



# Rail Executive

## Via e-mail only

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## CH2M HILL FINAL REPORT: DFT COMMENTARY

Dear John,

Thank you for giving us the opportunity to comment on the latest version of the CH2M Hill (CH2M) report, examining the different Applications for Track Access on the East Coast Main Line (ECML).

Before I begin, I should note that I have yet to receive responses to the questions I posed in my letter to you dated 21 December 2015, particularly about how the ORR takes into account absolute levels of abstraction from franchised operators and the absolute level of funds available to the Secretary of State as part of its decision making process. We are meeting to discuss this on 16 February, but it may be necessary to revert to you with further points on these matters following our meeting.

Additionally, before turning to the substance of the CH2M report, I wanted to raise one important preliminary point. The technical note accompanying the CH2M report acknowledges that there are numerous areas of uncertainty where judgement calls will be made by the ORR, without providing substantive detail about how these judgments will be made. For instance, when discussing the gravity model the note states that the ORR *'recognise that the associated estimate of generated demand is necessarily subject to a higher degree of uncertainty than other aspects of the demand forecasts'* and that therefore *'this is one factor that will need to be considered when the ORR reaches a decision'*. However, it is not clear from this exactly what weight will be applied to the inherent uncertainty that there is with this model. I would be grateful for purposes of transparency and to assist DfT to effectively engage with the ORR, if you could explain in more detail exactly how these judgement calls will be made and what scenarios will be presented to the ORR's Board.

*Overall Comments*

Overall, after carefully considering the CH2M analysis, we are still of the view that there are a number of serious flaws in CH2M's methodology. This is a particular concern given the importance ORR appears to be giving to this analysis in its decision making process. Our technical advisers (SDG) have reviewed the CH2M analysis, the report produced by LeighFisher and the audit report produced by Systra. Their comments, which highlight the wide ranging issues with the analysis undertaken by CH2M, are summarised in the attached note. We consider it is important that the ORR gives careful consideration to this before any decision is taken on the applications.

I discuss many of the points raised by SDG below. We note that, for each of the methodological points I refer to, the effect of the assumption that has been made is to make the Open Access options seem preferable, both in terms of the estimated generated versus abstracted revenue and of the economic welfare impacts. The Department is seriously concerned that the cumulative effect of all these skewed assumptions is that the analysis provides a highly unbalanced overall perspective of the value of the different applications. The resulting risk is that the ORR Board will be presented with, in our considered view, unrepresentative information regarding the potential costs and benefits of the different applications, and that any decision made on this basis will not be robust.

As the ORR has already acknowledged, any analysis of the competing applications will be subject to a high degree of intrinsic uncertainty. This is especially true when considering the inclusion and application of any model overlays, and any divergences from conventional and well-established industry forecasting guidance (PDFH) and the economic appraisal guidance (WebTAG and the Green Book). Our technical advisers have produced, and we have provided you with, an economic appraisal of these options conducted in accordance with PDFH and WebTAG<sup>1</sup>; this demonstrates that the VTEC options are the highest value for money options, both in NPV terms and taking into account cost to government. Stakeholders have had an opportunity to comment on this analysis, a finalised version of which, including our response to points raised by stakeholders, will be provided to the ORR shortly. In the meantime, I would be grateful if you could clarify what weight the ORR will apply to this analysis when making its final decisions.

Finally, we are also concerned that some of CH2M's outputs appear to be implausible. For example, it is not clear how the VTEC Middlesbrough service – an option which provides an additional 2 hourly service over the VTEC Core – could be shown in the modelling as generating a negative crowding impact so large that it results in a negative NPV for the option. I would be grateful if you could explain how this result occurs so that we can better understand the approach taken here. Without access to the supporting analytical files, we cannot determine how this result was achieved, but we believe that such a counterintuitive result is indicative of either an implausible methodology, model input assumptions, or a model error.

Given the scale of the impact that the ORR's decision could have on taxpayers, I would urge you again to ensure that every possible step is taken to ensure that the analysis underpinning your Board's decision is robust and is able to withstand careful scrutiny.

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<sup>1</sup> Economic Appraisal of ECML Track Access Applications, SDG, December 2015

## *Specific Issues with the CH2M analysis*

### *Treatment of Fares*

CH2M's modelling assumes that there will be a "competitive response" from incumbent operators following the introduction of an Open Access service. As SDG demonstrate, the results of the analysis are very sensitive to this assumption. However, in the report which the ORR itself commissioned from LeighFisher, the clear conclusion was that:

*'Based on the evidence available to us, we have not identified a competitive response.'*

When the ORR circulated the LeighFisher report, stakeholders were asked to consider whether it contained 'additional evidence relevant to [the] ECML access decisions'. Given how sensitive the results of the analysis are to this assumption and in the absence of any supporting evidence, we think it would be unreasonable for the ORR to depart from what we understand to be its normal approach by including a competitive response in the fares modelling. This is particularly true in the case of the London – Edinburgh flow, where air transport accounts for the majority of point to point journeys, and airlines offer extremely competitive fares. VTEC's fares on this flow are therefore already set in the context of a highly competitive market, as they have to be competitive with air fares in order to attract demand to rail. Therefore, there seems to be even less scope for any competitive response on this flow, and there is no evidence at all that a response of the scale assumed by CH2M would constitute a reasonable assumption. This also suggests there may be less scope for the proposed Open Access London – Edinburgh services to offer the large discounts relative to the VTEC services which CH2M have assumed.

In addition, even if inclusion of a "competitive response" in CH2M's modelling were appropriate, the way this change in incumbent fare levels is estimated appears to us to be incorrect. CH2M have modelled the competitive response on the basis of the total spare capacity on the franchised operator's services, rather than the spare capacity created by the market entry. The result of this is that the analysis would show that *any* market entry, however small, would lead to a step change in VTEC fares. This is, in our view, plainly illogical, as clearly covered in the SDG note. The consequent over-estimation of any competitor response will lead to inappropriately high estimates of the economic welfare gains and NPA results for the Open Access options.

Finally, as SDG also pointed out in the note we sent to the ORR on 12 November 2015<sup>2</sup>, the CH2M analysis implies that the demand growth that will occur following a fare reduction will apply to the entire rail market. It seems to us to be irrational to assume that a rival operator offering a lower fare will significantly increase the market for VTEC services. We consider that a more reasonable assumption would be that price sensitive passengers attracted to rail by lower fares would primarily travel with the operator offering these lower fares. Again, the assumption used in the CH2M report will lead to an overestimation of the NPA ratio for the Open Access options.

Although we cannot say with certainty without examining the underlying analytical files, we consider it likely that these issues alone are likely to go a long way towards explaining

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<sup>2</sup> Review of CH2M Hill Methodology Report

the unusually and in our view implausibly high generation versus abstraction ratios, particularly for the First Group options.

### *Systra Modelling Audit and Air Competition Overlay*

As noted by SDG, the Systra review of CH2M's work provides no commentary on the appropriateness of the methods developed and the validity of the assumptions used, nor any commentary on the definition of options and sensitivities tested by CH2M and the results produced. Without knowing the parameters of the review, it is unclear what Systra's overall perspective of CH2M's work is.

Of more concern however, Systra note that they '*have not been able to independently verify the provenance of [the] source data [used in the modelling of air market transfer in response to reduced fares] due to the confidentiality restrictions*'. Given that this data was provided by a stakeholder with an interest in the ORR's final decision (First Group), we find this especially concerning. We also are not clear why the ORR was happy to provide First with assurances regarding the handling of information it provided to it, given its refusal to provide assurances to the Department regarding our contractual obligation to ensure confidentiality of components of the IEP agreements.

### *First Group overtaking*

For Option 7 – representing the First Group Edinburgh service in combination with the May 14 IEP Speeds timetable – CH2M model the First service as being overtaken by the southbound VTEC service. However, such a move is not necessary when considered in combination with the IEP base timetable and would appear undesirable as it would introduce performance risk for both First and VTEC, as well as unnecessarily using up capacity in the Darlington area. We see no reason why such a service pattern is assumed. As with the fares issues we refer to above, this will also result in over-estimates of the ratio of generated versus abstracted revenue compared to a more reasonable assumption.

### *Impacts on the Secretary of State's Funds*

Our most significant concern continues to be that CH2M does not take into account the impacts of the various options on the Secretary of State's funds and therefore on taxpayers and railway investment. In particular, we remain concerned that the CH2M analysis only reports Net Present Values for each of the options considered. As noted in previous correspondence, and consistent with conventional, established approaches, this metric is of limited use when making value for money judgements within a constrained budget.<sup>3</sup>

Clearly, it would not be reasonable or appropriate to consider the Government as operating with an unconstrained budget, particularly in the current fiscal environment and the challenges to public finances, something that we will set out in more specific detail in separate correspondence very shortly. Furthermore, we consider this would be entirely inconsistent with a number of the ORR's duties under the Railways Act 1993, including

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<sup>3</sup> WebTAG Unit A1.1 Section 2.8.11, 'Cost-Benefit Analysis metrics: Net present value'

the obligations under section 4(1)(b), section 4 (5C) quoted later in this later and the obligation under section 4(5)(c) to:

*'have regard to the funds available to the Secretary of State for the purposes of his functions in relation to railways or railways services'*

We have made these points previously, but we are still unclear as to how the ORR intends to take these impacts into account, in accordance with its statutory duty, or what figures it proposes to use for these impacts.

For the avoidance of doubt, we consider that the CH2M calculations of abstraction set out in the report are not a complete or credible estimate of the costs to Government, both because these calculations do not include all elements of the costs to Government, and because of our serious concerns about CH2M's methodology, particularly what are in our view inappropriate assumptions which the ORR has instructed CH2M to use.

#### *IEP and treatment of Sunk Costs*

The technical note issued alongside the CH2M analysis discusses VTEC rolling stock costs, noting that the ORR are interested in *'estimates of VTEC incremental rolling stock costs net of sunk costs for each relevant option'*. However, it is not clear to us how the ORR could make this assessment, given its refusal in its letter to Dan Moore of 29 January 2016, to accept the confidentiality provisions, which flow directly from the Department's contract with Agility and which are necessary for the DfT to be in a position to share this information with ORR. We will write to the ORR shortly about this specific issue.

The technical note also states that the ORR are interested in understanding *'the extent to which this rolling stock could be redeployed onto other services'*. As we explained in detail in our letter dated 21 December 2015, there is absolutely no scope to do this.

To re-iterate, the majority of rolling stock costs for the VTEC options are sunk. It is a fundamental requirement of an accurate economic appraisal that sunk costs are treated as sunk. It is our view therefore that any alternative consideration of these costs by the ORR board would not be consistent with the statutory duty to:

*'have regard to the interests, in securing value for money, of the users or potential users of railway services, of persons providing railway services, of the persons who make available the resources and funds and of the general public'*

#### *The Gravity Model*

We continue to have serious concerns regarding CH2M's use and application of the Gravity model. As they have indicated in their note, SDG still contend that use of the model is counter to PDFHv5.1 recommendations and that its application will lead to inappropriate estimates of the impacts of new services.

As mentioned earlier, although the technical note states that the ORR recognise that there is a high degree of uncertainty associated with the results of this model, it does not state how the ORR will take this into account in its decision making process.

## *Performance*

As we have previously set out, operation of more trains, and use of a higher proportion of available capacity, is likely to lead to worsened operational performance. We have previously provided you with suggestions as to how this could be taken into account, but the CH2M appraisal still does not do so. We are unclear as to whether and how you intend to consider this factor, in particular given your statutory duty to '*promote improvements in railway service performance*'.

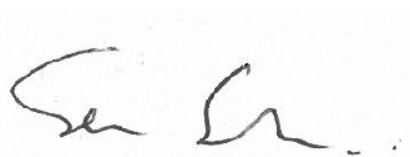
## *In Conclusion*

For the reasons set out above we are concerned that the evidence base which is being prepared for the ORR Board is not robust and will make it difficult for the Board to make a fair and reasonable decision.

I would be grateful if you could revert to me on these issues above on which I am seeking clarification, to ensure we have a shared understanding of the ORR's approach to these issues and so that the DfT as a key stakeholder can effectively engage with the ORR. I would also urge the ORR to reconsider the assumptions and methodology used in the CH2M report, in particular the diversions from accepted modelling practice, so that its Board can take a decision on the basis of a credible assessment of the likely outcome of each option.

It may be helpful to discuss these issues at our meeting on 16 February, after which it may be helpful to receive a written response.

Yours sincerely,



**Simon Smith**  
**Director, Passenger Services Design**  
**Rail Group**

To Department for Transport  
From Steer Davies Gleave  
Date 8<sup>th</sup> February 2016  
Subject Review of CH2M Hill Methodology Report

Project No. 22611403

## Introduction

Steer Davies Gleave (SDG) acted as technical advisor to the Department for Transport (the 'Department') on the specification and procurement of the InterCity East Coast (ICEC) franchise. Following the successful award of the franchise to Stagecoach / Virgin who are operating the franchise under the Virgin Trains East Coast (VTEC) brand, SDG was asked to estimate the impact of open access applications on the income that will accrue from the ICEC franchise.

Further to this advice, the Department has requested that we review the report prepared by CH2M Hill that sets out their methodology for and results of considering the various requests for paths on the East Coast Main Line (ECML)<sup>1</sup>. Our review findings are described below. It should be noted that:

- the time available to review the CH2M Hill report was limited; and
- the CH2M Hill report does not detail all calculations and the underlying analytical files were not available for review.

As such, further issues may be identified if the review period were to be extended or the analytical files were available.

We have previously commented upon the methodology proposed by CH2M Hill for this piece of work in a note, titled 'Review of CH2M Hill Methodology Report', which was provided to the Office of Rail and Road (ORR). These comments still stand. To avoid repetition this note concentrates on the issues and concerns that appear to have a large impact on the results of the analysis.

## Our findings

Our review has identified a number of issues in relation to the CH2M Hill report. Without access to the detailed analytical work we have limited visibility of the impact of each issue. However, it is apparent from the report that some of the issues we have identified would have a material impact upon the reported results.

The ORR also provided a technical note to accompany the CH2M report<sup>2</sup>. This note sets out ORR's proposed approach in relation to some of our areas of concern. Therefore this note describes our concerns in two sections:

- concerns that are not mentioned in the ORR note; and
- concerns that are mentioned in the ORR note.

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<sup>1</sup> CH2M HILL (January 2016) Assessment of Aspirations for Track Access on the East Coast Main Line: Phase 2 Final Report

<sup>2</sup> The Office of Rail and Road (January 2016) ORR technical note to accompany CH2M ECML report

## Concerns that are not mentioned in the ORR note

### Treatment of fares

The most significant of our concerns relates to the treatment of fares. There are two key issues in relation to the treatment of fares in the CH2M Hill modelling. In combination these will significantly understate the assumed level of abstraction.

#### *Competitive Response*

CH2M Hill has assumed that the incumbent operator will reduce fares following an increase in competition (referred to as competitive response). This is counter to the findings for a separate study undertaken by Leigh Fisher on behalf of the ORR<sup>3</sup> that has just been made available to us. The following quotes are taken from the final report for that study:

*“Following comparison of ICEC fares on flows with competition, with those in the comparator flows model, we could not find conclusive evidence of lower yields on flows with competition.”*

(Leigh Fisher (2016), Page 12)

*“Based on the evidence available to us, we have not identified a competitive response.”*

(Leigh Fisher (2016), Page 19)

*“In our analysis we have not found consistent evidence of a competitive response from franchised operators in the form of lower fares.”*

(Leigh Fisher (2016), Page 88)

This assumption by CH2M Hill that VTEC will reduce fares following the entry of another operator into the market is central to the reported results of the options where Alliance operates services to Cleethorpes/West Yorkshire and where First Group operates services to Edinburgh. This assumption is particularly inappropriate in the case of the London to Edinburgh market where significant air competition is already in place. In this market it would be expected that any potential downward pressure on fares due to competition would already be reflected in VTECs pricing strategy.

