Halcrow Group Limited

Thames Gateway Integrated Land-use and Transport Study (GILTS)

02 August 2004

Transport for London/London Development Agency

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Baseline Report

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Signed
1	A	Draft Baseline Report	27.07.04	RH/JB
	B	Draft Baseline Report	02.08.04	RH/TP/RE

Contents

1 Introduction

1.1 Background and study objectives

Halcrow was commissioned by Transport for London, in partnership with the London Development Agency, to provide inputs to the Thames Gateway Integrated Land-use and Transport Study (GILTS). This paper provides a review of the baseline position and the proposed working method for the study. This is an initial draft paper, which will be finalised by the end of August 2004.

GILTS will eventually provide a prioritised, costed programme of transport investment, in conjunction with agreed total levels of housing and employment growth and phased programmes of development, for London Thames Gateway.

Figure 1.1 provides a mind map of the study's conceptual framework. The overall aims for the study, as identified by the client group, are to:

- Contribute to a better understanding of the relationship between transport and economic activity in London;
- Understand the different views of development scenarios and their implications for transport provision, including issues of phasing, capacity and accessibility;
- Determine what step changes in transport provision are required to support housing and employment aspirations;
- Reconcile/coordinate the top down analysis of the London Thames Gateway area with the bottom up master planning/zones of change analysis; and
- Produce costed and prioritised transport programmes that will provide capacity and accessibility to support the optimum mixture and density of population growth and employment development.

Supporting the study aims, more detailed study objectives are to:

- Understand the cumulative impact of employment and housing growth in the London Thames Gateway area and East London Sub-region on the transport network;
- Understand the sensitivity of transport demand to policy, pricing, control and other variables;
- Determine how planned and potential transport provision in terms of the capacity and accessibility provided will affect:

  - Total employment that can be supported by Opportunity Areas and other areas for development growth;
  - Total employment potential that could reasonably be expected from market demand;
  - Total housing that can be supported by Opportunity Areas and other areas for development growth;
  - Total housing potential that could reasonably be expected from market demand.
- Understand the implications of growth being achieved in Thames Gateway that is higher than in the London Plan, either within the overall growth of London or additional to it;
- Identify packages of schemes that from both a strategic and local perspective are necessary to resolve capacity and accessibility issues, and to identify appropriate phasing of these schemes;
- Provide a common assessment of packages of schemes using consistent assumptions, methodologies and forecasts;
- Identify where changes in land-use assumptions (phasing, land-use mix, density, spatial distribution) are required to fit with transport accessibility and capacity;
- Identify where opportunities for development arise to focus attention on sites with most potential and decide which transport investment gives best value in terms of the potential growth it supports;
- Ensure that the work links with the more detailed masterplanning assessment undertaken for ADFs, Opportunity Areas, Areas for Intensification and specific other sites;
- Establish priorities and assist in the preparation of the business cases for schemes in future TfL Business Plans; and
- Provide initial output to the TGDIF to help determine what initial development strategy should be followed.

The proposed study stages are shown in Figure 1.2. GILTS will provide a suite of appraisal tools which will be used to evaluate development and transport scenarios and provide an input to update the annual TfL Business Plan review in 2004.

Figure 1.1: *Conceptual Framework for the Study*

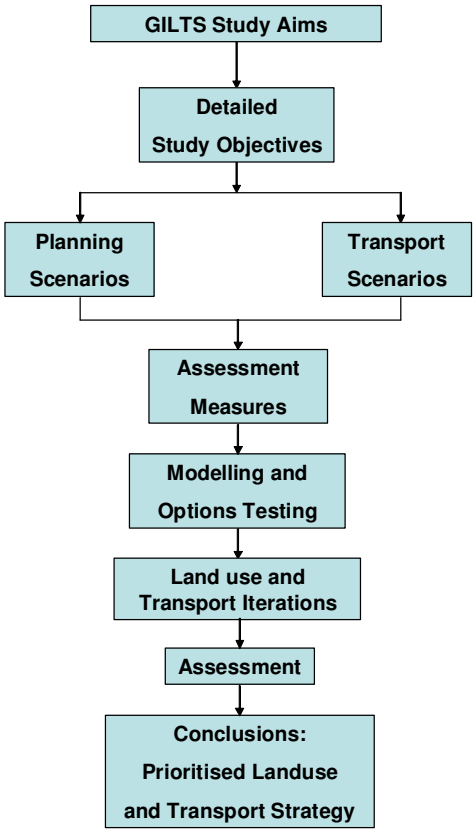
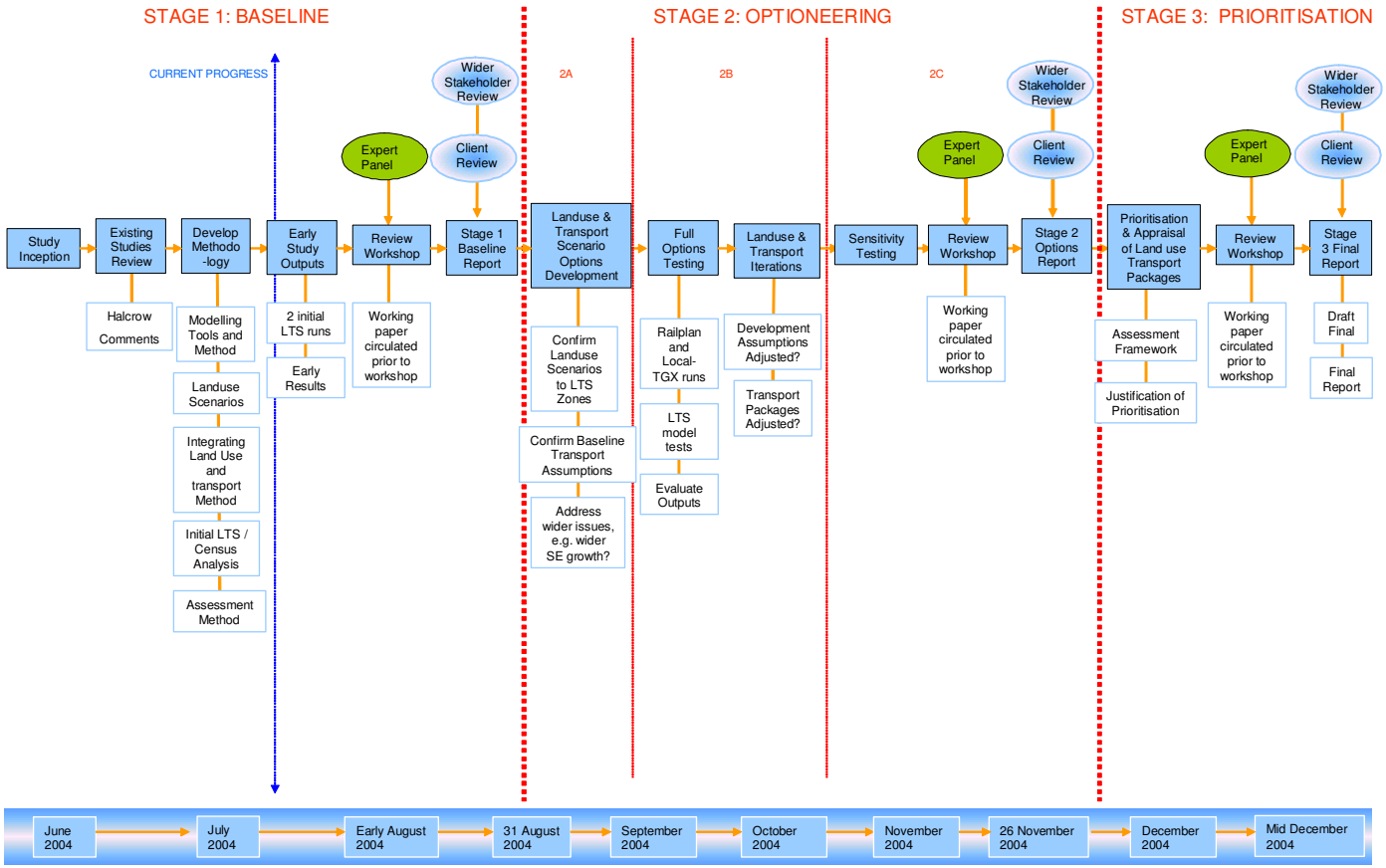


Figure 1.2: *Study Working Method*



1.2 Structure of this Report

The remainder of this baseline report is structured as follows:

- Section 2: The study area
- Section 3: Existing studies review
- Section 4: Urban planning scenarios
- Section 5: Transport planning scenarios
- Section 6: Package assessment and prioritisation
- Section 7: Transport modelling context and approach
- Section 8: Iterating land-use and transport scenarios
- Section 9: Synthesis: optimising the land-use and transport fit
- Section 10: Next steps: stage 2 and 3 GILTS programming

A number of background papers/annexes providing additional information are envisaged for the full GILTS report (December 2004). These will cover the following areas:

- Annex 1: Good practice in integrating land-use and transport planning
- Annex 2: Thames Gateway: summary problems and opportunities
- Annex 3: Population and employment forecasts
- Annex 4: References

2 The Study Area

2.1 Overview

This section provides an initial descriptive summary of the study area: the London part of the Thames Gateway. It covers both urban planning and transport planning issues. A more detailed contextual section will be provided as part of the final baseline report to be presented by the end of August[1].

