rail fares for 'commute' and 'other' rail revenue.		As a simplifying assumption, the share of petrol and diesel in total car miles is assumed to be 50%/50% throughout the appraisal period. No electric car mileage is assumed.
Financial assumptions			
Assumption	**Value**	**Source**	**Comment**
Current franchise revenue and operating costs transferred to government	100%	Network Rail assumption	Under ERMAs, government takes revenue and cost risk. Overall revenue and operating cost transfer assumptions are shown in the TEE tables.
Future franchise revenue and operating costs transferred to government	100%	Network Rail assumption	
Network Rail operating costs	All NR operating costs are treated as central government costs		
Other assumptions			
Assumption	**Value**	**Source**	**Comment**
Value of preventing a fatality (VPF)	£1.647m in 2010 prices	TAG Databook v1.21 May 2023 v1.0 Table A4.1.5	Growth in line with GDP (real terms) per person growth

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Table 4.3: TEE table for Option 1

TEE tables - Opt1 Heavy Rail						
Table 1: Economic Efficiency of Transport System (All costs & disbenefits are negative, all benefits & savings are positive)						
	Total in 2010 price base £	Cars, LGVs & goods vehicles	Bus & Coach	Rail Total	Bus Passengers Franchised	Rail passengers, TOCs
Non-business commuting benefits						
Travel time saving	6,159,889	2,303,344	0	3,856,545	0	3,856,545
Vehicle operating costs	0	0	0	0	0	0
User charges	0	0	0	0	0	0
During construction & maintenance	-355,087	0	0	-355,087	0	-355,087
Net (1a)	**5,804,802**	2,303,344	0	3,501,458	0	3,501,458
Non-business other benefits						
Travel time saving	5,619,860	2,303,344	0	3,316,516	0	3,316,516
Vehicle operating costs	0	0	0	0	0	0
User charges	0	0	0	0	0	0
During construction & maintenance	-355,087	0	0	-355,087	0	-355,087
Net (1b)	**5,264,773**	2,303,344	0	2,961,429	0	2,961,429
Business benefits						
Business user benefits						
Travel time saving	6,503,527	4,606,688	0	1,896,839	0	1,896,839
Vehicle operating costs	0	0	0	0	0	0
User charges	0	0	0	0	0	0
During construction & maintenance	-710,174	0	0	-710,174	0	-710,174
Net (2)	**5,793,352**	4,606,688	0	1,186,664	0	1,186,664
Private sector provider impacts						
Revenue	38,730,653	0	0	38,730,653	-1,808,387	40,539,040
Opcost	-53,057,562	0	0	-53,057,562	0	-53,057,562
Private sector	0	0	0	0	0	0
Revenue transfer (100% to government)	-38,672,286	0	0	-38,672,286	1,808,387	-40,480,673
Opcost transfer from TOCs (100% to government)	53,057,562	0	0	53,057,562	0	53,057,562
Sub total (3)	**58,367**	0	0	58,367	0	58,367
Other business impacts						
Developer contribution (4)	**0**			0		
Net business impact (5 = 2+3+4)	**5,851,720**	4,606,688	0	1,245,032		
Total, PV of transport econ eff. benefits (6 = 1a+1b+5)	**16,921,294**	1(a), 1(b) and (5) flow into the AMCB table, not (6)				