The inclusion of this factor does not seem consistent with the treatment of fares in the VTEC Core and Full Bid options. When estimating the reduction in VTEC fares that might occur following the introduction of a new operator, CH2M Hill has considered the amount of empty seats on VTEC trains that operate adjacent to the Open Access services. However, according to the main report<sup>4</sup> CH2M Hill has assumed no real fare reductions for the VTEC Core and Full Bid options despite these options introducing significant additional capacity with associated implications for the amount of empty seats and fare reductions. CH2M Hill justifies not assuming real fare reductions on the basis that ‘load factors will be around the same as [...] in May 14’. However, CH2M Hill does not report comparable figures for options where open access operators are in place.

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<sup>3</sup> Leigh Fisher (7 January 2016) Evidence of revenue generation and abstraction from historical open-access entry and expansion

<sup>4</sup> The main body of the report suggests that no reduction in VTEC fares is assumed in the VTEC Core and VTEC Full Bid cases. However Appendix C, which sets out the detailed approach to fares modelling, suggests that reduced fares have been modelled in these cases, in line with the approach taken when Open Access services are included. We have assumed that the text in the main body of the report is correct.



Even if it was appropriate to model a competitive response we have significant concerns in relation to its calculation. CH2M Hill has developed a bespoke formula to estimate the scale of fare reductions that VTEC would introduce following the entry of a competitor. The logic behind this formula is not clearly set out by CH2M Hill, and as such we have had to apply a degree of interpretation. We have assumed that the formula is attempting to apply the following logic:

- The passengers that would have been travelling on VTEC seats that are empty are instead travelling on Open Access services at the Open Access average fare.
- That VTEC offers all of these passengers an average fare that matches the average Open Access fare (and they all take up the offer), leading to a reduction in the average VTEC fare so that it equals the weighted average of the Open Access average fare and the base VTEC fare.

It is not clear that VTEC would follow such a fares policy, and as such there is significant doubt as to the robustness of this assumption. However even if this argument is accepted, if our interpretation of the logic is correct then, in our opinion, the formula requires correction for the following issues:

- **Issue 1** – The formula currently appears to weight the fares incorrectly, using ‘option journeys’ (journeys in the case of Open Access entry).
- **Issue 2** - The formula should use additional empty seats rather than total empty seats. In the absence of the Open Access operator and the undercutting fares introduced by them there are likely to already be some empty seats. However these will be empty through choice, VTEC could have filled them with a lower average fare, but that would not maximise revenue. The introduction of additional Open Access services and undercutting fares leads to more empty seats. In our opinion, it is only these additional empty seats that should be offered the additional discount and therefore figure in the new average fare equation.

These corrections would change the formula from the following taken from Appendix C to the CH2M Hill report:

$$\text{New VTEC fare} = ((\text{open access fare} \times \text{empty seats}) + ((\text{option journeys} - \text{empty seats}) \times \text{existing fare})) / (\text{option journeys})$$

To:

$$\text{New VTEC fare} = ((\text{open access fare} \times \text{additional empty seats}) + (\text{existing fare} \times \text{option journeys})) / \text{base journeys}$$

We have used a simple example to illustrate the difference between these assumptions, as follows:

- Existing VTEC fare = £50
- OA fare = £40

In the base case:

- Base VTEC journeys = 80
- Total VTEC seats = 100
- Base VTEC empty seats = 20

With Open Access entry and undercutting fares, but no competitive response:

- VTEC journeys = 70
- VTEC seats still = 100
- VTEC empty seats = 30

Using the formula set out in Appendix C to the CH2M Hill report:

- The new average VTEC fare =  $(40 \times 30 + 50 * (70 - 30)) / 70 = \text{£}45.71$  an 8.6% discount compared to the existing VTEC fare (without a response to the Open Access fare)

With issue 1 resolved:

- The new fare =  $(40 \times 30 + 50 * (100-30)) / 100 = \text{£}47.00$  a 6.0% discount

With issue 2 resolved:

- New fare =  $(40 \times (30-20) + 50 \times 70) / 80 = \text{£}48.75$  a 2.5% discount

CH2M Hill provides a sensitivity where it reduces the competitive response by half. Assuming a linear relationship we have extrapolated the implications of these sensitivities to provide an estimate of the generation / abstraction ratio in the case that no competitive response is modelled (as implied by the findings of Leigh Fisher’s study on behalf of ORR). Table 1 below sets out how critical this assumption is to the results achieved.