2.2 Spatial Context

The London Thames Gateway is the part of the Thames Gateway area falling within the Greater London boundary. Although the precise boundaries have changed over time, for the purpose of GILTS it is to be assumed that the boundaries are as shown in the 'London Thames Gateway Development and Investment Framework' document produced by the key partner authorities in April 2004. The area (which extends slightly beyond the Greater London boundary at the eastern end) is shown in Figure 2.1.

The London Thames Gateway (LTG) area falls wholly within the East London Sub Region identified in the London Plan (2004) (with the exception of the small areas beyond the Greater London boundary). Large areas of the sub region lie to the north and the south of the LTG. This in effect creates three swathes of land that comprise the East Sub Region, which may be described as:

- London Thames Gateway (comprising 6 "Zones of Change", 3 on each side of the river Thames)
- East London Sub Region north and west of the LTG (including the City of London)
- East London Sub Region south of the LTG

[1] Much has been written on planning and transport problems and opportunities in the Thames Gateway; including two references by the authors of this baseline report. See Hickman, Pharoah and McGreevy (2003) City-Region Planning in London: Towards a Sub-Regional Transport Framework; and Hickman and Pharoah for Llewelyn Davies and TfL (2003) Transport and Planning Databank: East Sub-Region. Halcrow's work on the TGB also provides useful contextual background.

The LTG comprises parts of several boroughs, namely Tower Hamlets, Hackney, Newham, Barking and Dagenham (north of the Thames); and Lewisham, Greenwich and Bexley (south of the Thames).

The Zones of Change do not coincide with ward boundaries, but the wards are associated with the Zones of Change (i.e. they have a substantial part of the ward area and/or development within the part that lies within the Zone of Change). These boundaries are shown in Figure 2.2.

Population change

The London Plan includes provision for major housing growth in the East Sub Region, and a proportion of this growth has been allocated to the "Opportunity Areas" defined in the Plan. These Opportunity Areas comprise the main areas for development within the LTG Zones of Change, but are by no means the only areas for development. The housing growth allocated in the London Plan to the Opportunity Areas within the LTG area is 45,400 new homes to 2016. Depending on the average household size, these homes could accommodate a population in the region 0f 90,000-105,000 (though the LTS B3-21 output assumes only 80,000).

Given the existing (2001) population of about 430,000, the population of LTG could increase on London Plan assumptions by more than a fifth by 2016. On the highest growth assumptions (say, an additional 300,000 people) the growth would be 70% on the 2001 base.

In addition to Opportunity Areas, the London Plan identifies "Areas for Intensification". There are two of these in the LTG, namely Beckton and Woolwich town centre/Royal Arsenal. The plan allocates a further 2,500 jobs and 1,500 homes to these areas by 2016.

(NB. It is assumed that the term "new homes" means a net increase in homes. This does not necessarily imply a proportionate net increase in population, however, since the population may change in the existing stock of homes. This could potentially be significant in estimating transport demand.)

Employment change

The London Plan includes provision for major employment growth in the East Sub Region, and a proportion of this growth has been allocated to the "Opportunity Areas" defined in the Plan. These Opportunity Areas comprise the main areas for employment growth within the LTG Zones of Change, but by no means the only areas for development. The employment growth allocated in the London Plan to the Opportunity Areas within the LTG area is 180,700 new jobs to 2016, of

which 100,000 are allocated to the Isle of Dogs. As noted above, there is a further 2,500 jobs allocated in the London Plan to the two "Areas of Intensification" at Beckton and Woolwich.

(NB. The LTS B3-21 output shows a total LTG employment growth to 2016 of only 115,000.)

Jobs/housing balance and distribution

The excess of new jobs over the likely new population suggests that by 2016 there will be a net inward commuting pattern to the LTG. However, if one excludes the Isle of Dogs from the totals (on the basis that it may be regarded as a third employment centre after the City of London and City of Westminster, relying heavily on radial commuting from the entire London labour market area) then there is a relatively average numerical balance between population and jobs in the LTG. This is 80,700 jobs and a population in the region of 85,000-95,000 (only around half the population works). The actual balance would depend on the economic activity rates within the LTG.

Equally important for GILTS is the likelihood that whatever the overall balance of people and jobs in the LTG, there will be marked variations between one part of the LTG and another. For example Barking Reach is expected to be mainly residential, whereas Belvedere/Erith is expected to be mainly employment-led development. This means that patterns of commuting will require intra-LTG analysis as well as strategic analysis.

An indication of the different spatial distributions of homes and jobs is provided in Figures 2.3 and 2.4 which show expected differences between 2001 and 2016 for homes and jobs respectively. Jobs-housing balance is shown in Figures 2.5 and 2.6.

2.3 Zones of Change: Development and Transport Schemes

The London Thames Gateway has been divided into a series of smaller geographical units known as Zones of Change. Below we provide a commentary on each of these, referring to the main characteristics in terms of population, employment and commuting.

Zones of Change

The six Zones of Change identified and mapped in the "London Thames Gateway, Development and Investment Framework" April 2004 are:

- Isle of Dogs: this zone provides the largest concentration of employment in the LTG, and this dominance will continue as the LTG develops.

- Deptford and Lewisham: includes a substantial employment base, especially in Lewisham, and the majority of commuting is from other parts of the East sub region, probably south of the Thames.

- Greenwich Peninsula: this is one of the most clearly distinguished zones. It has been the subject of some low intensity development (retail and employment) but a planning framework has been produced that envisages much greater intensity mixed use development. The population is currently low, although the Millennium Village is included. Employment is not intensive, but is planned to become more so as low intensity river-based activity gives way to more intensive forms of employment.

- Stratford, Lower Lea Valley, Royals: this large zone represents an "arc of opportunity" as described in the Newham Borough Plan. The three sub zones each have distinctive characteristics and both the pace and type of development varies considerably between them. Stratford is an important centre and public transport interchange, and the focus for the Olympic bid. Plans for its regeneration are relatively advanced. The Lower Lea Valley is potentially well served by public transport, but there are local access and other issues to be resolved before major development sites can be implemented. The Royals have already been the subject to major regeneration for both homes, employment and other uses, but there remains further considerable development potential. Population in the zone currently is concentrated in the areas away from the rivers (Thames, Lea, Roding), whose banks have until now been occupied by industry which now provides much of the development opportunity. The areas of low population intensity shown in the population projection diagrams illustrate the point. Large parts of the Zone have low employment. At present, commuting into the zone is from the rest of the East London sub region (outside the LTG, represents the largest single commuting flow observed in the LTG in 2001. However, both the workplaces, and especially the residences of the employees are dispersed over a wide area.

- Barking and Havering Riverside: this large zone along the north bank of the Thames is characterised by heavy utility installations, despoiled landscape, declining or derelict industry, and poor accessibility. In terms of regeneration and attracting new homes and employment, this zone probably represents the biggest challenge in the LTG. The zone also stretches inland, however, to include the more robustly developed area of Barking. It currently has low population intensity. Most of the commuting into this zone is from other parts of the east sub region (probably north of the Thames), and most of the resident employees work within the zone or commute to the remainder of the East Sub Region north of the Thames.

- Woolwich and Thamesmead, Belvedere and Erith: this large zone stretches along the south bank of the Thames. Population intensity is highest in the western and central parts of the zone, where there is higher density development, including at Thamesmead. Employment is most intense at the west and east ends of the zone. Most of the commuting into this zone is from other parts of the East Sub Region (probably south of the Thames). Employed residents work mostly within the zone or commute to the Central London Sub Region. Much of this out-commuting is undertaken by rail.

Within the Zones of Change described above, the main areas for future development (at least in terms of large contiguous sites) are in the Opportunity Areas and Areas of Intensification identified in the London Plan. Those within the LTG are listed below together with their Zone of Change identification number:

Opportunity Areas

- Isle of Dogs (1)
- Stratford (4)
- Lower Lea Valley (4)
- Royal Docks (4)
- Barking Reach (5)
- London Riverside (5)
- Deptford Creek/Greenwich Riverside (2)
- Greenwich Peninsula (3)
- Belvedere/Erith (6)
- Thamesmead (6)

Intensification Areas

- Beckton (4)
- Woolwich Town Centre and Royal Arsenal (6)

3 Existing Studies Review

3.1 Overview

Much work has been carried out on transport and planning issues in the London Thames Gateway. GILTS needs to draw on, and develop, this considerable volume of work.

In this section we identify where gaps or significant weaknesses still exist in the knowledge base, and where further analysis to supplement past work is most needed. TfL have usefully produced a 'Review of transport studies work for Thames Gateway' (Working Paper 30th June 2004, TfL). Halcrow in turn have considered this review. This found a "typical methodological structure" in terms of transport modelling and strategy development using readily available and tested models.

Strategic models such as LTS and LASER have been used to feed broad-based information into local highway and public transport models. The review highlighted gaps in the studies' ability to assess the cumulative effects of development and transport capacity over a large area, and to develop and appraise a prioritised and costed programme of transport investment that matches land-use development.

The TfL review of studies and methods concludes that the main modelling tools for GILTS will be LTS for strategic testing of transport and land-use scenarios, and the Thames Gateway Bridge models for testing local public transport and highway networks. Railplan is not specifically mentioned, but it is assumed that this will be used to test public transport networks, alongside the Local-TGX model for highway assignment.

The travel demand forecasting work that has been carried out to date has relied largely on the use of the strategic LTS model and there are concerns about how well that model represents existing and forecast future travel patterns and crowding/congestion levels in the London Thames Gateway.

As part of the GILTS work, it is intended that travel demands output from the currently available LTS model (Version B3.21), both for 2001 and each 2016 forecast scenarios, will be carefully examined. This will be done so that those aspects of the GILTS methodology that rely on the LTS model (e.g. the distribution of trips and their allocation between public and private modes, and how these change over time and between land-use/transport scenarios) can be reviewed and a view taken as to the confidence that can be placed on the modelling outputs.

The GILTS study will make use of the Railplan model for public transport trip assignment and the Local-TGX model for highway assignment. It is intended that a review of the results of the 'model validations' will be carried out similar to that for the LTS model, but in this case concentrating on the comparison between modelled and surveyed use of the local highway and public transport networks, and their representation of crowding and congestion levels in 2001.

The TfL review points to many caveats and limitations in relation to the various studies and modelling tools, which serves to highlight the inherent difficulties in modelling large and complex areas. Three key points flow from this:

- Care will be needed to keep the model component of GILTS in context, and to ensure that it does not obscure analysis of land-use and transport interactions.
- Models should be confined to testing land-use and transport scenarios where the assumptions behind them are explicit.
- The baseline data must be consistent for all the model runs. This is important so that differences between scenarios can be examined, even where the absolute values are questionable. Given the fact that the various studies have been undertaken for different purposes, and that the various models and data bases have changed and are changing, it is recognised that achieving this will require considerable care in model use.

GILTS will need to get beyond the straightforward outputs from model runs in order to meet the study objectives. For example, LTS (and most other models) forecasts on the basis of observed relationships and interactions. This would not be a problem if existing travel conditions were regarded as satisfactory, but clearly they are not. Consequently, in modelling the impact of population and employment growth, it is important not to lose sight of the need to improve conditions overall, and of the possibility of changing relationships through policy and pricing measures. Policy is explicitly geared to changing the relationship between land-use and transport, and requires outcomes for the new communities in the Thames Gateway that are more sustainable than in the past.

These issues will be addressed in GILTS by combining a top-down approach (forecasts of population and employment, and transport capacity provision) with a bottom-up approach (scenarios of transport and development at the local level together with policy assumptions about trip making, mode split, etc.) The complexities of figures and forecasts in the various studies highlight the problem of defining what each means in reality.

3.2 Study by Study

The TfL review covered the following studies, and a brief comment on the GILTS context is given. Two kinds of study were reviewed:

- Studies relating to East London and Thames Gateway
- Studies elsewhere that may be relevant from a methodological point of view

Studies relating to East London and Thames Gateway

1. The Draft London Plan (GLA)

This provides the crucial relationship between population and job growth in London, and houses and job growth in the Thames Gateway by 2016. It is understood that the 45,000 housing increase to 2016 in the London Plan relates only to the "Opportunity Areas" in the Thames Gateway area. One would expect some extra capacity from other parts of the Thames Gateway.

It is acknowledged that the modelling had limitations, and that further analysis is required in GILTS, especially in marrying the top down and bottom up approaches.

2. London Orbital Multi-Modal Study or "ORBIT" (KBR)

It concluded that even with high capacity public transport provision, high levels of development growth would require measures to limit demand for road travel.

3. Relationship between Transport and Development in the Thames Gateway (LD and SDG)

Doubts are expressed about the validity of the modelling work, in particular the likely underestimation of peak hour demand due to inadequate handling of through trips (as opposed to trips within the study area) and averaging of the 3-hour peak period. The method was not considered robust enough to provide the information needed for LTGDIF or business cases for scheme appraisal as required by GILTS. Not mentioned by TfL, but the study addressed the outer Thames Gateway, and excluded areas west of Woolwich/Barking.

The study did, however, address the importance of local as well as strategic transport provision like Crossrail and CTRL, and emphasised the importance of local transport quality and quantity to support high density growth. It argues that rail-based local transport is likely to be required to achieve the highest densities of development.

The study gives thumbnail sketches of development and transport in the main growth areas. Of relevance to GILTS are (a) Barking and Havering riverside (north of Thames) and (b) Greenwich and Bexley riverside including Erith and Slade Green (south of the Thames).

A problem with some of the analytical work is that assumptions (inputs) are lumped in with outputs. For example, mode split assumptions are used, whereas in reality mode split is an output of transport/land-use configuration. Also the transport modelling focused on transport intervention as overcoming capacity constraints, rather than informing about thresholds of development and transport.

4. Transport in the Thames Gateway for DfT/ODPM (Mott MacDonald)

This concluded that the Government's "mid growth strategy" of 60,000 housing units could be accommodated in the Thames gateway without the need for the Thames Gateway Bridge or Crossrail. However, TfL concludes that the study results were insufficiently robust to be carried forward into GILTS.

5. Crossrail Business Case

TfL considers that the method used to calculate accessibility indices might be useful in GILTS, and that more work will be needed to decide how. This will need to be addressed in the next stage of GILTS. (LTS future year public transport trip matrices were assigned to the Railplan model. The CAPITAL model was used to produce outputs on accessibility. This shows accessibility to a point from all other points.)

6. Thames Gateway Bridge Accessibility Study (ARW/Symonds using Volterra)

The study gave a set of estimated employment and population growth that could be supported by transport infrastructure. This was based on transport capacity and took no account of site availability, suitability or market demand. The relationship between population and employment density and accessibility was based on observed (and relatively weak) relationships in 390 London wards. This modelling output needs to be interpreted intelligently since the policy aspirations for the Thames Gateway are for communities that generate a lower travel demand than in London as a whole. TfL also highlight the fact that "the relationship would not be exact because so many other factors other than accessibility determine the observed densities".

7. Strategic Public Transport Capacity Assessment for Thames Gateway (SKM)

(This refers to ADF areas but does not explain what these are.) The methodology is considered simplistic, and unable to deal with cumulative demand, diversion due to congestion or other factors. But the study did address issues of phasing the transport infrastructure programme by identifying over-capacity corridors.

8. Canary Wharf Studies (SDG)

These are primarily to assess the benefits of Crossrail in the Canary Wharf economic context.