Table 2 Public Accounts (costs should be recorded as a positive number, surpluses as a negative one)				
	All Modes Total	Road Infrastructure	Bus & Coach	Rail
Local Government funding				
Revenue	0	0	0	0
Operating costs	0	0	0	0
Investment costs	0	0	0	0
Grant/subsidy: Public funds (unappraised)(b)	0	0	0	0
Revenue transfer	0	0	0	0
Net (7)	**0**	0	0	0
General Government funding: transport				
Revenue	0	0	0	0
NR operating costs	0	0	0	0
Investment costs (a)	*117,942,579*	0	0	*117,942,579*
Grant/subsidy: Public funds (unappraised)(b)	*0*	0	0	*0*
Developer (c)	*0*	0	0	*0*
Private sector(d)	*0*	0	0	*0*
Net investment costs to central govt (= a-b-c-d)	117,942,579	0	0	117,942,579
Revenue transfer (100% to government)	-38,672,286	0	1,808,387	-40,480,673
Opcost transfer from TOCs (100% to government)	53,057,562	0	0	53,057,562
Infrastructure cost savings	-62,161	-62,161	0	0
Net (8)	132,265,694	0	1,808,387	130,519,468
General Government funding: non-transport				
Indirect Tax Revenues (9)	**5,511,658**	5,683,438	0	-171,780
Totals				
Broad transport budget (10=7+8)	**132,265,694**	* These costs exclude developer contributions		
Wider public finances (11=9)	**5,511,658**			

Table 3: Analysis of Monetised Costs and Benefits (AMCB)		
Noise	74,327	
Local air quality	54,893	
Greenhouse gases	-790,774	
Rail environmental costs	0	
Journey ambience (inc. station amenity and crowding benefits)	0	
Accidents (incl. safety)	1,161,690	
Consumer users (sub-total 1a+1b, Table 1)	11,069,574	
Business users and providers (sub-total 5, Table 1)	5,851,720	
Reliability (including performance)	0	
Option values	0	
Wider public finances (indirect taxation revenues) (sub-total 11)	-5,511,658	Sign changed from Table 2
PV of Benefits (a = sum of all benefits)	**11,909,773**	
Broad transport budget (sub-total 10)	**132,265,694**	From Table 2
PV of Costs (b = 10)	**132,265,694**	
Overall impacts		
NPV (a-b)	**-120,355,922**	
BCR (a/b)	**0.09**	

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Table 4.3: TEE table for Option 2

TEE tables - Opt2 Tram Train						
Table 1: Economic Efficiency of Transport System (All costs & disbenefits are negative, all benefits & savings are positive)						
	Total in 2010 price base £	Cars, LGVs & goods vehicles	Bus & Coach	Rail Total	Bus Passengers Franchised	Rail passengers, TOCs
Non-business commuting benefits						
Travel time saving	6,159,889	2,303,344	0	3,856,545	0	3,856,545
Vehicle operating costs	0	0	0	0	0	0
User charges	0	0	0	0	0	0
During construction & maintenance	0	0	0	0	0	0
Net (1a)	**6,159,889**	2,303,344	0	3,856,545	0	3,856,545
Non-business other benefits						
Travel time saving	5,619,860	2,303,344	0	3,316,516	0	3,316,516
Vehicle operating costs	0	0	0	0	0	0
User charges	0	0	0	0	0	0
During construction & maintenance	0	0	0	0	0	0
Net (1b)	**5,619,860**	2,303,344	0	3,316,516	0	3,316,516
Business benefits						
Business user benefits						
Travel time saving	6,503,527	4,606,688	0	1,896,839	0	1,896,839
Vehicle operating costs	0	0	0	0	0	0
User charges	0	0	0	0	0	0
During construction & maintenance	0	0	0	0	0	0
Net (2)	**6,503,527**	4,606,688	0	1,896,839	0	1,896,839
Private sector provider impacts						
Revenue	39,008,551	0	0	39,008,551	-1,808,387	40,816,938
Opcost	-31,095,566	0	0	-31,095,566	0	-31,095,566
Private sector	0	0	0	0	0	0
Revenue transfer (99% to government)	-38,672,286	0	0	-38,672,286	1,808,387	-40,480,673
Opcost transfer from TOCs (100% to government)	31,095,566	0	0	31,095,566	0	31,095,566
Sub total (3)	**336,265**	0	0	336,265	0	336,265
Other business impacts						
Developer contribution (4)	**0**			0		
Net business impact (5 = 2+3+4)	**6,839,792**	4,606,688	0	2,233,104		
Total, PV of transport econ eff. benefits (6 = 1a+1b+5)	**18,619,540**	1(a), 1(b) and (5) flow into the AMCB table, not (6)				

