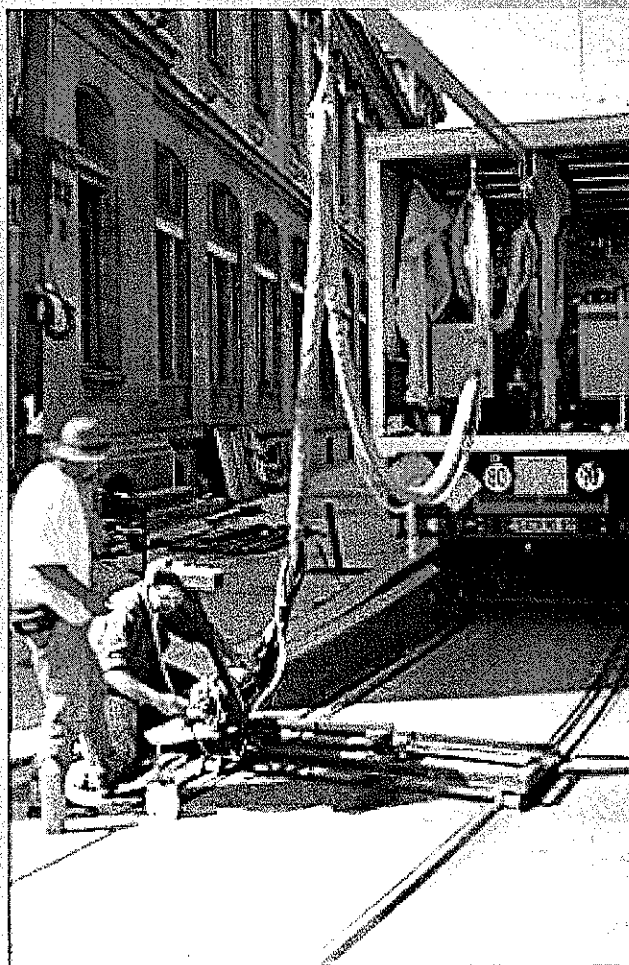


Making Tracks – Light Rail in England and France

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*Swedish National Road and
Transport Research Institute*

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Abstract <p>Several French cities are now developing and building Light Rail-systems (LR) from scratch, that is LR has been absent for several decades. In France LR and urban public transport in general are very strongly connected to the city in a broad sense, to city politics and politicians, urban environment matters and urban planning. This seems to make rapid implementation of LR-projects a lot easier, in Lyon for example the two new lines were built in four years. The proportion of urban regeneration costs of the total LR infrastructure investments is about half. Financing of LR has hitherto been exclusively public, private financing is discussed (as in Sweden) but there are at present no such schemes.</p> <p>The French urban transport legislation, for which there is probably no equivalent in other countries, demands a reduction of urban car traffic. This is a political objective and LR-development has become one of the means of achieving it.</p> <p>Like France and Sweden, England was for the most part without light rail for about 40 years. Most of the urban tramway systems were abandoned in favour of the bus in the 1950's, and street running light rail was not seen again until the early 1990's (in Manchester).</p> <p>In England the new light rail projects serve urban regions and sub-regions. This distinguishes them from the French schemes, which mostly tend to serve areas within the city itself. Beyond the city boundary, public transport tends to be less satisfactory, and may suffer from resources being focused on "showcase" light rail projects within the city itself. Perhaps this reveals a difference of urban culture and structure, in that English suburbs are usually of higher social status and quality than their French counterparts.</p> <p>In both countries LR is seen as a way of providing more priority for public transport, given the perceived difficulties of enforcing priorities for buses. However, LR development is not linked to traffic reduction policies in English cities.</p>					
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Foreword

The Swedish National Road and Transport Research Institute, *Statens väg- och transportforskningsinstitut*, (VTI) has been commissioned by Swedish Agency for Innovation Systems (VINNOVA) and the Swedish National Rail Administration (*Banverket*) to carry out Light Rail (LR) research and development. The main project is called Light Rail – Light Cost.

Within the main project VTI researcher Bertil Hylén reported on LR developments in France. "Light Rail i Frankrike – Planering, organisation och finansiering". (VTI Notat 10-2001). France was chosen because many cities are now reintroducing LR from scratch, having had no LR or tramway for more than one generation. This description also applies in general to Sweden.

In 2001 the project management decided to compare developments in France and the United Kingdom in order to draw relevant conclusions for further Swedish and Scandinavian developments. To complement the previous French report VTI therefore commissioned Tim Pharoah, independent consultant working for i. a. Llewelyn-Davies Architects and Planners, to carry out a survey of four British cities.

Bertil Hylén has translated the previous French report into English, the translation has been checked by Tony Palm, Linköping. The English photos have been taken by Tim Pharoah and the French photos (unless noted) by Bertil Hylén. Gunilla Sjöberg, VTI, has edited the final version and assured that it reached its final shape.

VTI hopes that this study will be interesting and relevant for further work in the project related to LR economics and urban planning aspects. The authors would like to express their warmest thanks to all that assisted them in various ways with this report and contributed to its completion.

Linköping and London, March 2002.

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Appendix 1

Abbreviations

€	Euro	
AO	Autorité Organisatrice	France
CBA	Cost Benefit Analysis	
CCTV	Closed Circuit Television	
CERTU	Centre d'Etudes sur les réseaux, les transports, l'urbanisme et les constructions publiques	France
DBFOM	Design, Build, Finance, Operate, Maintain	
DETR	Department of the Environment, Transport and the Regions	England
DLR	Docklands Light Railway	England
DTLR	Department of Transport, Local Government and the Regions	England
ENTPE	Ecole Nationale des Travaux Publics de l'Etat	France
ERDF	European Regional Development Fund	
EU	European Union	
FRF	French Francs (until 31 Dec. 2001)	
GART	Groupelements des Autorités Responsables de Transport	France
GBP	Pounds Sterling	England
GDP	Gross Domestic Product	
GMPT	Greater Manchester Passenger Transport Executive	England
HMRI	Her Majesty's Railway Inspectorate	England
LR	Light Rail	
NATA	New Approach to Transport Appraisal	England
PDU	Plan de Déplacements Urbains	France
PPP	Public Private Partnerships	
PTA	Public Transport Authorities	England
PTE	Public Transport Executives	England
RER	Reseau Express Regional	France
RTM	Régie des Transports de Marseille	France
S56	Section 56 (Grant system)	England
SLTC	Société Lyonnaise de Transports en Commun	France
SNCF	French State Railways	
SYPT	South Yorkshire PTE	England
SYSL	South Yorkshire Supertram Limited	England
SYTRAL	Syndicat Mixte des Transports pour le Rhône et l'Agglomération Lyonnaise	France
TAM	Transports de l'Agglomération de Montpellier	France
TCL	Tramlink Croydon Limited	England
TCL	Transports en Commun de l'Agglomération Lyonnaise	France

TCSP	Transport Collectif en Site Propre	France
TGV	Train a Grande Vitesse	France
THM	Trafikhuvudman	Sweden
UK	United Kingdom	
VINNOVA	Verket för Innovationssystem	Sweden
VTI	Statens Väg- och transportforskningsinstitut	Sweden

Making Tracks – Light Rail in England and France

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Summary

Big differences between Light Rail expansion in England and France

The Swedish National Road and Transport Research Institute, *Statens väg- och transportforskningsinstitut*, (VTI) has been commissioned by the Swedish Agency for Innovation Systems (VINNOVA) and the Swedish National Rail Administration (*Banverket*) to carry out Light Rail (LR) research and development. The main project is called Light Rail – Light Cost.