Studies elsewhere that may be relevant from a methodological point of view

1. London to Southend movement study (Hyder)

This has been widely reported as concluding that a "mode shift of 40-50% would be required from private car to public transport" to cater for substantial growth with existing infrastructure. The percentages are not explained, however. What is relevant to GILTS is that the study looked at both highway and public transport capacity in order to explore the level of mode shift needed to prevent congestion and crowding. For further details see http://www.tgessex.co.uk/downloads.php.

Halcrow note from this study that rectifying the current imbalance of homes and jobs in Southend, for example, could reduce London-bound commuting and hence have a favourable impact on crowding through London TG corridors.

2. London to Ipswich Multi-Modal Study or "LOIS" (Mott MacDonald)

This study made infrastructure recommendations for the short, medium and long term. Some of the short term measures have been or are being progressed, but the Secretary of State noted that it was premature to judge the longer term infrastructure requirements. He made reference to the need to balance accessibility with environmental impacts, and to develop alternative packages to promote travel demand management and sustainable travel choices as well as infrastructure proposals. This could be of great significance for GILTS, and reinforces the point made elsewhere in this document that the analysis should be supported by and not wholly dependent on model outputs based on simplistic relationships between supply and demand.

3. Dynamic Urban Model or "DUM" (SDG)

This has not been used in London area studies, but is interesting from a methodological point of view. DUM aims to explore the interactions between transport and the wider aspects of an urban

area's social and economic activity. It is not geared to traffic modelling, nor is it intended to produce numeric forecasts. It was used in NE England and Humberside to help develop and test alternative (transport and planning) policies to counter negative impacts. To be of use in the London context it would require more time to develop and apply than is available in the GILTS context.

4. PTAL and CAPITAL accessibility models for London

These models can present accessibility to public transport from a point, and to a zone from all other zones by public transport. Accessibility to opportunity areas and areas of intensification can be evaluated.

5. Trip end model presentation programme or "TEMPRO"

TEMPRO distributes to sub-district level the forecasts produced by the National Trip End Model (NTEM). It includes a reference case mode split, and changes in mode split resulting from demographic change, but not other factors such as rising incomes, changes in generalised costs of each mode, or policy actions to influence travel behaviour. TEMPRO does not include traffic figures or trip lengths, but other models can use the trend-based data.

6. Paramics (Quadstone), PAXPORT (Halcrow)

Such micro-simulation models are useful in visualising the impacts of transport changes at the local level.

7. PTV Visum (Planung Transport Verkehr AG)

This system allows multi-tier analysis of both strategic network performance and site specific junction and lane capacities. However, the development of a strategic network would not be possible within the GILTS timeframe. The micro simulation could be considered as the GILTS study enters the phases of site specific and local transport assessment.

Further studies of relevance to GILTS

A number of other studies will be given consideration prior to the issuing of the final version of this baseline report. For example:

- ODPM (May 2004) London Thames Gateway UDC Boundaries, Roger Tym and Partners. Considers variations to UDC boundaries, and in so doing examines some of

the development potential. For further details see: http://www.odpm.gov.uk/stellent/groups/odpm_urbanpolicy/documents/page/odpm_urbpol_028659.pdf

- Pell Frischman was awarded a commission to examine transport links between Barking centre and Barking Riverside. No details are currently available.

Other to consider prior to the final version of this report:

- TfL (2003) East Sub-Region Databank: Problems and Opportunities
- LDA (2004) London Thames Gateway Development and Investment Framework
- TGDIF project work (housing site database)
- Previous masterplans of areas within the LTG (to be identified)
- Wider growth studies (Stansted, London-Stansted-Cambridge-Peterborough; Ashford, MK)

4 Urban Planning Scenarios

4.1 Introduction

This section of the report provides an overview of the work undertaken by RTP in developing population and employment scenarios for the London Thames Gateway. It outlines the potential urban planning scenarios to be used in GILTS, the key caveats and assumptions used in the development of the scenarios, and gives a number of issues for further discussion.

4.2 Proposed Development Scenarios

RTP have produced a technical note on their working method in developing different LTS projections (RTP LTS Projections, July 2004). The approach used is one of apportioning forecasts made for or by GLA at a pan-London level to smaller levels of spatial disaggregation. Old LTS zone boundaries (2002) have been used.

Population scenarios

One population scenario is provided by RTP (91,000 dwellings). 2001 base data is derived from the 2001 Census and projected forward using borough growth levels derived from GLA projections. The controlling factor for the population projections at LTS zone level is the forecast prepared by the GLA (Variant 8.1). Forecasts are broken down by age and sex cohort. Projections take into account proposed housing development as incorporated in the London Housing Capacity Study.

For GILTS, we require comparable population growth forecasts for a number of scenarios as outlined below:

- Medium: London Plan – 45,000 dwellings (London Plan) to 59,000 dwellings (ODPM)
- High: GLA/ LDA/TGLP – 91,000 dwellings (TGDIF)
- Very high:150,000 dwellings (TGDIF/Richard Rogers Urbanism Unit)

We propose to initially test the 45,000 and 91,000 dwelling scearios against a number of transport scenarios. Further discussion is required with RTP (an initial meeting was held with Halcrow/RTP on 29th July 2004) and TfL to confirm the scenarios to be used in GILTS. Currently the 45,000 and 91,000 forecasts are derived from different base assumptions, so will not enable comparable analysis. As far as we are aware, further work is required to produce scenarios of 59,000 dwellings and 150,000 dwellings disaggregated at an LTS zone level.

Employment scenarios

One central employment scenario is provided by RTP. The controlling factor for the employment projections at LTS zone level is the forecast prepared by Volterra in May 2004. This provides projections of employment for 2002-2016 for London as a whole and for each of the boroughs (and for London as a whole at an industrial sector level). 541,000 new jobs are projected for London from 2002-2016. Previous Volterra forecasts (dated 2002) projected an increase of 636,000 jobs for London from 2001-2016.

It appears that only one employment projection is available from RTP. For the GILTS analysis we would expect employment levels to differ along with population projections; for example medium/high/very high. Again further discussion is required with RTP/TfL as to how to incorporate a more robust employment modelling base for the later land use/transport options testing.

Housing and employment forecasts have been produced for years 2001, 2006, 2011, 2016 and 2021.

4.3 Assumptions and Caveats

A number of issues therefore will need to be clarified prior to the completion of the final baseline paper at the end of August 2004. For example:

- Re-basing issues: all population and employment projections need to be developed from the same base assumptions otherwise analysis will be meaningless.
- Disagreggations of population and employment data to LTS zone level do not reflect local masterplanning studies; they are simply a redistribution of top-down forecasts. Clearly they will not reflect local aspirations and changes on the ground. Use of the London Housing Capacity Study and a development database compiled for the London Plan has been made, however both of these are in need of updating.
- Additional population and employment projections need to be disaggregated to LTS zone level.
- Redistribution: the RTP work has assumed that the additional housing units in the Thames Gateway should be treated as a redistribution of population. This assumption needs to be confirmed as appropriate.

A key requirement in GILTS, as in any strategic study, is for all the assumptions and inputs to be clearly defined and explained. Similarly, it must be clear in the study analyses which data are input assumptions, which are based on observation, and which data are outputs from the analysis. Comparative analysis of model forecasts without such definition is very difficult.

For the strategic analysis based on LTS and other models, the core requirements are for consistency and clarity, to enable comparison between different model runs. For the bottom-up analysis the requirement is for assumptions based on realistic and understandable models of how the different development areas are intended to work in terms of transport and accessibility. The bottom up modelling might include benchmarking of best practice examples elsewhere, or assumptions based on policy-driven targets, for example, an assumed mode split being based on the understanding that interventions would be made to achieve it.

The urban planning scenarios will need to address different levels or scales of accessibility. These levels might be:

- Access to neighbourhood facilities (such as food retail, primary school, parks)
- Access to district level facilities (e.g. town centres, secondary schools etc.)
- Access to metropolitan level facilities (e.g. the City, West End, Canary Wharf)
- Access to inter regional and international connections (e.g. Eurostar, airports etc.)

For each level it may be possible to consider transport and development configurations that influence kilometres travelled, mode split, and other key factors.

4.4 Modelling the Relationship between Development Capacity and Accessibility

As a complementary piece of work to the development of planning scenarios, GLA Economics, CBP and Volterra have developed a method, using regression analysis, which provides an understanding of the housing and employment potential that could be supported by different levels of accessibility in London. We see this as an important part of the assessment framework for GILTS and this is discussed further in Section 6. The GILTS programme allows for the development of this work prior to the assessment of the land-use and transport packages in the Autumn of 2004.

4.5 Wider Issues

A number of further issues will be clarified prior to the issuing of the final version of this report. For example:

- Phasing timescales: 2006-2011/2011-2016/2016-2021
- Relationship with wider growth issues (outside the TG)

The phasing is very important in scenario building because this will affect demand for new development, and the feasibility of new transport investment. For example if new development proceeds slowly, or at many locations at once, this may delay the point at which sufficient critical mass can be achieved to deliver a major transport project. This would be critical in terms of a public transport scheme, less so for a road scheme.

5 Transport Planning Scenarios

5.1 Overview

TfL have provided GILTS with a number of transport planning scenarios to be tested in combination with the land-use scenarios. These are discussed below using three levels of investment: funded, business plan, revised business plan.

5.2 Funded

The funded schemes are listed below

- LU PPP & PFI
- A13 Junction Improvement
- East London Line Extension*
- National Rail upgrade*
- Thameslink 2000*
- CTRL
- DLR Extension to London City Airport
- Bus Network Improvements

Figure 5.1 provides a map of these schemes. (Note. *subject to funding)

5.3 Business Plan

In addition to the funded schemes, the Business Plan schemes are listed below

- A206 Thames Road
- East London Transit (ELT)
- Greenwich Waterfront Transit (GWT)
- TGB Transit
- Crossrail 1
- Thames Gateway Bridge
- DLR extensions to Woowich Arsenal, Dagenham Dock, Stratford International, and 3-Car Upgrade for Bank-Lewisham
- Bus network intensification

Figure 5.2 provides a map of these schemes.

5.4 Revised Business Plan

In addition to the Funded and Business Plan schemes, the Revised Business Plan schemes are listed below

- ELT Extensions
- GWT Extensions
- National Rail enhancements
- Crossrail 2
- Silvertown link

Figure 5.3 provides a map of these schemes.

5.5 Additional Schemes

It is conceivable that during GILTS a number of further options will be required on the transport side, e.g. new transport schemes or routings. GILTS will provide a list of further schemes to study in greater detail if this is the case (NB. This approach to be confirmed with TfL). Such additional schemes could arise in the following circumstances:

- Areas for development not envisaged when current proposals were conceived
- Higher density or intensity of development requiring higher capacity and/or higher quality transport facilities than currently proposed
- Alternative transport configurations required as a result of more detailed examination of the urban masterplanning exercises at the local level (i.e. responding to issues revealed in the "bottom up" planning process)

5.6 Non Infrastructure Variables

In trying to match transport supply with transport demand, there is always the danger that present observed relationships are (a) likely to hold good in the future, or worse (b) aren't expected to hold into the future, but are modelled as doing so.

There are many factors that influence demand (trip distance, mode split and distribution) and not all of these are well represented in standard models. Moreover, the policy thrust is to create new communities for which there is no precedent, at least in the UK. We therefore do not have observable baseline data that is relevant to the forecasts we are trying to make. This does not invalidate the role of modelling as envisaged for GILTS, but it does reinforce the importance of the modelling serving the analysis rather than the reverse. The analysis must be in line with the policy aims for the LTG, not framed in terms of past urban development and transport patterns that are by definition seen as unsatisfactory.

The transport planning scenarios must therefore be developed to take account of non-infrastructure influences that could or will arise. Important amongst these will be road user charging (which could replace the current method of paying for road use by 2016), and the supply, pricing and control of parking. There are other factors that could have a major influence on demand and hence system performance, including the application of “soft measures”, lower speed limits, and changes in social attitudes and habits, perhaps fuelled by price or other incentives. Within the timeframe of GILTS these considerations are important, and will be included as part of the discussion around modelling outputs.

6 Package Assessment and Prioritisation

6.1 Overview

This section outlines a suggested approach to the assessment of the GILTS land-use and transport scenarios. It contains the following sections:

- GILTS Objectives
- GILTS Scenarios
- Assessment Principles
- Suggested Assessment Approach

The assessment framework will be discussed with the TfL Business Planning Team during Stage 2 of the study.

6.2 GILTS Objectives

GILTS is concerned with the London part of the Thames Gateway area which has been designated as an area with the potential for considerable growth, both in housing and in other development. GILTS has to identify and ultimately resolve the issues arising in relation to the integration of land-use and transport within the London Thames Gateway area.

The GILTS study objectives are as outlined in section 1 of this report. The assessment and prioritisation of packages of interventions will need to be based on the wider objectives for development and transport in the London Thames Gateway area. These objectives reside in a range of documents including:

- National planning guidance, especially PPS1, PPS6, and PPG13
- Transport White Papers,
- Regional planning guidance, including RPG9a (1995) (Now recognised as needing revision for example in terms of hones/jobs balance and transport infrastructure)
- The London Plan (2004)
- The London Transport Strategy
- Strategies and policies of the London Thames Gateway Partnership
- Emerging policies of the Thames Gateway Urban Development Corporation
- Borough Plans (UDPs and LDFs)
- Supplementary Planning Guidance for specific areas
- Area masterplans

As can be readily imagined, there is scope for a wide range of policy and interpretation when all of these are considered together. It is proposed for GILTS assessment to establish some key baseline policy objectives, and to associate these with the key indicators that will be used in the assessment. This will be done by the production of a "causal chain" diagram, following consultations with the client group.

The objectives to be selected will be those where transport and land-use interaction can make a contribution, and those where indicators allow the scale and nature of that contribution to be judged. By way of illustration, the objectives could include:

1. Providing a choice of means of travel for those living in or moving to the LTG
2. Ensuring that jobs and facilities of all kinds are accessible to everyone in the LTG
3. Minimising the choice of private motorised travel within the overall transport mix
4. Minimising the environmental impacts of transport infrastructure and activity (noise, emissions, visual, severance)
5. Minimising the scale of infrastructure and likely cost for a given level of housing and employment growth
6. Interventions should preferably have a beneficial impact (and at a minimum, a neutral impact) on the environmental and travel conditions of the existing population of the LTG and adjacent areas.

The indicators to assess performance against objectives are discussed later in this section. The most important are likely to relate to mode split of all trips, and to total kilometres travelled by private motorised modes. This is important because it will (or should have) an influence on the strategic and local plans for urban development and transport schemes.

6.3 GILTS Scenarios

GILTS is concerned, at least initially, with two different housing scenarios (and potentially with an employment scenario to be developed for each by Roger Tym & Partners) and three different transport scenarios, which embrace different levels of investment in transport infrastructure. Ultimately GILTS may be concerned with more housing and employment scenarios and with transport scenarios involving alternative policy measures as well as infrastructure.

The alternative housing scenarios are for 45,000 additional dwellings (as in the London Plan) and 91,000 dwellings (as in the London Thames Gateway Development and Investment Framework). Ultimately GILTS may be concerned with examining the potential for an additional 150,000 houses, but the need for this would be established following a review of the transport and development "fit" with the initial two scenarios. (There are other forecasts or aspirations that have been expressed from time to time, such as an ODPM figure for the LTG of 59,000 new homes.

The strategic analysis for GILTS will initially be based on the 45,000 and 91,000 figures, with interpolation of these results being possible.)

The currently-envisaged transport scenarios are described as Funded, Business Plan and Revised Business Plan. The development scenarios will allocate housing and job growth to the identified Zones of Change.

Model runs (LTS model) will combine different transport and development scenarios: each transport scenario is likely to be associated with at least two development scenarios and each development scenario with at least two transport scenarios to give more information on the fit between them.

6.4 Assessment Principles

Full assessment of transport infrastructure proposals should identify their impacts in relation to the five overarching objectives of transport policy – economy, safety, the environment, accessibility and integration. A full assessment would require more detailed modelling and a wider range of assessment than is possible in the strategic GILTS study.

In addition, we are necessarily concerned with different development scenarios and different scales of development here than would normally be the case. In particular we are concerned with the interaction between transport and development scenarios, so there is a need to answer such questions as:

- How many trips will be satisfied locally in each scenario?
- How many people will have to travel different distances in each scenario?
- How do different scenarios affect average trip lengths?
- How many trips will be made by public transport and by road in each scenario?

The approach to the initial assessment of scenarios - as set out below - begins to answer these questions and begins to develop indicators that serve to proxy for the economy and accessibility objectives.