Table 2 Public Accounts (costs should be recorded as a positive number, surpluses as a negative one)				
	All Modes Total	Road Infrastructure	Bus & Coach	Rail
Local Government funding				
Revenue	0	0	0	0
Operating costs	0	0	0	0
Investment costs	0	0	0	0
Grant/subsidy: Public funds (unappraised)(b)	0	0	0	0
Revenue transfer	0	0	0	0
Net (7)	**0**	0	0	0
General Government funding: transport				
Revenue	0	0	0	0
NR operating costs	0	0	0	0
Investment costs (a)	*90,571,866*	0	0	*90,571,866*
Grant/subsidy: Public funds (unappraised)(b)	*0*	0	0	*0*
Developer (c)	*0*	0	0	*0*
Private sector(d)	*0*	0	0	*0*
Net investment costs to central govt (= a-b-c-d)	90,571,866	0	0	90,571,866
Revenue transfer (99% to government)	-38,672,286	0	1,808,387	-40,480,673
Opcost transfer from TOCs (100% to government)	31,095,566	0	0	31,095,566
Infrastructure cost savings	-62,161	-62,161	0	0
Net (8)	82,932,986	0	1,808,387	81,186,760
General Government funding: non-transport				
Indirect Tax Revenues (9)	**5,683,438**	5,683,438	0	0
Totals				
Broad transport budget (10=7+8)	**82,932,986**	* These costs exclude developer contributions		
Wider public finances (11=9)	**5,683,438**			

Table 3: Analysis of Monetised Costs and Benefits (AMCB)		
Noise	74,327	
Local air quality	54,893	
Greenhouse gases	712,906	
Rail environmental costs	0	
Journey ambience (inc. station amenity and crowding benefits)	0	
Accidents (incl. safety)	1,161,690	
Consumer users (sub-total 1a+1b, Table 1)	11,779,749	
Business users and providers (sub-total 5, Table 1)	6,839,792	
Reliability (including performance)	0	
Option values	0	
Wider public finances (indirect taxation revenues) (sub-total 11)	-5,683,438	Sign changed from Table 2
PV of Benefits (a = sum of all benefits)	**14,939,918**	
Broad transport budget (sub-total 10)	**82,932,986**	From Table 2
PV of Costs (b = 10)	**82,932,986**	
Overall impacts		
NPV (a-b)	**-67,993,067**	
BCR (a/b)	**0.18**	

Table 4.4: TEE table for Option 3

TEE tables - Opt3 Tram LRV						
Table 1: Economic Efficiency of Transport System (All costs & disbenefits are negative, all benefits & savings are positive)						
	Total in 2010 price base £	Cars, LGVs & goods vehicles	Bus & Coach	Rail Total	Bus Passengers Franchised	Rail passengers, TOCs
Non-business commuting benefits						
Travel time saving	6,159,889	2,303,344	0	3,856,545	0	3,856,545
Vehicle operating costs	0	0	0	0	0	0
User charges	0	0	0	0	0	0
During construction & maintenance	0	0	0	0	0	0
Net (1a)	**6,159,889**	2,303,344	0	3,856,545	0	3,856,545
Non-business other benefits						
Travel time saving	5,619,860	2,303,344	0	3,316,516	0	3,316,516
Vehicle operating costs	0	0	0	0	0	0
User charges	0	0	0	0	0	0
During construction & maintenance	0	0	0	0	0	0
Net (1b)	**5,619,860**	2,303,344	0	3,316,516	0	3,316,516
Business benefits						
Business user benefits						
Travel time saving	6,503,527	4,606,688	0	1,896,839	0	1,896,839
Vehicle operating costs	0	0	0	0	0	0
User charges	0	0	0	0	0	0
During construction & maintenance	0	0	0	0	0	0
Net (2)	**6,503,527**	4,606,688	0	1,896,839	0	1,896,839
Private sector provider impacts						
Revenue	38,918,270	0	0	38,918,270	-1,808,387	40,726,657
Opcost	-26,115,227	0	0	-26,115,227	0	-26,115,227
Private sector	0	0	0	0	0	0
Revenue transfer (99% to government)	-38,672,286	0	0	-38,672,286	1,808,387	-40,480,673
Opcost transfer from TOCs (100% to government)	26,115,227	0	0	26,115,227	0	26,115,227
Sub total (3)	**245,984**	0	0	245,984	0	245,984
Other business impacts						
Developer contribution (4)	**0**			0		
Net business impact (5 = 2+3+4)	**6,749,511**	4,606,688	0	2,142,823		
Total, PV of transport econ eff. benefits (6 = 1a+1b+5)	**18,529,259**	1(a), 1(b) and (5) flow into the AMCB table, not (6)				