Through previous studies, analyses of the professional press etc. the differences and similarities in LR developments between the European countries were noted. Subsequently it was decided to study in greater detail how positive developments might be transferred to the Swedish LR environment.

Several French cities are now developing and building LR-systems from scratch, that is LR has been absent for several decades. In France LR and urban public transport in general are very strongly connected to the city in a broad sense, to city politics and politicians, urban environment matters and urban planning. This seems to make rapid implementation of LR-projects a lot easier, in Lyon for example the two new lines were built in four years. It is also important to note the important role of LR for urban regeneration. The proportion of urban regeneration costs of the total LR infrastructure investments is about half. Financing of LR has hitherto been exclusively public, private financing is discussed (as in Sweden) but there are present no such schemes.

The French urban transport legislation (PDU), for which there is probably no equivalent in other countries, demands a reduction of urban car traffic. This is a political objective and LR-development has become one of the means of achieving it.

The connection to the city, urban planning etc. may be favourable for LR development but it may be less positive for public transport in a wider geographical sense. Public transport responsibility is split between various organisations and commuting over longer distances often requires a range of tickets or passes. Multi-modal passes or tickets are still rare in France.

The Swedish or northern European model where the public sectors commitment is limited to investment and tendering out operations in competition and where the operators are mainly privately owned is seen as difficult to understand in France. Acting as both buyer and provider is, however, seen as quite acceptable.

Like France and Sweden, England was for the most part without light rail for about 40 years. Most of the urban tramway systems were abandoned in favour of the bus in the 1950's, and street running light rail was not seen again until the early 1990's (in Manchester).

In England the new light rail projects serve urban regions and sub-regions. This distinguishes them from the French schemes, which mostly tend to serve areas within the city itself. Beyond the city boundary, public transport tends to be less satisfactory, and may suffer from resources being focused on "showcase" light rail projects within the city itself. Perhaps this reveals a difference of urban culture and structure, in that English suburbs are usually of higher social status and quality than their French counterparts.

Connection with local politics is less strong than in France, probably as a direct consequence of weaker local government. For example, local authorities in England depend on central government for the great majority of transport funding; they are limited in the amount of money they can borrow, raise through local taxes, and spend. Moreover, unlike French communities, they have only symbolic Mayors with little power. Nevertheless, LR projects can be important politically, with local decision takers being keen on using LR promote a "modern" image.

The role of LR in English urban regeneration is varied, and no clear picture emerges. Generally, however, the English schemes have been promoted primarily as solutions to transport problems, and there has been little effort to develop comprehensive land use development plans alongside LR plans. This seems to be similar to the position in France, although urban re-regeneration often plays an important role in French schemes.

In both countries LR is seen as a way of providing more priority for public transport, given the perceived difficulties of enforcing priorities for buses. However, LR development is not linked to traffic reduction policies in English cities (there are few such policies).

Split responsibilities are a concern in England. The Passenger Transport Authorities (PTA) can promote LR and contribute financially, but central Government has to be satisfied in regard to cost benefit and other criteria. Although schemes are usually developed in partnership with the private sector, once established, the PTA has little power over the operator. This can lead to damaging competition with buses, high fares, poor conditions of service, and other problems. It is important to lay the cause of this at the door of deregulation rather than privatisation of public transport.

In England, minimising demands on the public purse, and minimising risk, is implicitly the main priority in the way LR is developed. This is not just a central Government position. A survey of local authorities in 1990 found a majority in favour of private sector involvement in public transport provision. Provision of the optimum public service to serve wider economic, social or environmental objectives is stated in the rhetoric, but does not encourage the development of LR, as apparently is the case in France.

LR in English cities is in most cases perceived as a suburb to city centre facility. This is particularly so for those systems that have relied on conversion of heavy rail routes (all except Sheffield). This is in stark contrast with many European tram systems, which link and serve city neighbourhoods with more frequent and convenient stops.

Nya spår – Light Rail i England och Frankrike

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Sammanfattning

Stora skillnader mellan Englands och Frankrikes spårvägsutbyggnader

Under temanamnet Light Rail – Light Cost bedriver Statens väg- och transportforskningsinstitut (VTI) forskning och utveckling inom spårvägs- och Light Rail-området (LR). Uppdragsgivare är Banverket och Verket för innovationssystem (VINNOVA).

Genom tidigare studier, analys av fackpress etc. har likheter och skillnader mellan LR-utvecklingen i olika europeiska länder konstaterats. Det beslöts därför att närmare studera hur positiva erfarenheter kan överföras till den svenska LR-miljön.

I flera franska städer har LR saknats i flera decennier och nya LR-system byggs nu upp från grunden. I Frankrike finns det starka band mellan LR och urban kollektivtrafik å ena sidan och staden, dess politik och politiker, urbana miljöfrågor och urban planering å andra sidan. Dessa band verkar underlätta byggandet av LR, i t.ex. Lyon byggdes de två nya linjerna på mindre än fyra år. LR spelar också en viktig roll i det urbana förnyelsearbetet. Av de totala kostnaderna för LR-infrastruktur svarar urban förnyelse för ungefär hälften. Finansieringen har hittills varit uteslutande offentlig, privat finansiering diskuteras (som i Sverige) men det finns f.n. inga konkreta sådana projekt.

Den franska urbana transportplaneringen (PDU), som torde sakna motsvarighet i andra europeiska länder, kräver en minskning av biltrafiken. Den är ett politiskt mål och LR är ett av medlen att uppnå målet.

Kopplingen till staden, urban transportplanering etc. kan vara fördelaktig för LR men mindre fördelaktig för kollektivtrafiken i ett större geografiskt perspektiv. Ansvar för kollektivtrafiken är splittrat på olika aktörer och pendling över något längre avstånd kräver ofta flera biljetter eller kort. Biljettsystem liknande de svenska trafikhuvudmännens är fortfarande ovanliga i Frankrike.

Den svenska eller nordeuropeiska modellen, där den offentliga sektorn begränsar sitt engagemang till infrastrukturinvesteringar och upphandling i konkurrens av själva trafiken från privata operatörer, är svår att förstå i Frankrike. Att offentliga organ agerar som både beställare och utförare anses emellertid som acceptabelt

Med få undantag saknade England (som Frankrike och Sverige) LR under 40 år. De flesta urbana spårvägssystemen lades ned på 1950-talet och urban spårvägstrafik återkom inte förrän på 1990-talet (i Manchester).

I England har de nya LR-systemen sin uppgift i regional trafik. Detta skiljer dem från Frankrike där de nya systemen mest har en trafikuppgift inom den rena stadstrafiken. Detta kanske visar på en skillnad i urban kultur och struktur, engelska förorter har oftast en högre social status och kvalitet än sina franska motsvarigheter.

