



Funding Public Transport Infrastructure in the UK: Private Finance and Risk Transfer

Simon Worsey

ERM Mitchell McCotter, Western Australia

Abstract

For much of the post-war period, transport infrastructure projects were funded entirely by government, with the development, design, construction, operating and revenue risks of the project borne entirely by the public sector and ultimately the tax payer. Over the last 10-15 years there has been a progressive shift in the UK to maximise the involvement of the private sector in delivering and financing transport infrastructure projects. At the same time, the public sector has sought to transfer as much risk away from the public sector to private sector developers, construction companies and concession operators. The purpose of this paper is to examine the principal mechanisms that have been used to fund transport infrastructure projects in the UK, and how risk transfer is central to all aspects of project financing, delivery and operation. The paper will draw principally upon the development experience of light rapid transit (LRT) schemes in the UK over the last 10-15 years. However, one of the conclusions of the paper is that although great strides have been made over the last ten years to transfer risk from the public to the private sector, the public sector will always remain the bearer of the ultimate risk of project failure, especially with flagship projects

Contact Author

Simon Worsey
ERM Mitchell McCotter
Grain Pool Building, 6th Floor
172 St Georges Terrace
Perth WA 6000

Phone: +61 8 9321 5200
e-mail: simonw@ermperth.erm.com.au

Fax: +61 8 9321 5262

Introduction

Milton Friedman once commented that “inflation is always and everywhere a monetary phenomenon”. Just as Friedman viewed money as central to all inflationary issues, so modern day transport promoters, funders and operators view the transfer of risk as central to the successful financing, construction and operation of a modern public transport system.

For much of the post-war period, transport infrastructure projects were funded entirely by government, with the development, design, construction, operating and revenue risks of the project borne entirely by the public sector and ultimately the tax payer. Over the last 10-15 years there has been a progressive shift in the UK to maximise the involvement of the private sector in delivering and financing transport infrastructure projects. At the same time, the public sector has sought to transfer as much risk away from the public sector to private sector developers, construction companies and concession operators. This has been achievable because in many instances the private sector is better placed than the public sector to bear those risks. Moreover, the private sector has been willing to bear certain risks, since risk normally provides the opportunity for higher returns.

The purpose of this paper is to examine the principal mechanisms that have been used to fund transport infrastructure projects in the UK, and how risk transfer is central to all aspects of project financing, delivery and operation. The paper will draw principally upon the development experience of light rapid transit (LRT) schemes in the UK over the last 10-15 years. At the start of the 1990s over 50 LRT schemes were being mooted in the UK. However, the majority of these schemes was unrealistic and stood no chance of successfully competing for funding. By the end of the decade, there are only 11 schemes in operation, construction or at some other stage of development.

In the UK, two main mechanisms have been used to channel public and private sector funding into transport projects: Section 56 grant and Private Finance Initiative (PFI) credits. Section 2 will outline the background and recent developments to each mechanism, the criteria by which transport projects are assessed under each, the types of schemes progressed and finally compare the potential for project promoters to secure funding via Section 56 grants as opposed to PFI credits.

Whether project promoters have used a Section 56 grant or PFI credits to progress their schemes, substantial amounts of equity and debt funding are required. Section 3 will provide an overview of the main sources of project finance for transport infrastructure projects in the UK, and comment on how specific transport projects have been financed, where appropriate.

Section 4 will identify the key project risks associated with financing, designing, planning, constructing and operating a public transport system. The section will comment on whether the private or public sector is best placed to bear a particular risk, and provide examples on how risk has been transferred or mitigated against in the UK.

There is no clear-cut answer as to whether project financing offers a more attractive route than conventional, government guaranteed packages. Section 5 draws some conclusions on the success of private finance and risk transfer mechanisms in UK transport projects, and the extent to which risk transfer is an achievable objective for the public sector.

Mechanisms for Obtaining Public Funding for Transport Projects in the UK

There have been two dominant mechanisms by which significant funding from the UK central government has been channelled into transport infrastructure projects. Under the first mechanism funds are made available to the project promoter to fund construction costs. The funding is in the form of direct grants (Section 56 grants) and borrowing consents to local authorities (Supplementary Credit Approvals). The second mechanism does not involve an up-front payment, but involves smaller annualised payments to the project operator based upon some measure of system usage, system availability or both.

A number of different organisational vehicles have been used to progress and develop transport projects to the point where a bid can be made for a Section 56 grant or PFI credits. In some instances, (for example, Manchester Metrolink and Sheffield Supertram) the public sector promoter (usually the PTE) has acted alone in progressing the scheme to the point where a separate DBOM (or other) contract can be put out to competitive tender. The approach pursued by Croydon Tramlink and Nottingham LRT has been to form a project development group, which is a partnership between public bodies and private consortia. In this instance, the objective of the group is to progress the scheme to the point where a separate DBOM (or other) contract can be put out to tender.

For example, in November 1991 the Croydon Tramlink Bill entered Parliament. The Croydon Tramlink Act received Royal Assent on 21 July 1994, giving London Regional Transport and Croydon Council the legal power to build and operate Tramlink. In the meantime, the Tramlink Project Development Group was established in 1992 to carry out the design of the scheme. The group consisted of Croydon Council, London Transport, and three private sector companies: Iarmac – a construction company, AEG – a tram manufacturer, and Fransdev – a French operating company. The group worked together to develop a Performance Specification, and was disbanded in 1995 when Tramlink went out to tender. The scheme was advertised across Europe inviting consortia to tender for the concession to design, build, finance and operate (DBFO) Tramlink.

In the case of the Merseyside Rapid Transit and the Bristol and South Gloucestershire Rapid Transit, a joint venture company (JVC) was formed between a successful consortium bidder and the public sector promoters to develop the scheme through to the award of *Transport & Works Act* powers. At this time, tenders would be invited to undertake construction and a separate company would be formed to operate and maintain the system.

Section 56 Grants/Supplementary Credit Approvals

The provision of direct grants from central government under Section 56 of the *Transport Act (1968)* and consents for local authorities to borrow an amount equivalent to the Section 56 grant has historically been the main way for central government to fund the construction of transport infrastructure. This was the mechanism used to fund the Sheffield Supertram, the first phase of the Midland Metro and the first phase of the Manchester Metrolink

The criteria by which transport projects were assessed for Section 56 grants prior to 1989 was based on the scheme maximising user benefits. However, the current criteria for payment of grant under Section 56 - known as Circular 3/89 - is concerned with maximising non-user benefits. To qualify for Section 56 grants:

- there must be no need for operating subsidies;
- full scheme costs must be exceeded by the revenues plus non-user benefits; and
- non-user benefits must exceed the grant required

The Manchester Metrolink scheme was developed in outline in the early 1980s and reached a stage at which applications for grant and for Parliamentary Powers were made in the mid-1980s, prior to Circular 3/89. The scheme proposed to convert two existing British Rail routes into Manchester from Altrincham and Bury which were in need of extensive investment and for use as a tram system to enable city centre access (existing heavy rail stations were on the edge of the town centre). The scheme was originally evaluated - and accepted in principle - using conventional cost-benefit analysis in the same way as road schemes. Although no detailed work was undertaken on non-user benefits until the new Section 56 criteria were introduced, the evaluation of the scheme under the new criteria was also positive.

If the non-user criteria had been applied at the time that the Metrolink system was initially developed, it may never have been realised. Its original rationale was to improve the quality of the public transport system that already existed. Thus, it was originally intended to produce user benefits not non-user benefits. Indeed, if the emphasis had been on capturing car trips to public transport new rather than existing alignments might have been examined. However, had a totally new line been built it is unlikely that the private sector would have been prepared to bear as much risk as it did at the time and contribute towards the capital costs. Thus, to some extent, the Section 56 criteria influenced the type of scheme that was originally built.

The Sheffield Supertram scheme appraisals were proceeding at the time when the Department of Transport was formulating its guidance note. Therefore, the scheme was justified on the basis of the benefits it would bring to those who would not use the facilities and not on the benefits to the users, since the latter were expected to pay for their own benefits through higher fares. The system operates over two lines. The first line extends for 23km across two main radials into the city centre from the northwest and the southeast. The track is mostly within the highway, segregated over

approximately 50 percent of its length by using verges and central reserves. The second line covers 7km from the city centre to the 1.5m sq ft Meadowhall Regional Shopping Centre northeast of the city. There is no on-street running and the line is mostly on ex-British Rail (now Railtrack) track formation.

Due to budgetary constraints and the implementation of the Croydon Tramlink and Midland Metro Light Rail schemes, the availability of direct funding to finance public transport schemes has been limited, and subsequent availability is uncertain. Therefore, the PFI is the main route by which DEIR will support public transport projects in the next century.

The Private Finance Initiative (PFI)

The PFI is currently the main route through which major UK public transportation projects can procure central government funding. The PFI was originally launched in 1992 and by the 1997 General Election a number of transport projects had achieved financial close

- Manchester Metro Salford Quays Extension.
- Croydon Tramlink
- 8 DBFO road projects.
- Northern Line trains.

Following their election in May 1997, the Labour government set up the *Bates Review*, with the objective of reinvigorating the PFI. The Bates recommendations were issued in June 1997. Two key issues emerged

- The importance of a proper assessment of viability prior to a project embarking on full procurement.
- The need to resolve uncertainty about risk transfer and balance sheet treatment

The PFI project would normally involve a public service contract requiring a stream of revenue payments by government in future years for the public use of an asset created and financed by the private sector. The decision on whether a project is suitable for PFI has been based on two tests, the “transfer of risk” test and the “value for money” test.

The test for transfer of risk involves comparing:

- the net present value (NPV) of future payments to the private sector for the provision of a service; with
- a specified percentage of the cost of the project if it were to be paid for under a conventional government procurement

If the former is less than the latter, the PFI solution was said to provide adequate transfer of risk. When PFI was first introduced, this specified percentage was 70 percent, leaving the balance of 30 percent to be carried as a risk by the private sector

against potential cost savings, residual value and any additional revenue potential. It was found, however, that given the nature of many of the assets, the private sector was not very attracted by such constraints, and few proposals proceeded. More recently, the level was raised to 90 percent and in some cases anything less than 100 percent has been considered acceptable to government in order to promote the PFI concept.

The test of value for money involves comparing:

- the original cost of the asset less the NPV of its residual value after any public service contract entered into under a PFI would have expired (which equates to the public sector comparator).
- the NPV of the stream of revenue payments the public sector would have to pay for the service under a PFI contract (the same cashflow used to calculate the transfer of risk)

If the former is more than the latter, the PFI solution is said to provide value for money.

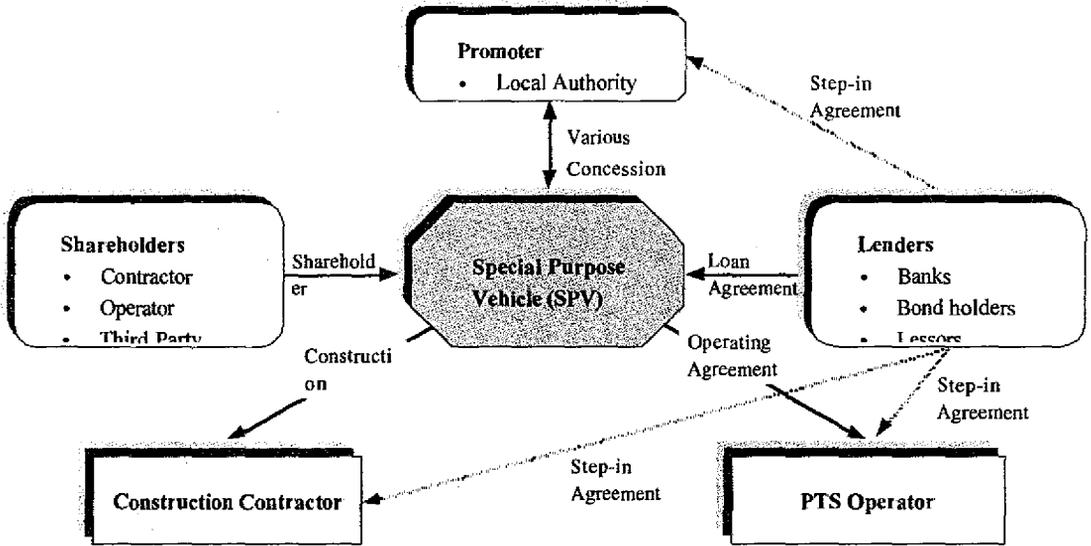
Annual revenue payments under the PFI, with no initial contribution to construction costs, are increasingly being seen as the main route by which local authorities can secure funding for major transportation schemes. Such annual payments are termed PFI credits and are being developed for schemes such as Nottingham. Two main payment mechanisms have been used.

- The use of “shadow” payments or tolls, which were initially, developed to finance PFI roads projects and are linked to the volume of traffic using the road. Shadow payments can also be used for public transport projects where the payment is linked to the number of passengers using a service or station
- Through availability payments, which are linked to the asset financed under the PFI being available for use.

If the scheme is to be successful in attracting significant private sector debt and equity to finance construction (see *Section 3*), the contract will have to be structured appropriately. A private sector consortium will form an SPV that will be responsible for raising funding for the construction period and providing the service for the operating period of the concession. Figure 1 below highlights the key parties within the contractual structure and the contractual relationship between each party.

For transport projects requiring low cost finance, the project financing will need to be highly leveraged in nature. The consequence of high leverage is that the funders will require very low risk to be retained by the SPV. The contractual structure is viewed by lenders as their main source of security, and is therefore designed to transfer risk out of the SPV to subcontractors and other parties.

Figure 1 Typical PFI Contractual Structure



Sources of Finance for Transport Projects in the UK

The main sources of project finance for transport infrastructure projects in the UK has, to some extent, been dependent upon whether the project has been submitted under Section 56 or PFI.

Equity Funding

It has not been uncommon for 20-25 percent of the cost of a transport project to consist of equity finance. The natural shareholders of the project are the project operators. The main problem in the UK has been that historically there are relatively few candidates. Another problem is that the operator may be reliant on the performance of other corporate activities for their equity contributions, which cannot be relied upon with certainty. Equipment suppliers and contractors are also often a source of equity capital, although they are often reluctant to contribute more funds than the profit margins generated on their supply contracts.

A growing source of equity finance during the late 1990s has been infrastructure equity funds. In 1997 a number of infrastructure equity funds were created by banks (for example, CIBC, BZW, Charterhouse) using pension, life insurance and institutional monies to invest in PFI-type situations. It was essential for the fund operators to be assured that strong, recognised contractors, suppliers of equipment and operators were contractually fully committed to the project before the funds were committed. The funds are likely to remain a useful source of equity for road and rail projects.