6.5 Suggested Assessment Approach

The combinations of development scenarios and transport scenarios will be run through the LTS and Railplan models and the TGX highway model, essentially adding the new development and transport infrastructure to the 2016 base case. Model outputs will include the highway and public transport trip matrices associated with the developments, and resulting conditions – flows, speeds, congestion, crowding - on road and public transport networks.

A deterministic approach is being taken to the development scenarios. It is assumed that given numbers will live and will work in each area/each model zone. The likelihood of these assumptions being realised will be tested by applying the approach previously developed (by CBP/Volterra) to address the relationship between accessibility in local areas and the development potential they support. This regression model estimates the changes in population or employment which could be sustained by changes in transport infrastructure independently of other factors contributing to an area's habitability or economic success.

A comparison will be made of this model's potential population and employment development in the Zones of Change and the assumptions made for each scenario to give a view on the likelihood of the development aspirations being achieved.

The LTS, Railplan and TGX highway models are to be the source of the assessment data so it is important that confidence can be generated in their outputs by confirming that they replicate the current situation in relevant areas well. The available information comparing modelled and observed flows on the road and rail networks will be assessed to confirm the models' validation.

Highway and public transport network flows and conditions will be compared for the following scenarios:

- Base year, e.g. 2001
- 2016 base case
- 2016 combination of each development and transport scenario

The comparison of transport network conditions will embrace:

- Congestion on the main road network, measured as v/c ratios on motorways and A roads and total flows on all roads across identified screenlines. This latter measure is necessary since the model will tend to fill the main roads first then assign remaining traffic on to the secondary roads, so v/c ratios on main roads alone will not differ much between scenarios and will not fully illustrate the pressure on the road network
- Crowding on the rail network (does the model allow the rail network to get more and more crowded? If not, what happens?)
- These transport network indicators will proxy the travel costs associated with different scenarios

A second strand to the assessment will identify the sustainability impact of scenarios by measuring for areas within Zones of Change, split by borough:

- The mode split of trips to and from each area
- The average trip length by mode of trips to and from each area, and
- Plots of trip destinations/origins for trips originating in/with destinations in identified areas
- Trip length distributions and trip cost distributions to identify areas poorly served by transport infrastructure
- Trip cost isochrones from each area to identify where new transport links could be beneficial

The proposed assessment framework for each scenario is summarised in Table 6.1 below.

Table 6.1: *Suggested Approach to GILTS Scenario Assessment*

Objective	Indicator	Scenario		
		A	B	C etc
	System-wide indicators			
	total trips by public transport			
	total hours – crowded and uncrowded – by public transport			
	total passenger km by public transport			
	total trips by road			
	total hours by road			
	total vehicle km by road			
	More local indicators: network conditions			
	road network: v/c ratios on main roads (m'ways and A roads)			
	road network: total flows across screenlines			
	public transport network: crowding on rail/DLR network			
	More local indicators: total travel generated			
	Total trips by car/PT to/from Zones of Change			
	Trips to/from each borough by mode from Zones of Change			
	Average trip length by mode to/from Zones of Change			

	Etc.			

(Note. Assessment method to be worked up in more detail, in consultation with TfL, prior to submission of the final baseline report at the end of August 2004).

7 Transport Modelling Context and Approach

7.1 Introduction

This section describes the proposed approach to transport modelling for the GILTS work. It outlines the modelling structure and how the models will be used to assess a range of land-use and transport scenarios.

It is not intended that the modelling work will drive the analysis that will contribute to the GILTS objectives, but it will provide the main quantitative inputs to the analysis. The aim is to tailor the modelling work to the key questions that need to be answered, and to understand and allow for the inevitable modelling limitations in the main analyses and conclusions.

It is suggested that checks can be made in terms of the validity of study conclusions by including "rule of thumb" analyses of individual development areas and the way in which they are likely to function in terms of transport and accessibility. This is part of the "bottom up" work required by the study brief.

7.2 Transport Modelling Tools

In their review of the currently available modelling tools, TfL concluded that the preferred models for use on GILTS are:

- At a strategic level: the LTS model. LTS is the best available tool for assessing the strategic level effect on trip making of changes in development and/or transport infrastructure. Version B3.21 of the LTS model is well proven, having been widely used in connection with the development of the London Plan and the progress of major transport scheme appraisals such as Crossrail and the Thames Gateway Bridge. A new LTS version (B5.0) is understood to be close to being re-validated against 2001 survey data. Work is also under way to prepare revised development assumptions for input to B5.0 forecasts, and to produce initial travel forecasts. The revised LTS B5.0 model is expected to be available in Autumn 2004, but not in time for use on the immediate GILTS work programme. It is therefore intended that LTS B3.21 should be used as the basis for GILTS, but with checks on the robustness of its outputs, as described in section 3.2 above.
- For local public transport assignment: the "standard" version of Railplan as maintained and operated by LTS is the most appropriate tool available. Railplan is well-established and has recently been used in connection with the development of the London Plan and a number of other public transport schemes. Variants of Railplan have also been

validated for use on the Crossrail and Thames Gateway Bridge projects. Whilst it might be attractive to make use of some of the refinements to the standard Railplan model, which have been made as part of the Crossrail and TGB projects, there is concern that adopting these may delay the GILTS work. It is therefore intended that the "standard" version of Railplan should be used for GILTS, again with checks on the robustness of its outputs, if possible under the time restrictions of the study.

- For local highway assignment: the Local-TGX model as developed for TfL for use in the development of road river crossings in east London is most appropriate. The Local-TGX model has been extensively used in the appraisal of the Thames Gateway Bridge and has been validated against traffic count and journey time survey data over a wide area of east London (including the whole of the London Thames Gateway).

7.3 Transport Modelling Approach

During Stage 2 of GILTS it is intended that the assessment of how well different packages of transport schemes perform in supporting alternative assumptions about the scale and location of additional development in London Thames Gateway will be carried out using:

- For the 45,000 and 91,000 housing growth scenarios: Travel demands (trip matrices) by mode as output by the LTS model for two alternative transport packages – the "Funded" package (as defined in May 2004), and TfL's "Business Plan". Outputs from these LTS model runs will be incorporated into the Railplan and Local-TGX assignment models. The transport schemes included in each of these transport packages is described in section 5 of this report. It is understood that a further variant to each of these packages – excluding Crossrail Line 1, Thameslink 2000 and the East London Line Extensions - is currently being examined.

7.4 Land-use and Transport Scenarios to be Tested

The GILTS Brief provides a matrix of land-use and transport scenarios – as shown in Table 7.1 – which are to be tested using the modelling tools. These have been slightly updated, and will need to be confirmed with TfL/GLA before modelling work commences.

Table 7.1: *Potential Model Scenarios*

2016 Housing Development Scenario	2016 Transport Scenario		
	Funded	Business Plan	Revised Business Plan
London Plan 45k	A LTS run. Interpret results and run sub-regional models	B LTS run. Interpret results and run sub-regional models	
ODPM 59k	C Sensitivity test of A	D Sensitivity test of B	
TGDIF 91k	E LTS run. Interpret results and run sub-regional models	F LTS run. Interpret results and run sub-regional models	G Sensitivity test of F
TGDIF 150k	H Sensitivity test of E	I Sensitivity test of F	J New run of LTS required

The final issue of this baseline report will provide commentary on the suitability of these tests, with potential amendments. Again this will be carried out in discussion with TfL/LDA. Employment scenarios may be added. Additional sensitivity testing may include model runs with and without major schemes.

7.5 Initial Review of 2 LTS runs.

Two initial LTS model run outputs for scenarios A and B have been programmed early into the GILTS schedule. Interpretation of these results will be carried out prior to submission of the final baseline report at the end of August 2004. This will include analysis and critique of the trip generation/distribution and mode split for development areas.

7.6 Further Issues

A number of further transport modelling issues are evident; these will be clarified prior to the issuing of the final draft baseline report. For example:

- Need for refinement of zoning system to differentiate between development sub-areas in public transport and highway accessibility models
- Need for critical assessment of the Thames Gateway Bridge Model, including assumptions included in the model and their impact on GILTS work
- Refinement of local assignment models and preliminary application to initial scenarios.