Kopplingarna till lokal politik är svagare än i Frankrike, förmodligen beroende på svagare lokal politisk makt. Till exempel måste den lokala nivån i England förlita sig på statlig finansiering av den lokala kollektivtrafiken. Det finns vidare begränsningar vad gäller att ta upp lån, lokal beskattning och utgifter. De har vidare (i motsats till sina franska motsvarigheter) endast symboliska borgmästare med föga makt. Icke desto mindre kan LR-projekt vara lokalt politiskt viktiga där lokala beslutsfattare är angelägna om att skaffa sig en modern "LR-image"

Det finns ingen entydig bild av vilken roll LR spelar i den urbana förnyelsen i England. I allmänhet har LR setts som en lösning på transportproblem och det har inte gjorts några ansträngningar för att integrera LR i den övriga planeringen. Samma synes gälla i Frankrike även om LR spelar en roll i den urbana renässansen. I båda länderna ses LR som ett sätt att öka framkomligheten för kollektivtrafiken, att få respekt för t.ex. busskörfält bedöms som svårt. I England saknas emellertid kopplingar till policies avseende minskning av biltrafiken – sådana policies är sällsynta

Det splittrade ansvaret för kollektivtrafiken i England bör framhållas. Trafikhuvudmännen kan vara positivt inställda till LR och bidra till finansieringen men statsmakterna måste övertygas om att ett projekt har en positiv nytta. Även om flera projekt tas fram i samverkan mellan trafikhuvudmän och den privata sektorn har huvudmännen föga inflytande över trafiken. Detta kan leda till skadlig busskonkurrens, höga biljettpriser och dålig trafikering i allmänhet. Det bör emellertid framhållas att detta är en effekt av avregleringen av sektorn snarare än av privatiseringen av kollektivtrafiken.

I England har LR utvecklingen i mycket styrts av kraven på att minska de offentliga utgifterna och risktagandet. Detta är inte endast den centrala statsmaktens policy. En kartläggning inom lokal offentlig förvaltning 1990 visade att det fanns en majoritet för ett (ökat) privat engagemang inom kollektivtrafiken. Vidare ekonomiska, sociala och miljömässiga målsättningar nämns ofta i debatten men omsätts inte så ofta i praktiken. Det verkar däremot vara lättare att gå från ord till handling i Frankrike.

LR i England ses mest som ett system för trafik mellan förort och stadscentrum. Detta gäller särskilt för de system som använder ombyggda förortsjärnvägar (alla hittills byggda system utom Sheffield). Här skiljer sig England från övriga Europa, där LR har en mera urban karaktär.

1 Background

The Swedish National Road and Transport Research Institute, *Statens väg- och transportforskningsinstitut*, (VTI) has been commissioned by Swedish Agency for Innovation Systems (VINNOVA) and the Swedish National Rail Administration (*Banverket*) to carry out Light Rail (LR) research and development. The main project is called Light Rail – Light Cost.

Within the main project VTI researcher Bertil Hylén reported on LR developments in France. "Light Rail i Frankrike – Planering, organisation och finansiering". (VTI Notat 10-2001). France was chosen because many cities are now reintroducing LR from scratch, having had no LR or tramway for more than one generation. This description also applies in general to Sweden. As will be shown in this report, the United Kingdom is similar to France in some but not all aspects of LR development. The project management therefore decided to compare developments in France and the United Kingdom in order to draw relevant conclusions for further Swedish and Scandinavian developments. Germany, however, is in some respects more difficult to relate to – starting from scratch in Germany has seldom been the case.

To complement the previous French report VTI commissioned Tim Pharoah, independent consultant working for i. a. Llewelyn-Davies Architects and Planners, to carry out a survey of four British cities. VTI hopes that this study will be interesting and relevant for further work in the project related to LR economics and urban planning aspects.

2 General reflections and conclusions

This section attempts to relate the findings of this report to the Swedish scene. The English conclusions are presented in sections 4.1 and 7, and the French conclusions in section 13.

The principal issue for Sweden, as for other countries, is to determine the role to be played by trams, LR and other guided systems in the overall transport mix. The answer to this depends on the objectives of such systems are intended to achieve (mode switch to public transport, urban regeneration, provision of capacity more cheaply than Metro, etc). These matters were explored in the case study process, but in general the purpose of tram and light rail schemes is often poorly described or documented. Most planning effort appears to be made after a decision has been taken to invest in the system. This planning involves a number of important aspects that again have been explored in the case studies. Such aspects include the organisational framework (city/regional split of powers etc.), funding issues and in particular the respective roles of their public and private sectors, and the costs of systems and the various means of appraising costs against benefits.

The fragmentation of English public transport caused by deregulation is highlighted in several sections of the report. Any Swedish visitor to England (outside London) will notice how difficult it is for people without local knowledge to use public transport. This is generally not the case in France. As long as you stay within the boundary of the city (or the slightly larger *Autorité Organisatrice*) information about public transport is good, sometimes better than in Sweden. The Swedish Public Transport Authorities (*trafikhuvudmän*, THM) cover a county or region, not a city, and all actors work towards better information, through ticketing and the seamless journey in general.

In 2001 the relationships between authorities and operators are very much on the agenda partly due to the proposed EU Regulation on Public Service Obligations etc. The present systems in many of the EU member states may have to be changed. VTI intends to deal with those matters in greater detail in another project.

Sweden, England and France all have criteria for cost benefit analysis (CBA) of proposed Light Rail schemes. This complex and important area has been dealt with in Sections 5.6 and 10.2. Together with Linköping University VTI hopes to be able to carry out a deeper analysis of CBA for public transport investments. Financing is closely related to this area, which is probably where the three countries differ most. Private money has funded several schemes in England but this is not the case in France. In Sweden private funding is being discussed, at present mainly for infrastructure schemes.

Although building a LR line is cheaper than building a metro line, it is still seen by many planners and politicians as unduly expensive especially compared to a system of high class reserved bus lanes. However, it should be remembered that in France (for example Lyon and Nantes) only about half the cost per km is attributable to the construction of the "tramway pur" (the French expression) the rest is for urban regeneration in a broad sense.

Urban regeneration demands strong links with urban (city) politics and planning. This was one of the objectives of the joint ownership of the Swedish *Trafikhuvudmän* by the local authorities (communes) and the counties. This joint ownership is still the norm in Swedish public transport. However, only the county

owns Storstockholms Lokaltrafik, SL. (The same applies to Skånetrafiken in southern Sweden). This means that SL has little power over physical planning matters in the communes, and vice versa the communes do not have to care about public transport if they don't want to. An inner city tramway in Stockholm is very much on the agenda and the split responsibilities are quite noticeable.

On the other hand tramway development and co-ordinated transport planning in Göteborg seems to work fairly smoothly. Göteborg is one of the owners of Västtrafik, the trafik huvudman; this may be one of reasons why.

When looking at construction costs in England and France one must remember that English LR lines are often converted suburban heavy rail lines. This English way of re-introducing Light Rail has not figured much in the Swedish discussions although the Saltsjöbanan in greater Stockholm and the Staffanstorpsbanan in Skåne have been mentioned. This approach to Light Rail may be an alternative to TramTrain system, this area may be worth further investigation.

