Research in Transportation Economics 54 (2015) 51–62

Contents lists available at ScienceDirect

Research in Transportation Economics

journal homepage: www.elsevier.com/locate/retrec

The economic viability of a Parallel Cross Country Route for England

David Worsley*

Newcastle Centre for Railway Research, Stephenson Building, Newcastle University, Newcastle upon Tyne, NE1 7RU, England, UK

ARTICLE INFO

Article history:
Available online 18 November 2015

JEL code:
L92

Keywords:
Rail routes
Economic appraisal
Gravity modelling

ABSTRACT

This paper is a contribution to the debate about the uses to which Britain's existing rail infrastructure should be put following the completion of High Speed 2. The provision of rapid high capacity rail services from London to Leeds, Sheffield, Nottingham, Manchester and Birmingham will remove the principal long distance passenger flows from the East Coast Main Line (ECML), Midland Main Line (MML) and West Coast Main Line (WCML). Most of the suggestions for alternative uses of the released capacity on these routes have involved either increased connectivity between existing secondary stations, better connections from the principal population centres to off route destinations, or increased capacity for commuting in to London. This paper suggests an alternative proposal, namely that sections of the ECML, MML, WCML and Great Western Main Line (GWML) could be linked together to form a new long distance route running on a south west to north east axis; the route would provide a broadly parallel (but slower) alternative to the existing Cross Country Route between Bristol and York, as it would run via Swindon, Oxford, Milton Keynes, Northampton, Leicester, Nottingham and Doncaster. This paper will utilise various methods for estimating the capital expenditure required and passenger demand expected from the provision of this route and accompanying rail services (along with standard assumptions regarding operational expenditure), in order to gauge whether there may be a case for developing this proposal further.

1. Introduction

This paper demonstrates the application of some techniques that are currently used for rail project appraisal in Great Britain to a proposal relating to the utilisation of the existing rail network following the completion of High Speed 2. Many of the principal long distance high speed (LDHS) passenger flows in England (and between England and Scotland) will be accommodated by HS2's infrastructure and services following its completion, which is scheduled to occur in stages between 2026 and 2033; other flows will be served by "classic compatible" trains, which will run on HS2's infrastructure for part of their journey before joining the existing network. One of the benefits of HS2 will therefore be the release of capacity on Network Rail's existing infrastructure; this capacity may be available to facilitate services and meet passenger demand which it has previously been impossible to accommodate due to the imperative to provide for the principal long distance flows that will transfer to HS2.

Network Rail and other stakeholders have produced proposals for the future use of this capacity, but these have tended to assume that the existing network geography will remain similar to the present. As the existing network has been largely configured to serve the demand for travel to and from London, the alternative proposals have been constrained to devising revised service patterns that improve the connectivity provided to smaller destinations (both on the main lines and slightly off route) which are currently relatively poorly served.

The proposal examined in this paper is a more radical suggestion, namely to facilitate a new long distance service which would run from Hull to Bristol Temple Meads, via Doncaster, Newark, Nottingham, Leicester, Northampton, Milton Keynes, Oxford, Swindon and Bath Spa. This proposal would therefore link the East Coast Main Line, Midland Main Line, West Coast Main Line and Great Western Main Line, and thereby provide new direct connections between several of England's major cities and large towns. However, it would require at least one major infrastructure project, in order to reinstate the Market Harborough to Northampton line, which was closed in August 1981, following the final withdrawal of passenger services in August 1973. (It would be possible to link Leicester to Northampton via the old Great Central route from

* Tel.: +44 07941 829463.
E-mail address: David.Worsley@newcastle.ac.uk.

http://dx.doi.org/10.1016/j.retrec.2015.10.025
0739-8859/

Leicester to Rugby, but this would create a significant interface with a section of the West Coast Main Line that would still be required to accommodate passenger flows from London to Coventry, the Trent Valley area and Stoke on Trent.) This new service would run broadly parallel to the existing Cross Country Main Line (CCML) from York to Bristol Temple Meads (via Leeds, Derby and Birmingham), at least up until the final section between Swindon and Bristol where it would switch decisively to an east to west alignment and converge with the Cross Country route. However, as the great majority of the proposed new long distance route runs on a north east to south west axis at a distance of between 13 and 42 miles east of the CCML, it is proposed that it be called the Parallel Cross Country Route (PCCR).

This paper includes an economic appraisal of this proposal, using a simplified version of the standard techniques of cost benefit analysis that are currently employed by the railway industry (under guidance from the Department for Transport) during Route Utilisation Studies. The calculations of project construction and operational costs use straight forward analytical techniques, with adjustments for optimism bias. There is however a more complex discussion of the demand forecasting which would be necessary to estimate the benefits arising from providing the new service, as there is a degree of disagreement within the industry with regards to which methods would be the most appropriate for such a proposal.