In the UK there has been growing interest since the construction of the Manchester Metrolink for project promoters to secure funding contributions from the indirect beneficiaries of a transport infrastructure project. The potential for gaining a funding contribution from a land owner, developer, investor or occupier towards the capital or revenue costs of a new public transport system will depend on the location of the site, and whether there is a net gain in land value, development value, or investment return by having the public transport system in place. In many instances, mechanisms have been used to extract financial contributions towards the public transport system. In the UK three forms of contribution are common: land owner contributions (LOCs), developer contributions related to the granting of planning permission (DCs); and developer/owner/occupier contributions related to mutually beneficial joint development (JD).

One of the proposed extensions to Line 1 of the Midland Metro will run for 9km and serve the Merry Hill Centre, an existing retail and commercial development. The total cost of the extension has been estimated to cost £105.4m (\$263.5m) in 1996 prices. The Merry Hill developer, Chelsfield, promised £10m (\$25m) in cash and professional services and structures worth another £15m (\$37.5m) which represents almost a quarter of the overall cost.

However, it has not been easy to obtain substantial contributions from developers, landowners and occupiers for transport schemes. In the case of Manchester Metrolink and Sheffield Supertram, the actual levels of developer contributions secured were substantially smaller than the amounts proposed by Chelsfield.

With the recent Metrolink extension to Salford Quays, even though the system already had an extremely successful trading record, contributions in cash and in-kind transfers of land from property owners, developers and occupiers amounted to only £13m (\$32.5m) out of a total project cost of £140m (\$350m). On the other hand, the bid for the concession to operate the route attracted a private sector contribution of £90m (\$225m).

Local government and PTEs may wish to invest in the scheme, although public finance constraints might limit the extent of their contribution. Such equity is likely to be in the form of land or assets, rather than cash.

Debt Funding

For project progressed under the auspices of the PFI, the project financing has been structured with one principal source of debt funding - either senior bank debt, a bond issue or lease finance guaranteed by banks. In some cases, the capital structure has incorporated all of these, although this has been rare. The principal source of funding has the highest level of security over project assets and agreements.

Usually, the principal form of private debt funding has been in the form of commercial bank loans. Senior bank debt invariably represents the bulk of the funding for private infrastructure projects, potentially up to 80-90 percent. It is flexible and readily

available, but sometimes the maturity of such loans is not long enough to sustain the slow build-up of cash flows inherent in such projects. In the UK, loans of 15-18 years can be obtained relatively easily for projects with strong cash flows, but for longer maturities the market is thinner.

Another form of debt funding that has become more common in the UK since the mid-1990s has been senior bond debt. Potentially, bond issues represent a major source of debt funding for infrastructure projects, since funds can be available for much longer maturities than bank loans. In the UK, infrastructure bond finance started to gain momentum from 1995 onwards, although in the USA bond issues have represented the bed-rock for funding infrastructure development. The situation and experience in the USA is slowly being transferred to Europe and the UK in particular.

Since bond markets are highly conservative in viewing risk, bonds have most often been used to re-finance completed projects rather than fund new construction. However, a number of pension funds and insurance companies, in search of new investment opportunities, have become increasingly interested in bond issues following the renewed interest in the PFI since 1997.

Leasing can be an alternative source of debt funding for road and rail schemes, particularly for long-life equipment and plant. However, leasing relies upon a stable leasing regime and the availability of profitable lessors with a long-term perspective on the absorption of tax benefits. Just as the UK has witnessed a growth in FPI equity funds, PFI leasing funds have also grown in prominence. Typical lessors in the UK have been financial institutions and large corporations (for example, GE Capital).

Public Sector Debt Funding and Grants

Section 56 Grants

Until recently, the main mechanism for UK government support for public transport projects was through Section 56 grants under the *Transport Act (1968)*. Such grants provided a substantial proportion of the costs, but had to be matched by an equal amount of local authority funding. They can be paid either as part of a conventionally-funded package, or as the amount required by a successful tenderer for a concession, who would normally be the bidder requiring the least public sector subsidy.

Transport Supplementary Grant (TSG)

A TSG (bid for through the IPP process) has in the past applied almost exclusively to major local road schemes, but the introduction of the Capital Challenge competition reduced the scale of TSG and widened the scope for public transport projects to compete with both road and other local projects. In 1996/97 over 60 local authorities received Capital Challenge funds for new transport projects totalling £204m (\$510m), of which the largest allocation was a £17.3m (\$43.3m) award for the Manchester Metrolink extension.

SRB/ERDF Grants

If a new transport project involves the regeneration of derelict sites or economic development of a deprived area, grants may be available through the UK's Single Regeneration Budget (SRB) and/or the EU's European Regional Development Fund (ERDF). Both grant sources are limited to specific, pre-selected geographical areas on the basis of high social deprivation (SRB) or comparative economic under-performance (ERDF).

European Investment Bank (EIB) Loans

The EIB can provide a useful source of long-term loans at competitive rates (LIBOR or fixed rates). Such borrowing requires the approval of HM Government and would require a government or first-class bank guarantee. However, an EIB loan could cover up to 50 percent of the project costs and, with a maturity of 20-25 years, is better suited to long-term projects. Normally, EIB loans are used to complement commercial bank lending once the business plan is well developed, not at the outset. On occasions, EIB will assume project risks, generally only after the construction period. For example, with the Channel Tunnel, the EIB loan was guaranteed during the construction period by a group of banks, but upon completion, the EIB assumed project risks.

The Identification and Allocation of Risk

For the private sector, the key to successful project financing is the overall management of risk. The secret is to allocate risks to those parties, whether in the public or private sectors, which are best, positioned to bear and manage them. Any imbalances may lead to short-term problems, and ultimately long-term failure of the project. For the public sector, the allocation of risk is also critical to secure transport projects via the PFI.

The private sector is not homogenous in its perception or treatment of risk. The providers of project finance, which may be individual investors, financial institutions or organisations within the consortium, will need to be convinced that debt repayments will be met or that the expected dividend payments on equity will be paid. On the other hand, the consortium developing or operating the system will need to be sure that contractors and the public sector share or take on those risks that they are most able to bear.

Some of the principal risks as perceived by the private sector in relation to UK transport projects are identified and discussed below. Whilst the discussion is UK-specific, the risk categories and perception of those risks are readily transferable to other developed economies.

Finance Risks

Finance Availability

There is a risk that the scheme may fail to commence, or may be considerably delayed, due to inadequate central government funding availability. Private sector sponsors are unlikely to invest significant time and resources in a scheme unless the required government funding is demonstrably in place. Therefore, the risk is borne by the public sector promoters via the procurement process.

For example, the Bill for the Midland Metro was deposited in Parliament in November 1988 and became an Act in the following year. However, Centro's quest for funding proved somewhat more difficult than first imagined and it was not until 1995 – some six years later – that the funding problem was solved and a contract to design, build and operate Line 1 was awarded to the Altram Consortium.

The Act of Parliament also gave Centro the legal powers to construct two further lines, which were originally identified. However, in 1997 Centro accepted that they were unable to get funding from Government sources. Consequently, they identified what became known as “bite-sized” extensions to Line 1 that could be financed through a PFI initiative.

Due to budgetary constraints and the implementation of the Croydon Tramlink and Midland Metro Light Rail schemes, the availability of direct funding to finance public transport schemes via Section 56 grants is been limited, and subsequent availability is uncertain. Therefore, the PFI is the main route by which DETR will support public transport projects in the next century.

However, whilst initial payments are low under PFI, enabling more schemes to be started in the short term, after a time the combined payments for a number of schemes could exceed government funding limits and perhaps no new schemes could be started. Moreover, the government would be locked into a long-term arrangement that might be difficult to manage if government policies and objectives changed, or underlying economic conditions worsened.

Financial Cash Flow

Sometimes, the cash-flow build-up for major public transport projects is slow and positive net revenues are hard to achieve in the early years of operation. Hence, debt service payments come under strain during this period, and dividends may not be covered (eg. Channel Tunnel, where expensive rescheduling of debt by banks). Because the later cash-flows represent a significant proportion of the overall NPV in the PFI *transfer of risk* and *value for money* calculations, this creates a mismatch between the risk profile calculated by government (20-30 years) and that relevant to the private sector (10-20 years). This is particularly the case in the current climate of relatively low UK interest rates, when the impact of long-term future is greater than if interest rates were higher. Unless investors and lenders are prepared to accept 20-30 year horizons,

the government may need to provide additional grant or borrowing approval to help counter these effects. In practice many PFI sponsors cannot raise long-term loans (i.e. 20-30 years) nor are their shareholders prepared to take a 20-30 year perspective, requiring at least some dividends in the early years to reward them for the risks assumed.

Lenders use a number of tools to analyse the potential robustness of schemes, in particular, the ability of a project to generate sufficient cash to meet its debt service requirements. Two key cover ratios are used in the UK. The debt service cover ratio measures the extent to which a project's net cash flow exceeds its debt service requirements in any one period. The loan life cover ratio measures the extent to which the net present value of a project's net cash flow exceeds total debt outstanding at any one time. The ratios provide an indication of the extent of the "cushion" between the cash flow generated and the minimum debt service requirements. Whilst the ratios required depend on many factors – such as the level of risk retained by the SPV – a transport project carrying moderate risk has typically required a debt service ratio of 1.25–1.30 and a loan life cover ratio of 1.35–1.40. These reflect a "medium" assessment of the project from lenders.

