

Lower Thames Crossing

**Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2
(D1 and D2)**

**Further Discussion on Scheme Appraisal: Treatment of Wider Economic
Impacts and Evidence around Induced Traffic – Appendix C**

Thurrock Council

 **thurrock.gov.uk**

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

Document Control Sheet

Project Name: Lower Thames Crossing

Report Title: Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 and D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic – Appendix C

Doc Ref:

Date: August 2023

Contents

Annex A	Treatment of Wider Economic Impacts.....	1
Annex B	Evidence Around Induced Traffic.....	4

Figures

Figure A1: Extract from SACTRA (1999) Transport and the Economy.....	3
--	---

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

This page is intentionally blank

Annex A Treatment of Wider Economic Impacts

- A.1.1. The Council notes that the appraisal carried out in support of LTC has used the phrase 'Wider Economic Benefits' throughout. However, this phrase is used very rarely in the DfT's Transport Appraisal Guidance (TAG), where the phrase 'Wider Economic Impacts' is used. This is because the 'wider effects' being assessed can be negative or positive as shown by the analysis of the DfT's advisory committee SACTRA in their work published in 1999 as described in following sections.
- A.1.2. The relevant current TAG advice note used in the applicant's DCO analysis TAG Unit 2-1 Wider Economic Impacts Appraisal published in 2018. This note provides guidance on how to form an analysis called the 'Economic Narrative' which is an important precursor to any calculation of what these Wider Economic Impacts might be.
- A.1.3. The following extract from this DfT advice is particularly relevant
- '5.1.5 The Economic Narrative is the main tool through which scheme promoters articulate and justify why a transport investment is needed to achieve the economic objectives set out in the Strategic Case as well as defining and justifying the scope of the analysis. To this end, the Economic Narrative should include information on the following (bold added by the Council):*
- a. *Identification of the expected positive **and negative** economic impacts and a description of the extent to which these are expected to achieve any economic objectives in the Strategic Case, **as well as any significant unintended economic impacts** of the scheme;*
 - b. *Justification of why these impacts are expected to occur on the basis of economic theory and context specific evidence;*
 - c. *Identification of the welfare change associated with these impacts, arising, for example from market failures;*
 - d. *Identification and justification of the proportionate level of analysis to quantify and value the impacts.'*
- A.1.4. The Council considers that it is very clear that the Economic Narrative for LTC cannot consist simply of an assertion of benefit and the application of pre-set formulas concerned exclusively with benefit.
- A.1.5. Rather, the Economic Narrative should present precisely what the conditions are which allow expectations and delivery of benefits or costs.
- A.1.6. The reason for this approach derives from another aspect of the work of the advisory committee SACTRA (1999) in its report 'Transport and the Economy', published by the DETR (predecessor of the DfT at the time, formed by a merger of the separate departments of Transport, the Environment, and Local Government).
- A.1.7. Until the publication of this report, the prevailing official view for economic analysis had focused on the scheme-specific measurement of the value of travel time savings and similar calculations. This approach was based on the economic theory which considered that while such travel time savings might indeed be used in ways which had effects on the wider economy, these effects were *not additional to their own value*.

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

- A.1.8. This was based on the assumption of an economy where the conditions of perfect competition applied, and that the initial utility or economic benefit enjoyed by the users of a road improvement might be transferred to other actors in the economy, but without enhancement.
- A.1.9. The 1999 SACTRA report showed that the existence of additional Wider Economic Impacts (i.e. over and above the direct impacts derived from the longer established calculations primarily of values of time savings) can occur, but *depend on imperfections in the economy, primarily in the size and direction of departures from perfectly competitive prices.*
- A.1.10. These imperfections are mainly seen when prices are above or below marginal costs, including external costs, in either the transport-providing sector or the transport-using sectors of the economy. They are mainly seen when prices are 'too high' (e.g. due to imperfect competition) or 'too low' (mostly due to uncharged external costs).
- A.1.11. Since the divergence of prices can be in either direction, Wider Economic Impacts can be either positive or negative.
- A.1.12. The SACTRA report summarised this in an analysis of the existence of the nine possible cases: i.e. prices higher, equal to or lower than marginal costs, for the transport providing sector and the transport using section.
- A.1.13. This provided a 3x3 matrix where the central cell represents perfect competition and no external costs, and there are no wider impacts.
- A.1.14. In the other eight cells there are symmetrically opposite effects, in the transport sector or the transport using sector, and two indeterminate cells. Depending on the circumstances there will be net wider benefits or costs from investment, some of which are better tackled by changes in prices than changes in infrastructure. .
- A.1.15. This is shown in Figure A1 on the following page which in effect summarises the core of the whole case for considering Wider Economic Impacts and modifying the simple perfect competition assumptions.
- A.1.16. These impacts can go in either direction, and logically must do so.

Summary

- A.1.17. The analysis by SACTRA shows is the reason why DfT recommends that the 'Economic Narrative' must include the full range of potential negative and positive effects as an **essential** precursor to the economic appraisal calculations.
- A.1.18. This can only be done if specific imperfections in the transport sector and the wider economy, and their direction, are identified.
- A.1.19. The applicant's economic narrative does not do this and does not even attempt to do so since its starting point is the assumption that the exercise is effectively only about discovering additional benefits to support the case for the scheme.
- A.1.20. The analysis provided in the DCO has in effect therefore only considered half the problem, with a presumption that Wider Economic Impacts are always wider economic benefits.
- A.1.21. Responses from the applicant suggest that the applicant is unaware that there is a real need to consider the precise mechanisms and conditions for economic impacts, both negative and positive, in a neutral and open way – and with an equal seriousness and balance of attention.

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

The applicant may have correctly identified some wider economic benefits – that remains to be shown – but the applicant has certainly not included the negative impacts.

Figure A1: Extract from SACTRA (1999) Transport and the Economy

Table 4.2 Imperfect Competition and External Costs Effects on the Evaluation of Transport Projects			
	Transport-Sector		
Transport Sector	$p < mc$ (pmb > smb) <i>subsidies</i> <i>labour market clears</i>	$p = mc$ (pmb = smb) <i>perfect competition</i> <i>labour market clears</i>	$p > mc$ (pmb < smb) <i>imperfect competition</i> <i>w > msc labour in assisted areas</i>
$p < lrmsc$ <i>adverse externalities</i> <i>congestion</i> <i>user charges too low</i>	Cell One $B < 1$; $B^{**} < 1$ Negative external effects exacerbated by overvalued output in transport-using sector; may be substantial benefits from reducing use	Cell Two $B < 1$; $B^{**} = 1$ Traditional external effects case; no offset from transport-using sector; conventional CBA overestimates total economic benefits.	Cell Three $B = ?$; $B^{**} > 1$ Transport and transport-using benefits are of opposite sign. CBA** is appropriate on transport sector but not on implications of imperfect markets.
$p = lrmsc$ <i>non externalities</i> <i>optimal capacity</i> <i>user charges correct</i>	Cell Four $B < 1$; $B^{**} < 1$ Subsidy to transport-using sector means total economic benefits < transport benefits Conventional CBA overestimates the value of transport improvements.	Cell Five $B = 1$; $B^{**} = 1$ No market failure. Economic benefits equal transport benefits; conventional CBA fully adequate.	Cell Six $B > 1$; $B^{**} > 1$ Extra output in transport-using sector and job creation in assisted areas; total economic benefits exceed transport benefits.
$p > lrmsc$ <i>positive externalities</i> <i>spare capacity</i> <i>user charges too high</i>	Cell Seven $B = ?$; $B^{**} < 1$ Transport benefits and transport-using benefits are of opposite sign for conventional CBA. Indeterminate case.	Cell Eight $B > 1$; $B^{**} = 1$ No market failure in transport-using sector; standard case for expanding transport usage by reducing user charges.	Cell Nine $B > 1$; $B^{**} > 1$ Spare capacity in the transport sector and transport benefits understate total economic benefits; reduction in user charges may give big welfare gains.
<p><i>Notes</i> Traditional CBA includes only externalities which have money values assigned to them (and land-use effects are assumed negligible for the purposes of this analysis)</p> <p>CBA** is as defined in Chapter 3 and includes money values for all externalities.</p> <p>pmb = private marginal benefit; mc = marginal cost; smb = social marginal benefit; lrmsc = long run marginal social cost; p = price</p>			

(Note the misprint in the table in the original report, where the word 'Using' has been omitted from the column heading. It should read 'Transport-Using Sector' not 'Transport-Sector', as is done in the text within the cells of the table itself)

Annex B Evidence Around Induced Traffic

B.1.1. In [REP1-183](#) the applicant asserts firmly, but very briefly:

'TAG Unit M2.1 sets out that LGVs and HGVs do not experience variable demand as their journeys are driven by commercial needs, and therefore remain consistent between the Do Minimum and Do Something scenarios.'

B.1.2. The Council has tried to find the source for this in TAG M2.1 (noting that the applicant has not used actual quote marks or referred to page or paragraph numbers). The Council has not been able to find these words in Tag Unit M2.1 or indeed in TAG unit M2.

B.1.3. Both of these TAG units use a much softer and more nuanced statement that assuming no induced traffic for freight transport is 'often done' in response to modelling difficulties.

B.1.4. Given the firmness and clarity of DfT wording when it wants to give formal advice about practice that appraisal should follow, the descriptive statement that this is 'often done' seems far short of advice or requirement.

B.1.5. The Council can find no DfT statement which is close to 'LGVs and HGVs do not experience variable demand'. It seems to be an assertion from NH itself.

B.1.6. Indeed, there is evidence published by DfT itself which gives support to the opposite conclusion.