**Table 1: Extrapolation of low fares sensitivity**

	Total Abstracted Revenue	Generated Revenue	Generation over Total Abstraction
<b>Option 1 - Alliance Yorkshire / Cleethorpes</b>			
CH2M Hill reported central case	40,497	20,103	0.50
CH2M Hill reported half competitive response case	42,766	18,105	0.42
Inferred results - no competitive response	45,035	16,107	0.36
<b>Option 7 - First Edinburgh</b>			
CH2M Hill reported central case	9,274	16,308	1.76
CH2M Hill reported half competitive response case	14,538	12,598	0.87
Inferred results - no competitive response	19,802	8,888	0.45

We assume that this assumption has a similar scale of impact on the economic case. However, as CH2M Hill has not provided a breakdown of the economic benefits by cause we are unable to provide similar analysis for the economic case. Nevertheless extrapolating the impact set out above, we believe that it is likely that the removal of the assumption of competitive response would fundamentally change the order of the options when they are ranked on a total NPV or NPV per path basis. Given that a study undertaken for the ORR itself places doubt on the validity of this assumption, it seems unreasonable to base any decision on analysis that assumes that such a competitive response occurs.

*Allocation of demand growth due to fares and implications for load factors on First Group services*

CH2M Hill also assumes that the demand growth that will occur following a fare reduction should apply to the entire rail market. However, it does not seem reasonable that a rival operator offering a lower fare will significantly increase the market for VTEC services. We consider that it is more reasonable to assume that the price sensitive passengers attracted to rail by lower fares would primarily travel with the operator offering these lower fares.

In support of its assumption CH2M Hill argues that this assumption is the only one which returns a revenue change of zero with a fares elasticity of -1.0. However this argument is not valid. The introduction of discounted operator specific tickets segments the market, offering passengers with a high price sensitivity a more affordable product with a more restricted set of trains, whilst continuing to offer

less price sensitive passengers a more expensive but more flexible option. Therefore even if the overall market elasticity was -1.0 the introduction of discounted tickets could increase total revenue.

The assumption that demand growth resulting from fares accrues to all operators is particularly crucial to the case for the First Group Edinburgh option, as CH2M Hill assumes that the fares offered by First Group would be substantially lower than those offered by VTEC.

CH2M Hill estimates that First's ratio of passengers to seats across the weekday in 2020 would be around 80%. However, this load factor has been estimated based on the assumption that the journeys generated by the lower fares would accrue to both operators. In our opinion it should be expected that, in reality, any additional journeys attracted by the lower fares would be undertaken using the lower fare products, and hence would be concentrated on First Group services, leading to much higher load factors on their services. Our own analysis found that fare reductions of the scale proposed by First Group would result in total train load factors well in excess of seated capacity, suggesting that a significant proportion of passengers would be required to stand even in off peak times or would be unable to travel<sup>5</sup>. Based on this analysis, in our opinion, it is more reasonable to assume significantly higher fares on First Group services would be offered in reality.

CH2M Hill notes that the parameters it has used to model changes in fares are not suitable for this purpose. The impact of alternative assumptions is not reported, but could be considerable in the case of the First Group services where fare reductions of up to 50% are considered.

*"We note that PDFH states that there is greater uncertainty over larger changes in fares, with  $\pm 10\%$  cited as the threshold for a large change. We have discussed this with ORR, and understand that ORR intends to conduct its own supplementary analysis."*

(Page 4-22 CH2M Hill, Assessment of Aspirations for Track Access on the East Coast Main Line: Phase 2 Final Report)

Finally, on page 2 of Appendix G to the report, CH2M Hill appears to state that the user dis-benefits associated with increased crowding have not been included in the appraisal. This would mean that even if the demand growth from fares is correctly allocated, any associated crowding dis-benefits are not included in the appraisal.

### **Timetable assumptions**

We recognise that the capability of the ECML to accommodate further services is currently unclear, and that there is an operational risk related to any options, which includes additional services. However, it is certain that some modifications to existing services would be required to accommodate new open access services. We have already set out these concerns when commenting on the methodology proposed by CH2M Hill. These concerns do not appear to have been addressed in the latest version of their report, and are likely to lead to inappropriate estimates of the value of abstracted revenue.