8 Approach for Iterating Land-use and Transport Scenarios

8.1 Overview

A working method is required which can help TfL assess the land-use and transport interactions within the Thames Gateway and to suggest the optimum development/transport fit. This should include assessment of the:

- Maximum level of development that can be supported by different fixed packages of transport provision (it is crucial that the transport scenarios deal with demand factors such as fares and parking, not just supply of capacity)
- Packages of transport provision (supply and demand) required by different fixed development scenarios (the land use mix influence on demand will be important)
- Some iteration in terms of the landuse/transport fit, including gap analysis, and
- Alternative travel patterns that could arise from altered demand factors.

This part of GILTS is designed to ensure that in addition to assessing land-use and transport options through the formal modelling process, we end up with a robust understanding of the land-use and transport iteration potential in the London Thames Gateway.

8.2 Land-use and Transport Interactions Literature Review

GILTS should be an exemplar of integrated land-use and transport planning and reflect best practice in the UK (and indeed further afield). Below we provide a very brief overview of developing thinking[2].

A large amount of research has concentrated on the potential interactions between land-use and travel behaviour. Much of this has been stimulated by the work of Newman and Kenworthy (1989) - on density and travel behaviour - and later by the publication of the European Commission's Green Paper on the urban environment, which advocated compact cities with higher population

[2] For more details see, for example, Hickman and Banister (2004) Reducing Travel By Design: Urban Form and the Commute to Work, AESOP Conference, Grenoble; or Hickman and Banister (forthcoming) Reducing Travel by Design: What About the Change Over Time? in Williams (2004) Spatial Planning, Urban Form and Sustainable Transport, Ashgate

densities (Commission of the European Communities, 1990). Newman and Kenworthy's analysis of fuel consumption in different international cities gave a direct comparison of carbon dioxide emissions around the world. Whilst land-use intensity was only one of the factors influencing the degree of automobile dependency, the basic - and attractive - hypothesis was that there was a relationship between density and the distance that people need to travel. The research argued that European cities were denser than either Australian or American ones, with activities concentrated in their centres, and that this was associated with a higher usage of public transport and lower energy consumption per capita. The analysis has subsequently been updated, see Newman and Kenworthy (1999).

Other researchers, such as Gordon and Richardson (1989), have critiqued the Newman and Kenworthy's original thesis, and show how they perceived the situation to be different in California, where both homes and jobs have suburbanised, 'co-locating' in such a way that commuting distances and times have actually decreased. They produce evidence which shows that there is no clear relationship between the proportion of car trips and population density and believe that the market place, quite independently from planning intervention, will adjust cities like Los Angeles so that car use will decrease 'automatically'.

The debate has rumbled on since, and two broad camps can be identified:

- The interventionists: who assert that urban form can and does impact on travel behaviour, and, critically, can be used to design more sustainable towns and cities (work drawing on empirical evidence mostly from compact city examples in Europe and Australia, e.g. Newman and Kenworthy, 1989 and 1999; Bozeat, 1992; Cervero, 1989; Curtis and Headicar, 1994; and Ewing 1997).
- The sceptics: who query the usefulness of planning interventions, and sometimes further argue that the efficiency of 'invisible hand' market mechanisms leads naturally to a 'co-location' of residential and employment locations. They believe that adjustments occur over time – unrelated to planning interventions - which bring workplaces and homes closer together and reduce commuting costs and distances (much of this work is based on research from suburban Los Angeles, e.g. Gordon and Richardson, 1989 and 1997; and Levinson and Kumar, 1994).

Breheny and Rookwood (1993) and Calthorpe (1993) in particular have produced illuminating concepts for integrating land-use and transport planning at the strategic scale.

Peter Hall (Sociable Cities, 2000) concludes that the land-use and transport interaction literature field is beginning to tell a consistent story. He draws out a number of key strategic policy elements – very relevant to the London Thames Gateway experience – and including:

1. Development of urban nodes: systematic efforts should be made to create new accessibility nodes by selective investment in new transport links. A polycentric model can balance flows along public transport corridors. Major efforts should be made to improve orbital links, since radial links are, as a general rule, much better developed. The Swedish principle of pyramids of density, used in the Stockholm satellite towns, should be developed.

2. Selective urban densification: urban compaction or intensification is desirable in order to help regeneration and renaissance, induce less use of the car and protect the open countryside.

3. No 'town cramming': densification must be compatible with good urban quality. Urban open spaces must be rigorously protected.

4. Strategic provision for greenfield development: this is perhaps the most controversial proposal. Because selective densification can never hope to provide more than half of the national housing demand, the residue will need to be accommodated elsewhere. A regional strategy will be critical, crossing county borders.

5. Clustered new development: an updated, linear version of Howard's Social City, with relatively small-scale residential communities (20,000-30,000 population) clustered along public transport routes, especially rail, light rail and guideway. Breheny, Rookwood and Calthorpe provide the way forward here.

6. Town/urban area expansions: clustered development can contain a mixture of different types of development. Medium sized and smaller towns with good public transport accessibility can be expanded. New towns may be an appropriate solution; at times better than an ad-hoc "pepperpotting" of development, which makes little strategic sense.

7. Areas of tranquillity: large areas of countryside should be protected to conserve tranquillity, with development restricted to only that which meets local needs.

A relatively neglected area of the debate concerns the context within which location and travel decisions are made. The was first raised seriously by the Smeed report on road pricing in 1964, which dealt in particular with the likely impact of marginal cost pricing. It took almost 40 years to demonstrate (with the central London charging scheme) that the amount of traffic on a network was a matter of choice, and not something for which one had to plan at all costs. Pricing and pricing regimes are only part of the story. It is also possible to conceive of transport and land use systems with entirely different travel and transport outcomes from those normally expected in the UK at the start of the 21st century. As to whether radically different scenarios will be developed and explored is simply a matter of professional and political will, and recognition of the

possibilities. No doubt thinking of this sort has influenced the much higher level of housing growth in the London Thames Gateway suggested by the London Urbanism Unit.

The trick within GILTS will be to combine leading-edge academic thought with governmental guidance and translate this into good practice on the ground.

8.3 Proposed GILTS Method in Detail

Our proposed method for assessing the land-use and transport fit in the Thames Gateway - drawing on the above thinking - is summarised below.

1. Analysis of transport strategy required for each development scenario

For each Zone of Change and for the London Thames Gateway as a whole we will suggest a transport strategy (transport schemes plus traffic demand management package) to meet both medium and high level development aspirations. When aggregated the development potential of the Zones of Change may reflect (but not necessarily) the different housing growth scenarios under review, i.e. 45,000, 59,000, 91,000 and 150,000 additional homes, as described in section 4.

This is part of the bottom-up procedure required in the brief, and will involve a more holistic consideration of the development and transport potential of the Opportunity Areas and other parts of the Zones of Change than could be undertaken within the context of the strategic modelling exercise. The purpose will be to provide a check on the results emerging from the modelling work, and also to establish where exactly higher levels of growth potential may be found. In addition the work will help to identify (in conjunction with the strategic modelling) where the important thresholds lie in terms of area development and transport infrastructure construction. This is turn will inform the later process of identifying development and transport scheme phasing and priorities.

2. Analysis of development potential possible for each proposed transport strategy

For each zone of change and for the London Thames Gateway as a whole we will suggest an ideal development scenario possible for each proposed transport strategy.

Transport scenarios:

- Funded by DfT
- TfL's Business Plan
- TfL's Revised Business Plan

Both of these work stages may be progressed using scenario development workshops. It is proposed that each of these will include pseudo "advocates" with public transport, highways,

demand management, high density proponents, high density doubters, all represented. This could be done by producing scenario papers from different viewpoints, and then discussion to reconcile the land-use and transport fit (options). Our method here will be clarified in discussion with TfL/LDA prior to the issuing of the final baseline report.

Background papers for the workshops will include some 'rule of thumb' assessments of levels of development required to support transport schemes (and the reverse: transport schemes required by different levels of development). The outline table below provides an example of how this could be tackled.