Evidence 1: SACTRA (1994)

B.1.7. As general background, SACTRA (1994) was the decisive study which persuaded DfT to accept the existence and importance of induced traffic. It defined induced traffic broadly, and established a very wide range of different sources of behavioural change which allowed it to exist.

B.1.8. The study relied on several different strands of empirical, qualitative and quantitative evidence and a large part of its methodology was to consider the consistency of these different strands, each of which showed just part of the evidence. The strands were:

- a. Before and after traffic counts on both the improved road and on alternative routes which the improvement had been expected to relieve, both in the short run (typically one year) and long run (often either taken to be five years, or open-ended);
- b. Comparison of outcomes with forecasts, both on parts of the network having improvements, and comparable parts which had not been improved;
- c. Inferences from studies of the effects of changes in fuel price, in combination with studies of the money value of time savings (or the time value of money savings) making use of theoretical techniques which enabled logical derivation of induced traffic from demand elasticities and time values;
- d. Inferences of time use studies looking at the degree of stability of travel time budgets and the implications of this for the use made of travel time savings;
- e. Observations of differential growth of traffic levels on different parts, road types and geographical location over time;

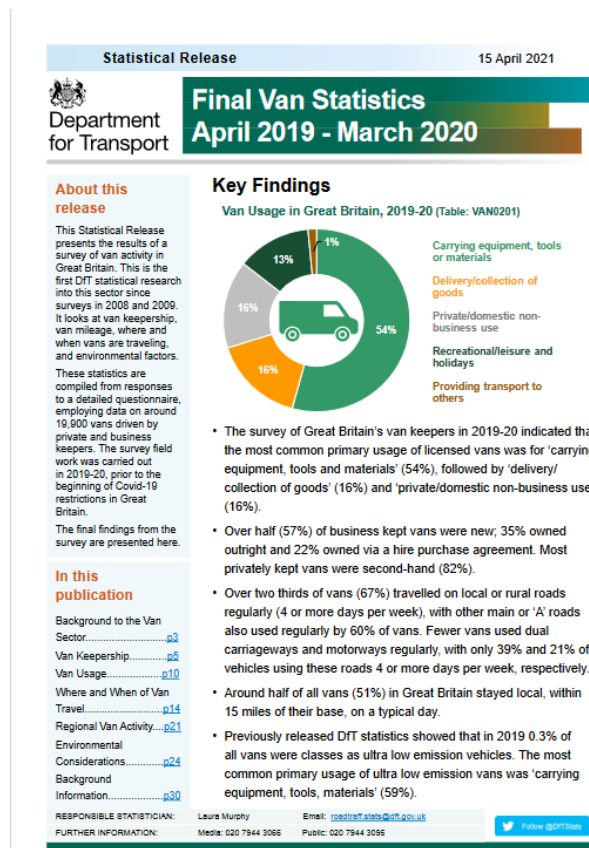
Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

- f. Interviews of drivers and others about their own perceptions of their responses and preferences for changes in travel conditions;
 - g. Interviews of professionals about their experience and judgements of the results of forecasts and models of travel choices; and
 - h. Inferences of separate studies of public transport demand especially focussed on choice between car use and public transport use.
- B.1.9. Since then, most reviews of evidence focused on identifying induced traffic have not adopted this multiple source approach but have focused on before and after traffic counts. This is especially true of Highways England/National Highways' 'POPE' studies which have used traffic counts for all traffic, including goods vehicles, and therefore cannot be used to distinguish freight vehicles and cars.

Evidence 2: Not all goods vehicles are for freight, especially in the case of those Vans which are included in the category 'Light Goods Vehicles'

- B.1.10. The DfT report 'Final van statistics April 2019-March 2020' issued in 2021 provides a summary of Key Findings (see Figure B1).

Figure B1 Final Van Statistics



Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

- B.1.11. This summary clearly shows that a substantial proportion of Light Goods Vehicles are not the type of freight vehicles which NH must have had in mind when stating that LGVs and HGVs do not experience variable demand.
- B.1.12. Rather, LGVs are used for a wide variety of purposes, of which the biggest use is carrying equipment, tools, and materials, for example by builders and tradespeople, who manifestly are able to expand their activity when time savings allow them more swiftly to visit more destinations.
- B.1.13. Another important activity is 'delivery' where modern logistics pack many visits to different households in a day and will certainly pack in more destinations if time permits.
- B.1.14. DfT has also published other evidence which suggests that there is evidence of induced traffic for goods traffic. The most telling is a report by consultants Dunkerley, Rohr and Daly (2014) 'Road traffic demand elasticities', published by DfT, which included a section on freight elasticities with respect to fuel price. The report comments that the evidence here is much less extensive than the much greater list of studies in relation to car traffic, but even so includes significant empirical studies. Here is the full freight section of the report.

