

TRANSPORT AND THE ECONOMY IN THE EAST OF ENGLAND (TEES)

Executive Summary

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Prepared for:

EEDA

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1. EXECUTIVE SUMMARY

Study Background

1.1 Steer Davies Gleave was commissioned to undertake a study into the economic impact of transport in the East of England, and how transport contributes to the Regional Economic Strategy (RES) headline targets in the area of prosperity and productivity, employment and the environment.

1.2 The brief set out three key requirements:

A) An analysis of current and future wider costs to the regional economy of the constraints imposed by the existing transport network. This aimed to answer the question ‘What is the wider cost to the regional economy of the constraints imposed by the current and planned transport network?’

B) Identification of spatial transport ‘hot-spots’ and priority areas, to identify ‘Where exactly in the region does transport impose the most severe costs upon the economy?’

C) An analysis of the economic benefits, direct and wider, of implementing additional transport interventions i.e. ‘What would be the wider economic benefits to the region of additional investment in transport interventions in the hot-spots identified?’

Approach

1.3 Our approach has been informed by *Towards a Sustainable Transport System* (TaSTS), the Government’s response to the Eddington and Stern Reports. The TaSTS focus is reflected in:

- The process adopted for the study, which sought first to identify problems, set these in the context of regional objectives (Phase 1), and then to identify strategic level priorities (i.e. non mode and non-scheme specific), which then formed the basis for developing potential solutions in the form of ‘package interventions’ (Phase 2).
- The particular focus of the study on the economic impact of transport, using the Department for Transport’s Wider Economic Benefits (WEBs) methodology, that was developed following Eddington’s identification of key productivity benefits that were excluded from ‘conventional’ transport economic analysis. The study also identified the Carbon impact of transport, which will be an increasingly important consideration for transport interventions following the Stern Report, and the likely introduction of transport specific Carbon targets or ‘budgets’, to be set out in the Treasury’s response to the Climate Change Committee’s report in the 2009 budget.

1.4 The study has been undertaken in two key Phases. Phase 1 analyses existing and future constraints (assuming committed transport interventions) on the transport network, and quantifies the extent to which these constraints impact on the regional economy and Regional economic Strategic (RES) targets. As part of this stage we conducted two Stakeholder workshops, with businesses and local transport authorities to understand what key players considered to be the main economic issues facing the region, and the role transport could play in addressing them

- 1.5 The study then identified, at a strategic level, where transport improvements should be targeted to help deliver RES economic objectives. From these strategic level priorities six strategic packages of interventions were developed and tested in terms of their contribution to economic productivity and wider RES objectives.

Key Findings

- 1.6 Within the context of the key RES targets, our analysis of the existing transport system identified the following headline findings:

- There is significant congestion on the strategic highway network, on both the current (2003 base year) network and in the future (2021). The most congested links on the network are focused around the London Arc and Thames Gateway, and around the some of the major urban centres such as Cambridge.
- There is significant rail crowding on nearly all rail routes into London, which will place constraints on the ability for further passenger growth in the absence of capacity improvements.
- A sizeable share of freight movements are carried by rail, though there are significant capacity constraints on the rail freight network. Significant expansion is planned at Felixstowe, Bathside and London Gateway, which will create additional demand for rail freight.

- 1.7 Two Stakeholder workshops provided valuable evidence on real and perceived transport issues, and were particularly useful in identifying transport priorities for the region in terms of where transport can address economic challenges. The main priorities for Stakeholders were:

- Managing/Supporting Growth;
- Access to London;
- Regional Imbalance between North-East/South-West of region;
- Access to Gateways; and
- Freight and Business Connectivity.

Baseline Assessment - Results and Interpretation

- 1.8 The key results of the economic analysis undertaken are:
- A measure of the economic (GDP) cost of congestion, based on the difference between peak and free-flow travel costs is £658m pa (2003 prices) in 2003, of which £494m pa directly impacts the regional economy. A measure based on reducing congestion to inter-peak levels would yield equivalent benefits of £324m and £234m respectively.
 - Despite planned and committed investment, and allowing for projected growth in development and travel, these figures would rise to £1,339m pa (UK) and £986m pa (East of England) by 2021. The equivalent inter-peak figures are £721m and £514m.
 - If all transport costs are included (including leisure, discretionary and commuter journeys) then the cost of congestion would be up to £2.2bn pa by 2021 unless additional interventions are made.
 - The vast majority of these costs (85%) are borne in the seven 'Engines of

Growth' areas.

- The transport network overall performs worse in 2021 than 2003. This indicates that the committed schemes planned by 2021 do not 'keep pace' with the additional demand associated with the RSS housing and employment allocations (and also some background growth).

Strategic Priorities

1.9 In terms of strategic priorities the analysis therefore suggests the mid and long term priority corridors and areas should be:

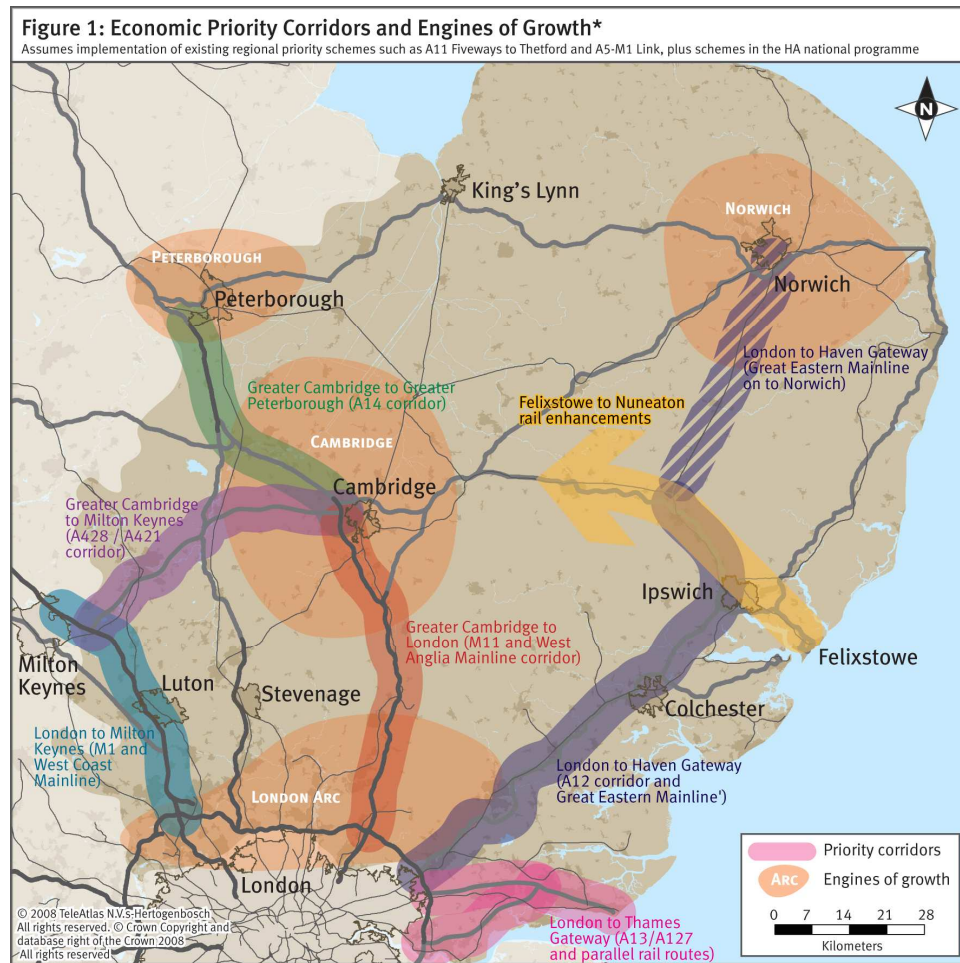
- Radial corridors from London (to the Thames and Haven Gateways, to Cambridge (and Peterborough) and to Milton Keynes.
- Also some east-west corridors, in particular between Cambridge and Milton Keynes.
- Key centres should be:
 - The London Arc engine of growth;
 - Cambridge, on the basis of all key indicators (flow, congestions an WEBs);
 - Norwich, Peterborough, on the basis of WEBs potential in particular.

1.10 This looks beyond the existing committed schemes such as A14 Ellington to Fen Ditton and the A11 Fiveways to Thetford which are part of the Business as Usual scenario and already committed regional priorities. Continued support is given to the Felixstowe to Nuneaton rail enhancement project.

1.11 The spatial priorities identified from our analysis reflect these, in terms of the key 'engines' that interact closely with London (the London Arc, Thames Gateway and Milton Keynes), as well as the key centres of Cambridge and Norwich in particular. The analysis also identifies the importance of transport connectivity from the Haven Gateway.

1.12 The strategic priorities also closely reflect the issues identified by the Stakeholder Workshops, including the central issues of managing/supporting growth (80% of economic growth is planned to take place in the Engines of Growth); improving access to London and key Gateways and improving freight and business Connectivity.

Figure 1 below highlights the priority corridors and areas.



Strategic Interventions Package Scenarios

1.13 The scenarios tested were designed to reflect the strategic priorities identified:

- Strategic Highway Test (Based on the Draft East of England Plan – 24 schemes)
- Targeted Highway Improvements (14 schemes)
- London Rail - Capacity Enhancement
- Access to Gateways
- Urban Access package for Cambridge and Norwich
- London Arc

Package Results and Interpretation

Productivity

1.14 The strategic packages options tested all deliver significant productivity benefits to the region in *absolute* terms, with benefits for the Rail Capacity Scenario of £119m per annum, and those for the DEEP and Targeted Highway Tests of £90m per annum.

1.15 However, it is evident that even the significant investment packages identified result in a fairly modest productivity improvement in the context of the overall scale of the congestion ‘problem’ identified in the baseline analysis. For example, no options are likely to secure more than 8% of GDP benefits that would be possible from removing congestion in the region, or less than 15% of the more ‘realistic’ target of achieving inter-peak congestion levels throughout the day.

1.16 Although the Rail Capacity option has the highest overall benefits of some £119m per annum, the majority of these benefits are shown to be generated in London, rather than within the region.

1.17 In productivity terms alone, the Targeted Highway Package delivers the best productivity performance of the Highway Scenarios tested through delivering equivalent productivity benefits as the DEEP package (£90m per annum), but at a cost in the order of 12% lower for the overall package.

Welfare Impacts

1.18 While this study has focused primarily on productivity impacts, the standard metric for economic appraisal is welfare benefits (in terms of time savings only) and these are higher by £18m per annum for the DEEP scenario compared to the Targeted Highway Scenario. It should be noted that we have not undertaken a full economic appraisal of any option, but that the relative package cost differential and the relative welfare benefit show that the DEEP scenario delivers broadly 15% more benefit at a 15% higher cost. The inference would be that on the basis of this analysis, the overall performance of the DEEP and Targeted Highway Package are broadly equivalent in welfare terms.

1.19 It is difficult to be definitive about the reason the DEEP and Targeted Highway Tests appear so similar in terms of welfare, but it would appear from the distribution of DEEP benefits, that this is the result of higher benefits to the north and east of the

region where connectivity is lower as a baseline. Many of the DEEP schemes address more localised 'hot-spots' which would improve travel times for 'traditional' trips.

- 1.20 The DEEP package is therefore potentially generating more 'traditional' time saving benefits whereas the Targeted package is generating higher economic value (in productivity and agglomeration terms) as measured by GDP impacts.
- 1.21 Another issue is that, within the south and west of the region (the focus of the Targeted Highway Scenario) in particular, considerable congestion occurs within towns and on accesses to the strategic network. There will be an element of additional capacity on the strategic network causing induced traffic that will exacerbate congestion on these links.
- 1.22 The Gateway scenario performs relatively poorly in welfare terms, generating £90m in welfare benefits per annum, which is 25%-30% lower than the other highway packages, for a similar investment cost. This is because the Gateway scenario is designed to improve access to economic gateways such as the Haven Ports, which generates relatively large productivity benefits and WEBS uplifts, but it does not have the characteristics that generate large welfare benefits, e.g. time savings on heavily trafficked commuter routes.
- 1.23 The welfare benefits for the Rail Capacity Scenario represent over £200m per annum, considerably higher than for any other Scenario tested, though this will accrue to a number of trips outside the region (i.e. wholly within Greater London), as well as to trips with either an origin or destination (or both) within the region. The rail capacity option therefore performs best of all the scenarios in terms of both Welfare and GDP performance.

Urban Access and London Arc

- 1.24 The Urban Access and London Arc Strategies are quite different from the modal packages in terms of their definition and specification. These aim to identify the potential economic benefits from reducing congestion based on a range of potential interventions, but without developing and modelling specific measures.
- 1.25 In the case of the Urban Access Package, based on the impact of reducing car trips in Cambridge and Norwich, in 2021 by 5%, the analysis shows that this would deliver overall benefits of over £20m per annum, equivalent to over £500m over 60 years, over half of which would translate to GDP benefits. This measures the benefit from reduced congestion only, and does not include the benefits to non-car trips from potential interventions such as public transport improvements and smarter choices initiatives.
- 1.26 However, even using the £500m benefit figure (or £250m for each city), this suggests that interventions that costed £100m (in PV terms) would deliver the forecast economic benefit at an implied 'cost-benefit' rate of 2.5 : 1. Although we have not costed specific interventions, this level of spend would support significant investment in measures such as smarter choices, P&R, network management measures and public transport improvements, which in combination could reasonably deliver a reduction in trips and congestion of the order we have modelled in our Urban Access package.

- 1.27 For the London Arc Package the analysis also suggests that a reduction in car trips and associated congestion would deliver significant economic and welfare benefit (£25m and £53m per annum respectively). The amorphous nature of the London Arc, comprising strong linkages with London, strategic east-west movements and a polycentric network of towns means that the identification of the means to deliver such a reduction is less clear, and that the cost-effectiveness of potential solutions would need to be examined further. The analysis does suggest, however, that there would almost certainly be merit in targeted initiatives to address congestion that would yield both GDP and welfare benefits in a cost-effective manner.

Priority Corridors for Investment

Rail Priorities

- 1.28 On the basis of our analysis of forecast over-crowding, and the potential benefits forecast by the Rail Capacity Enhancement option, the key rail priorities are:
- Addressing capacity constraints on the West Anglia Main Line, to enable more trains to Cambridge, Stansted Airport and Hertford East, and lengthening trains to Cambridge, Hertford East or Enfield or shuttle services from Cheshunt. The main scheme proposed for this corridor is the four-tracking of the West Anglia Main Line between Broxbourne Junction and Coppermill Junction.
 - Providing additional capacity on the GEML route, which is almost at full capacity in the peaks, with the most heavily used sections are between Liverpool Street and Colchester. The provision of 12-car trains in the peak would address the crowding / capacity constraints between London and Colchester, and hence deliver benefits not just to this section but also to trips such as London – Norwich, which was identified as the public transport movement with the highest WEBs uplift potential.

Highway Priorities

- 1.29 The analysis does allow some clear priorities to be made, although the details of any interventions proposed would need to be the subject of further work:
- London / London Arc to Thames Gateway Corridor, where the key improvements would appear to be those on the A13 and particularly the A127 where they lead to and link with the M25. The A127 would have a greater role in the distribution of freight from the London Gateway ports.
 - London - Milton Keynes corridor. The 'Business As Usual' scenario includes the committed widening of the M1, but significant congestion is forecast by 2021, particularly on the A5. To address future congestion and maximise productivity potential, the primary options would be to either further invest in the M1 (though this falls outside the remit of the Region), though targeted investment on the A5 could also deliver significant benefits.
 - Cambridge – Milton Keynes, with the A428 as the key priority.
 - London Arc to the Haven Gateway, served by the A12. The most congested section of the A12 is that between Chelmsford and Colchester, with the A120 between Colchester and Braintree also subject to significant congestion. However, the greatest productivity potential is likely from improving the section between the M25 and Chelmsford, and this section will yield greater agglomeration related benefits from its closer interaction with London.

- The corridor between London – Cambridge – Peterborough exhibits high economic potential though the extent of highway congestion on these links is not as acute as for the corridors cited above. This could change if there were to be a second runway at Stansted, and the M11 link from Bishops Stortford to the M25 would be a higher priority than the link to Cambridge. However, this corridor is also characterised by excellent rail connectivity but that is subject to severe capacity constraint, and the provision of additional rail capacity offers at least part of the potential package of measures for this corridor.

Carbon

- 1.30 The analysis shows that despite improvements in vehicle and fuel efficiency the increased number of vehicle kilometres travelled in 2021 will mean that Carbon emissions will increase by 5% by 2021 with the Business as Usual scenario. This then forms the ‘baseline’, to which the impact of the scenario packages tested are incremental.
- 1.31 For the DEEP and Strategic Highway Tests, the productivity and welfare benefits outlined above would be achieved at a ‘cost’ of an increase of around 4% in carbon (equivalent to just under 0.2 million tonnes per annum in 2021). The Gateway Scenario also shows an increase in Carbon, but of only 2%.
- 1.32 The rail investment package would, we believe, deliver the economic and welfare benefits in a broadly carbon neutral way, as the improvements identified largely represent lengthening of existing services rather than the provision of new services. There will also be an associated carbon reduction associated with modal shift to rail.
- 1.33 It is not possible to quantify the carbon impact for the Urban Access or London Arc Package, but the focus of these packages in seeking to remove car trips from the network, and the potential levers identified (smarter choices, network management) would be expected to deliver benefits in a more carbon-efficient manner than schemes aimed at delivering additional capacity (particularly highway capacity). This reinforces the conclusion that balanced packages of measures (rather than simply infrastructure investment) may do most to achieve the RES targets as a whole.

Conclusions

- 1.34 Congestion and overcrowding on the East of England’s transport networks are costing the UK economy at least £720m per annum (2021 data). If all congestion could be eliminated and all travel was made at ‘free-flow’ speeds (an ambitious and arguably unachievable target which would probably be uneconomic to implement), this rises to £1,340m per annum.
- 1.35 The costs of congestion in the region, assuming ‘free-flow’ speeds, amounts to £0.5bn in 2003 (2003 prices). This cost is projected to increase over time to £1bn in 2021 (2003 prices).
- 1.36 These costs exclude those associated with journeys not traditionally assumed to have a GDP impact (including leisure journeys, journeys to shops and schools, and commuting). If these wider welfare costs are also considered, the above figures increase to £1,100m and £2,200m per annum respectively.

- 1.37 There are significant productivity losses in the region as result of this. These are up to £900 per worker per annum in value.
- 1.38 By investigating where the direct costs of transport congestion (i.e.: lost travel time) and the foregone wider economic benefits (i.e.: agglomeration and labour force impacts) are greatest, the TEES has identified a number of priority corridors for intervention. These are:
- London/London Arc to Thames Gateway (A13/A127 and parallel rail routes)
 - London/London Arc to Milton Keynes South Midlands (M1 and West Coast Mainline)
 - London/London Arc to Haven Gateway (A12 and Great Eastern Mainline – further analysis suggests significant benefits in extending any GEML improvements to Norwich)
 - Greater Cambridge to Milton Keynes South Midlands (A428 / A421 corridor)
 - Greater Cambridge to London/London Arc (M11 and West Anglia Mainline corridor)
 - Greater Cambridge to Greater Peterborough (A14 corridor)
- 1.39 In terms of which engines of growth are themselves most susceptible economically to congestion constraints, the London Arc shows the most significant impact by some margin when both direct and wider economic costs/benefits are considered. Thames Gateway, Greater Cambridge, Haven Gateway and MKSM show broadly similar levels of impact.
- 1.40 However, although both Greater Peterborough and Greater Norwich suffer less direct impact due to congestion, the analysis has shown that both locations show greater wider economic benefit potential than the other engines of growth.
- 1.41 A key conclusion from this element of the work, however, is that whilst there are significant benefits than can be secured through packages of investment, none of the major investment scenarios have a significant impact on the overall economic costs of congestion and reduce it by, at most, between 8% and 15%. This reflects the widespread and amorphous nature of congestion in the region which is not just focussed on the strategic networks but in urban centres, their hinterlands and on the local networks.
- 1.42 The TEES study therefore points to the conclusion that, whilst targeted investment in new infrastructure can have a clear economic benefit, there will still be a significant residual economic cost of congestion will remain. Demand-side measures that seek to reduce the overall demand for transport will therefore need to be pursued, together with targeted investment in our urban areas, if congestion and its wider economic costs are to be reduced further. These should be focussed on our key urban centres and engines of growth.
- 1.43 In addition to examining economic impacts, the study has also considered carbon impacts. This has shown that despite improvements in engine technology and efficiency benefits, carbon emissions from land-based transport in the region will increase by 5% between 2003 and 2021 under a ‘business as usual’ scenario, driven

primarily by increasing car ownership and the significant housing and jobs growth in the region.

Summary Points

- Removal of transport constraints (congestion) would, if achievable, deliver significant economic benefits to the region.
- However, major interventions tested deliver only a small proportion of these potential benefits. The implication is that, even with significant transport investment in additional capacity, overall congestion will remain a significant economic issue for the region.
- Nevertheless, in absolute terms the benefits of the packages tested do deliver large-scale benefits, and there would be an economic case for targeted implementation of the most cost-effective of these measures.
- The wider implication, however, is that if transport constraints in the region are to be addressed a broader range of transport interventions, including non-infrastructure measures such as demand management, behavioural initiatives as well as non-transport measures (sustainable land use, more flexible working practices) would need to be considered in addition to treated supply-side measures.

Next Steps – Uses of this study

- 1.44 The analytical work presented in this report, both in terms of the baseline analysis and package tests, will be used to inform a range of current and future studies.
- 1.45 At the regional level, these include informing the upcoming Regional Funding Advice to Government, and the Regional Economic Strategy Implementation, as well as future thinking on Single Integrated Regional Strategy / Review of the Regional Spatial Strategy.
- 1.46 The study will also have a role in shaping the development of a Regional Infrastructure Fund, including involving private sector more in transport infrastructure delivery through the provision of a stronger evidence base about the economic benefits of transport interventions.
- 1.47 At the national level, the findings can help the region region's engagement with Central Government on a range of transport issues, such as major national infrastructure investment and shaping the region's response to the forthcoming DfT consultation on option generation within the DfT's Towards a Sustainable Transport System programme.