Although the report highlights a range of difficulties in achieving tram and other system in the case study countries, it would be difficult with the benefit of hindsight to conclude that the cities that have introduced such systems would have been better off without them. For some, the tram has given a boost to the city image, and given a lift to the image public transport and hence its overall ability to compete with the car. For others, especially in England, the tram has brought superior levels of access to city centres thus helping them to fight off competition from out-of-town shopping and leisure complexes. There are, however, also cases in England and France where out-of-town centres are served by Light Rail. There is also the prospect that systems will enable major regeneration of inner city and other areas, although it must be said that the evidence of direct causality in the respect is hard to find.

So overall, the message from the case studies is a mixed but fairly positive one. Tram and related systems can bring great benefits in the context of environmental and urban vitality objectives. Although the investment costs are higher than for bus transport, this can be offset by greater benefits, especially if the less tangible social and environmental benefits are given due weight.

For Sweden there are important lessons that can be learnt from other countries, especially with regard to the need for sound and co-ordinated planning mechanisms, and public control of the key factors necessary for efficiency and integration, namely quality of service and fares and tariffs. No country could claim to have found the perfect solution to tram and light rail planning, but it is hoped that the issues discussed in the following pages will assist the Swedish authorities in deciding their own approach.

3 England – introduction

3.1 Why England?

The funding, planning and other procedures for transport tend to differ between different parts of the United Kingdom, with Scotland, Northern Ireland and Wales having their own Assemblies and, in many cases, laws. Since there are no light rail schemes in any of these other countries, there is little point in studying these differences. This report therefore deals with light rail in England only.

3.2 Method of approach

This English part of the report consists of two main sections.

The first section provides an overview of the light rail situation in England. As far as possible, issues raised in the context of the French schemes are addressed in this report, and comparisons are drawn.

The second contains specific information and commentary on four case study light rail schemes in Manchester, Sheffield, West Midlands and Croydon. Accompanying this report is a table of information that is consistent in style with the table of French case studies. Key findings and comments are provided in a concluding section.

4 Overview of Light Rail (LR) in England

4.1 Issues raised by French case studies

1. Like France and Sweden, England was for the most part without light rail for around 40 years. Most of the urban tramway systems were abandoned in favour of the bus in the 1950's, and street running light rail was not seen again until the early 1990's (in Manchester).¹
2. In England the new light rail projects serve urban regions and sub-regions. This distinguishes them from the French schemes, which tend to serve areas within the city itself. Beyond the city boundary, public transport tends to be less good, and may suffer from resources being focused on "showcase" light rail projects within the city itself. Perhaps this reveals a difference of urban culture and structure, in that English suburbs are usually of higher social status and quality than their French counterparts.
3. Connection with local politics is less strong than in France, probably a direct consequence of weaker local government. For example, local authorities in England depend on central government for the great majority of transport funding; they are limited in how much money they can borrow, raise through local taxes, and spend. Moreover, unlike French communities, they have only symbolic Mayors who have little power. Nevertheless, LR projects can be important politically, with local decision takers being keen to use LR promote a "modern" image.
4. The role of LR in urban regeneration is varied, and no clear picture emerges. Generally, however, the English schemes have been promoted primarily as solutions to transport problems, and there has been little effort to develop comprehensive land use development plans alongside LR plans. This seems to be similar to the position in France, although urban re-regeneration often plays an important role in French schemes.
5. Regeneration is particularly hampered by lengthy periods of uncertainty before final funding is approved. In these circumstances developers are reluctant to invest in property designed around the LR facility.
6. Other quality attributes of LR are appreciated as in France – accessible, lower costs than heavy rail, ride comfort, zero emissions at point of use, low noise, high level of priority in traffic, image capable of attracting people out of cars.
7. In both countries LR is seen as a way of providing more priority for public transport, given the perceived difficulties of enforcing priorities for buses. However, LR development is not linked to traffic reduction policies in English cities (there are none).

¹ A traditional tram system operated throughout this period in Blackpool, though this served mainly as a tourist attraction.

8. Split responsibilities are a concern in England. The Passenger transport Authorities (PTA) can promote LR and contribute financially, but central Government has to be satisfied on cost benefit and other criteria. Although schemes are usually developed in partnership with the private sector, once established, the PTA/PTE has little power over the operator. This can lead to damaging competition with buses, high fares, poor conditions of service, and other problems. It is important to lay the cause of this at the door of deregulation rather than privatisation of public transport. Only in London does a single body have control over services, fares and information.
9. In England, minimising calls on the public purse, and minimising risk, is implicitly the main priority in the way LR is developed. This is not just a central Government position. A survey of local authorities in 1990 found a majority in favour of private sector involvement in public transport provision.² Provision of the optimum public service to serve wider economic, social or environmental objectives is stated in the rhetoric, but does not drive the development of LR, as apparently is the case in France. This reflects a deep-seated difference between Britain's attitude to public transport and that in most of the rest of Europe.
10. Metro development is rarely discussed outside the London context. The English LR schemes are not just seen as cheaper, but better in that they provide better city centre access.
11. LR in English cities is in most cases perceived as a suburb to city centre facility. This is particularly so for those systems that have relied on conversion of heavy rail routes (all except Sheffield). This contrasts starkly with many European tram systems, which link and serve city neighbourhoods with more frequent and convenient stops.
12. This means that LR is often operating at relatively high speeds with infrequent stops, and hence signalling is required, unlike in France. Planned extensions to French schemes involving running over ex-rail lines in Lyon and Montpellier may, however, require signalling.

² Local Transport Today, Issue 36, 1990.

4.2 The English Case Studies

The choice of English case studies was determined by the schemes already started. The four schemes are:

- Manchester (Metrolink)
- Sheffield (Supertram)
- West Midlands (Midland Metro)
- Croydon, Greater London (Tramlink)

All of these systems have plans for further expansion.

There is an important feature, which distinguishes English LR schemes from those in other countries. In most cases they have been designed to replace or upgrade former heavy rail suburban to city centre routes. The exception to this is Sheffield, where much of the system is street running. While such arrangements are not unknown elsewhere (Karlsruhe being a notable example in Germany), the English systems rarely have the intensely "urban" character of street trams in cities such as Amsterdam, Milan or Zürich.

This feature of the English systems can be explained in two ways. First, it reflects the suburban city structure, in which city centre resident populations are relatively low (unlike most Continental cities), and suburban living produces relatively lengthy journeys into the city centre for work, shopping or other purposes. This pattern has been reinforced in recent decades with the outward movement of jobs, shopping and leisure facilities to suburban locations.

Second, the disappearance of traditional trams from British streets 40–60 years ago meant that people and (particularly) the traffic and rail authorities were extremely nervous about, and resistant to the idea of trams mixing with other traffic on the street. In some respects the LR that can be seen in England today resemble suburban railways that have somehow ventured into the streets. This is especially the case in Manchester, where even the traditional suburban railway platform heights are maintained even in the street running sections through the city centre. The overhead catenary also looks more like a heavy rail installation, and has attracted a lot of criticism for the visual intrusion on the street scene. Similar catenary, also criticised, can be found in Sweden.

The following are suggested differences between the English LR systems and traditional urban trams.

Suburban LR (England)

- Relatively long routes
- Serve relatively low population densities
- Widely-spaced stops
- Elaborate "stations" rather than informal stops
- Likely to serve mainly city centre trips, especially for work

Traditional urban tramways (exemplified in Amsterdam, Milan and Zürich)

- Routes contained within high density built up city area (not remote suburbs)
- Serve high density development throughout
- Frequent stops (akin to bus stop frequencies rather than rail)
- Informal or simple stop infrastructure
- Serve intra-neighbourhood as well as city-centre trips, and for all trip purposes, not just work

Apart from the four case study systems described in this report, two other systems have been operating since the 1980's. These are the Tyne and Wear Metro (Newcastle-upon-Tyne) and Docklands Light Railway in London, but neither of these have street operation or sit very neatly in the category of LR as discussed in this project. For example, the Tyne and Wear system can better be described as a Metro system that happens to use lighter equipment, while the DLR has unconventional third rail power supply making it incompatible with street running or with other LR. Both systems have fully segregated track and tunnel sections in the city centre.

Finally, a mention must be made of the Blackpool tram system. This is a significant survivor from the first tram era, with a certain amount of street running, and (very) traditional style trams. There are plans to upgrade and expand this system to modern LR. But at present it operates primarily as a tourist facility, taking day-trippers and holidaymakers up and down the seafront in historic trams. The only other light rail systems in England are either tram museums or light steam railways.³

³ In Britain the term "light railway" has a legal meaning and denotes railways that have less stringent requirements in terms of physical segregation, signalling, crossing protection, standard of track, and so on. Even so, the design and operational requirements are rigorously checked by the Railway Inspectorate, a procedure that frequently exposes conflict with design aspirations. In France also LR or tram is a rail mode which means for instance that taxis are forbidden to use LR lanes. In Sweden a tramway is legally not a railway.

Table 1 *British cities in which light rail schemes have been implemented, planned or studied since 1989. Position at 2001. (A study of light rail schemes in 1991 by Halcrow Fox Associates concluded that only 12 schemes were likely to prove viable in terms of the current funding and planning criteria).*

Avon (Bristol area)
 Barking (London)
 Bedford
 Blackpool
 Brighton
 Cambridge
 Cardiff
 Chelmsford
 Chester
 Cleveland
 Coventry
 Croydon (opened)
 Dartford/Gravesend
 Edinburgh
 Hull
 Isle of Sheppey
 Lancaster
 Leeds (being planned)
 Liverpool
 London Alexandra Palace
 London cross-river line
 London Greenwich-Woolwich
 London Docklands Light Railway
 Maidstone/Medway
 Margate
 Nottingham (under construction)
 Portishead
 Portsmouth (being planned)
 Preston
 Sheffield (opened)
 Southampton
 Strathclyde (Glasgow)
 Tyne and Wear (opened)
 Tyne and Wear Sunderland (being planned, first proposed 1989)
 West Midlands (opened)

4.3 Cost comparisons

Table 2 below shows variations in the cost of schemes, but the lower cost of light rail compared to heavy rail and underground metro systems.

Table 2 PTE Group Light Rail Systems: Capital Costs For Existing and Proposed Light Rail Lines⁴ (French data from the French section of this report). The costs relate to all infrastructure and rolling stock costs, planning and related costs for for instance land purchase. Please note that price bases vary.

System	Line/extension	Year Open	Route Length Km	Capital cost GBP M	Capital cost GBP M/km
Tyne and Wear Metro	Initial system	1980	55,0	284	5,2
	Airport extension	1991	3,5	12	3,4
	Sunderland extension	2002	19,2	101	5,3
Docklands Light Railway	Initial system	1987	12,0	77	6,4
	Bank extension	1991	1,5	276	184
	Beckton extension	1994	8,0	280	35,0
	Lewisham extension	1999	4,5	140	31,1
Manchester Metrolink	Initial system	1992	30,9	145	4,7
	Salford Quays/Eccles	2000	7,5	85	11,3
	Oldham Rochdale ext.	2002?	24,0	115	4,8
	Airport/Wythenshawe ext	2003?	21,0	145	6,9
	East Didsbury ext	2004	10,0	80	8,0
	Trafford Park ext	?	7,0	55	7,9
	East Manchester ext	2002?	10,0	100	10,0
South Yorkshire Supertram	Initial system	1994	29,0	240	8,3
Midland Metro	Initial system	1999	20,4	145	7,1
	Snow Hill-Fiveways ext	?	?	?	–
	Wednesbury-Merry Hill ext	?	?	?	–
Croydon Tramlink	Initial system	1999	28,0	200	7,1
Lyon	Initial system	2000	19,0	350 M €	18 M €
Marseille	Extensions to open	2006	16,0	305 M €	19 M €
Montpellier	Initial system	2000	15,0	350 M €	23 M €

Metro systems for comparison

Toulouse	Metro line B		13	523	64,7
Turin	Metro extension		9	442	78,8
Paris	Metro – Meteor		9	706	117,6
Singapore	Metro NE line		20	2 118	169,4
London	Jubilee Line Extension		16	3 600	225,0

⁴ Evidence by Passenger Transport Executive Group and Scott McIntosh to the House of Commons Select Committee inquiry, Eighth Report Session 1999–2000.

5 UK Public Transport organisation

5.1 Organisational structures

The main point of interest for observers in other countries is Britain's use of privatised public transport. The general impression is that while the rest of Europe has been giving priority to increasing the role played by public transport by improving its quantity and quality, Britain has been obsessed with reducing costs, in many instances with disastrous consequences for the quality of services, their ability to limit growth in car use, and the safety of passengers.

The context in which public transport has shifted from being almost entirely in public hands (until 1985), to being almost entirely in private hands today, is bound up with a major change in the British political landscape. For the Conservative government, public transport was a political liability, an unwanted drain on public finances, and a remaining bastion of unionised labour which was able, and often willing, to "hold the country to ransom" in pursuit of wage claims and conditions of service. Privatisation was therefore seen as the answer. The loss of public control of public transport and the potential consequences for disintegration within the sector and between the sector and other urban and environmental objectives was seen as a small price to pay, if indeed it was recognised at all. The privatisation and deregulation of bus services (1986) under prime minister Margaret Thatcher, was followed by rail privatisation under her successor, John Major, in 1997.

When Labour was swept to power in 1997, it was widely assumed that public transport would, to some degree, be brought back under public control. Apart from some further regulation of the private sector rail companies, and some tentative moves towards local authority involvement in bus service operation, this has not happened. New Labour has been content to continue with an attitude to public transport that was a feature of the "Thatcher revolution", namely that the private sector is the best means of providing investment, and of delivering services.

The reason for this is straightforward, even if not fully accepted by traditional Labour supporters: the political success of "New Labour" has been underpinned by its ability to woo financial and business interests (as usually represented by "the City"). This it has done *inter alia* by promoting private sector involvement in the delivery of public services (health, schools as well as transport). New Labour may have adopted a more pro-public transport stance in its urban transport policies than the Conservative government, but it has embraced privatisation as the means of delivery. In this respect New Labour now occupies the political territory once occupied by the Conservatives, which goes more than a small way towards explaining the unprecedented second defeat of the Conservatives in 2001.

The position is highlighted by an article in the August 2001 issue of the magazine "Director". A leading investment commentator Malcolm Craig wrote:

*"My tip of the month is W S Atkins.... The group makes good profits from the Government's private finance initiative (PFI) and Labour's penchant for PFI contracts is increasing. Under the Conservatives, only 50 such deals were signed over 5 years. Labour has so far clinched 300 deals worth GBP 9,5 billion, and is now back in office promising an extra 100 hospitals and 3,000 surgeries by 2010."*⁵

The Government's 10 year transport plan (issued in 1999), envisages a total investment of GBP 180 billion over 10 years. The plan says: "Public and private partnerships, in different forms, will provide the funding for delivering much of this modernisation programme, harnessing private sector finance and disciplines to public objectives. This partnership is central to the new approach of the 10 Year Plan."⁶

Unlike in France, the private public transport operators have been able to reduce, or at least hold down, wage levels and labour costs as a means of boosting profits or offering lower bid prices to win contracts. While the Government has valued the "success" of privatisation in reducing public transport losses, and hence reducing the call on the public purse, these gains may not be permanent. It must be remembered that much of the experience with privatised local transport services has been during an era (up to the mid 1990's) in which the economy was relatively weak, unemployment relatively high, and expansion of public transport generally low on the political agenda. Things have changed in recent years. A shift of emphasis in transport policy now envisages significant expansion of local public transport (a target increase in light rail patronage of 100 %, and a target increase of 10 % patronage of buses, in the next 10 years). The economy is now stronger, and more stable, and unemployment is at its lowest level for 20 years. As a consequence, public transport operators are finding it difficult to recruit and retain staff at the low wage levels that they have worked with to date. In the long run this may lead to either a decline in the level of service provided, or to increasing demands for public subsidy. Already, some bus companies are cutting back bus services that they claim are not commercially viable unless local authorities take on the financing of them on the grounds that they are "socially necessary". In addition, the tender prices of such social bus services are reported to be increasing.

Reports in a recent issue of "Transit" magazine clearly illustrate how Stagecoach is already experiencing this problem.⁷ In one article, Stagecoach chairman complains that a "lack of drivers is blocking plans to boost bus frequencies". A second article about Supertram, also operated by Stagecoach, points out that a reduction of operating losses has been achieved partly due to reduced labour costs. The average "unit cost" of Supertram operating staff is a mere GBP 12 000 per year (i.e. wages and employer tax and insurance obligations for employees) which as the magazine comments "is unlikely to be sustainable in the long term".

⁵ Quoted in "The Guardian", August 18th, 2001.

⁶ Department of the Environment, Transport and the Regions, 2000, "Transport 2010: The 10 Year Plan".

⁷ Transit, No. 159, June 8th 2001.

5.2 PTA and PTE structure in UK

All the light rail schemes studied here were promoted by the Passenger Transport Executives and local authorities for their respective areas. It is therefore appropriate to set out the structure and purpose of these authorities.

The PTA/PTE structure was first established by the Transport Act 1968 as a means of securing better integration of passenger transport in the major conurbations, six in England and one in Scotland. London Transport was a long established body doing the same job in London, although had never included control over surface (national) rail serving the London area.

They have survived both the creation and the abolition of conurbation authorities, but their powers and influence have suffered, especially since the privatisation of public transport, and in particular the deregulation of bus services. This means that integration often has to rely on voluntary co-operation of the private operators. This is not always forthcoming – for example no system map exists of public transport in Glasgow. Planning in these circumstances also is difficult and uncertain, with local authorities unable to provide assurance to investors and developers as to what services can be provided, at what date, and at what price or quality.

The Passenger Transport Authority is the body established to assess the public transport needs of the county and make policy decisions about public transport provision. It is made up of elected representatives of the local authorities within the conurbation. The Authority also provides finance for the Passenger Transport Executive (PTE). The PTE is responsible for securing and promoting the best possible public transport network for the area. In addition to procuring socially necessary non-commercial bus services it specifies, through franchise agreements with train operating companies, all local train services and their fares. It also manages concessionary fares arrangements, the provision of local public transport information and the bus service infrastructure, including bus stations and stops. It contributes toward the development of bus/rail interchange facilities.

The PTEs do not operate services themselves, and their influence over service levels and fares is limited, unless co-operation with private companies can be secured. For example, this limitation is reflected in the wording of the objectives of the South Yorkshire PTE (my emphasis):

- **Maximising** use of the public transport network by improved publicity and information, the provision of better facilities (interchanges, bus and local rail stations), concessionary fares schemes, and attention to public transport safety;
- **Encouraging** expansion of the public transport network. This includes promoting new transport systems, and cultivating the relationship with highway development, traffic management, and land use planning bodies;
- Providing necessary services not met by commercial operators. This means **securing** tendered bus services, **supporting** local rail services, and **assisting** people with limited mobility to get around.

5.3 London organisational structure

London differs from the rest of the UK since it was exempted from the bus deregulation that took place in 1986. London Regional Transport was created when London Transport was re-nationalised by the conservative Government in 1984.

Under the London Regional Transport Act of 1984 London Regional Transport has statutory duties to provide or secure public transport services in London with due regard for efficiency, economy and safety of operation. London Transport procures bus services throughout London through tendered contracts with private operators which specify route, frequencies and fares and operates the Underground sub-surface and deep "tube" trains through its subsidiary company, London Underground Ltd.

In 2000 London Transport again came under the control of a London-wide elected authority, the newly created Greater London Authority, and its executive body "Transport for London". However, the Underground system will not be transferred until later, due to the immensely controversial issue of its future ownership and management involving the private sector.

5.4 Government Policy, and recent changes

Enthusiasm for trams or light rail was never strong in Britain. The first wave of construction during the late nineteenth century and early twentieth century produced electric tramways in virtually every town and city, and these were very influential in the structuring and encouragement of a rapid outward spread of urban development. But the systems were often poorly planned and fragmented. The various privately built lines in London were notoriously unconnected, for example.

Motor traffic quickly gained priority, both cars and buses, and the obstruction to this traffic caused by the tramways was perceived as sufficiently serious to warrant the death sentence. After the Second World War, most local authorities (who had in most cases taken over tramways in their areas) decided that rather than repair the damage and neglect of the war years, it was better to scrap the trams and replace them with buses. So it was that all the systems disappeared by around 1960.

The bus was seen as more flexible, and more compatible with city traffic. Electric traction survived in many places by replacement of trams with trolley-buses, which had the merit of being able to draw into the kerb, and to pass vehicles that otherwise would obstruct a tram.

Anti-tram attitudes became very ingrained in traffic planning circles, and were completely and probably deliberately oblivious to the tramway improvements taking place in Germany and other continental countries.

It was not until the late 1970's that light rail (as opposed to tram) began to enter the consciousness of transport planners. The Tyne and Wear metro was the first system to be built, and this only just managed to get approval before a complete moratorium was placed on the development of such schemes by the Thatcher government elected in 1979. So firmly against such schemes was this administration that they even cancelled the "after" studies phase of the research programme covering the impact of the Tyne and Wear metro.

The Docklands Light Rail was very instrumental in a fundamental change of attitude. The Conservative government was keen to demonstrate its ability to

regenerate London's Docklands, which had lain mostly derelict for more than 15 years. The idea was to import North American concepts of urban regeneration, which basically amounted to removing planning controls and allowing the private sector to do as it wished. This model carried with it the slight difficulty that the private sector was completely uninterested in taking the enormous financial risks involved in developing difficult industrial land without any public transport or road infrastructure. So the Government had to break with its ideology sufficiently to invest public money to connect the Isle of Dogs "Enterprise Zone" to the rest of London with new roads and rail. Thus the Docklands Light Rail was conceived as the cheapest answer to providing enough public transport capacity to make the initial developers feel secure. In total it is estimated that around GBP 400m of public money was invested in Isle of Dogs transport infrastructure, at mid-1980's prices. Docklands Light Rail accounted for about a fifth of this.

Having "broken the myth", a string of light rail proposals were studied and promoted during the late 1980's and early 1990's. In 1989 there were about 50 towns and cities with schemes under consideration. Most of these fell a long way short of any convincing case for public investment, let alone commercial viability. During the 1990's and opening months of the new millennium four serious schemes were developed and completed, namely the four case study schemes included in this report.

The return of a Labour government in 1997 produced great hopes for a more sympathetic attitude towards light rail, hopes that were quickly dashed by Labour's transport White Paper of 1998. This policy statement argued that priority would be given to the development of bus systems, which could deliver improvements to a larger number of people more quickly and at lower cost. However, this position changed following a Government review of public spending in March 2000, and a "step change" in transport funding was included in the government's 10 year transport plan of July the same year.

With the promise of a real increase in transport investment, and a more positive support for light rail from the government, local authorities once again dusted off their plans for new light rail schemes. In 2000 there were more than 25 schemes and extensions under active consideration.

5.5 Procedures – Transport Act S56; Privatisation and deregulation

The Legislation Process

Until 1992 Light Rapid Transit schemes in the UK generally required the authority of an Act of Parliament. This is in contrast to, say, highway schemes which require conventional planning permission and associated orders for the compulsory purchase of land. Furthermore, unlike conventional bus services all rail and Light Rapid Transit systems (including Guided busways) have to meet the requirements of Her Majesty's Railway Inspectorate (HMRI).

For the four stages of the Docklands Light Railway and for Croydon Tramlink, London Transport promoted private Bills. Although all these projects were of broadly similar nature and complexity the time taken for the Bill to be enacted varied considerably as shown in Table 3 below. This created uncertainty over the timing of the project and meant that it was difficult to proceed with, for example, the tendering process, until the parliamentary process was nearing completion.

Table 3 *Parliamentary procedure times.*

Project	Bill Deposited	Royal Assent	Period
DLR Initial Railway	November 1982	April 1984	17 months
DLR City Extension	November 1985	December 1986	13 months
DLR Beckton Extension	November 1986	July 1989	32 months
DLR Lewisham Extension	November 1990	May 1993	30 months
Croydon Tramlink	November 1991	July 1994	32 months

From 1984 onwards there was a sharp increase in the amount of parliamentary business taken up by contentious private railway Bills generated by, amongst others, London Transport. The system began to attract criticism from both houses of Parliament, due to the increased time members of both Houses were required to spend and also the amount of parliamentary time being taken up by debates on the floor of both Houses.

Accordingly, the Joint Committee on Private Bill Procedure was established by Parliament in 1987 to look into the private bill procedure. The Committee concluded that private bills were no longer the appropriate mechanism and recommended that a system be established outside Parliament requiring public local inquiries to be held. Power was to be conferred upon a Minister to make an Order, which would broadly have the same effect as an Act of Parliament.

Accordingly the legislative process for all such projects was changed with the enactment of the Transport and Works Act 1992 ("the 1992 Act"). The system of promoting rail schemes by private Bill was replaced by a system of Ministerial Orders, made following the successful completion by an applicant of a number of procedural steps which may include the holding of a public local inquiry into the application. The granting of planning permission became part of the overall process leading to the making of an Order.

It had been hoped that the new procedure would shorten the process and reduce uncertainty. Unfortunately it is not clear that this has been the case. For example the order for a heavy rail extension scheme in London (East London Line) took 38 months, more than any of the schemes in the table above.

In addition there are a number of other hurdles that have to be cleared before a LR scheme can go ahead. In summary these are:

- Transport and Works Act orders to be approved (see above for details)
- Section 56 (Transport Act 1968) criteria must be met to achieve Government Grant (see tables of S56 criteria and typical cost benefit analysis)
- New Approach to Transport Appraisal, showing impacts in terms of Economy, Access, Environment, Safety and Integration.
- Private Finance Initiative "test" in Local Transport Plans, to satisfy Government that private sector funding has been sought with sufficient vigour.

5.6 Funding criteria

In general, and outside London where London Transport have responsibility for public transport, it is for local authorities to determine the role which light rapid transit should play in meeting the transport needs in their areas. Because of the relatively high cost of such systems, and the fact that they cannot generally be built and operated on a commercial basis, local authorities require funding from the DETR for such projects. Grant is available from the Department under section 56 of the Transport Act 1968 and, more recently, from funding provided to support the local authority Private Finance Initiative. European funding is available in certain areas where there is a social or economic regeneration priority.

Applications for funding for light rapid transit systems are subject to appraisal to establish that they represent good value for money for the taxpayer. This appraisal ensures that transit systems can bring wider benefits, particularly in terms of reduced congestion, which cannot be captured in revenue from the operation of the system, and that they contribute to the achievement of the Government's overall transport objectives. Government contributions are in recognition of these wider benefits, and do not reflect any benefits to users themselves, which are intended to be represented by the fares paid by users.

For the past 15 years, each light rail project in England has been developed individually with each promoter evaluating the funding and procurement options in discussion and negotiation with central Government. This has often taken several years and has resulted in projects being developed with different funding arrangements and different forms of contract.⁸ The cost of consultancy input alone has been substantial. It has been argued by the PTEs that a common approach to funding and procurement of LRT systems in the UK would significantly reduce the risks and the timescales associated with scheme development and hence reduce the overall project costs.

Tables 4 and 5 below show, respectively, the nine steps involved in a Section 56 appraisal, and the typical format of a cost-benefit appraisal using dummy figures. From 1989, Section 56 grants were available only for the non-user benefits of a scheme. User (passenger) benefits were expected to be fully reflected in the fare revenues.

However, the British Government has recently introduced a new form of appraisal aimed at evaluating all transport projects (road and rail) on an equal footing. This "New Approach to Transport Appraisal" (NATA) has five criteria, which are assessed by quantitative means where possible, but also by qualitative means. The five criteria are:

- Environment
- Safety
- Economy
- Accessibility
- Integration

⁸ For example, the length of private contracts varies considerably: Metrolink 15 years; Midland Metro 23 years, Croydon Tramlink 99 years.