2.4.1. Fuel price elasticity:

- a. *The sensitivity of freight transport demand to price is the focus of two literature reviews. Graham and Glaister (2004) calculate an elasticity of -1.07 (standard error 0.84) using 143 elasticity estimates from seven international papers that mainly used data from before 1988. The review by de Jong et al. (2010) expands on the literature of Graham and Glaister (2004), to include several more recent studies; two of these are based on UK data. They are also more specific in terms of the units of both the freight demand and fuel price. Assuming, among other things, that 25 per cent of vehicle-km costs are due to fuel cost, the authors derive consistent 'best-guess' estimates of long run demand elasticities in both tonne-km and vehicle-km with respect to both fuel price and vehicle-km cost. 20 Their calculations allow for effects of fuel efficiency, transport efficiency and modal shift in addition to a direct demand effect. Improving transport efficiency (e.g. vehicle routing, shipment size) and changing transport volumes by shifting mode or changing production technology, for example, are found to have a greater impact on costs, so that demand is more elastic with respect to the km cost than to fuel price. These values are shown in Table 3.*
- b. *Comparing these results with two other empirical studies in our review, Agnolucci and Bonilla (2009) and Rizet and Bougerra (2013),²¹ the elasticity estimates are reasonably consistent, in the range 0.1 to -0.2 for the fuel price elasticity of demand in tonne-km and in the range -0.25 to -0.4 for the fuel price elasticity of demand in vehicle-km. Indeed these values are also in line with the range of elasticity estimates for the fuel price elasticity of passenger demand. Although based on French data, the Rizet and Bougerra (2013) study is interesting for two reasons; firstly, it finds that the fuel price effect accounts for almost 50 per cent of vehicle-km costs; and secondly, they obtain a much better fit to the data when the elasticity explicitly increases as a function of time, resulting in a corresponding long run average value of -0.33.'*
- B.1.15. The reason why this is relevant is that there is a hard-wired relationship in the form of transport modelling and appraisal used by NH and DfT, that money costs and time costs are connected by the value of time.

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

- B.1.16. So, if the volume of freight traffic is to some extent sensitive to fuel price, the conclusion can be firmly drawn that it must also be proportionately sensitive to journey times. To reject such a relationship undermines a central feature of the economic appraisal and would cast doubt on all the values of time savings in the appraisal.
- B.1.17. There is a difference between short-run and long-run elasticities, reported by SACTRA (and in subsequent econometric analyses by Dargay) that the long-run induced traffic is about twice the size of the short-run. This would be consistent with the idea that distribution companies *can* make use of their time savings to develop new markets, but it takes time to develop.

Evidence 3: SACTRA (1999) Transport and the Economy

- B.1.18. The SACTA report 'Transport and the Economy' was the foundation of subsequent practice of calculating Wider Economic Impacts.
- B.1.19. Before that, it was assumed that time savings might indeed have effects on the economy, but these effects were not additional, being fully measured by the direct value of the time savings themselves.
- B.1.20. The report considered in some detail the nature of the impacts on production and economic growth that might follow from the provision of expanded road capacity. This considered especially the effect on freight operations and markets, and the following extract reproduces the report's own summary of that evidence, received in submissions from academics, consultants, and representatives of the freight industry. An extended extract is provided because of its direct relevance to the assessment of the assertions made, without evidence, by the applicant.
- B.1.21. The SACTRA report was influenced by Venables, especially the understanding that wider economic impacts could be negative or positive. The approach to calculating Wider Economic Impacts was further extended by Venables in the 2014 paper 'Transport Investment and Economic Performance: implications for project appraisal'. This paper is quoted in Tag Unit A2.1 Wider Economic Impacts Appraisal (pg32).

Extract from SACTRA (1999) Transport and the Economy, Department of the Environment, Transport, and the Regions

'How Firms Respond to Transport Changes

5.03 This section aims to explain how firms, both transport providers and transport users will respond to the changes discussed in Chapter 4. In a perfectly competitive world, we assume that firms pay the marginal cost of the transport they use and price their output according to their marginal costs. In such a situation any change of transport costs will have a direct impact on the cost of the output and hence on the final price and quantity of output. This is the basic linkage in the traditional model.

5.04 Here it is relevant to note that traditional approaches have suggested that because transport costs are a relatively small proportion of total costs, we can expect the output response to any change in transport costs to be small. It is possible to argue that transport costs might have a slightly larger role if we assume that transport costs are more variable than other costs of production. For example, in an economy in which input prices were constant in all locations, and firms enjoyed no scale economies in production, the only costs which could be varied would be those relating to location. A change in transport costs could make a substantial difference to the rate of return, thus causing the firm to react more than the change in total costs would imply.

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

5.05 Traditional approaches to the role of transport costs in the determination of levels of economic activity assume that firms will attempt to minimise transport costs for a given level of activity. Thus, as transport costs change, firms would be expected to adjust their levels of output to reflect the lower costs of reaching markets and acquiring inputs. If the transport costs of factor inputs and outputs change differentially in different locations, the optimal location of the firm would be expected to change.