The results of the cost benefit analysis are presented in the form of two variations on the outcome which would occur were different assumptions to be made. The paper concludes with suggestions for the future direction of related analysis.

2. Contribution to transport project appraisal

This paper is not intended to critique the current methodology of transport project appraisal in the UK. It provides a description of a particular proposal, some context regarding the strategic background in to which the proposal fits, and an economic appraisal of the proposal using the normal techniques currently in use in Great Britain by Network Rail and High Speed 2. Some of the data used as the basis for this paper, such as current passenger numbers and revenue for the flows between particular origins and destinations, is covered by commercial confidentiality. However, anyone with access to this data would be able to recreate these results given the description of the method and assumptions herein.

The originality of the paper lies in the proposal itself. Rail industry bodies in the UK have undertaken a reasonable amount of analysis regarding the uses to which the existing railway network could be put following the planned completion of the full HS2 network in 2033. Stakeholders who have published documents discussing the issue include Greengauge 21 (2011), Network Rail (2013b) and Passenger Focus (2012). However, these analyses have not considered whether the release of capacity on existing lines will facilitate the economic viability of new alignments.

Similarly, Network Rail's current programme of Route Studies is examining the potential impact of HS2 on the current network in the period up to 2043, but these planning documents are not intended to assess the viability of potential new routes. The recently published East Midlands Route Study covers the area most directly affected by the proposal outlined in this paper, but it assesses only the optimal usage of the existing network, with some incremental enhancements such as junction realignments (Network Rail, 2015). This paper is thus original in that it examines whether a combination of released capacity and new infrastructure could support a new rail service in the 2030s and beyond.

3. The integration of high speed 2

As currently configured, HS2 is intended (by 2033) to provide the infrastructure required to support the following services on entirely new alignments designed to a high (GC) loading gauge:

- London Euston to Birmingham Curzon Street (3 trains per hour in both directions);
- London Euston to Manchester Piccadilly (3 tph);
- Birmingham Curzon Street to Manchester Piccadilly (2 tph);
- Birmingham Curzon Street to Leeds (2 tph);
- London Euston to Leeds (2 tph) (HS2 Limited, 2013b, p. 42).

Meanwhile, the following routes will be served by classic compatible vehicles that will switch from the new high loading gauge alignments to the existing infrastructure at new junctions:

- London Euston to Liverpool Lime Street (2 tph);
- London Euston to Preston (1 tph);
- London Euston to Scotland (2 tph, with the train splitting at Carstairs, and one part proceeding to Glasgow Central whilst the other half proceeds to Edinburgh Waverley);
- Birmingham Curzon Street to Scotland (1 tph, to either Glasgow Central or Edinburgh Waverley in alternate hours);
- Birmingham Curzon Street to Newcastle upon Tyne (1 tph);
- London Euston to Yorkshire (1 tph, with the train splitting at Meadowhall, and one part proceeding to Leeds whilst the other half proceeds to York);
- London Euston to Newcastle upon Tyne (2 tph) (HS2 Limited, 2013b, p. 42).

The original Department for Transport Command Paper of 2010 envisaged that HS2 would allow the use of “400 m long European sized trains, which are higher and wider than UK rolling stock and with a capacity of up to 1100 seats” (DfT, 2010, p. 82). The passenger capacity of such a GC gauge vehicle compares favourably with the trains that currently serve HS2's markets, such as the Class 390 Pendolino (up to 597 seated passengers), the Class 91 High Speed Train (477), the future Hitachi IEP (up to 627), the Class 221 Super Voyager in use on Cross Country services (252), and the Class 222 Meridian in use by East Midland Trains services from St. Pancras (up to 343 seated passengers) (HS2 Limited, 2013b, pp. 37–38). Although the (as yet undesigned) classic compatible vehicles would probably have a seating capacity comparable to existing train sets, it would be possible to link two together to create a high capacity train.

Meanwhile, in most cases, the point to point journey times provided by HS2 will be a significant improvement on current journey times; the hypothetical improvements originally suggested ranged from a 17% reduction for Newcastle to London (189 min–157 min), through a 25% reduction for Liverpool to London (130 min–97 min), very significant 43% reductions for both Manchester to London and Leeds to London, up to a 46% reduction for Leeds to Birmingham (120 min–65 min) (DfT, 2011, pp. 4 & 16; cf. Stokes, 2013; HS2 Limited, 2013a).

The demand forecasting work undertaken for HS2 has assumed that ticket prices will be no higher than those on the existing network are forecast to be at the time HS2 becomes operational. Therefore, taken together, the service patterns, vehicle capacity and journey times offered by HS2 should ensure that HS2 becomes the principal carrier of the rail passenger flows served by its routes. One consequence of this is that a significant proportion of the capacity provided by the existing rail network will be released for other uses, due to the transfer of many LDHS passenger flows to HS2. The routes that will benefit from this released capacity include: