Deliverable E1: Funding and Phasing of Transport Projects – Literature Review
2005 Update

by C Burke, K Townley and A Binsted

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1 Introduction

1.1 Background

DISTILLATE builds on an earlier scoping study which revealed that financial, institutional and cultural barriers are faced by local authorities in delivering sustainability in transport and land use (Pedler *et al*, 2004). The objective of the research is to work with local authorities to develop means of overcoming these barriers. More effective and efficient selection, planning and delivery of schemes and projects will enhance the sustainability of urban areas and the quality of life of people who live in them.

The objective of DISTILLATE Project E is to identify the implications of different funding strategies and contractual arrangements and ways by which implementation may be phased, in order to achieve a more effective delivery of sustainable transport and land use schemes. The project therefore seeks to understand the funding procedures which affect transport and land use projects and how these procedures affect project implementation; it will go on to develop and test methods for dealing with different funding strategies. The project will also investigate how the phasing of implementation may affect the projects outcome, and suggest how phasing should be handled at the planning stages.

As part of the scoping study for the DISTILLATE project, a literature review identifying funding of transport project and potential effects on implementation was undertaken. One of the Tasks within Project E is to update this literature review in 2005, 2006 and 2007, to reflect new material on the subject of funding and phasing.

Therefore, this document includes the original material from the scoping study relating to the funding of transport projects, but also looks at more recent reports into transport funding in the UK and innovative funding mechanisms. As stated above, this review will be updated subsequent years until the end of the DISTILLATE programme, and will inform other Project E deliverables.

1.2 Aims of Deliverable and its Content

The aim of this deliverable is to identify and discuss relevant literature related to the funding and subsequent implementation of transport projects, primarily in the UK, but with examples or case studies from Europe and further afield. As stated above, this deliverable builds upon the original scoping study, adding material from 2004/05.

Chapter 2 focuses on public, private and public-private funding mechanisms that are currently used to fund transport, which is largely based on the scoping study material for this study, and examines the best circumstances to use public, private or public-private funding sources. **Chapter 3** looks at the more innovative funding mechanisms available, including road user charging, land value tax and work place parking levies amongst others. **Chapter 4** provides some case studies regarding the funding and implementation of various transport projects. This is followed by a summary, conclusions and details of next steps in **Chapter 5**.

2 Funding of Transport Projects

Transport projects have been traditionally financed by the state. However, the implementation of large scale projects has often involved private companies who finance and build the development through Private Finance Initiative (PFI) or Public Private Partnerships (PPP). There are pros and cons of wholly public financing, as well as drawbacks of wholly private financing and mixed public-private finance, which will be explored here.

2.1 Public Funding

Transport projects funded by the local authority or central government are publicly funded. Each year, the Department for Transport produces its annual report, including details of money spent on transport over the past years and the budget for the coming year. This budget is split between local transport initiatives, as decided by local authorities through the Local Transport Plan process, maintenance of roads, and support for other transport industries in the UK.

The Local Transport Plan forms the main basis of block grants from central government for capital expenditure in funding transport improvements, which allows both support for package bids for public transport improvements ahead of road schemes and wider social, economic and environmental frameworks to assess the value of package bids. Revenue in England and Wales consists of non-domestic rate, council tax, rate support tax and other specific grants.

Vickerman (2002) discusses the rationale that is used to justify public financing of transport infrastructure. It is often suggested that infrastructure should be paid for directly from general taxation, mainly due to the 'public good' that the scheme will provide. However, it is not always the case that the public good of transport projects can be used in justification, as transport infrastructure rarely meets all the criteria for a public good. This is as a result of infrastructure externalities that arise when the infrastructure approaches capacity, such as environmental and economic costs that are felt by users and the public.

2.1.1 Capital Funding

Capital is wealth in the form of money or property, used or accumulated in a business by a person, partnership, or corporation. Capital finance regulations have been amended a number of times since 1990. The Local government Act 2003 replaced the capital financing framework with effect from April 2004. The difference that this act has made is that Local Authorities' can now raise finance for capital expenditure without government consent, where they can afford to service the debt without government support. The government can set limits on borrowing and credit, but these limits would only be used in exceptional circumstances.

Capital funding often covers construction and implementation costs of a project, such as building a new road, implementation of rail improvements, the purchase of vehicles etc. Examples of capital funding sources include the following:

- *Transport Supplementary Grant (TSG)* in England and Transport Grant (TG) in Wales are awarded for accepted major road schemes (above £5million). Grants awarded consist of 50% TSG/TG and 50% SCA;
- *Supplementary Credit Approval (SCA)* is the Government sanction for the local authority to borrow that amount. Supplementary Credit Approvals are 1- or 2-year agreements used to finance half the cost of major projects (those above the £5 m threshold). The remainder is provided through a Transport Supplementary Grant or Section 56 grant. As with Basic Credit Approval (see below), Supplementary Credit Approval (SCA) authorises borrowing which is then repaid through the Revenue Support Grant. However this funding is excluded from the Single Capital Pot and as such cannot be diverted. Supplementary Credit Approval that cannot be used within the time allowed must be surrendered within 6 months of the end of the first financial year. It

may then be reallocated to an alternative project. Supplementary Credit Approval is declining as a mechanism for funding.

- *Basic Credit Approval (BCA)* is Government-sanctioned approval to borrow for schemes/projects proposed by the local authority. In Wales, the National Assembly for Wales is given a Block Grant by the Treasury to cover all areas of spending, given to local authorities and sub-divided between spending heads (e.g. education, social services, transport etc). In the case of transport, this covers schemes under £5m (e.g. highway schemes, public transport infrastructure, maintenance, etc). (RTPI, 2002)
- *Section 56 Grant (S56)* is a grant made under Section 56 of the Road Transport Act 1968. The grant provides 50% of the cost of new and existing accepted major road schemes over the life of the scheme. The aim is that the remaining 50% will be provided through SCA allocation.
- *Single Capital Pot* – The Single Capital Pot (SCP) was introduced in 2002/03, allowing local authorities to be more flexible and making it easier for them to address cross-cutting issues, such as social exclusion. The Single Pot allows local authorities to decide how to move funds awarded under one budget to another.
- *Industrial Development Act Grant*. These grants are issued under the 1982 Industrial Development Act and provide partial support (up to 30%) for the provision or improvement of access roads to industrial or commercial developments in Assisted Areas.
- *Challenge Fund* - Challenge Fund grants, designed to fund innovative capital investment projects, are seen as a valuable additional source of support for local transport projects, particularly as they offer ring-fenced capital and revenue funding. However, there is considerable dissatisfaction with the bidding process, which is considered to be costly, time-consuming, high-risk and liable to distract from the objectives outlined in the Local Transport Plan. Some amendments to the scheme have been suggested. Integration of Challenge Fund bids with the preparation of the Local Transport Plan has been suggested to help to streamline the application process. Other options include the incorporation of the bid process in the Annual Progress Report framework.
- *Annual Capital Guidelines* - This is for general maintenance and integrated transport schemes costing less than £5m, central government funding is provided through Annual Capital Guidelines. Payments are distributed via the allocation of funds to the Single Capital Pot through Basic Credit Approval. Repayment of the credit is financed in the Revenue Support Grant.

The amount allocated in the Annual Capital Guidelines includes the allocation of the total capital receipts obtained from the sale of local authority assets. This approach has raised several concerns regarding the funding of transport projects. The first is that Basic Credit Approval constrains the associated expenditure to the financial year following its issue and cannot be deferred if the project is subject to delay.

The second is that under the Single Capital Pot approach, transport projects compete directly for funding at the local level, and the funding initially allocated may be diverted to address over-expenditure in other fields, particularly education or social services. This practice of diverting funds was identified by 62% of transport lead officers and members in a recent Local Authority Survey (Commission for Integrated Transport, 2002). In the two years following the introduction of the Single Capital Pot in Scotland, capital expenditure on transport dropped by almost 50%.

A further problem is associated with the level of the threshold between major and minor schemes. For smaller local authorities, projects between £2m and £5m represent a significant fraction of the total available capital, and can be difficult to implement under current restrictions for annual funding.

- *Capital receipts* – Local authorities can, at their discretion, supplement their expenditure with capital receipts. The importance of community and voluntary transport and opportunities for funding such schemes via the Rural Transport Development Fund should also be noted. The Rural Transport Partnership scheme offers a new opportunity to improve transport for communities in rural England." (RTPI, 2002)

- *Business Rates* – Income from the Uniform Business Rate, or National Non-Domestic Rate (NNDR) is redistributed among the local authorities and contributes to the total level of revenue set by the Standard Spending Assessment.
- *Section 106* – This enables Local Authorities to secure provision or improvement of existing infrastructure necessary to meet the needs of the occupiers or users of new development. Done by way of land or finance contributions. Section 106 agreements may enhance quality of development and enable proposals to go ahead which may other wise be refused. Such agreements should be relevant to planning directly related to the proposed development and necessary to make it acceptable in land use planning terms
- *European Union Objective 1* – Monies have been made available by the EU and have been co funded by governments and the private sector. Objective 1 promotes the development and structural adjustment of regions whose development is lagging behind that of the rest of the EU. In the UK, Objective 1 covers Merseyside, South Yorkshire, Cornwall and the Isles of Scilly. Objective 1 areas fund project based support activities which bring about social economic and environmental development. Money available from EU objective is matched by equivalent amount of public sector money as well as attracting private sector contributions.

2.1.2 Revenue Funding

Revenue is the inflow of assets that results from sales of goods and services and earnings from dividends, interest, and rent. A lot of Local Authorities revenue is in the form of taxes. Local Authorities set their own budgets and levels of tax, but central government can limit the amount that each local authority can raise from taxes.

The revenue finance system underwent change in 2003/04 when there was a move from the standard spending assessments to formula spending shares. Revenue funding is required for the ongoing costs of running and maintaining transport schemes and services, for example, the staffing and running costs of bus services.

Currently the financing system does not control Local Authorities' individual financing and spending decisions. Constraints are in place on the actual sources of finance for capital expenditure.

- *Rural Bus Challenge.* - has made funds available to English county councils, unitary authorities and Passenger Transport Authorities to implement cost-effective innovative rural bus transport. Bids for funds should fall into one of the following categories:
    - New approaches and projects which are distinctive in that they bring fresh thinking to the solution of rural transport problems including demonstration projects, from which lessons of wider applications might be learned;
    - Projects which bring new transport provision to rural areas currently poorly served by applying solutions which have proved successful elsewhere; and
    - Enhancement of existing schemes, particularly those previously supported by an earlier Rural Bus Challenge award, where the bid can demonstrate value for money from the use of Challenge funds for this purpose (DfT, 2002).
    - There is also a similar scheme for urban areas: the *Urban Bus Challenge*.
    - The rural bus challenge fund finished in 2003.
- *Rural Bus Subsidy Grant* - Where the introduction of new or extended bus services are concerned, local authorities can apply for the Rural Bus Subsidy Grant (RBSG). Rural Transport Partnership Scheme funds local partnerships which aim to address social exclusion in rural areas by identifying local transport needs and taking the necessary action to meet them.
- *Revenue Support Grants* – Revenue Support Grants are used to administer the Central Government contribution to local authority revenue budgets. The Revenue Support Grant payment

represents the balance of the amount attributed to the local authority under the Standard Spending Assessment once the income from the National Non-Domestic Rate and from Council Tax have been considered. The adjustment for Council Tax assumes that the level is set at that for 'standard spending'.

Revenue Support Grant payments are not ring-fenced and transport must compete for resources with other services. Revenue levels recommended for transport under the Standard Spending Assessment are often diverted according to local priorities.

- *Standard Spending Assessment* – The level of revenue paid by Central Government to each local authority is allocated through the Standard Spending Assessment. This process considers the demographic, physical, economic and social characteristics of each authority in order to reflect the different needs and costs in the allocation of the revenue budget. Adjustments are made to reflect regional differences in specific costs, such as wages.

The Standard Spending Assessment uses a set of formulae to calculate a recommended level of expenditure for each local authority for each of seven service blocks. Transport revenue costs are included in Environmental, Protective and Cultural Services in addition to Highways Maintenance. The Standard Spending Assessment procedure does not currently include any direct link to the revenue costs of measures specified in the Local Transport Plan.

The additional payments required to match local authority income to the specified standard spending are administered through the allocation of a share of income from business rates and the payment of a Revenue Support Grant. Council Tax revenues at a standard level are taken into account.

- *Council Tax* – Council Tax is a significant source of revenue for local authorities, contributing 22% of revenue income in 1998/1999 (Department for Transport, 2003a). A Council Tax Standard Spending level is set by central government. It is a recommended level only and assumes a standardised pattern of spending to be undertaken by the local authority. The Standard Spending level is used in calculating the portion of the Standard Spending Assessment total to be paid through the Revenue Support Grant.

- *Rents, Fees and Charges* – Additional income is obtained from the rents on local authority properties and from fees or charges on services provided by the local authority. This provided 11% of local authority revenue income in 1998/1999 (Department for Transport, 2003a).

2.1.3 Public Funding in Practice

In March 2005, the Commission for Integrated Transport (CfIT, 2005) published a review of capital and revenue funding for transport. Looking back to a Local Authority Expenditure Study (conducted in 2004), the report looks in more detail at revenue and capital funding. With regard to revenue funding, it was found that it had increased over the study years (£3.3b in 1999/00 to £5.4b in 2002/03). There was evidence to suggest that lesser performing authorities may not be spending their full transport allocation or diverting it to other areas (there was a statistically significant correlation between authorities spending more and their Comprehensive Performance Assessment (CPA[1]) rating). The study also revealed that there had been a threefold increase in revenue expenditure on bus services during the study period. This is primarily related to spending in London (amounts there have risen from £1m to £420m). Outside of London, spending has increased by 30% over the same time

[1] Comprehensive Performance Assessments (CPAs) were introduced in the White Paper 'Strong Local Government - Quality Public Services'. The CPA is a key element of the Government's performance framework for local government which aims to support improvement planning in local authorities and lead to co-ordinated and proportionate audit and inspection and increased freedoms and flexibilities for local government. The Audit Commission's role in CPA is to form a judgement on the performance and proven corporate capacity of every single tier and county council in England. Once a judgement has been formed, the Audit Commission produces a 'balanced scorecard' for every authority, available to the public. Each Council is given a rating - excellent, good, fair, weak or poor - to describe how it is performing overall.

period. However, rather than this being a result of provision of new services, much has been related to inflationary pressures (e.g. increased tender costs) (CfIT, 2005).

Looking at capital funding, the amount allocated to local authorities has increased from £1.1b to £2.4b. Capital expenditure exceeds funding provided, demonstrating local authorities' access to a variety of funding sources. Interestingly, the study revealed that capital funding and expenditure increases have been more rapid than the increases in revenue funding and expenditure, raising issues for the future. These new assets will require ongoing servicing and maintenance with the support of revenue funding (CfIT, 2005).

Revenue spending is influenced by the relevant importance of transport in the service assessment elements of the CPA. Transport appears as 50% of the environment score, equating to 8% of the overall score. In order for authorities to achieve 'excellent' rating, they must also achieve at least a 2 star standard for the Education and Social Services block. Effectively, Transport only needs to score 50% of the 8% score to receive an 'excellent' rating, therefore local politicians may choose to focus spending on those areas of the CPA process viewed as priorities. Recent proposals to refine the process seek to give transport more prominence where performance is not consistent with that of the local authority overall. There are four areas of the transport contribution where performance would be judged, including:

- Condition of principle roads (LTP indicator);
- Progress towards casualty reduction targeted (LTP indicator);
- Progress with the Local Transport Plans (Annual Progress Rreports); and
- Intervention by the Secretary of State under their powers in the Traffic Management Act 2004.

If authorities obtain poor performance in any of these, the score would be adversely affected. Scoring poorly in 2 or more areas would prevent the authority from obtaining an overall 'excellent' score.

CfIT (2005) states that although they welcome the changes to the CPA system, there should be more done to monitor transport spend against allocations and against delivery of Government objectives. CfIT points out that the proposed measures do not cover the bulk of revenue spending on transport, including public transport support. Therefore, a system that monitors transport expenditure is needed. Alternatively, the LTP indicators and APR procedure could be used to monitor progress, as these allow for a broader set of measures than being proposed in the CPA process; "*with the possibility of longer term indicative allocation of revenue funding becoming more likely, the opportunity of combining revenue and capital funding allocation on monitoring as part of APR becomes more plausible*" (CfIT, 2005).

In July 2005 the DfT published the report '*Long Term Process and Impact Evaluation of the LTP Policy'* produced by Atkins consultancy (DfT, 2005a). Based on the findings of workshops with a range of stakeholders and local transport practitioners as well as interviews, data analysis and regional case-studies, it addresses the issue of whether the LTP system is effective and outlines the impacts and consequences at ground level that the policy has had.

In the workshops practitioners stressed the importance of budget in delivering progress, and the report states that the DfT has delivered more than double the amount of capital investment that was available to authorities in the previous five years of the Transport Policies and Programmes process. All authorities have, however, identified revenue as a key barrier to LTP delivery, although findings in the report indicate that the increase in funding has allowed authorities to be more ambitious in the programmes that they pursue. Authorities are said to particularly benefit in this sense where they have spent more on local transport than their DfT LTP allocations, such as through the Single Capital Pot (DfT, 2005a).

The Single Capital Pot, provided by Central Government, gives authorities flexibility on which services are given financial support. The report does not respond to the authorities' fear that as the Pot required money to be spent within the year it would result in short-term schemes as opposed to the delivery of more complex schemes. It does however address the concern that transport projects could

be sidelined by spending on services such as education, stating that this has not materialised. The DfT's 2004 Standard Spending Assessment (SSA) however showed that 84 of the 106 authorities and districts surveyed spent less than the allocated SSA amount on transport, with revenue funding being transferred to other services. To reduce the chance of this happening, Atkins' report calls for transport officers to continue to make strong internal cases for transport investment (DfT, 2005a).

An issue highlighted in the report is that funding is being increasingly linked to an authority's performance in delivery and contribution to targets. In 2003 £68 million was given to authorities for good performance while 'weak' authorities had some of their allocation withheld until they improved performance. The report states that it is 'unclear' as to how much this triggers a commitment to improvement in 'weak' authorities. For 2005-06 performance related funding is being withheld which Atkins do not think will have a negative impact on performance. Allocations based on 'quality of planning and delivery performance' are still key elements of the DfT's approach, however, but within a +/- 25% range (of allocated funding) as an incentive (DfT, 2005a).

A lack of revenue funding was outlined by all stakeholders as a 'pressing issue.' The report suggests that as a result it is becoming increasingly difficult to fund maintenance for infrastructure, so benefits may diminish, schemes requiring high revenue funding may be delayed or cancelled, and easily-funded capital works may replace revenue-based schemes, such as increases in bus services. Revenue shortages could even result in inadequate staffing, particularly in rural areas where measures tend to be more revenue-intensive. Options for external support are also identified as being 'limited' in rural areas. Factors such as increasing costs for existing transport services, internal efficiency exercises as well as funding pressures in other services and local political issues may further exacerbate the problems of low revenue funding (DfT, 2005a).

Findings of the report suggest that some authorities are viewing the revenue problem constructively by developing local solutions, such as partnerships with revenue-rich capital poor partners, such as bus operators, and strengthening the case internally for transport, i.e. by stressing its contribution to wider corporate and community objectives (DfT, 2005a).

The LTP2 Guidance does not offer any direct solutions to the revenue problem but suggests that authorities consider how revenue based transport spending which supports capital investment could be funded, with auditor support, by a capital programme. The report suggests however that in the long term Local Government could make it easier for capital and revenue expenditure to be integrated. They offer the possibility of achieving this via flexibilities in the Prudential Code. Innovative approaches are also mentioned as a way to secure funding in the future, through land value and increased trade schemes for example (DfT, 2005a).

The report highlights the fact that authorities are using a wide range of different funding sources to supplement LTP capital application – it is thought that the certainty of funding over the five year LTP period has supported such 'match contributions.' The 'bidding culture' developed by some authorities (both internally and externally) is identified as a means to receive substantial additional funding. The report also draws attention to the £10million revenue funding available for promotional and behavioural measures as part of the "Sustainable Towns" initiative (Darlington, Peterborough and Worcester) which demonstrates the effectiveness of a combined approach to funding. As a cautionary note however the report mentions the necessity to recognise that the management of separate funding streams (some of which may come with additional requirements) is time-consuming, and that it must be ensured that this does not detract from the effective delivery of the LTP (DfT, 2005a).

2.2 Private Finance in Transport Projects

Most local authorities have used private financing, in some form, to support transport projects. There is a majority view within local authorities (and particularly among officers) that there is potential to increase the levels of private investment. Currently, the mechanisms most commonly used are the leverage of funds through planning gain and partnership with local bus operators or businesses. Around half of local authorities have experience of Private Finance Initiative schemes. Limitations on available staff and skills are cited as significant obstacles to increasing the levels of private finance, as

is the reluctance to jeopardise proposed local development by pressing for Section 106 (planning gain) agreements.

The requirement that schemes above the £5m threshold be assessed for their suitability for private finance has been identified as a resource-intensive process, requiring a significant investment of time and money, with concomitant risk.

The majority of literature available concerned with financing of transport projects focuses on private sector involvement in the funding process. Private sector funding or investment in transport schemes can have its advantages, and there are benefits to be gained through using both public and private financing for projects, partnerships are often made to maximise the benefits when funding transport projects, both small and large. The main forms of public private funding mechanisms are known as Public Private Partnerships (PPP), Private Finance Initiative (PFI) and Design Build Finance and Operate (DBFO) projects, described in the following section.

The increase in use of and the benefits of private sector involvement in the financing and delivery of transport projects has been well documented. Vickerman (2002) puts forward the two main reasons for private finance, which are:

- Concern about the ability and efficiency of the public sector in the management of large scale projects; and
- The availability of finance capital seeking projects which could advance the scheduling of a project.

However, there is one main counter-argument about this expected cost advantage; because there is a higher degree of risk to the private sector, the cost of finance would typically be higher than to the public sector.

Most local authorities have used private financing, in some form, to support transport projects. There is a majority view within local authorities (and particularly among officers) that there is potential to increase the levels of private investment. According to Chatterjee et al (2003), private finance can be acquired through equity and debt. Equity involves investment made directly by project promoters and debt involves loans from banks and other institutions with rates of interest. Projects are usually financed by a mixture of debt and equity

2.2.1 Public Private Partnerships

DETR (2000) outlines the objectives of Public Private Partnerships as follows:

- To deliver significantly improved public services, by contributing to increases in the quality and quantity of investment;
- To release the full potential of public sector assets, including state-owned businesses, and hence provide value for the taxpayer and wider benefits of the economy; and
- To allow stakeholders to receive a fair share of the benefits of the PPP. This includes customers and users of the service being provided, the taxpayer and employees at every level of the organisation.

Partnerships between public and private organisations concerned about local environment and accessibility as well as transport providers have worked together for a range of purposes. Integrated transport strategies have been developed through securing funding through the TPP/LTP process. It is often the case that funding for studies can be achieved from private partners who may have a commercial interest in the resultant scheme or infrastructure (RTPI, 2002).

2.2.2 Private Finance Initiative (PFI)

The Private Finance Initiative (PFI) is a form of PPP that is regularly used. The Government's Private Finance Initiative policy provides the potential for additional funding for major projects, including infrastructure, educational establishments and hospitals. The PFI policy was adopted in 1992 and the public sector decides on the infrastructure that is required and then gives the private sector the opportunity to provide the facilities in whatever way it sees fit and subsequently manages those facilities (Kain, 2002).

It is a scheme where "*a private sector consortium undertakes to complete a capital project in return for which they either receive "Shadow Tolls" or charge fees over an agreed period of time*" (RTPI, 2002). PFI is, principally, a form of contracting or procurement, the hallmarks of which are:

- A long term service contract between a public sector body and a private sector 'operator';
- The provision of capital assets and associated services by the operator;
- A single 'unitary' payment from the local authority which covers investment and services;
- The integration of design, building, financing and operator's proposals;
- The allocation of risk to the party best able to manage and price it;
- Service delivery against performance standards set out in an 'output specification';
- A performance related 'payment mechanism'
- An 'off balance sheet treatment' for the local authority so that any investment delivered through the project does not count against borrowing consents;
- Support from central government is delivered through what are known as 'PFI credits' (RTPI, 2002).

There are usually three categories of major deals involved in PFI. These are:

- FFS – Financially Free Standing projects
- JV – Joint Venture projects where some of the costs are recovered through subsidy but the overall control of the project remains with the private sector
- SS – Services Sold - projects where services (with some capital expenditure) are sold to the public sector.

Table 2.1 identifies some of the transport infrastructure PFIs that have been undertaken during the 1990s.

Table 2.1: Transport Infrastructure PFIs (Kain, 2002)

Signed or Completed projects	**£m expenditure**	**£m public subsidy**
CTRL (1996)	4,300 (5,800 NPV	JV - £1800 NVP; land and building transfer; transfer of Eurostar (UK) and its assets; underwriting of £3.8 billion of bond finance
Birmingham Northern Relief Road (1992)	350	FFS – revenue from tolling
Luton Airport Parkway (1996)	20	JV – Government credit approval up to £2.8m to local borough
Northern Line Trains (1995)	400	SS
8 DBFO roads (1996)	591	SS – shadow tolling
Second Severn Crossing (1990)	331	FFS – transfer of existing bridge (revenue) and its debt
Dartford Bridge (1987)	150	FFS – transfer of tunnel revenue and supply of approach roads
Midland Metro Line One (1993)	145	JV - £133m EC, central and local government
Croydon Tramlink	200	JV - £125m government grant
Manchester Metrolink extension	125	SS
CAA Oceanic Flight Data Processing System (1997)	30	SS
DLR Lewisham Extension (1996)	200	JV - £60m central and local government plus land
London Underground Power Supply	108	SS
London Underground 'Prestige' ticketing system	335	SS

DETR (2000) devised Table 2.2 to aid decision-makers in deciding when PFI should be used to finance projects. It is thought that private finance can provide better value for money than conventional procurement. In deciding whether a particular capital project is suitable for PFI, the Government takes into account the following factors outlined in the table.

Table 2.2: When to use PFI (DETR, 2000)

What is the scale and complexity of the project? Does it cover more than one location?	PFI offers the advantages of: • Optimal overall risk allocation, with risk falling to those parties best able to manage it • Integrated supply-chain management • Commercial discipline leveraged into the deal through lenders' due diligence
How much scope is there to innovate in designing in infrastructure and operating procedures?	PFI focuses on specifying the outputs rather than retaining detailed control over inputs. So long as there is an effectively structured competition, PFI should encourage: • New ideas for the design of assets and operational systems • Synergy between design and operation • A focus on the whole life cost of the operation of the asset • Avoidance of costly over-specification in design
What is the value of the transaction?	PFI contracts are complex long-term arrangements, so there may be significant costs associated with the transaction itself. This tends to make them more suitable for larger value projects. Nevertheless, it may be possible to justify small scale and low value schemes, particularly if they can be "bundled" with other PFI schemes.
Discrete nature of the services to be provided	As the risks and rewards for the contractor are much greater than conventional procurement, there must be clear differentiation between private sector responsibilities and remaining public sector accountability, so that the contractor is only exposed to financial penalties for his own performance.

According to Chaterjee *et al* (2003) a successful PFI project will involve:

- Transfer of risks to parties who are best able to manage them;
- The public sector requiring a set of services rather than a physical asset, through which services will be provided and these services should form the basis of payment made by public sector;
- The private sector being responsible for the asset it provides for the whole life cycle; and
- The private sector achieving desired performance standards.

2.2.3 Design Build Finance and Operate (DBFO)

The Highways Agency formally launched its use of the Private Finance Initiative (PFI) to procure a road service on parts of the motorway and trunk road network in August 1994, known as Design, Build, Finance and Operate (DBFO). The Agency's objectives for each DBFO project were:

- To ensure that the project road is designed, maintained and operated safely and satisfactorily so as to minimise any adverse impacts on the environment and maximise benefit to road users;
- To transfer the appropriate level of risk to the private sector;
- To promote innovation, not only in technical and operational matters, but also in financial and commercial arrangements;
- To foster the development of a private sector road-operating industry in the UK; and
- To minimise the financial contribution required from the public sector (Highways Agency, undated).

Table 2.3 shows ten of the UK's DBFO road schemes and the total amount of investment for each.

Table 2.3: UK Design, Build, Finance and Operate Road Schemes (Vickerman, 2002)

Project	Length	Total Investment	Region
A69: Carlisle-Newcastle	84 km	£9.4 million	N
A417/417: Swindon-Gloucester	52 km	£49 million	SW
A1(M): Alconbury-Peterborough	21 km	£128 million	E
M1-A1: Lofthouse-Bramham	30 km	£214 million	YH
A50: Stoke-Derby link	57 km	£20.6 million	EM/WM
A30/35: Exeter-Bere Regis	102 km	£75.7 million	SW
M40: Denham-Warwick	122 km	£65 million	SE/WM
A19/A168: Dishforth-Tyne Tunnel	118 km	£29.4 million	N
A249 Sheerness Link Road	17 km	£75 million	SE
A1 (M) Darrington-Dishforth	22 km	£240 million	YH

The Highways Agency (undated) points out that the main benefit of the DBFO scheme is that by transferring the responsibility to the private sector for designing, constructing, financing and operating road scheme(s), the obligations of the private sector will be considered over the whole 30-year period of the contract. This means that full account of the risks at each stage of the project is taken by the private sector. "*The private sector chooses how to provide the service to the level specified by the Agency. Allocation to the private sector of project risk, which it is capable of managing, leads to an efficient service and a lower whole-life cost for the Agency*" (Highways Agency, Undated).

Before the Highways Agency used the DBFO system, the procurement of construction and maintenance of roads was carried out through the letting of contracts for separate tasks. This would include the involvement of a design agent, a contractor and a maintenance agent. Previously, companies holding a construction contract for the agency would construct the Agency's design, more recently, these two functions have been combined into a design and build contract.

There have been a number of lessons learnt from the introduction of DBFO contracts and private finance to the Agency. These include:

- The introduction of cost efficiencies, innovative techniques and whole-life cost analysis into the design and construction of road schemes and the operation of roads has been accelerated by the DBFO contracts;
- Protester action and latent defect risk (two areas of transfer of risk to the private sector) have delivered good value for money;
- The DBFO contracts have delivered value for money, with an average cost saving of 15%;
- By using a model contract, bidders are saved time in the preparation of their bids and significant efficiencies are provided for the Agency, both in negotiation and in operating the contracts;
- Training in negotiation for project teams and dissemination of accumulated knowledge on DBFOs and PFIs generally within the Agency continues to improve the quality of DBFO projects delivered (Highways Agency, undated).

The Highways Agency has to pay the DBFO Company for the provision of the road service. The payment amount is based on the number and type of vehicles using the road, with adjustments made (see figure 2.4).

Table 2.4: Payment Criteria by Highways Agency to the DBFO Company (adapted from Highways Agency, undated).

Payment Criteria	Description
Usage/demand	Shadow tolls involve payment per vehicle kilometre of the project road, in accordance with a tolling structure. They are referred to as 'shadow', as opposed to real, tolls because the payment for usage is made by the Agency, rather than the road user.
Availability of Service	Where the road project consists of an existing stretch of road with one or more construction schemes along its length, then shadow toll payments will be made at a reduced level representing the cost of operation and maintenance for the existing road. This level varies substantially depending on the nature of the DBFO project.
Performance	Safety performance payments and lane closure charges are the two aspects of performance payments. As an incentive for the DBFO company to address safety, it is encouraged to suggest safety improvements for the Agency's approval. If these are approved, DBFO company constructs and pays for the scheme and is recompensed by receiving 25% of the economic cost of each personal injury accident avoided in the following five-year period. Deductions are made from the toll payment when lanes are closed depending on the number of lanes closed, the expected traffic at time of closure and the economic value of user delay which can differ between business and leisure use.

Alternatively, the private sector has the potential to contribute to the financing of transport projects. There are a number of commercial incentives to be had through using private finance the requirements of the customer can be focused on. The private sector can often develop new and innovative approaches to solving problems and providing services, as well as having the relevant business and management expertise (DETR, 2000).

2.2.4 Local Government and PFI

The majority of transport projects are planned and implemented as a result of local transport plans, and are therefore the responsibility of local government. ODPM (2002) discuss the issues of finance related to local government, including Public Private Partnerships (PPP) and Private Finance Initiative (PFI).

The public sector does not buy the asset, but pays for the use of the assets held by the private sector and the services associated with those assets. The private sector will recover the investment it has made in the asset over a long contract period. PFI projects should be structured to provide incentives for the private sector supplier to perform efficiently and effectively.

The projects implemented through PFI and PPP must prove to be value for money. PFI can be considered better value for money than buying the asset and being responsible for running and maintaining it. The private sector bears the major risks involved in the design, building, financing and operation of the asset. Overruns and additional costs are therefore less likely and means that the local authority does not bear any costs involved (ODPM, 2002).

There may be greater efficiencies in both building and running costs (e.g. in relation to energy management). Thirdly, because the authority will pay on a performance-related basis for the use of the asset and for its continuing management, which provides incentives for the contractor to build the asset to a high standard and maintain it in a good condition.

In the early stages of a project proposal local authorities are encouraged to work with the Public Private Partnerships Programme ("the 4Ps"), which acts as a private finance unit for local government helping to develop viable projects, determining whether PFI is a suitable procurement route and advising on how best to present the case.

2.3 Public, Private or Public Private Financing?

There are advantages and disadvantages of each of the financing options, many of which have been discussed in the literature. Arguments revolve around who is best suited to bear the risks of financing transport but also get the best out of design, planning, construction and delivery of the project.

The public-private partnership route seems to offer the best of both worlds in transport finance structures. The public private partnership includes both the security and political commitment of the government, and the expertise and financing of the private sector. Vickerman (2002) evaluates the various sources of funding available for transport projects and makes a comparison of the various funding methods in Table 2.5.

Table 2.5: Comparison of Funding Methods (Vickerman, 2002)

Type of scheme	Example scheme	Advantages to private sector	Disadvantages to private sector	Advantages to public sector	Disadvantages to public sector
Full private provision	Channel Tunnel	Full control of project; limited regulation	Full risk exposure; possible need to transfer project at end of agreed concession period	Transfer of all risk; retain some rights to asset at end of concession period	Residual risk of failure; lack of control over prices etc unless regulatory structure
PFI-scheme	DBFO road schemes; Urban rapid transit (tram) schemes	Greater control over project management; some risk retained by public sector	Value of project depends on correct forecasting of costs and revenue streams; need to return asset to public sector at end of franchise	Transfer of (some) risk; lower overall cost of project; typically receive asset at end of agreed payback period	Retention of some risk; need to fix payment for services to be delivered over long life of project
PPP-scheme	Channel Tunnel Rail Link; London Underground Modernisation	Agreed framework for payment received	Little or no ownership rights	Retention of ownership and control; all rights to asset revert at end of agreed payback period	Costs of payments; retention of risk elements

Kain (2002) states that the private finance partnerships that exist between public and private sectors "offer potential advantages over purely public schemes in the areas of finance, expertise and efficiency".

Private Finance Initiative (PFI) offers one form of private-public partnership (PPP) in which local authorities can gain access to new or improved capital assets (broadly buildings, roads, plants, apparatus and vehicles). PFI is often also referred to as Design Build Finance and Operate (DBFO) schemes. DBFO involves the various responsibilities and risks relating to the procurement and operation of a capital asset being transferred to the private sector (ODPM, 2002).

2.3.1 Risks involved in funding and resourcing transport schemes

It has been suggested that risks related to the financing transport should be and will be transferred from the public sector to the private sector:

> "Where commercial risk is genuinely in the hands of the private sector, one can expect the private sector to be a better judge of that commercial risk – and therefore, in commercial terms, of priorities – than the public sector would be. This is because risk, so galvanising in the commercial world, is essentially a misnomer in the public sphere. 'Mistakes' may be made but, so long as the correct internal procedures are followed, the participants will not greatly suffer" (Association of British Chambers of Commerce to the Commons Transport Committee, in Glaister *et al*. 1998)

Government can raise funds relatively cheaply as it is a large, low-risk borrower BUT account must be taken of the benefits that tend to go with private finance and management, such as improved efficiency, lower costs, and reduction in the risks falling on the tax payer. Risks identified by the Department of Transport included design risk, construction risk, opening date risk, traffic risk, maintenance risk and operational risk (Glaister *et al.* 1998). Other risks that have been identified include protester risk and latent defect risk, thought to be unique to the Highways Agency DBFO contracts (Highways Agency, undated). Some of these risks have been outlined below:

- **Construction risk** is due to the long gestation periods involved in design and construction process. Much of the detailed design is often carried out during construction period. This can lead to underestimates in the project costs due to previously inadequate specification.
- **Revenue and maintenance risk** is where usage is below expected. In the opposite situation, where usage levels are underestimated, higher maintenance costs due to the need to repair structures designed for lower traffic levels and loss of revenue during repair periods may occur.
- **Planning and political risk** occurs due to the long gestation periods of infrastructure projects. During these long periods, projects are vulnerable to changes in policy (Vickerman, 2002).
- **Traffic risk** is based on the number and type of vehicles using a road, which will affect the cost of constructing a road with a reasonable life expectancy, and the cost of maintaining it to the required standard.
- **Protestor risk** is due to the increase in direct action to delay the construction of new roads, placing extra costs on public sector. DBFO companies are often asked to bear protestor risks.
- **Latent defect risk** is where a public body asks a DBFO Company to take over responsibility for operating an existing length of road. Technical advisors for the DBFO Company carry out investigations, but they cannot often find problems such as latent defects (e.g. spalling of concrete or a structure component not meeting expected design life) (Highways Agency, undated).

Debande (2002) also looks at risks incurred in the financing of infrastructure projects. Table 2.6 has been produced identifying the risks during the development, construction and operation phases of infrastructure projects.

Table 2.6: Allocation of Risks in Infrastructure Projects (Debande, 2002)

Type of Risks	Risks Transfer to the Private Sector	No Risks Transfer to the Private Sector
Development Phase		
Design Risk	Full responsibility of the operator to ensure the underlying asset is fit for purpose	Operator provides a service from a design defined by the public sector which guarantees that the asset will be fit for purpose
Technology or Obsolescence Risk	Payment depending only on the achievement of performance standard	Payment is fixed
Construction Phase		
Construction Risk	Operator not paid until construction realised, must absorb all variations and pay some penalties for delay	Operator transfers significant variations in construction costs to the public sector for this latter is not responsible
Regulatory or Legislation risk	Operator responsible for change in law or regulations of general application	Public sector compensates cost variation due to specific or general legislation changes
Operation Phase		
Performance Risk	Service payment depending entirely on the achievement of performance criteria	Service payment fixed and independent of performance criteria
Operating Cost Risk	Operating responsible for all variations in operating costs	Significant changes in operating costs passed back to the public sector
Demand or Volume risk	Payments are volume related	Service payment independent of volume
Residual Value Risk	Asset remains with the operator or public sector option to acquire at market value at the end of the contract	Asset reverts to the public sector at the end of the contract at a pre-fixed notional value
Pricing Risk	Service payment taking the form of a pre-determined RPI-X	Service payment varying with the underlying cost base

3 Innovative Funding Mechanisms

Innovative forms of funding transport projects have evolved as traditional funding mechanisms have become increasingly unable to bridge the growing gap between operating expenses and revenues and increasingly complex and diverse transport needs. Public transport funding is also becoming more vulnerable to political pressures, with Governments becoming increasingly sensitive to levels of general taxation and the long lead time of public transport projects.

The 'fare-box' is now regarded as a socially and environmentally unsustainable means of supplementing funding (Chase, 2003) so increasingly new innovative sources of funding are being sought. Most innovative financing techniques will not generate the total amount required for a project to be completed, but they can significantly supplement available funds and bring forward work on public transport projects. This report identifies different forms of innovative funding which could be applied to a range of transport schemes.

Jay Walder of TfL (Waterfront Conference Company, 2004) opened a conference on funding transport through land value by stating that the current system for financing transport infrastructure improvements is fundamentally flawed. Therefore the government needs to find new means of funding to provide the necessary resources. In order to overcome the current problems involving funding and implementation there are various new ideas/ schemes that have either been piloted or have been put forward in order to improve future funding. These include land value tax, work place parking levy, road user charging, national motor taxes, local authority business grant incentive, planning gain, transport development areas (TDAs) and Sales tax.

3.1 Property Taxes

Property taxes are acknowledged as being relatively easy to administer as the required administrative systems are already in place and they are regarded as beneficial as they provide a relatively large and stable revenue base. It is a very visible form of payment which requires increased accountability and can face resistance, particularly as the taxes bear no relation to a household's or buildings' ability to pay. Property taxes can be introduced in the form of;

- Earmarked General Property Tax - Earmarked general property tax is where a proportion is earmarked specifically to subsidise public transport. This is common in the USA, easy to administer and can be levied without respect to the benefit to the land taxed;
- Benefit Assessment District Tax - Benefit Assessment District is where properties in localities that have directly benefited from public transport systems contribute towards the cost. Special benefits need to be outlined in an engineering report which requires a public hearing and compulsory charges to land owners. It is hard to isolate the impact of a capital expenditure from other influences on property values and it is not as efficient as user fees as charge is not directly related to the use of the service); and
- Land Value Tax Increment - Land value increment taxes are used to reflect increases in land value generated by public investment. They can be captured through taxes or fees or directly through on-site improvements that benefit the community at large and collected in large amounts from a small number of taxpayers so are easier to administer.

To date practice in this area has had limited success (their low effectiveness has been primarily put down to the way in which taxes were spent as opposed to the way in which they were generated). Some banks also regard property development as too risky to use as security for infrastructure loans, which also suggests that property taxes may only be effective where significant rises in land values occur.

3.2 Land Value Tax

3.2.1 What is Land Value Tax?

Land Value Tax (LVT) is the policy of raising state revenues by charging each landholder a portion of the assessed site-only value of the improved land. LVT is developed from the idea that the natural world was originally the common property of all persons. Therefore LVT is not really a tax but a collection of rent on behalf of the proper owners (community). Land Value Capture is not new, both Los Angeles and Seattle have used a system of tax incremental financing. The idea of LVT is that it would apply to all sites, residential, commercial, agriculture, open space etc. Thus not using a site that has permission for houses, a factory or offices to be built on it, would not be an excuse for avoiding the tax.

The valuation of the land would be based upon the "optimum permitted use". This means that the valuation is dependent upon the market's demand to use the site and the community's decision on how that site may be used. For example; if the site has permission only to be used as public open space, then the valuation would be zero and the tax liability would be zero. If, however, the decision is that the same site should be used for offices of a certain size, then the valuation would depend on the market's need for offices, of that size and in that location. Close to a major road or rail station this value would be higher than a similar sized site with the same permission but farther away from the transport (all other things being equal). However, if the site was up a mountain there would be no market value for offices and the site value would probably depend upon farming or tourism.

According to Price (2003), the Royal Institute of chartered Surveyors have identified various types of LVT that could be introduced. Freehold charge is aimed at existing properties, designed to capture capital due to properties increasing in value due to transport. Freehold charge only requires payment from those who benefit from the scheme. If planning permission is granted, then local authorities can impose conditions on the permission – 'Planning Gain'. This method can only be used to support infrastructure that would have direct relevance to a new development. Development buy in charge is where developers/land owners can be charged for some aspect relating to the input of new infrastructure. This charge may only be able to establish small levels of revenue as only those who invest will see the potential benefits. Tax Incremental financing is where bonds are issued to pay for infrastructure. Due to the new infrastructure, the amount raised through business rates increases. This increase is then ring-fenced to repay the bonds.

3.2.2 Benefits and Problems of Land Value Tax

Wetzel (2005) believes that funding new infrastructure from land value gains provides a win – win situation, including the land owners who provide the finance. The benefits are as follows:

- Provision of new transport improvement by the government;
- Tax payers are not penalised;
- Taxes on trade are not increased;
- More convenient journeys and shorter travelling times;
- Car users can use the new system with economic and environmental gains for all;
- Businesses near stations will see their profits and trade increase; and
- Assuming that the project requires 50% of land value gain, landowners retain 50% of a large increase if the scheme is completed, rather than 100% of no increase if it is not built.

There are problems with the idea of LVT. The main problem is that there is no standard method for assessing uplift value and that for LVT to work then it will need to be introduced as a gradual replacement for council tax (although it could be additional)

3.2.3 Cases where Transport have Increased Land Value

There have been many arguments for the case of LVT as there is strong evidence to suggest that in many cases transport has increased land value quite significantly. The two cases of the Jubilee line extension and the Croydon tram link highlight this issue:

Riley (2002, in Wetzel, 2005) calculated the total land value increase that arose within a 1,000 yard radius of the JLE extension. He found that these land values alone increased by £13billion when construction cost £3.5 billion. Riley suggests that some of this wealth should have been collected by the government in order to fund the project. An independent study carried out by Transport for London, also estimated that between 1992 and 2002 the JLE caused land values to rise by £2.8 billion close to two of the 11 new stations (Southwark and Canary Wharf). The extension could have been paid for by the land value increase, but instead it was paid for from taxation (apart from 2 small contributions).

In spring 2002 RICS and ODPM commissioned research into the relationship between land use property value and transport (RICS, 2002a). The study looked at the Croydon tram link as a newly opened tram system. The results found that:

- The demand for office space within Croydon does not appear to have been influenced by the tram link;
- The tram link has increased retail turnover within central Croydon; and
- The tram link has provided a boost to industrial users by enabling employees to reach industrial areas more easily.

It was found that within central Croydon, property values had increased by 4% above those wards that were not served by the Tramlink.

Enoch and Ison (2004) discuss the use of land value capture, as a form of hypothecated tax revenue, as is a means by which to attain funding for public transport by taxing owners of properties to reflect the benefits (i.e. increased land values) resulting from the provision of public transport. It allows the party undertaking the transport development, public or private, to retain part of the finance gained from land developers or the community at large in terms of increases in real property values.

The capital for undertaking transport development projects can be recouped either through property taxes (where properties pay regular and continuous amounts to government to raise money for public transport) or developer levies (one-off or irregular payments to put towards public facilities needed for effective site operation) (Enoch and Ison, 2004).

Raphael (2005) questions why land value tax is still just a proposal when it could be used, particularly in London, to fund transport projects. An example of the Jubilee Line extension is given. The owners of Canary Wharf were persuaded to contribute £180m, a fraction of the amount that they gained as a result of the transport investment by the state. However, other developers and landlords along the route did not contribute anything, but have seen the value of their properties double, an in some cases quadruple. The £5.5bn Channel Tunnel Rail Link was built with Government guarantees. However, it has led to similar increases in land values around Kings Cross, Ebbsfleet and Stratford without anything being paid back to the state. Raphael describes the current methods of recouping windfall development gains as opaque and inefficient. Section 106 allows local authorities to reach agreement with developers so that the gains that result from planning approval can be recouped by local authorities. However, the results are often uncertain and bear little relation to the potential returns. Other countries, such as the United States, have taken a more coherent approach,. Nearly $20bn has been raised by increasing property tax revenues over the past decade to capture rises in property values resulting from development via tax incremental financing. An infrastructure fund for London has been proposed by the London School of Economics, which would be financed by a hypothecated levy on business rates. An example given is that of Crossrail, which could be financed by a levy of 2% on all those businesses which could benefit from the new line.

Tongue and Kyrou (2005) also question the non-use of land value tax to fund transport improvements. They point out that it is the land, rather than the property, that is taxed, which means that there is not financial incentive to sit on empty undeveloped land. Therefore, land value tax should result in investment and development. An example where LVT has been successfully implemented is in Harrisburg, Pennsylvania. Previously a declining backwater, the city has been greatly improved over two decades by basing local taxes on land value and using these taxes to help finance the city's needs. In areas where LVT has been introduced, there has been a substantial reduction in empty plots of land and derelict buildings. Before the introduction of LVT, no VAT was paid on run-down sites where the buildings became vandalised, leading to neighbourhood decline. This trend can be reversed by providing the financial incentive for developers to develop, rather than wait for the speculative cash to roll in. LVT can therefore result in increases in investment on brownfield sites, a key government aim in order to develop housing and infrastructure in our cities. Tongue and Kyrou conclude that LVT is a fair and efficient way to finance the necessary transportation infrastructure that the UK desperately needs.

3.2.4 Case studies of LVT in practice

An example of where LVT has been in place is in Engadine, Australia, a suburb that is south of Sydney. When it was developing in the 1920s the locals wanted a station on the existing rail line that ran into Sydney. There was no public funding available so they had to fund it within the local community and fund it fairly. In order to fund it they drew three concentric circles on a map with the centre being the proposed station. Payments were proportional to the land value gain for each sector due to the new station. Payments from landowners in the centre were the highest. This case study is a very simple example of how LVT enabled funding for a transport scheme that was supported and benefited a community.

For many years there has been the talk of the reintroduction of passenger services on Edinburgh's freight only South Suburban railway. The line runs from Waverley-Portabello to Morningside, Haymarket and back to Waverley. E rail believes that a service could be introduced by harnessing the uplift in land values from developments that are adjacent to the line (Price, 2003). E rails role is to approach sites owners around a potential transport location and explanation is carried out into the uplift in property value that would occur if transport improvements went ahead. The site owner is then asked to agree to provide a certain amount of funding, based on the calculated uplift and that planning permission is granted for the transport project.

3.3 Workplace Parking Levy

In the UK the levy has been introduced through the Transport Act 2000. It allows local authorities to charge companies and organisations for each commuter car park space provided in the work place. The levy is a charge on each commuter car parked at the work place (all car parking spaces contracted and paid for by employers will be subject to the levy).

According to Enoch (2001) the main negative impacts of the workplace parking levy are as follows:

- Employers will assume the charge and will not pass it on to the end users;
- Difficulties where a group of employers share the same car park; and,
- Employers may then be encouraged to locate to out of town locations or to neighbouring towns that do not impose the levy.

Very few case studies involving this type of funding exist. Nottingham has volunteered to be one of the first authorities to introduce the scheme as it needs money for trams. The levy is designed to manage congestion and, in turn, provide revenue for a modern, efficient transport system and to give alternative modes of transport other than the car. The levy is just part of a major transport integration programme to provide a total solution to Nottingham's transport issues. It is anticipated that with the levy there will be a reduction in car pollution and congestion as people find alternative ways to get to

work and those who continue to drive to work will be contributing to a new fund. In Nottingham the charge will be billed to employers for £150 per car parking space per year (rising to £350 within the next 10 yrs) and it is then down to the employer as to whether or not they charge their employee. It was originally anticipated that the parking levy in Nottingham would come into operation in April 2005. All areas will be covered by the levy within the boundaries of Nottingham city. Exemptions to the levy include the disabled, small businesses, emergency vehicles, motorcycles/scooters/mopeds/cycles, and companies who implement commuter plans will be discounted (Enoch, 2001).

Other examples of parking levy can be seen abroad, for example the Perth parking licence fee. Perth has a high level of car dependency and in order to address this, the state government of Western Australia, in partnership with the city of Perth, introduced the work place parking levy or parking licence fee as one measure. The idea is that all parking both on street and off street (apart from private off street residential parking) is licensed. As with the proposed Nottingham scheme, there were a number of people who were exempt from the fee in the Perth scheme. The licence fee is a tax for which property owners (not tenants) are liable. To enforce the licence fee, parking officers are able to enter properties and demand records. In Perth the money went back into improving the access and amenity of that area. Thus the Central Area Transit (CAT) bus system was funded. However, the parking licence fee was just part of a package of parking measures.

In Ireland consideration has also been put forward for this type of funding. In 1999/2000 four options for charging an individual for use of their car parking space at work were considered. These were:

- The use of changes in benefit in kind taxation;
- The inclusion of work place car parks in any pay and display schemes operated by local authorities;
- The introduction of differential rating of car parking adjacent to business premises; and
- Workplace parking levies.

Out of all of these the differential rating of car parking adjacent to business premises has been taken forward (Enoch, 2001).

3.4 Road Tolling

This involves charging road users (either by pre paid system or on entry) in order to use road space. The charge can depend on the time of day, type of user, or the congestion/pollution levels, e.g. the initial revenue for the London congestion scheme that started in February 2003 was expected to be £100 million per annum, although the net funding that has been achieved is £50 million due to a greater level of reduction of congestion in the City.

Road user charging, already mentioned as a form of hypothecated tax revenue, is the most direct beneficiary-based revenue source in common use. Road user charging generates revenue via a direct user fee charged for use of road capacity and services to motorists. It is the users of infrastructure that create external costs, so there is a clear rationale for raising charges for the direct use of infrastructure to reflect these costs. Road user charging is also attractive in that it encourages the formation of PPPs by attracting private capital, increases the amount of resources available for non-revenue generating projects, and allows sustainable transport facilities to be developed. Aspects such as the cost of borrowing capital, long queues and emissions at collection points, equity considerations and negative public opinions have however served to reduce the attractiveness of this option in the past.

There are many examples of successful road tolling schemes in America such as in Houston, Colarado, Florida and Carolina and across Europe, particularly in Scandinavia.

3.5 Developer Levies

Developer levies are paid at the planning stage with fees set aside for the construction of facilities or to purchase capacity of an existing facility, to solve problems generated by the development. Development charges and impact fees are one-off charges to new users of services to pay for their expansion, normally assessed when building permits or certificates of occupancy are issued. This means services don't have to be subsidised by current users thereby improving equity. Costs are predictable and do not provide capital far in advance of development. It can be hard to ascertain capital needs and thereby fees and it has been accused of increasing housing costs. It is possible that developers could pass on impact fees to residents, and development could be encouraged to subsidise required facilities).

Benefit sharing is a voluntary joining of public agencies with private firms to undertaken mutually beneficial development in connection with public infrastructure. It is legally binding between the parties and can also be initiated through an informal working arrangement where public agencies and private developers work together to compete projects in a mutually beneficial way. It is a preference between parties of a non-legally binding agreement.