5.06 Transport at the firm level will include both freight transport and personal business travel. These are trip purposes which are not well represented in current transport modelling and appraisal, but which we shall show need to be understood in greater depth than hitherto if we are to ensure that all the impacts of transport on the economy are fully integrated. We present some evidence on this in Chapter 6 and deal with the appraisal issues in Chapters 8-10.

5.07 The question of changes in output has been dealt with in some detail in the previous chapter. This is the way in which, in an imperfectly competitive market, firms will not change output in the unambiguous way suggested by traditional approaches which assume perfect competition. For example, the reduction of transport costs to firms in the imperfect market may result in an increase of output by firms, or an increase in the number of firms, or an increase in price-cost margins, by which the firms absorb the fall in transport costs in increased economic rent.

5.08 Much of the impact is likely to depend on the way in which the changes in transport costs affect the opening up of markets to increases in competition, and the relative efficiency of firms in the different markets. We return to this issue later in this chapter.

5.09 More significantly, we need to explore the ways in which changes in transport costs affect the way goods are produced or activities undertaken. This may ultimately affect output, but even without changes in output there could be changes in the amount of transport used by firms due to the reorganisation of the process of production.

5.10 How this operates within firms will depend on how their operations are structured. Firms which are vertically integrated (ie, with different stages of the production process under a single firm's control), but with different operations in different locations, may be less able to take advantage of such changes than independent firms which buy and sell in the most appropriate markets. However, even independent firms have to find new suppliers and markets, sign new contracts, set up new quality control procedures, etc. There is, therefore, always a transactions cost to any change which may be too high to enable the firm to respond effectively to a change in transport costs.

5.11 We also need to recognise that firms do not just consider transport independently of the rest of their operations. Transport needs are integrated with other aspects of firms' logistic operations. Thus, as transport has become more reliable, firms have been able to reduce their stockholding and concentrate this in fewer depots or logistics centres. DETR (1999) quotes statistics showing a 20% fall in the ratio of manufacturing stocks to output, realising a saving of £17 billion with a further £11 billion savings in wholesaling and retailing.

5.12 Total logistics costs for firms will include the total costs of their warehousing and stockholding, plus the direct costs of transporting goods. Thus a change in transport costs could have a number of different impacts. The provision of new road capacity could reduce both total costs and the variance in those costs. Thus firms regard transport as cheaper and substitute transport for other parts of the logistics process. This could lead, for example, to fewer warehouses and longer average trip lengths. It may also make logistics cheaper relative to total production costs leading to firms seeking new markets and/or new sources of supply.

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

5.13 *On the other hand an upward trend in the average cost of transport, for example, through the imposition of higher charges for road vehicles, could lead to firms attempting to reduce total logistics costs. This may not necessarily mean a reversal of a general trend to fewer larger depots; indeed the need to make savings may lead to more transport as firms seek cheaper sources of supply to compensate for more expensive transport. It may also cause firms to be more efficient in their use of transport, for example ensuring higher load factors or increasing vehicle size.*

5.14 *This suggests that a number of possible responses could be counter-intuitive, eg, higher costs of transport leading to more transport, if the full logistics picture is not taken into account.*

5.15 *We need to introduce here what happens when firms are not operating in a world of perfect competition or continuous cost functions. If there are discontinuities or threshold effects, firms may, on the one hand not respond directly to quite substantial changes in their transport costs, often because of the cost of making these changes, but on the other hand make major changes apparently in response to quite small changes in transport costs. It is thus not sufficient to base any assessment of impacts on a simple analysis of the relative size of transport costs in the total costs of an activity. Firms may only be able to change their operations in discrete steps. Hence, it is only when certain thresholds are reached that it becomes efficient to the firm to revise its number or location of depots, or the location of suppliers or main marketing points.*

5.16 *Although the individual firm may respond in this way, this would not lead to a need to change the basic model of behaviour as long as these discontinuous responses were to average out across all firms. However, it is possible that, in imperfect markets with relatively small numbers of firms, such averaging cannot take place. Systematic evidence is not available to test the hypotheses implied in this discussion. We do, however, have a number of pieces of independent evidence which provide some support for the views expressed.*

5.17 *The evidence available suggests that the complex relationship between transport improvements and business costs can be seen at a number of levels, as follows.*

- a. *Firms can benefit from a range of re-organisational opportunities which appear to exceed the benefits arising from pure savings in journey times and vehicle operating costs.*
- b. *Different firms respond in different ways to the opportunities which transport improvements make possible.*
- c. *Some categories of benefit appear to be assuming greater importance than others for business transport users. If one also considers that, compared with the freight needs of business, little is known about how transport improvements affect firms' labour productivity, then it is likely that the relationship is yet more complex.*