In particular it is unclear why ORR has instructed CH2M Hill to model the First service as being overtaken by the southbound VTEC service in Option 7 (First Group Edinburgh in combination with the May 14 IEP Speeds timetable). Although such an overtaking move may be required when the First services are

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<sup>5</sup> As described in our Economic Appraisal of ECML Track Access Applications (December 2015) report, our initial modelling assumed a First Group fares reduction of 40%, which led to average load factors of around 140% by 2026/27. Reducing the discount to 25% for the First Group option based on IEP base, and 15%, for the option based on the VTEC bid timetable, reduced the average load factor to a more plausible, but still higher than usually observed, 100% by 2026/27.

considered in combination with the **VTEC bid** timetable, it does not appear necessary when considered in combination with the **IEP base** timetable. In our opinion, it is not feasible for First services to be “overtaken by the southbound regular VTEC hourly service in the IEP base” at Darlington in the same way as in the VTEC 2020 timetable, as both southbound VTEC Newcastle/Edinburgh services call at Darlington in the IEP base.

It is only in the VTEC bid timetable that the introduction of the third Newcastle path enables one of the two Edinburgh trains to skip Darlington and hence overtake a First train there. Assuming that the First service is overtaken by the VTEC service will bias the estimated ratio of generated versus abstracted revenue by underestimating the level of abstraction by the First service.

As a sensitivity test an option (Option 15) has been tested which removes this overtaking manoeuvre. As the timetable tested under Option 7 (which includes the overtaking move) is operationally infeasible, in our opinion the variant of the option without overtaking moves would make a more appropriate central case. It is notable that Option 15 would increase the forecast loadings on First Group services to a level which CH2M Hill suggest would lead to First Group choosing to raise fares to manage demand. The extent to which the First Group fare level reductions would need to be reduced and the associated reduction in the competitive response from VTEC (compared to that used by CH2M Hill in the other scenarios) to reduce loadings to levels forecast for other First Group options was tested by CH2M Hill as a sensitivity. Testing this combination of these two factors significantly reduces the revenue generated by the First Group services and results in a much higher level of abstraction from VTEC services proportional to generation than in Option 15 or Option 7.

In our opinion, based on the study undertaken by Leigh Fisher, it is not appropriate to include any form of competitive response. In addition, we would expect First Group to offer fares that are significantly higher than it has currently proposed, as the proposed fares would lead to unsustainable load factors if the demand increase from its proposed fare reductions was correctly allocated solely to First Group services. Therefore, we have extrapolated the results of the ‘half competitive response and reduced fare reduction’ sensitivity test as shown in Table 2 below:

**Table 2: Extrapolation of Option 15 lower fare reduction sensitivity**

	Total Abstracted Revenue	Generated Revenue	Generation over Total Abstraction
Option 15 – First Group Edinburgh no overtaking			
CH2M Hill reported central case	19,072	15,374	0.81
CH2M Hill reported half competitive response and reduced fare reductions	23,400	10,900	0.47
Inferred results – no overtaking, no competitive fares response, and further reduction in fare reductions	27,728	6,426	0.23

CH2M Hill also raises the possibility that First Group may be awarded paths that operate immediately in front of VTEC’s regular hourly service. It is unclear why ORR has instructed CH2M Hill not to test the impact of this likely outcome.

**Other considerations**

There are a number of areas where the explanation of the results presented is difficult to follow or inconsistent. For example in relation to Option 10, CH2M Hill states that it has:

*“made the simplifying assumption that VTEC’s revenue is the same as in option 3. The difference in revenue between option 10 and option 3 is therefore attributed to Alliance”*

(Page 6-62 CH2M Hill, Assessment of Aspirations for Track Access on the East Coast Main Line: Phase 2  
Final Report)

This decision to allocate to Alliance any additional revenue generated in Option 10 (compared to Option 3) may lead to an overestimate of the generation to abstraction ratio for the Alliance component of Option 10. For Option 6, the description of the transfer of revenue between TOCs appears at odds with the results presented (which show a negative NPV) and the negative impact of crowding appears implausible (given an additional two-hourly service) without further detailed explanation.