Payment can be voluntary by the property owner, whereby they can pay for itemised elements of transportation improvements in exchange for a public commitment to and assistance in removing delays in administrative approval for the proposed development. This method is used in many countries and it ensures developers pay the true cost of community expansion from their direct benefit from it. Payments are individually negotiated, which allows flexibility. The revenue collected can be significant, but not as predictable or equitable as developer charges. Politics can enter into negotiations which can reduce their equity.

The sale of surplus land or air rights by the transit authority to developers can be used to recover some of the authorities' costs. This is less common and not necessary for the transport project but the land value will increase when the project is completed and so a cross-subsidy arises.

Connection fees can be charged to property owners of both existing and future buildings when they connect with an existing utility. Charges can be lump sum payments to cover extensions, annual contributions of operating costs, enhancements to the facility, land earmarked for i.e. station areas. This method is most effective where subways/access to levels increases rental value of buildings, hence 'connection fees'. This can result in beneficiaries paying for extensions of services to them as opposed to being subsidised by new customers. They can provide capital only after the need created by new residents so requires a prior means of raising capital, which may be a disincentive for business to join central systems.

Due to their nature developer levies are often confined to rapid growth areas and tend to be unpopular with developers although highly beneficial to government as they can transfer the cost to those who profit from or use the development – in some cases it can also be used to subsidised residents' tax. To be effective the public sector needs to own or control the land which is to be developed – this could be problematic in the UK as despite the compulsory purchase land order for necessary new infrastructure, it is harder to obtain 'extra' land. Other problems include the need for positive government involvement, and the timing of the project needing to coincide with new buildings that are helping to fund the projects. In practice, policy makers have been ensuring that any extensions to services can be financially justified on existing patronage levels and base these calculations on conservative estimates about how patronage and property values will grow.

3.6 Planning Gain

Planning gain has been defined as the increase in value of land due to a change in planning permission for its use (a tax on the increased value) (Highways Agency, 2005, Huhne, 2004). Planning gain was proposed to reduce the impact of proposed new developments (Borough of Macclesfield, 2005), for example by providing sustainable transport to meet the demand created by the development. It is a

legally binding arrangement to carry out or provide funds for work as part of submissions for planning application.

Planning gain was provided for in Section 106 (s106) of the 1990 Town & Country Planning Act in relation to planning obligations resulting from the need to 'safeguard the local environment' or to 'meet the costs imposed as a result of development' and may possibly result in proposals accepted which may otherwise have been refused.

Planning gain must be relevant to the development, reasonable in its scale and nature, and directly necessary for and related to the proposed development for it to be viable. If it is specified that the development will be required to provide sustainable forms of transport, for example, then the developer will have to supply these to a standard set out by the local authority or pay an amount to the Authority to finance the facility – a commitment may also need to be made to fund maintenance over a number of years (Borough of Macclesfield, 2005). Arrangements are made through Supplementary Planning Guidance which usually stipulate a given time over which the sum must be used (in an accountable manner), otherwise the money must be repaid.

The concept of planning gain has been criticised by many people; RICS for example state that its introduction would be 'seriously flawed.' The main criticism is the fact that it is an example of a stealth tax, does nothing to help fund infrastructure and transport in existing built-up areas, and that it is based on a misunderstanding of how land is valued, how planning gains arise and how the property market works (Barker, 2004) i.e. the tax would be paid when permission was granted rather than on the actual gain in value. Developments in close proximity to the proposed site would also potentially stand to gain from increases in rents and values as a result of transport and infrastructure improvements but would not be required to contribute towards them. It is also thought that planning gain would reduce the amount of land put forward for development as profits would be lower than they are now.

It is thought that the tax, which arose from a Kate Barker's review of housing supply (BPF, 2005, Barker, 2004), has been driven by a need to increase the supply of affordable housing, particularly in London and the South East (Huhne, 2004). It has been suggested that to raise funds for infrastructure improvements a wider use of planning tariffs would be easier to collect, fairer, and more likely to contribute resources for infrastructure (BFP, 2005).

3.7 Transport Development Areas (TDAs)

A Transport Development Area (TDA) is an integrated land use/transport planning approach operating around urban public transport interchanges or nodal points well served by public transport, in which a more specific relationship between development density and public transport service level is instituted. TDAs are about the promotion of more sustainable transport choices (RICS, 2002b).

The revised PPG13 (DTLR, 2001) referred to TDAs as "*A mechanism to help integrate development and transport objectives in highly accessible locations, for instance bringing together all parties with a shared vision*". TDAs link with government policy as they focus on the PPG13 idea that dismisses the need to travel. In terms of funding TDAs will mainly involve developer contributions to public transport infrastructure. However, this will vary according to the economic viability of individual schemes.

3.8 Advertising

Advertising has recently been raised as a source of revenue for public transport projects. By selling space for interior and exterior advertisements on buses and trains, bus shelters, in stations and at interchanges, the Chicago Transit Authority made $7 million in advertising revenue. The Chicago Transit authority found that it was best to outsource their advertising programme to produce more revenue, and to ensure that the contractor is competitive they undertake a bidding process. Their current advertiser, TDI, is responsible for finding advertisers, installing the adverts, maintaining the adverts and collecting the revenue. The revenues can then be used to finance public transport

projects, and with language in the adverts designed to promote public transport (i.e. take bus route x to event x which is being advertised) patronage could also increase (Chicago Transit Authority, 1998).

3.9 Innovative Funding Mechanisms in Practice

RICS (2003) undertook a study on funding London's transport needs. The purpose of the study was to assist those responsible for planning London's transport infrastructure in securing the best and most appropriate infrastructure for the needs of London. The study identified 17 'innovative' funding mechanisms that could be used to generate funding for selected transport projects in London. These included road pricing, workplace parking and general parking charges, motor taxes, consumption taxes (sales tax, gambling tax), employee/employer taxes, cross-utility funding, property related taxes (Business Rate Levy, Tax Incremental Financing/Local Tax Reinvestment Programmes, Business Improvement Districts, Land Value Taxation, Greenfield Development Tax), Development Charges (Freehold levy, planning gain/tariff, Buy-in Charges), Bonds and State-based loans and grants.

The study reviewed each of the funding mechanisms against a set of criteria in order to select the most appropriate funding approach. It was stressed that the use of such methods would increase the tax burden on London, and therefore the benefits should be made clear to those who will provide the additional funding. It was estimated that the individual funding methods could generate between £10m and £450m per year. A key consideration is current availability of the funding methods and how coercive they are and how suitable for the job. Table 3.1 provides a summary of the various funding mechanisms related to 'core' transport infrastructure projects in London.

Immediately available funding sources include bonds, state-backed grants and loans, PFI and, shortly, Business Improvement Districts (BIDs) and Tax Incremental financing (TIF). Others include congestion charging, parking charges and planning gain. RICS (2003) suggest that these methods should be considered first, although there are benefits from using other methods, such as TIF, as it does not place an additional tax burden on businesses. Funding methods that should be reviewed further include business rate levy and site value rating.

Table 3.1: Suitability of Innovative Funding Mechanisms for Transport Projects (RICS, 2003)

Scheme	Timing	scale	Funding Required	Currently Available Funding Mechanism	Potential Funding Methods
East London Line Extensions	2007	Network	Large	PFI, Bonds, TIF, Road Charging	Consumption tax (sales and gambling), Business Rate Levy, Freehold Charge
Thameslink 2000	2008	Network	Large	Bonds, Road Charging, Grants, Planning Gain	Consumption Tax (sales and gambling), Business Rate Levy, Freehold Charge
Upgrade Liverpool Street to Stansted Link	2010	Corridor	Small	Grants, Planning Gain	Business Rate Levy
CrossRail Line 1	2013	Network	Large	TIF Bonds, Planning Gain	Consumption Tax, Employer tax, Business Rate Levy, Freehold Charge, LVT/SRV
West London Transit	2009	Corridor	Small	PFI, BID, Grants, Road Charging	Development Buy-in Charge
Greenwich Waterfront Transit	2008	Corridor	Small	PFI, BID, Grants, Road Charging	Development Buy-in charge
East London Transit	2009	Corridor	Small	PFI, TIF, BID, Grants, Road Charging	Development Buy-in Charge
Cross River Transit	2011	Corridor	Medium	PFI, TIF, BID, Bonds, Grants, Road Charging, Planning Gain	Development Buy-in charge, LVT/SVR
Croydon Tramlink Extension	2010+	Corridor	Medium	PFI, TIF, BID, Grants, Bonds, Road Charging, Planning Gain	Development Buy-in Charge
DLR Extension to City Airport	2005	Local	Small	PFI, TIF, BID, Grants, Bonds, Road Charging, Planning Gain	-
Woolwich DLR Tube Crossing	2007	Local	Small	PFI, TIF, BID, Grants, Bonds, Road Charging, Planning Gain	-
Terminal 5	2005+	Local	Large	Bonds	Congestion Charging, Consumption Tax, Employer Tax.

Hampshire County Council commissioned consultants to help identify and review potential funding sources to bridge their current funding gap (Hampshire County Council, 2000). Atkins identified the following as potential funding options;

- User revenue (farebox, parking charges, road/bridge tolls);
- Property development gains, sale of information, third party revenues (businesses);
- Local authority resources;
- Third party revenues (individuals) – private non-residential parking, congestion charging;
- PFI credit;
- Investigate potential eligibility for other public sector funds.

The County Council is looking to maximise funding contributions from those who benefit most from measures within their LTP and is embracing the opportunity, as enabled by the Transport White Paper, for local authorities to raise funds locally through a charging mechanism and earmark those funds to public transport investment within their LTP. Government funding will still however remain

a very important requirement and will ultimately allow projects to go ahead. All three tiers of local government (County Council/Highway Authority, District councils, and parish councils) are increasingly working together and combining their funds to achieve their objectives.

The majority of innovative funding mechanisms have developed without reference to principles of public finance, with many developed with the sole aim of generating funds to support public transport provision. In their 2002 study Ubbels & Nijkamp attributed the type of scheme and the level of public acceptability as having the most positive impact on the level of success (defined as the achievement of a scheme's objectives) of unconventional public transport funded projects. Other 'critical success' factors which they identified include:

- Approval at decision making level (i.e. voter, regional or national);
- Simplicity (complexity tends to increase costs and reduce transparency);
- Whether changes in law or technology are required;
- Whether the transport scheme is sufficiently simple for both users and administrators;
- The degree to which is supports transport policy and other modes of transport;
- Ambitiousness of the scheme;
- Acceptability of extra charges (public and thereby political);
- Whether there is time to phase the introduction of unconventional charges (flexibility to fine tune mechanisms in line with impacts and success);
- Geographical location of the scheme (local context).

The application of each funding method needs to be considered on a case by case basis. In practise all the funding methods mentioned above are available for use, however, there is the question of the practical implementation e.g. in the case of motor tax this would require action by the government or in the case of road user charging there is the issue over the effect upon the local economy.

In many cases one or more funding methods may be appropriate. According to GVA (2004) funding methods can depend upon both contextual and technical factors. Contextual factors include the state of the economy, public and political attitudes to funding, effective coordination between key players and the means by which progress is communicated.

4 Case Studies – Funding and Phasing of Transport Schemes

This section explores the funding and resourcing of transport projects, including a variety of methods and the advantages and disadvantages that were experienced in each case.

4.1 Urban Public Transport - LRT

Urban light rail transit in the UK has seen the use of private finance in various forms of public-private-partnership (PPP). Most cases involve a joint venture company of construction firms, finance providers and transport operators to provide the private investment whilst the public sector contributes some combination of initial grants, guarantees on loans and ongoing subsidies (Vickerman, 2002).

The first of these to be completed have been in major urban areas, including two in London, and one in each of Birmingham and Manchester. There are a number of these projects currently in the pipeline as well as further extensions to existing schemes. Each of these proposed projects have required direct government finance in the construction phase and/or continuing subsidies in operations. Table 4.1 outlines urban metro projects that have already been undertaken involving private sector investment.

Table 4.1: Examples of Urban Metro Projects (Vickerman, 2002)

Project	Length	Total investment	Private sector investment	Public sector involvement
Midland Metro	20.4 km	£145 million	£11.4 million	Government and EU grants
Manchester Metrolink Salford Quays/Eccles extension		£160 million		Government grants
DLR Lewisham extension	4.2 km	£202 million	£202 million	Government approved loan TfL subsidy
Croydon Tramlink	28 km	£205 million	£75 million	Government grants

To help pay for the construction of light rail systems, the Department for Transport pays local authorities capital grants and also supports them in borrowing funds. Central government has paid £1.2 billion (54 per cent), the largest share of the £2.3 billion that has been spent on the construction of light rail systems since 1980. The Department has a long-established principle, however, that local bodies should contribute to the costs because light rail schemes primarily deliver local benefits. The Department expects to pay not much more than 75 per cent of total construction costs of individual schemes; in one case, the Department contributed 93 per cent. Local authorities are therefore expected to contribute their own monies, draw on European structural funds and bring in private sector funds. Some recent schemes have been built under the private finance initiative. Local authorities' applications for Departmental funding are subject to assessment by the Department to establish that schemes offer value for money to the taxpayer and contribute to the government's overall transport objectives. Since 1989, central government has not provided funds to any new light rail systems expected to require subsidies towards their running costs, although the Tyne and Wear Metro is subsidised by the Tyne and Wear Passenger Transport Executive. (NAO, 2004)

Arrow Light Rail Ltd is a special purpose company formed to design, build, fund, operate and maintain Line One of Nottingham Express Transit (NET). Arrow is owned by six partners, each bringing their own particular skill and expertise to the organisation: The Promoters of the scheme, jointly Nottingham City Council and Nottinghamshire County Council, awarded a private finance initiative (PFI) concession to Arrow for a period of 30.5 years - the largest local authority PFI deal ever completed. Arrow let a 3.5 year fixed price turnkey contract to the Bombardier Carillion consortium for the design and construction of the tram system. Bombardier provided the trams, power, signalling and communications systems, and Carillion the civil engineering, track and tramstops. Arrow has also let a contract to the Nottingham Tram Consortium (NTC), comprising Transdev and Nottingham City Transport, who will operate and maintain the system for 27 years.

4.2 Street Lighting PFI - Newcastle and North Tyneside

Private Finance Initiative (PFI) has more recently been used for street lighting contracts. In Newcastle and North Tyneside, a contract was awarded to replace eighty per cent of street lighting in the area. Capital for the project was secured through a PFI contract including a consortium of Scottish and Southern Electricity, SEC lighting services and the Royal bank of Scotland. Funding from these companies was vital as ordinary replacement schemes could have taken an estimated 140 years to complete the scheme (Millar, 2004).

Criteria for the scheme were that lighting facilities should be improved to: reduce crime, reduce light pollution, minimise maintenance, provide best value and emit white light. To meet these demands, much time was spent deliberating over the most appropriate lighting units. Satisfying the criteria was the 'Arc 80' lamp and the 'SON-T Comfort lamp'. The latter was used on additional columns above the number being replaced, as it was more cost-effective whilst meeting minimum average and maximum average illumination levels. To meet with maintenance demands WRTL exterior lighting fitted wiring to the lamps in their factory to minimise faults. They also increased their production capacity to meet the 60,000+ lamps needed over 5 years. The lamps are also made almost entirely of aluminium making them recyclable in the event of damage or removal.

PFI has been successful in this instance as it has allowed the specifications of the lighting to be met. This echoes Tindall's sentiment, "PFI is merely a wrapper to help deliver street lighting and other capital infrastructure project – but it is working." (Tindall, 2005).

4.3 Congestion Charging - Durham

The first toll imposed on motorists in the UK was in the city of Durham, primarily for environmental reasons to protect the city's historic core. Durham's £2 toll scheme is more limited the later implemented London Congestion Charge, but its introduction is evidence of the value Durham places on its built environment. Alistair Darling, the Secretary of State for Transport, approved the plan to charge motorists £2 each time they exit an area including the city's castle and cathedral.

Up to 3,000 motorists a day use the only road into the historic part of the city, near a loop of the River Wear on which the imposing cathedral stands in a World Heritage site. The road also reaches homes, businesses, parts of Durham University and the Chorister School. The same road, Saddler Street, which is wide enough for only one car at a time, is also used by 13,000 pedestrians a day, rising to 17,000 on a Saturday, which creates conflict between pedestrians and drivers, causing safety concerns.

Rising bollards, already in place, are linked to a ticket machine and control the traffic flow. The machine is be monitored by CCTV cameras and linked to an intercom system. Exemptions allow residents and their visitors, as well as mopeds and disabled drivers, to leave Saddler Street without charge but drivers who do not pay or fail to produce an exemption permit face a £30 'excess charge'.

A monitoring report for the scheme (Durham County council, 2003) reveals an 85% decrease in vehicular traffic and a 10% increase in pedestrian activity. The revenue generated as a result of the scheme will be used towards funding a new bus service to the cathedral and Shopmobility project providing scooters for disabled people.

4.4 Sustainable Transport in Wiltshire

Dean and Swabey (1998) discuss the decisions taken by Wiltshire County Council (WCC) when using Private Finance Initiative (PFI) to finance sustainable transport in the region. Western Wiltshire was in need of economic regeneration having witnessed a decline in the range of industries along the A350 corridor area. However, this provided a number of opportunities to be exploited in order to sustain the future of Wiltshire's economic base. An essential part of making the western Wiltshire region more self sufficient in terms of employment is making improvements to transport infrastructure in the A350 corridor. Improved infrastructure would aid companies in making sensible decisions about their location. WCC decided to explore the potential of Private Finance Initiative (PFI) when considering

the options for regeneration in the corridor between two major regional east/west routes, the M4 and the A303.

Policy for the area had already been created relating to transport policies to reduce the reliance on the private car by encouraging a transfer to more sustainable modes. To put this policy into practice, WCC sought to develop and finance an integrated approach to solving the regeneration problems. They involved consultation services to assess the role of PFI in delivering a scheme, moving away from the more traditional road based schemes associated with PFI (eg toll roads/motorways) and look for more sustainable options.

Immediately. a number of barriers to the use PFI in sustainable transport options became apparent. One of the key aspects identified was whether a PFI project can deliver, or improve on, publicly funded schemes. Publicly funded schemes are more likely to deliver non-financial benefits, but it is possible that private sector consortiums could be required to include demand management and sustainability objectives into a scheme. The tolling process rewards its operators for maximising traffic flows, an action that would conflict with Wiltshire County Council's sustainability objectives, looking to restrain private car use. Economic regeneration objectives will not necessarily be met through the maximisation of traffic flows on the A350.

The Private Finance Initiative needs to be creative enough to give the DBFO company a financial incentive to include sustainability balanced transport objectives within a scheme. It has been suggested that revenue schemes could be linked so that a broader criteria financial rewards could be made to DBFO companies for (depending on objective priority):

- assisting economic regeneration;
- encouraging cycle use;
- increasing public transports' mode share; and
- reducing air pollution.

Barriers exist in that it is difficult to identify those responsible for the improvements that have been made. For example, it could be the DBFO company, but the improvements in the local areas could be due to a factory closure. It is difficult to decide what should be monitored and the way in which it is monitored to define success or progress. "The implication is that the more a sustainable solution is sought, the more requirements in terms of evaluation and monitoring become necessary" (Dean and Swabey, 1998).

The local authorities could leave the problem open to the private bidders by being less prescriptive in the bid document. The private bidders can therefore identify revenue streams other than the more conventional traffic flow based sources. However, the uncertainty in this option may prove to be a barrier with the private sector regarding the project as too risky.

There are a number of potential measures that could be taken into consideration:

- upgrading bus services – DBFO company running extra services or paying an operator to enhance frequency;
- provision of bus stop infrastructure and bus information;
- improved rail frequency – DBFO operating its own trains or sub-contracting the operation of an additional train to a train operating company;
- cycle improvements on the A350 and other locations the operation and maintenance area;
- traffic management measures in town centres encouraging through traffic to remain on by-pass routes; and
- transferring control of off-street public car parks to DBFO Company.

There are problems with two of these schemes above. It is not possible to provide bus services that could reduce patronage of commercial services (according to existing legislation) and there is no off street parking controlled by WCC in the area.

Dean and Swabey (1998) conclude by stating that for most of the measures identified as being sustainable little prevents them from being introduced to a PFI package. The extra bus services are the only element that can be regarded as unworkable. For any local authority the key issue is therefore affordability. "Whatever is specified in terms of measures additional improvements to the highway network only will be reflected in the level of payments required by the DBFO Company".

The issue of affordability is linked to value for money. Although the Government is pursuing a more integrated approach to planning, it is important that measures brought forward are able to demonstrate "added value" to meeting movement needs in a way which justifies the proposed expenditure. It is therefore important that all local authorities bringing forwards sustainability measures in a PFI package should draw up a prioritised list of measures which they would wish to see included in an integrated DBFO option, the relationship between the measures, possible phasing and an overall timetable for implementation drawn together by demonstrating how implementation will assist in fulfilling the stated objectives.

4.5 Home Zone Implementation, Morice Town, Plymouth

Morice Town was successful in biding to be part of the Government's Home Zone Pilot Programme in July 1999. It is one of nine sites chosen by the government though out England and Wales. The aim of the Pilot Programme was to assess whether the home zone schemes could be developed successfully under current legislation (Jones, 2001).

Various sources of funding had to be investigated for the scheme, as inclusion in the programme did not provide any new central Government funding. Plymouth City Council's local Transport Plan made available £320,000. This amount was supplemented by £240,000 from the Single Regeneration Budget Round 5. The Groundwork Trust submitted a Lottery New Opportunities Fund (NOF) bid for £300,000 for further funding for the scheme. Small sources of private sponsorship and good support and benefit in kind from alternative sources were also exploited, bringing the total of funding amount to approximately £1 million.

The SRB funding bid was successful. However, the bid made by the Groundwork Trust for the NOF was unsuccessful. Subsequent bids had to then be submitted by Plymouth City Council to the ERDF Objective 2 fund to meet the shortfall (Jones, 2001). This is an example how local authorities may have to exploit many avenues of funding to fund one transport scheme. What the case study does not explain is if the unsuccessful bid for funding made by the Groundwork Trust had any significant effects on the progress of the project, or if alterations in the remaining design, planning and implementation stages were required.

4.6 Channel Tunnel Rail Link, UK

The Channel Tunnel services commenced in November 1994. Both the French and Belgian capitals were linked to the tunnel via high speed rail links. The benefits of providing a UK equivalent were explored and included reduced journey times and the removal of overcrowding on domestic trains. The British government decided to facilitate Channel Tunnel Rail Link (CTRL) but not initially subsidise it.

In 1991 a team of diverse organisations was assembled by the Government to find ways of attracting private finance. It was agreed that finance should be raised by using the approach adopted for financing estuarial crossings in the past (Kain, 2002).

Kain (2002) noted:

"Although Eurostar was yet to commence operation, the team concluded that Eurostar would generate a similar up-front cash flow to help finance CTRL construction, putting money into the

enterprise well before construction is complete". The Government decided to provide subsidy "in recognition of the domestic transport and regeneration benefits and also the very large benefits to international passengers". "The Government would also underwrite revenue by purchasing half of the train paths for operating new, high-speed domestic commuter services between Kent and London. The Government bundled the government-owned Eurostar with the government-owned CTRL developer Union Rail into a 'whole-business', opening the new company to the private sector through PFI bidding provided the new owner builds the CTRL".

London and Continental Railways (LCR) were the winning consortium who took over the CTRL project, Eurostar (UK) and £600 million in ancillary physical assets in May 1996. A financial case to build CTRL by 2003 was made by LCR subject to £1.8 billion (NPV) staged subsidy.

In early 1996, after 18 months of Eurostar operation, British Rail's early traffic projection, 15 million passengers per annum, was almost four times the amount achieved in 1995. LCR's passenger projection was 10 million ppa, whereas the Eurostar partner railway, SNCF, reduced their own projections to just 6 million ppa, a level that was achieved in 1997. This led to a huge loss of money due to the shortfall in passengers projected by LCR. It was originally forecast by LCR that within 18 months of taking over the business, they would make the cash flow needed to help finance the CTRL construction and provide a financial track record to inspire investment confidence so that the company could then be floated.

In 1997, LCR made a loss of £140 million on a turnover of only £130 million. LCR then delayed floatation, sought to find other private sector partners, to sell land and trains and scraped and postponed Nightstar and Regional Eurostar services. In the following year, LCR approached the Government and asked for an additional £1.2 billion (NPV) subsidy. The government subsequently rejected the request, so LCR informed the government that it couldn't meet the terms of their PFI contract.

Instead of the subsidy level being reduced, subsidy was increased and the following further guarantees were made:

- "Between 2010 and 2020, Government will contribute up to £100 million to Eurostar(UK)'s track access payments to Railtrack and will underwrite the payments up to £360 million should Eurostar earn less revenue than forecast. More importantly, Government will also underwrite £3.8 billion of long-term (930-40 year) LCR bonds. This reduces financing costs as the bonds become like government gilts, reducing bond risk and, therefore, the interest rate required to attract investors;
- The southern (cheaper) 74 km of Link, was completed on both time and budget in 2003 with commercial services starting on the 28th September (DfT, 2005b). On completion the section was bought by Railtrack, the national railway infrastructure owner. The northern 39 km from northern Kent to St Pancras will be built if finance is forthcoming, meaning in practice, if Railtrack decides to also purchase this stage; and
- By way of partial compensation to the additional backing, Government will take a passive 5% management stake in Eurostar (UK), which LCR has franchised to a third party; and Government will get 35% of any LCR profit after the year 2020" (Kain, 2002);

In 2003, Section 1 of the CTRL, from the Channel Tunnel to Fawkham Junction, was issued a Permit to Use and the railway opened. It is expected that the second and final section of the railway, from Southfleet Junction to St Pancras, will open in 2007 when all of the 109km of track will be complete (CTRL, 2005a; DfT, 2005b). Testing and commissioning of Section 2 will take place in 2006, and St Pancras station and the installation of all fixed equipment will also be completed in 2006. It is forecasted that the testing and commissioning will be complete in 2007 resulting in the Permit to Use being issued and the railway opened.

The cost of building the CTRL is now estimated to be £5.2 billion – £1.9 billion for Section 1 and £3.3 billion for Section 2 (CTRL, 2005b; DfT, 2005c). The Government will pay £3.1 billion of this cost. LCR has raised all of the capital to construct the entire railway and to service their debt. Over

half of the capital is underwritten by a Government guarantee to reduce the cost of borrowing. In return the Government will take a stakeholder share in LCR and will receive a share of their cash flow after 2020. When the project was proposed it was agreed that the remainder of the capital would be raised by the promoter, Union Railways Limited, which was funded by the European Commission under the Trans-European Networks. As part of the contract URL was transferred to LCR, the successful private sector promoter who was given permission to issue Government Guaranteed Bonds to raise £3.75 billion. Currently the shareholders are Arup, Bechtel, Halcrow, National Express, UBS Investment Bank, Systra, EDF Energy and SNCF (CTRL, 2005d).

From the outset it was obvious that the CTRL could not be constructed without a mixture of private and public finance. Service revenues would not be enough to privately finance the project and resultant benefits and regeneration, particularly for the Thames Gateway and east London justified public investment (DfT, 2005d). The result was a Public Private Partnership which the DfT (2005c) has lauded as one of the most successful examples of a Public Private Partnership (PPP).

While ultimate ownership of the CTRL will remain with the Government, LCR will have a lease for the track until 2086 and the commercial opportunities created along the route. The line will be operated as a single entity by Network Rail who will manage the daily operations of the track and integrate services with the rest of the UK network. The Eurostar train services which will use the route are also owned by LCR and there is also the chance for local services to use the rail link (DfT, 2005d).

5 Summary and Conclusion

5.1 Overview

This review has included wide ranging literature from the UK and further afield identifying the various funding mechanisms available for Transport projects. In the UK, public, private and public-private funding is obtained by local authorities and the Government to implement and maintain transport projects. The main public source of funding is the Local Transport Plan settlement awarded to local authorities to implement schemes in the local area, although additional sources of funding are often required to fulfil all needs.

A number of studies stand out as being important in understanding the funding of transport in the UK and the implications of using various sources. CfIT (2002) undertook research into public funding of LTP projects, which identified that revenue funding is a key issue for local authorities. Atkins have recently reviewed the LTP process, and included a section on funding. This study for the DfT (2005a) revealed local authorities are using a wide variety of funding sources to supplement the LTP capital allocation. However, the use of alternating funding streams have their drawbacks, such as their time-consuming nature (particularly during the bidding processes), and local authorities should ensure that this does not detract from effective delivery.

Like the CfIT, the Atkins study (DfT, 2005a) identifies revenue funding, lack of it, as a key barrier to delivery, especially for the funding of infrastructure maintenance. Increasing costs for existing transport services, internal inefficiency exercises, as well as funding pressures in other services and local political issues may further exacerbate the problem of low revenue funding.

In addition to these traditional sources of funding, a number of innovative funding mechanisms were identified, including applying a Land Value Tax, Work Place Parking Levies, Road User Charging (RUC), Developer Levies, and Transport Development Areas (TDAs). Some of these methods are beginning to be used in the UK, such as road user charging, whereas others are still in the early stages of development. However, there are some positive opportunities for alternative funding mechanisms to assist in the funding of transport schemes in the UK.

5.2 Implications for Project E and Next Steps

The Atkins study (DfT, 2005a) on the Local Transport Plan and funding sources is very comprehensive and will be taken into account in the development of comparative analysis framework for case study schemes and subsequent financing toolkit. It is important that when conversing with the case study local authorities that the research compliments the study rather than duplicates it.

As was identified from the original scoping study, the identification and maintenance of revenue is still a problem experienced by many local authorities. This will be examined in the case studies, particularly regarding the ongoing revenue funding of transport schemes. This includes the Bristol Showcase Bus Routes, maintenance of cycle routes by B&NES, Strathclyde Airport Rail Link and Surrey's Fastway service between Horley, Gatwick and Crawley.

The literature review has identified a number of important funding sources and issues to be examined further in the next issue. The 2006 updated literature review will focus on the following:

- In depth review of current public funding options available to local authorities, schemes they can be used for and implications;
- Barriers faced by institutions with regard to funding mechanisms or regimes;
- A European/worldwide perspective on funding transport;
- Identify/develop case studies where innovative funding mechanisms have been used in practice, how local authorities achieved the funding, implications for project delivery and scheme outputs, including:

  - Congestion charging (e.g. Durham);
  - Workplace Parking Levy (e.g. .Nottingham);
  - Advertising (e.g. Adshel to generate revenue);
- Identify comparator case studies to the five Project E case studies where funding has been achieved for cycling schemes/route implementation, showcase bus routes, rail link, infrastructure for housing developments, and city centre redevelopment including transport improvements.

The literature reviews, alongside the case study reports, will provide the basis for the DISTILLATE Project E funding toolkit. It is envisaged that the toolkit will be used primarily by local authorities when selecting funding sources, or identifying potential barriers that a funding source may entail. It may also be useful to use the toolkit to highlight barriers that local authorities face to the Department for Transport (DfT) and other funding institutions.

Abbreviations

APR	Annual Progress Report
BCA	Basic Credit Approval
BIDs	Business Improvement districts
CfIT	Commission for Integrated Transport
CPA	Comprehensive Performance Assessment
CTRL	Channel Tunnel Rail Link
DBFO	Design Build Finance and Operate
DETR	Department of the Environment Transport and the Regions
DfT	Department for Transport
DLR	Docklands Light Rail
FFS	Financially Free Standing
JV	Joint Venture
LRT	Light Rail Transit
LTP	Local Transport Plan
LVT	Land Value Tax
NNDR	National Non Domestic Rate
ODPM	Office of the Deputy Prime Minister
PFI	Private Finance Initiative
PPG13	Planning Policy Guidance Note 13
PPP	Public Private Partnerships
RICS	Royal Institution of Chartered Surveyors
RTPI	Royal Town Planning Institute
S56	Section 56
SCA	Supplementary Credit Approval
SCP	Single Capital Pot
SRV	Site Value Rating
SS	Services Sold
SSA	Standard Spending Assessment
TDA	Transport Development Areas
TfL	Transport for London
TG	Transport Grant
TIF	Tax Incremental Financing
TPP	Transport policies and Programme
TSG	Transport Supplementary Grant

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