Table 2 Public Accounts (costs should be recorded as a positive number, surpluses as a negative one)				
	All Modes Total	Road Infrastructure	Bus & Coach	Rail
Local Government funding				
Revenue	0	0	0	0
Operating costs	0	0	0	0
Investment costs	0	0	0	0
Grant/subsidy: Public funds (unappraised)(b)	0	0	0	0
Revenue transfer	0	0	0	0
Net (7)	**0**	0	0	0
General Government funding: transport				
Revenue	0	0	0	0
NR operating costs	0	0	0	0
Investment costs (a)	*92,333,600*	0	0	*92,333,600*
Grant/subsidy: Public funds (unappraised)(b)	*0*	0	0	*0*
Developer (c)	*0*	0	0	*0*
Private sector(d)	*0*	0	0	*0*
Net investment costs to central govt (= a-b-c-d)	92,333,600	0	0	92,333,600
Revenue transfer (99% to government)	-38,672,286	0	1,808,387	-40,480,673
Opcost transfer from TOCs (100% to government)	26,115,227	0	0	26,115,227
Infrastructure cost savings	-62,161	-62,161	0	0
Net (8)	79,714,380	0	1,808,387	77,968,155
General Government funding: non-transport				
Indirect Tax Revenues (9)	**5,683,438**	5,683,438	0	0
Totals				
Broad transport budget (10=7+8)	**79,714,380**	* These costs exclude developer contributions		
Wider public finances (11=9)	**5,683,438**			

Table 3: Analysis of Monetised Costs and Benefits (AMCB)		
Noise	74,327	
Local air quality	54,893	
Greenhouse gases	712,906	
Rail environmental costs	0	
Journey ambience (inc. station amenity and crowding benefits)	0	
Accidents (incl. safety)	1,161,690	
Consumer users (sub-total 1a+1b, Table 1)	11,779,749	
Business users and providers (sub-total 5, Table 1)	6,749,511	
Reliability (including performance)	0	
Option values	0	
Wider public finances (indirect taxation revenues) (sub-total 11)	-5,683,438	Sign changed from Table 2
PV of Benefits (a = sum of all benefits)	**14,849,637**	
Broad transport budget (sub-total 10)	**79,714,380**	From Table 2
PV of Costs (b = 10)	**79,714,380**	
Overall impacts		
NPV (a-b)	**-64,864,743**	
BCR (a/b)	**0.19**	