### **Systra Revenue and Demand Modelling Audit**

The CH2M Hill work has been subject to an audit by Systra<sup>6</sup>. The focus appears to be upon ensuring the method applied is consistent with the method described in the CH2M Hill documentation (e.g. paragraphs 1.1.5 and 2.3.2). No evidence is provided on the appropriateness of the methods developed and the validity of the assumptions used, nor any commentary on the definition of options and sensitivities tested by CH2M Hill and the results produced. In the absence of this, the level of confidence in the review and untested assertions, such as stating (in relation to the gravity model) that it is expected that the “generation:abstraction ratio will be marginally over-stated” is reduced. Furthermore it appears that Systra has not had full visibility of the source data and modelling. For example in relation to the modelling of air market transfer in response to reduced fares Systra states that:

*“we have not been able to independently verify the provenance of this source data due to the confidentiality restrictions”*

(Page 14–20, Systra, East Coast Main Line Track Access Applications – Revenue and demand Modelling  
Audit)

As such a number of elements of the forecast, that may be central to the results achieved have not been reviewed.

## **Concerns that are mentioned in the ORR note**

### **The use and application of the gravity model**

CH2M Hill has used a gravity model approach where a direct service is provided between locations that were served by a less than hourly frequency of direct services prior to the introduction of the open access operations. We have previously set out the evidence as to why the use of a gravity model in this context is inappropriate, and counter to PDFHv5.1 recommendations. We have also outlined some of our concerns with the proposed form of the gravity model and its application. These issues still stand. For example in many cases we would expect a significant proportion of the population in the catchment of newly served stations to use alternative rail services in the absence of new services. CH2M Hill only intends to take account of this in a handful of cases. Although the ORR states that the use of the gravity model for demand forecasting will be taken into account as part of the decision making process, it does not set out how.

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<sup>6</sup> Systra (26 January 2016) East Coast Main Line Track Access Applications – Revenue and demand Modelling Audit

### Formulation of the appraisal

In addition, we have previously raised the following concerns in regard to the formulation of the appraisal, which in our opinion will advantage the cases for additional open access services, and disadvantage the case for VTEC operated services. Specifically:

- The appraisal will assume that the costs of the Class 800 series fleet are fully incremental. This does not reflect the current situation. VTEC is contractually obliged to make Train Availability and Reliability (TARA) payments to Agility. VTEC is contractually obliged to make the majority of the TARA payments even if the rolling stock is not in use, although a relatively modest reduction in the payments will accrue if the sets are used for less miles than are assumed in the contract<sup>7</sup>. As such it is not appropriate to include full incremental costs for the options operated by VTEC as the majority of the related costs are sunk costs<sup>8</sup>; and
- It is proposed that the appraisal will include the benefits and incremental revenue of infrastructure upgrade works without reflecting the relevant costs. Only benefits which are 'paid for' should be considered in an appraisal.

### Conclusion

Whilst we welcome the consideration of these issues we still have considerable concerns around their treatment in the central case. The ORR seems to suggest that it will consider the impact of each of these elements, and the sensitivity of the results to the assumed competitive response and the inclusion of an overtaking move in the case of the First Group Edinburgh services, in isolation. However, although each of these sensitivities may not in isolation alter the ranking of each option, in our opinion it is highly likely that when considered in combination these factors will fundamentally alter the ranking of options and the value of the economic case for each option.

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<sup>7</sup> There are mechanisms within the contract that could lead to a relatively small decrease in the TARA payments in the event that the sets are operated over less miles than those set out in the contract. Any such decrease will depend on the scale of variation from the contracted mileage. In the case that the variation is outside the bounds set out in the contract, any cost change would be subject to negotiation between VTEC and Agility.

<sup>8</sup> While CH2M Hill has produced NPV results excluding operating costs for all options, this fails to differentiate between the different nature of the costs for each applicant, e.g. sunk costs or uncertain costs, and hence the relative performance of the options. We believe the ORR should present results for VTEC options with sunk costs treated in line with WebTAG.