Planning Risk

The project may experience a delay in construction or failure to commence construction due to an absence of appropriate consents and approvals. The private sector has historically seen this as being at the risk of the public sector promoters of the scheme, via the *Transport and Works Act*. For example, since Centro (the public sector project promoter) took powers for the construction of three lines for the Midland Metro, only Line 1 from Snow Hill to Wolverhampton has been constructed and has just commenced operation. However, whilst plans exist for extensions to the existing route, the powers for Lines 2 and 3 have been allowed to lapse, which has delayed the next stage of the scheme. This risk has been borne entirely by Centro, as the public sector promoter.

The project may also incur an increase in costs due to the failure to secure planning permission on schedule. Private sector sponsors also see this risk as residing with the public sector promoters under a fixed price, turnkey construction contract. Again, the private sector would expect the public promoters to bear this risk via the *Transport and Works Act*. On the other hand, the concession company and its funders have historically borne the risk on PFI transport schemes of obtaining detailed planning permission, usually via the construction contractor.

Design Risk

The inappropriateness of design elements of the project may increase overall project costs or reduce the long-term viability of the project. It is normal for design risks to be allocated to the construction contractor on a fixed price, turnkey contract. However, if the public sector promoters require a design variation after the signing of the construction contract, then the private sector would normally expect the public sector promoter to bear any additional costs and risks in relation to the variations.

Greater Manchester PTE (GMPT) placed great emphasis on the design and planning of Metrolink and worked hard to ensure continuity of emphasis into the Project Team, and continuity from the Project Team to the contractor. Consequently, the project was operationally rather than engineering driven, focused on minimising running times and optimising stop locations. This contrasts sharply with the Supertram situation. The final alignment was substantially different from that originally envisaged, stop locations were not optimised, crucial decisions in the city centre were made very late and insufficient priority was given where segregation had already been yielded. One of the results of these design variations was to reduce running speeds making Supertram uncompetitive against bus on certain sections of the route, thereby increasing revenue risk for the operator (see later).

Although very little station investment took place on the Manchester Metrolink, with the exception of purpose-built interchanges, the existing stations were well located to service passenger needs. The stops on Supertram, on the other hand, although excellent in design, were too far apart. Therefore, it is important for a design balance to be attained.

Construction Risk

If land needs to be procured before construction can commence (often the case) then risk associated with land procurement may manifest itself in two ways: increased costs due to unexpectedly high land costs; and increased costs due to unforeseen delay in the procurement of land. On previous public transport projects in the UK, the private sector has viewed the acquisition of land as the responsibility of the public sector as they will be primarily responsible for securing appropriate powers and will be more effectively set up to excise them. In addition, it has normally been the case that the public sector promoters would take on the risk associated with an increase in construction costs due to delay or cost overrun associated with diverting utility plant and equipment. However, the private sector could potentially be persuaded to take on this risk through the construction contractor. The private sector has historically been prepared to take on the risk associated with land contamination and waste and landfill costs on PFI transport schemes, via the construction contractor.

The risk of construction cost overruns and delays in completion of the scheme have normally been transferred to the private sector through the use of fixed price, turnkey construction contracts. The construction contractor will generally have to pay liquidated damages to the private sector consortium if the scheme is not completed and operational before the contracted data. It is likely that the private sector consortium will, in turn, be required to pay liquidated damages to the public sector promoters. The technical robustness of the scheme will have to be proven satisfactory prior to the private sector agreeing to invest funds. Where equipment is new or untried, appropriate warranties and performance guarantees may be sort over and above the fixed price, turnkey contract.

The recent failure of the Midland Metro to commence operations as scheduled is an excellent example of risk transfer from the public promoter to the private sector concessionaire (builder/operator). Under the terms of Altram's DBOM concession contract with Centro, construction was scheduled for completion by 2 August 1998 and three months were allowed after this date to establish a reliable service, compliant with the full specification. If that fully compliant service was not operating by 2 November *substantial liquidated damages* were payable by Altram to Centro for *every day of non-compliance*.

In June 1998 Centro advised its parent body (West Midlands Passenger Transport Authority) that Altram intended to open a sub-specification 10 minute frequency service on 25 October with just nine vehicles out of the 15 required for the full service. The proposed reduction in service was caused by a delay in the construction of vehicles being assembled by Firema, which was a sub-contractor to Ansaldo Trasporti, one of the members of the Altram consortium. The delays were compounded by the fact that the vehicles still had to be approved by HMRI for passenger operations – the risk of compliance with the safety case/HMRI will usually reside with the private sector construction contractor via the fixed price, turnkey construction contract. The partial opening in October did not absolve Altram from its liability to liquidated damages. In the end, Altram did not commence a full service until early 1999 and was still experiencing minor operating difficulties until recently.

Where a variation is required by the public sector promoters, and this variation increases project costs, full compensation is generally sought by the private sector. However, overall construction is a risk process which requires careful management since it can impact on the future operational performance of the transport system. For example, GMPTE took great care to ensure that all parties in the city centre were aware of construction works that were to take place. Changes to bus stops and routes were done as infrequently as possible. The public, including motorists, were kept informed by bulletins in the local media. When Metrolink arrived, it was warmly welcomed the general public. Again, this contrasts sharply with the construction phase of Supertram. The contractors tended to regard the city centre as a building site rather than a city, which posed considerable problems to pedestrians, shopkeepers and bus operators and engendered much ill-will. In due course, this was reflected in these people's attitudes to Supertram and has had consequent effect on usage.

Other risks during the construction phase, such as substantial inflation and interest rate variations are generally borne by the construction contractor under the auspices of a fixed price, turnkey construction contract (inflation) or by the concession company via a comprehensive hedging strategy (interest rates). In both cases, the risks reside with the private sector.

Operation Risk

Poor performance from the operator will suit neither the public or private sector scheme promoters. As a result, generally the operator will be penalised by a reduction in

revenue and eventually termination of the agreement between the operator and the private sector sponsors. The concession company will look to mitigate against this risk by using an experienced operator, with the private sector operator directly bearing the risk.

The concession company and its funders will mitigate the risk of increasing operating costs as far as possible by ensuring that operating cost forecasts are realistic and, as far as possible, fixed and that the operator is experienced. In the case of significant maintenance requirements that materially impact on the ability of the project to meet its debt service requirements, the private sector will normally look to mitigate this risk through the establishment of reserve accounts by the concession company. On the other hand, there is a risk that the failure of fixed assets may lead to a reduction in revenue and/or an increase in operating costs. Whilst all defects should be located during an exhaustive commissioning process, warranties should cover the project for the early years of operation. Where the project equipment is relatively untried, these warranties might have to be substantive to ensure that the project can attract the necessary level of finance from the private sector.

Over the operating concession, the risk of increasing interest rates resulting in an increase in debt service costs will be borne by the private sector, but mitigated against through a comprehensive hedging policy. Likewise, the risk of higher than anticipated inflation will be borne by the private sector and mitigated against by ensuring that the project's financial structure is robust enough to cope with variations in inflation.

Revenue Risk

There is a risk that forecast development may not take place impacting adversely upon patronage and revenue levels. However, significant private sector funding for a transportation scheme of this nature can not be raised against anything other than proven development or development that is proven. This risk is borne by both the private and public sectors. The proposed Kent Thames-side public transport project, which is currently being considered as a PFI-type project, would be aligned through a major redevelopment area. The project promoters have been advised that there is potential for local developers to contribute up to £84m (\$210m) towards capital and operating costs if the full scheme were constructed. However, the actual level of developer contributions to the project will be dependent on how it is prioritised relative to other projects by local authorities, which may seek contributions to other initiatives as a condition of planning permission. Given the risk inherent in these estimates it may be difficult for the project promoters to rely too much on these equity contributions in their overall funding strategy.

If forecast patronage is not achieved then this will result in lower than expected revenue. Where it is taking revenue risk, the private sector will seek to mitigate risk by ensuring that the project's revenue forecasts are realistic and by ensuring its financial structure can cope with some fall off in expected revenue. Historically, bankers and financial institutions are very sceptical of revenue streams being forecast, no matter how much

sensitivity testing is undertaken, mainly because of competitive pressures from car and bus.

Within the PFI a number of mechanism exist to transfer revenue risk from the public sector promoter to the private sector operator. In the case of the Nottingham scheme, an availability payment is planned, which will be fixed in absolute cash terms when the project agreements are signed and begins when construction is complete and the system is operational. This type of payment mechanism has the following advantages.

- Revenue risk lies with the concession company. This incentivises the company to operate the scheme in such a way as to maximise patronage and therefore revenue on the scheme.
- It insulates the local authority from inflation risk.
- The availability payment profile can be linked to performance of the concession company, with reductions in the level of payments if the concession company fails to operate the scheme according to the requirements of the public sector promoters.

The “shadow payments” mechanism also incentivises the operator to increase patronage and insulates the government against schemes that fail to encourage sufficient numbers to transfer from private vehicles.

As with all LRI schemes, consortia bidding for the DBOM contract have to critically appraise the promoter’s passenger forecasts. They must try and anticipate the competition they will face when the LRI comes into operation, since a substantial proportion of LRI users are diverted from parallel bus services.

The risk of a reduction in revenue due to unforeseen competition from other transportation modes is likely to be shred by the private and public sectors. Prior to investing in the scheme, funders will have to be satisfied that the risk of substantial competition is minimal. This may require undertakings from the public sector sponsors in the form of priority at junctions and traffic lights and minimisation of bus competition. This has become an issue of increasing importance, especially in light of the Supertram experience.

The ALIRAM Consortium (Ansaldo/Laing) which won the DBO concession for Midland Metro has been joined by Travel West Midlands (IWM) the main private local bus operator. IWM’s decision to join ALIRAM was critical in reducing revenue risk to the consortium. IWM integrated the Metro fully with their bus network and developed through ticketing arrangements, which was important since immediate access to the line in places is not easy. In this way, station access design problems are also overcome.