Table 8.1: *Potential Land Use/Transport Rule of Thumb Capacities*

Transport Scheme	Population Catchment Served; Expected Mode Share	Population Required to Support Cost-Effective Scheme [e.g. 50% loading on average]	Average hectares within catchment per stop	Average gross population densities required within catchments (London Plan approx ave 200 people or 100 dwellings per ha.)	Best Practice Comments
Bus corridor 10 minute frequency	200m walkable catchment, 300 metre stops 8% pt mode share				London corridors
Bus corridor 5 minute frequency	300m walkable catchment, 400 metre stops 15% pt mode share				e.g. Curitiba e.g. Uxbridge Road, London
Guided bus corridor or busway or trolley way 5 minute frequency	400m walkable catchment, 400 metre stops 20% pt mode share				e.g. Leeds, Essen e.g. Lyon e.g.Netherlands busways
LRT corridor 6 minute frequency	600m walkable catchment, 500 metre stops 30 % pt mode share				e.g. Strasbourg, Freiburg
State of the art walking and cycling network	800m walkable catchment 35 % green mode share				e.g. Groningen (50% green mode share
Car-based urban development	70% car mode share	Population density: <30 HH/ha			Continuing current trends

(NB. Diagrams to be included as part of above scenario development/rules of thumb)

This rule-of-thumb exercise will be accompanied by explicit and robust assumptions derived as far as possible from best practice examples and from London Planning documents. Attention will be paid to relevant development densities for the Zones of Change, requiring a method to be developed to relate these to the residential densities in the London Plan. It should also be noted that the "service area" populations of public transport routes are extremely sensitive to the assumed walkable catchment size, which emphasises the importance of the proposed "bottom up" approach to scenario building.

Further rule of thumb analysis can assist in checking the validity of scenario testing. An example would be determining the true capacity, or range of capacities, that can be provided by different modes of public transport. Similarly, road performance can be judged in alternative ways, for example attempting to eliminate congestion or accepting some congestion as an element of optimum performance.

Benchmarking provides a useful way of constructing scenarios. We would expect to undertake (in parallel with the main modelling procedures) bottom-up scenario building for the growth areas which uses constant trip generation rates and time budgets, together with and mode split and trips distributions benchmarked from other locations. For example

- Based on transport constant of trips per person (3 trips per person per day)
- Make assumptions about distribution of these trips to derive peak period/hour
- Total demand arising from new development can then be derived by applying mode split assumptions.
- Trip distribution can be assumed or derived with reference to where people are likely to travel to (with spatial distribution of employment being the single most important factor in terms of transport network capacity/quality, although not in terms of transport sustainability).

8.4 Further Issues to be addressed

The iteration of transport and land-use scenarios requires simultaneous consideration of the following issues.

- Jobs-housing balance analysis (for different area disaggregations)
- Accessibility analysis, both to and from development areas. Consideration of outbound and inbound accessibility will depend on the mix of origin uses (mainly housing) and destination uses (mainly employment and other non-residential development).
- Sensitivity testing, identifying which variables are critical in determining the quality of "fit".

- Consideration of likely market demand for housing and employment projections (GLA to advise), but recognising the possibility of generating market demand through the quality of transport and other infrastructure provided.
- Best practice land-use and transport integration, including benchmarking.
- The development scenario building (land-use inputs for testing) needs to be a bit more sophisticated than just plain numbers. We need to explain who the people are, where they come from, and how this would affect assumptions about where they would work, and how they would get there. For example, the proportion of affordable and key worker homes is likely to have a major influence on travel patterns in the growth areas.
- This requires reference to existing masterplans or at least aspirations, i.e. bottom up analysis for each major development area.
- It also requires "open" consideration of transport attributes (not just current proposals and commitments).
- Consideration will need to be given to growth in London TG compared to non-London TG and the rest of London. For example, is this just a phasing issue or are there choices to be made about where growth goes? E.g. the whole of the 200,000 extra homes in South East could be pushed into London TG, but there may be good reasons why this shouldn't happen.
- On the transport side, what are the dependencies involved? If the current transport schemes were conceived on the basis of a particular set of development assumptions, what happens if these development assumetions are to be radically altered?
- The employment side is crucial. TG is not just about supplying housing for increasing armies of Central London workers. It is not just about how much employment where, but what type, and does this fit realistically with the expected population profile? RTP will help with this.
- To contribute to sustainability, development must deliver an overall trip mode share for car driver of less than 48% (national average).

The Transport Assessment methodology provides a potentially useful way of structuring consideration of these issues. It consists of three main steps.

1. Travel characteristics

Existing and expected situation for Thames Gateway London (for 2001 and 2016)To include:

- Journeys per day: existing and expected number of journeys to and from TGL as a whole and each Opportunity Area/Intensification Area/Other area per day as separate totals (figures should show particular peak hour flow expected and where capacities are exceeded). The number of journeys per capita may be taken as constant, so variations by area will reflect different development scenarios and densities.

- Mode split: existing and expected modal split for all journeys (excluding freight) to and from each growth area (figures should make clear whether car journeys include driver only or passenger and driver journeys). While all modes are included, the crucial analysis would be between car driver, public transport, and other modes.

2. Measures to influence travel to/within area

Comments on efforts to reduce car traffic volumes and increase mode share by public transport, car passenger, walk and cycle. Particularly how car dependency issues are being addressed

- Access, scale and design: the efforts made to promote choice of access to each growth area, including for all modes and disabled people
- Promoting walking and cycling: such as pedestrian routes and crossings, cycle routes, junction designs and cycle parking. How are the new growth areas designed and located to facilitate the greatest possible mode share by walking and cycling?
- Promoting public transport: such as guided bus or quality bus potential (or a better system), information; bus stops; improved services and bus priority. How are the new growth areas designed and located to facilitate the greatest possible mode share by public transport?
- Minimising car dependency/parking: overall number of parking spaces and what this represents in relation to relevant maximum standards and styles of provision, controls and charges. How are the new growth areas designed and located to facilitate the smallest possible mode share by private car?
- Organisational measures: such as being part of travel-wise initiatives, awareness raising and marketing and transport initiatives including car sharing, green travel planning, school and hospital travel planning (perhaps organised by new growth area)
- Freight efficiency: such as involvement in local freight partnerships and clear plans to minimise numbers of vehicles
- Securing travel measures: how measures will be delivered i.e. included in masterplan implementation; through conditions or through planning or other legal agreements & where relevant total value of contributions towards transport initiatives
- Land-use and transport integration: assessment of the land-use and transport fit. Are the suggested growth options supported by an adequate transport network? Is the suggested transport strategy supported by the urban form vision? What level of iteration has been carried out between land-use and transport: how has the transport strategy been shaped to reflect the urban form vision (and vice versa). What is the 'optimum' land-use and transport fit considered to be?

3. Transport impacts

Once all of the above have been considered, the outcome will be a set of development and transport proposals, and these will have a range of impacts that may require responses in terms of mitigation and/or compensation. Consideration will need to be given to the scale of such impacts.

9 Synthesis: Optimising the Land-use and Transport Fit

9.1 Drawing Conclusions from the Analyses

This part of GILTS will address directly the study objectives as set out in Section 1. It will bring together the different strands of analysis – strategic modelling, scenario building, bottom-up analysis of development potential, thresholds and phasing, non-infrastructure and demand management sensitivity tests – in order to draw conclusions in a digestible form.

9.2 Study Objectives

The key output of GILTS will be to provide a robust assessment of the range, scale, style and mix of developments that can be built in the London Thames Gateway, and the transport interventions that will be necessary to support them. This will refer crucially to network and service performance.

In addition to these core outputs, it will be necessary to communicate in a useable form an understanding of the many factors and variables that lie behind the headline results.

The key issues behind the conclusions will be:

- Homes and jobs potential in LTG
- Type and mix of development by area
- Transport schemes to support LTG growth
- Thresholds of transport provision
- Phasing of development (location and timing)
- Critical timing of transport infrastructure
- Other interventions required (especially demand management)

9.3 Policy objectives

The conclusions will refer to the basic policy objectives that apply to the LTG, and demonstrate how the land use and development scenarios have been tested and appraised against these objectives.

10 Next Steps: Stage 2 and 3 GILTS Programming

10.1 Detailed Programme

The next stages in GILTS are as follows:

- Complete Stage 1 Baseline, including an expert panel review by end of August 2004
- Testing of land use and transport options, with iterations, sensitivity testing and expert panel review, by end of November 2004
- Prioritisation and assessment, with final expert panel and final reporting by mid-December 2004.

A detailed programme chart is shown in Figure 10.1.

Annexes

Annex 1: Good practice in integrating land-use and transport planning
Annex 2: Thames Gateway: summary problems and opportunities
Annex 3: Population and employment forecasts
Annex 4: References

(TO BE PROVIDED AS PART OF FINAL REPORT)