System Operator

NetworkRail

Table 4.5 TEE table for Option 4

TEE tables - Opt4 VLR						
Table 1: Economic Efficiency of Transport System (All costs & disbenefits are negative, all benefits & savings are positive)						
	Total in 2010 price base £	Cars, LGVs & goods vehicles	Bus & Coach	Rail Total	Bus Passengers Franchised	Rail passengers, TOCs
Non-business commuting benefits						
Travel time saving	6,159,889	2,303,344	0	3,856,545	0	3,856,545
Vehicle operating costs	0	0	0	0	0	0
User charges	0	0	0	0	0	0
During construction & maintenance	0	0	0	0	0	0
Net (1a)	**6,159,889**	2,303,344	0	3,856,545	0	3,856,545
Non-business other benefits						
Travel time saving	5,619,860	2,303,344	0	3,316,516	0	3,316,516
Vehicle operating costs	0	0	0	0	0	0
User charges	0	0	0	0	0	0
During construction & maintenance	0	0	0	0	0	0
Net (1b)	**5,619,860**	2,303,344	0	3,316,516	0	3,316,516
Business benefits						
Business user benefits						
Travel time saving	6,503,527	4,606,688	0	1,896,839	0	1,896,839
Vehicle operating costs	0	0	0	0	0	0
User charges	0	0	0	0	0	0
During construction & maintenance	0	0	0	0	0	0
Net (2)	**6,503,527**	4,606,688	0	1,896,839	0	1,896,839
Private sector provider impacts						
Revenue	38,825,134	0	0	38,825,134	-1,808,387	40,633,520
Opcost	-18,784,170	0	0	-18,784,170	0	-18,784,170
Private sector	0	0	0	0	0	0
Revenue transfer (100% to government)	-38,672,286	0	0	-38,672,286	1,808,387	-40,480,673
Opcost transfer from TOCs (100% to government)	18,784,170	0	0	18,784,170	0	18,784,170
Sub total (3)	**152,848**	0	0	152,848	0	152,848
Other business impacts						
Developer contribution (4)	**0**			0		
Net business impact (5 = 2+3+4)	**6,656,375**	4,606,688	0	2,049,687		
Total, PV of transport econ eff. benefits (6 = 1a+1b+5)	**18,436,123**	1(a), 1(b) and (5) flow into the AMCB table, not (6)				

Table 2 Public Accounts (costs should be recorded as a positive number, surpluses as a negative one)				
	All Modes Total	Road Infrastructure	Bus & Coach	Rail
Local Government funding				
Revenue	0	0	0	0
Operating costs	0	0	0	0
Investment costs	0	0	0	0
Grant/subsidy: Public funds (unappraised)(b)	0	0	0	0
Revenue transfer	0	0	0	0
Net (7)	**0**	0	0	0
General Government funding: transport				
Revenue	0	0	0	0
NR operating costs	0	0	0	0
Investment costs (a)	*87,652,664*	0	0	*87,652,664*
Grant/subsidy: Public funds (unappraised)(b)	*0*	0	0	*0*
Developer (c)	*0*	0	0	*0*
Private sector(d)	*0*	0	0	*0*
Net investment costs to central govt (= a-b-c-d)	87,652,664	0	0	87,652,664
Revenue transfer (100% to government)	-38,672,286	0	1,808,387	-40,480,673
Opcost transfer from TOCs (100% to government)	18,784,170	0	0	18,784,170
Infrastructure cost savings	-62,161	-62,161	0	0
Net (8)	67,702,388	0	1,808,387	65,956,162
General Government funding: non-transport				
Indirect Tax Revenues (9)	**5,683,438**	5,683,438	0	0
Totals				
Broad transport budget (10=7+8)	**67,702,388**	* These costs exclude developer contributions		
Wider public finances (11=9)	**5,683,438**			

Table 3: Analysis of Monetised Costs and Benefits (AMCB)		
Noise	74,327	
Local air quality	54,893	
Greenhouse gases	712,906	
Rail environmental costs	0	
Journey ambience (inc. station amenity and crowding benefits)	0	
Accidents (incl. safety)	1,161,690	
Consumer users (sub-total 1a+1b, Table 1)	11,779,749	
Business users and providers (sub-total 5, Table 1)	6,656,375	
Reliability (including performance)	0	
Option values	0	
Wider public finances (indirect taxation revenues) (sub-total 11)	-5,683,438	Sign changed from Table 2
PV of Benefits (a = sum of all benefits)	**14,756,501**	
Broad transport budget (sub-total 10)	**67,702,388**	From Table 2
PV of Costs (b = 10)	**67,702,388**	
Overall impacts		
NPV (a-b)	**-52,945,887**	
BCR (a/b)	**0.22**	