5.18 *The factors leading to changes in the organisation of logistics and supply can be summarised under four main headings:*

- a. *Restructuring of logistical systems - the spatial concentration of production or inventories;*
- b. *Realignment of supply chains - vertical disintegration of production, changing patterns of sourcing, changing markets;*
- c. *Rescheduling of product flow - use of just-in-time, etc; and*

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

- d. *Management of transport resources - changes in vehicle size etc, increasing efficiency of vehicle utilisation, handling systems.*

5.19 *These will have different effects on the nature of the change in the transport demand resulting. The first two of the points in the previous paragraph are the main drivers behind changes in handling and average lengths of haul. They tell us about the factors which have led to an increase in the numbers of legs in a typical supply chain and the fact that increasing dispersion of locations and increases in market areas have led to increasing journey lengths. Changes in the latter two points reflect the efficiency of the transport logistics sector and will affect the total amount of transport through changes in carrying capacity and load factors. We examine some quantitative evidence on these issues in Chapter 6.*

5.20 *Quarmby (1989) has shown that improvements to a road network can enable a retailer to serve the same number of outlets from a smaller number of distribution depots. The benefits of this re-organisation can exceed the straight time savings by 30-50%. This evidence is supported by work done by Mackie and Tweddle (1993). In modelling a large change in network quality on the distribution systems of three case study firms, they conclude that distribution costs savings may be significantly in excess of the transport costs savings in certain circumstances.*

5.21 *Instead of arguing that there may be benefits to firms in excess of journey time savings (ie, direct cost savings), McKinnon (1995) claims that infrastructure improvements may themselves have little direct effect on economic activity. He argues that "firms are often influenced much more by the service opportunities that are created [by road improvements] than by marginal changes in transport cost."*

5.22 *McKinnon's approach is based on two views.*

- a. *Transport costs are not a significant element in total costs for many firms (and that therefore savings in these costs from network improvements are potentially even less significant). A survey of European logistics costs claims that manufacturers spend, on average, only 1.5-2.0% of sales revenue on transport (McKinnon, 1996, p2). Even if a significant reduction in transport costs were translated into lower prices, the prices of manufactured goods would fall by an amount so small as to be very unlikely to have much effect on the level of economic activity.*
- b. *Transport must be seen within the wider context of logistics management. The importance of transport to firms can only be properly recognised if due recognition is given to the contribution of logistics to corporate competitiveness and its high status in corporate strategic decision-making (McKinnon, 1996, pp. 10-11).*

5.23 *McKinnon supports his view on the relative unimportance to firms of changes in transport costs due to infrastructure improvements in two other ways.*

- a. *In the case of road haulage operations, terminal and vehicle standing costs can account for a significant element of total transport costs (McKinnon, 1996, p2). Ernst and Young (1996, p.6) cite other studies which support this view. These points further reduce the importance to firms of the savings in transport costs brought about by infrastructure improvements.*
- b. *Within a product's total logistical cycle time - the time elapsing between the arrival of inbound supplies and the delivery of the finished product - the proportion accounted for by time taken to transport goods "can be very small indeed" (McKinnon, 1996, p12).*

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
 Lower Thames Crossing

5.24 The 'service opportunities' which are argued by McKinnon (1995, pp.3-5) to be more influential for businesses can be categorised in three broad types of re-organisational benefits:

- a. *Market expansion, where a new link enables a firm to widen the search for more efficient, higher quality suppliers and to win additional sales from more distant customers;*
- b. *Spatial concentration, whereby firms which can supply markets from fewer, larger locations as a result of transport improvements can benefit from both lower unit costs of production and from lower stock levels; and*
- c. *Tighter scheduling, which enables firms to apply just-in-time principles in manufacturing and adopt 'quick response' in retail distribution, helping to cut inventory levels, releasing working capital for investment in more productive activities and reducing stockholding costs.*

5.25 Evidence submitted to SACTRA by the Freight Transport Association (1997, pp27-8) also supports this view. Citing the impact on different firms of improvements to the A55 in North Wales, the FTA points to benefits in terms of wider sourcing of inputs, increased vehicle utilisation, better predictability of journey times and improved product quality (in the case of a seafood processing firm, where freshness is paramount).

5.26 The complexity of the relationship between transport and the economy at a micro-level indicated by the above references further manifests itself by the fact that different firms respond in different way to changes in the quality of the transport system. For example, of the three case studies undertaken by Mackie and Tweddle (1993), the optimal number of depots falls for only one of the firms, but in the case of the other two (and of one firm in particular), there would be a change in the optimal location of the depots (for example, by moving depots closer to market).

5.27 A survey of 88 large British based manufacturers (McKinnon and Woodburn, 1996) also shows that transport costs can differ in importance between firms, and can lead to different responses to changes in transport costs. Significant amongst a range of responses to a hypothetical 50% increase in road transport costs included passing the cost increases on to customers, absorbing the costs/reducing profits, improving efficiency of current operations and considering alternative modes.