The Sheffield Supertram experience, where the system incurred huge operating debts partly as a consequence of having to compete on unequal terms in deregulated bus market, sent a chill through the LRI industry. It is not surprising to note that in the case of Nottingham, the Arrow Consortium that has achieved preferred-bidder status

includes Nottingham City Transport, which operates the local bus network. In the case of the Croydon Tramlink, it is highly likely that local bus services will be re-shaped around the tramway to reduce competition, especially since the commercial freedom of the operator is reduced by having to participate in the London Transport managed fare scheme.

One of the proposed extensions to the Midland Metro that will run on-street through Birmingham city centre will involve removing all bus services from Corporation Street, which is the main bus route through the city, in order to reduce modal competition.

Concluding Remarks

There is no clear-cut answer as to whether project financing offers a more attractive route than conventional, government guaranteed packages. The main problem is that many of the transport schemes that are promoted are marginal financially, notwithstanding the economic and social benefits they would bring.

Although PFI has enabled many more projects to be progressed, a major criticism of PFI is that rather than solving the funding dilemma, all it is doing is postponing or prolonging the problem. For project promoters to develop a transport project to the extent where it can bid to secure PFI credits can cost a large amount of money, usually borne by the public sector. Indeed, Nottingham's PFI bid has currently cost the public sector £6m (\$15m) and the scheme has yet to be approved by Treasury.

Whichever mechanism is used, promoters of transport schemes must have clear objectives as to what they are hoping to achieve. The operational requirements must be consistent with travel needs in the area or route corridor, and hence driven by passenger demand. There is always a risk, particularly with DBOM contracts, for schemes to be engineering-driven rather than operationally led. Moreover, the main source of patronage and hence, revenue, for LRI schemes, will always come from existing public transport users. Therefore, to minimise revenue risk, the scheme must either have a substantial operating advantage over competing modes, or else include the principal bus operator within the operating consortium.

Even though great strides have been made over the last ten years to transfer risk from the public to the private sector, the public sector will always remain the bearer of the ultimate risk of project failure, especially with flagship projects. This was borne out in June 1998 when the UK government announced details of a deal to rescue the Channel Tunnel Rail Link. Under the plan, the UK government was committed to put between £140m (\$350m) and £360m (\$900m) of public money into the project, and take on the ultimate risk of the project failing by providing government guarantees to cover £3.8bn (\$9.5bn) of project debt.

The immediate consequence of the commitment was to reduce the availability of government funds to promote public transport schemes still awaiting funding (for example, Nottingham, Leeds, Bristol). It appears that the availability of government

finance is not a given, especially as more projects are promoted. There is perhaps a more significant medium term impact. The government had been very insistent that no public sector guarantees or underwriting of risk could be allowed for major public/private schemes such as light rail schemes. With its rescue plan for CTR, whatever its merits, the government has reinforced the private sector lender's view that government will always "step in", in the event of scheme failure, ultimately bearing the risk. However, if government provided the confidence to private sector lenders by *openly* standing behind major infrastructure projects, such projects may be more likely to happen and much more likely to be successful because they will not be burdened with the high interest rates/rates of return that investors require if such projects have to bear a disproportionately high level of risk.

Sheffield Supertram was purchased by the Stagecoach Group in early 1998 after a High Court judge ruled that the PTE faced a bill of £115m (\$287.5m) equivalent to the cost of trading and non-trading credit approvals plus debts from running costs. The PTE thought that they had previously secured a guarantee from the government that it would meet these costs. The court ruled that it had not. In the end, Stagecoach was able to take over the operations of Supertram with a 30-year contract worth £1.5m (\$m) which, at one stage, had been worth £80m (\$200m). Again, the public sector, and ultimately the (local) tax payer, will bear the risk when a transport scheme collapses.

References

- Banister, D Capello, R and Nijkamp, P (1995) *European Transport Communications Networks: Policy Evaluation and Change* Wiley
- Birdlife International (1997) *Funding for Sustainable Transport: A Review of Inward Investment in Western and Eastern Europe*
- Department of the Environment (1996) Transport and the Regions, *The Channel Tunnel Rail Link and the Private Sector*, <http://www.railways.detr.gov.uk/ctrl>
- Department of the Environment, Transport and the Regions (1998) *White Paper on Integrated Transport*, DETR, UK
- Gross, P (1995) *The Practical Delivery of Non-User Benefits – Progress so Far*, Light Rail and Non-User Benefits Conference, Sheffield, UK
- Owen-Smith, R and Topley, A (1995) Sheffield Supertram, <http://www.rudi.herts.ac.uk>
- Hellewell, D S (1998) *What future for Light Rail and Urban Transit?* Tramways & Urban Transit, January 1998
- Tyson, W J (1995) Non-User Benefits, Section 56 and Manchester Metrolink, *Light Rail and Non-User Benefits Conference*, Sheffield, UK
- Tyson, W J (1997) Manchester Metrolink and the Private Initiative, *Fifth International Conference on Competition and Ownership in Land Passenger Transport*, Leeds, UK