5.28 Just over 20% of the firms surveyed by Ernst and Young (1996, p18) reported that changes in their use of transport as a result of new or improved transport had led (with varying degrees of significance) to wider business benefits. Benefits claimed varied between:

- a. *Ability to access new markets;*
- b. *Increased sales;*
- c. *Relocated activities;*
- d. *Improved staff punctuality;*
- e. *Increased size of labour catchment areas; and • a decrease in stock held.*

5.29 Mackie and Simon (1986), in examining the industrial impacts of the Humber Bridge, state that three quarters of the firms in their study claimed they were able to utilise their savings productively. The cited operational effects of the bridge were:

- a. *Vehicle re-routing;*

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
 Lower Thames Crossing

- b. *Increased vehicle utilisation;*
- c. *Improved market penetration;*
- d. *Increased market area; and*
- e. *Internal rationalisation (ie, changes to the number or size of depots).*

5.30 *This study highlights another aspect of transport improvements - that some firms stand to benefit more from reductions in the costs of staff movement than in goods transport (eg, service companies compared with manufacturing firms). Employers' business travel is a seriously under-researched area and includes such travel as that by sales staff (which may be seen as more akin to the physical distribution which will typically be its outcome) and that by executives which is likely to be less predictable or regular and to display characteristics more similar to leisure travel although with rather different values attached to time savings, etc.*

5.31 *While the survey revealed that very few firms could quantify the cost of non-productive staff travelling time, it reported that the recognition of the cost of travel was widespread among the companies interviewed (Ernst and Young, 1996, p.5). The survey suggests that this may become more of an issue for some firms, either as they become more aware of the direct travel costs incurred by their staff, or due to the increasing costs of individuals' time as real wage levels rise (Ernst and Young, 1996, pp.5-7). The survey implies that there is much scope to improve understanding of the relationship between transport and labour productivity. We address this issue in more detail in the following section of this chapter.*

5.32 *A further dimension to the complexity of the micro-level relationship between transport and firms is the dynamic nature of that relationship. McKinnon (1995, pp.6-7) suggests that the development of the trunk road network over the last 30 years has "undoubtedly made a large contribution to economic growth, much of it from the restructuring of firms' logistical systems". New road construction projects, however, are likely to make a much smaller contribution, partly because much of the earlier benefit was network related, but also because the restructuring process has largely run its course.*

5.33 *Improvements which maintain and enhance reliability of journey times are claimed to have become much more important to firms which, through logistical re-organisation, have reduced inventory levels (McKinnon, 1995, pp.4-5; 1997, p.38). This point is also made by Quarumby, supported by figures in a Sainsbury's case study quoted by the CBI (1994). McKinnon (undated, pp. 9-10) has identified that there is in fact still much that firms themselves can do to improve operational efficiency and so reduce costs. The implication is that, without appropriate measures to deliver journey time reliability in the face of growing congestion, the wider organisational benefits made possible by development of the road network will begin, in time, to be eroded.*

5.34 *The proposition that the most important benefits to firms arising from transport improvements might be changing in nature as the network nears maturity should not mask the fact that there may remain schemes or programmes which could make more than a marginal difference to the quality of the network. Major improvements to the A55 and A14 - quoted by the FTA and the Ernst and Young study - have only recently been completed yet are claimed to have returned major reductions in journey times: other schemes of a similar nature could also have comparable effects. Taken in aggregate, proposed investment programmes in the strategic road network, the railway infrastructure and in London Underground represent significant expenditures on well-developed networks yet could make substantial improvements to the efficiency of the UK's transport system.*

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

5.35 Furthermore, the proposition that logistical re-organisation may have run its course may need to be treated with some caution. McKinnon and Woodburn (1996) quote conflicting views on likely future trends in European logistics. This includes a survey of one hundred large British manufacturers who had indicated that they would be cutting warehouse numbers in the UK by 15% in the period 1992-95, while anticipating a 40% reduction in their warehouse numbers across the Continent.

5.36 Evidence from the European Logistics Comparative Survey 1998 (quoted in DETR, 1999) shows that the level of stockholding in the UK is one of the lowest in Europe and has shown one of the greatest reductions in recent years. The same source cites comparative data which shows that warehousing costs represent a higher proportion of total logistics costs than in any other EU country surveyed.

5.37 The problem is that much of this evidence remains only claims, albeit based on a range of valuable survey evidence. They have not been subjected to a consistent and rigorous economic analysis. The complexity of the responses identified begs questions about whether investment appraisal is itself sufficiently refined to capture the diversity of potential business benefit from transport improvements. There is, however, sufficient evidence of discontinuity and threshold effects to suggest that we cannot simply rely on the law of large numbers averaging these out, especially at the more local level.'

Commentary on SACTRA report

- B.1.22. This lengthy extract from the SACTRA analysis of the evidence submitted to it on freight responses to road improvements indicates many examples which would result in induced traffic from the freight sector.
- B.1.23. Induced traffic of course does provide benefits for the users themselves. Indeed, the examples below suggest that additional traffic is one of the key signs that additional economic activity may be taking place, as shown in the frequent references to 'extending markets'. The Council also notes that in the applicant's own publicity material they produced many videos of interviews with businesses supporting the Lower Thames Crossing *precisely because they think it would enable them to develop new markets or expand activity on existing ones*, which indeed might be true if the increases in speeds were actually to be developed and maintained.
- B.1.24. Those benefits have been included, described as 'wider economic benefits' at the same time as assuming they all arise without inducing any additional traffic. In reality, induced traffic also produces more congestion, carbon emissions and other negative effects, which have not been taken into account. Overall, this means that in the economic analysis of LTC there is an overestimate of benefits and an underestimate of costs.
- B.1.25. Based on this review, the Council considers that the evidence that goods vehicles can and must include induced traffic effects is substantial; that no evidence has been offered to support the applicant's proposition that LGVs and HGVs do not experience induced traffic; that DfT itself has not given the advice in the form attributed to them.

Logical implications of the 'No Induced Traffic for Goods Vehicles' Proposition

- B.1.26. Despite the evidence that goods vehicles will be affected by induced traffic, the Council has also followed the logic through of what is implied for the appraisal if the proposition is true i.e. there is no induced traffic for goods vehicles.

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

B.1.27. If it is true that operators of goods vehicles are constrained to have the same number and destinations of journeys in the 'with LTC' and 'without LTC' scenarios, then it means that all the time savings goods vehicles (and their drivers) make from using LTC cannot be used to develop their market, expand their customer base, or fit in additional trips. Therefore, the freight operators:

EITHER

- a. Reduce their employment of drivers and support staff, and the size of their lorry fleet, to make the same journeys at lower cost. In that case their cost base will reduce, so their profit should increase, but they do not grow.
- b. This will be reflected in a reduction of employment in the distribution industry, and a reduced demand for lorries affecting the manufacturing industry. This should be reported in the relative section of the appraisal as an impact on the transport industry, but there is no mention of any effect of this sort.
- c. There would then be a reduction in costs to the transport-using sector. The presumption that there is no induced traffic would need also to be true of them, i.e. no firms should make use of the lower freight costs to expand their own production to sell more goods which might need transport; the only beneficiaries of the reduced cost would have to be firms or organisations whose own activities could not require increased transport. It is logically possible for this to occur but not as a general response by the entire transport-using sector.

OR

- d. They keep their lorries and drivers but work them less intensively. They lead a more comfortable life, do not contribute to economic growth but have some utility improvement for themselves (due to working less intensively).

B.1.28. Either of these means options means that the calculation of Wider Economic Benefits is exaggerated. If the time savings (both average and via reliability improvements) are not converted into the expansion of distribution activity, then the value of the time savings should not be calculated as their high wage rate plus economic value of overheads, but at a lower leisure value, from shorter working hours, and more time for breaks in the canteen etc.

B.1.29. This value could be calculated from the total lorry hours saved by LTC (assuming the same pattern of goods being delivered faster and more reliably) using the difference between lorry speeds, in the network as a whole, with and without LTC, times the number of miles required to make the required deliveries.

B.1.30. But what if distribution companies or their clients do make use of the higher and more reliable speeds of 'with' compared with 'without' LTC, year by year, by continuing to make all the same deliveries to the same destinations, and then using the time saved by developing more customers, to a wider catchment area.

B.1.31. Then with the same number of staff, and the same size fleet, they are contributing to economic growth without proportionate increases in cost.

B.1.32. This would not happen overnight, but that would be the whole point of their logistics planning, to make use of the better travel conditions and reduced costs by logistics improvements, shared loads, etc.

Thurrock Council Comments on Applicant's Submissions at Deadline 1 and 2 (D1 & D2) – Further Discussion on Scheme Appraisal: Treatment of Wider Economic Impacts and Evidence around Induced Traffic - Appendix C
Lower Thames Crossing

- B.1.33. In that case there will be induced traffic, buying extra mileage with reduced time per delivery (the direct effect) and by reducing the wasted time allowed for expected delays. This would be the justification for giving the time savings and reliability improvements an economic value of expanded production.
- B.1.34. This could be calculated most simply by assuming that all the lorry hours saved are incorporated back into increased activity, and the volume of induced traffic is, to a first approximation, equal to the extra mileage which can be travelled in the time difference between with and without LTC.
- B.1.35. This approach is based on confidence that the good industry is able to operate efficiently and expand their activities to make use of the new facility. This is embedded in the use of direct and wider economic benefits of freight providers.
- B.1.36. **Summary: So, EITHER the economic benefits are exaggerated, OR there is significant induced traffic. In either situation, the case for LTC is weakened.**