Table 4 *Section 56 Grant – The Nine Stages of Judgement.*

1	Local Public Transport	Show that the project will achieve a substantial improvement in local transport facilities
2	Local Funding	Provide exceptional reasons why service users and local Council Tax payers should not meet all the costs
3	Achievement of Objectives	Demonstrate that the scheme is the most cost-effective way of achieving the desired objectives
4	Rate of Return	Show that the project fails to earn a commercial rate of return (currently 8 %)
5	Revenue Potential	Demonstrate that revenue potential has been optimised, taking account of market prices and the potential for premium fares
6	Need for Subsidy	Cost and revenue predictions must show that the service can be provided without any operating subsidy
7	Private Sector Role	Demonstrate that every reasonable effort has been made to attract private sector contributions
8	Non User Benefits	Show that the total value of non-user benefits exceeds the total amount of public sector grant sought
9	Other Funding	Secure the necessary funds or credit approvals to complement the grant

Source: Local Transport Today, Issue 187, 31 August 1995

Table 5 Full Cost Benefit Appraisal.

The typical format of a full cost benefit appraisal is shown below, using illustrative figures. It has not been possible to obtain an example from the schemes which have been implemented, these figures are not in the public domain.

COSTS		Net present value (GBP million)
A	Capital Costs	(70)
B	Total Operating Costs	(35)
C	Total Costs (A + B)	(105)
BENEFITS		
Transport User Benefits		
D	Time Savings	40
E	Car Operating Cost Savings	6
F	Bus Operating Cost Savings	15
G	User Accident Cost Savings	5
Transport Non-User Benefits		
H	Road User Time and Cost Savings	80
I	Non-user Accident Cost Savings	2
J	Mobility Impaired Benefits	0,2
K	Disbenefits during Construction	(0,2)
L	Highway Works Savings	0,5
M	Regeneration/Employment Benefits	4
N	Pollution Reduction Benefits	2
O	Induced Traffic Effects	(6)
P	Total Benefits (sum of D to O)	148
Q	Net Benefits (P-C)	43
R	Full Benefit-Cost Ratio (P/C)	1,41
S	Operating revenue	40

Operating revenue (line S) should normally be greater than operating costs (line B) if schemes are to be funded.

6.1.2 Motivation for Light Rail

The origins of Metrolink go back to the mid 1980's when the Authority carried out a review of the role of the local rail network. At the time, the situation was characterised by:

- a rising deficit and deteriorating performance of the services;
- the prospect of substantial capital investment in new rolling stock and signalling to keep the services running in the future;
- inability to attract more passengers to the network – especially from the car – because of the peripheral location of the main stations at the edges of central Manchester and other conurbation centres.

A wide range of options for the future of the network was considered which included:

- reviving plans to build a tunnel under central Manchester;
- conversion to LRT with a tunnel in central Manchester;
- conversion of the lines to LRT operation with surface links in the city centre (the eventual choice);
- conversion to either a guided or an unguided busway;
- retaining the existing lines with further investment but no central area links;
- complete closure.

Conversion of the suburban rail lines to LR, and connecting them via street running sections through the city centre, was decided as the most cost-effective option.



Former heavy rail station at Altrincham. Photo: Tim Pharoah.

6.1.3 Planning, Organisation and Funding

Funding in the main was provided by Government and the PTA with a significant contribution from European Union sources. Metrolink also had a contribution from the private sector. While this was not unknown elsewhere (the Docklands Light Railway received private sector contributions from property developers, for examples), this was the first venture into *operating* railways by the private sector. Consequently the value of this benefit was limited to GBP 5 million because of the perceived risks.

When cost-overruns emerged in 1992, Greater Manchester Metrolink Limited attempted to recoup these costs from the PTE, arguing that they had been caused

by factors outside their control. Matters were eased considerably by the award of a European grant.

The structure of the private sector franchise contracts in Manchester is such that each time a new line or extension is built, the franchise has to be re-negotiated. This is to enable a single operator to take over the entire system (to avoid tendering separately for the extension, and so running the risk of ending up with different operators seeking joint use of track etc.). This is seen as rather cumbersome, and in Liverpool, for example, attempts are being made to secure a contract at the outset for the proposed 3 new lines, even though design, approval and funding for lines 2 and 3 are a very long way from being finalised.

The Manchester Metrolink is due to be extended considerably (see details in the table). In 2001 GMPTE⁹ shortlisted four consortia to be invited to bid for the Metrolink single contract. From the award of the contract, the new Metrolink concessionaire will assume responsibility for the existing lines between Bury and Altrincham and between Manchester and Eccles and will design, build, operate and maintain (DBOM) the three extensions to Rochdale and Oldham, Manchester Airport and Ashton-under-Lyne. Subject to private sector funding, the contract may also include the extension to the Trafford Centre. It is intended that the concessionaire for this greatly enlarged system will be appointed in autumn 2002.

The Eccles extension is already completed. It gained Transport & Works Act planning permission in September 1996. GMPTE raised the money for construction from the GMPTA, European Regional Development Fund and Department of Environment Capital Challenge. The public sector costs were estimated at GBP 52,6M, including ERDF GBP 9,8M. GBP 77,8M of the cost, however, was raised from the private sector, namely Altram, who receive the revenues not only from the Eccles line, but also from the existing lines, thanks to Altram's 17 year contract to run the entire system.

Metrolink forecast maximum patronage of 12 million. 7,5 million annual trips were made on the two heavy rail lines that were converted to Metrolink.

Actual ridership figures for the whole system were:

Year 1 – 8 M (92/93)	
Year 2 – 11 M	
Year 3 – 12 M	
Year 4 – 13 M	
Year 5 – 13 M	
Year 6 – 14 M	
Year 7 – 13 M	
Year 8 – 14 M	(about 40 000/day)

Passenger kilometres (as opposed to trips) have tripled since Year 1: from 53M to 153 M in 1999/2000. However, the proportion of (longer) trips to the city centre has been lower than expected, so that passenger kilometres travelled have been lower than the original forecast.

Although conceived primarily as a city centre commuter service, the particular success of Metrolink has been for off peak travel. This is also reflected in the fact that 35 % of Metrolink trips are within the corridors (i.e. without origin or destination in the city centre). It is estimated that 3 % of car trips within the corridors have switched to Metrolink.

⁹ Greater Manchester Passenger Transport Executive

In 1999 the Government approved a GBP 500m extension package for lines to Rochdale, Ashton-Under-Lyne and Manchester Airport, and agreed to contribute GBP 250m, with the balance to be met by local authorities and the private sector. A final long-term network of 100 km is envisaged, including a link it to the Trafford Park out-of-town regional shopping mall.

6.1.4 Relation to land use, regeneration and aesthetics

The original network was not seen in terms of land use development. It was a solution to a transport problem. The stations on the former suburban rail lines to Bury and Altrincham which have now been converted to light rail are still suburban rail stations, often poorly related to the districts they serve, and without modern facilities or appearance. This failure to integrate the light rail stations with their catchment areas is one of the most disappointing features of the Manchester Metrolink, and is a further expression of how the system has followed a low-cost model.

Later extensions (including the already completed Eccles extension) have been more closely tied to urban regeneration. This is now emphasised more positively, perhaps in part because this improves the chances of funding through the European Regional Development Fund (ERDF). For example, it is claimed that the planned extensions of Metrolink will increase the region's GDP by GBP 259 m and create 6 650 jobs.

In the view of most observers, aesthetics were not given any priority in Manchester. Little effort was made to minimise the visual impact of the infrastructure of the street running sections in central Manchester (e.g. catenary is supported mostly on unsightly poles rather than secured to buildings, because neither the time nor effort was expended on negotiating with building owners). The design of the system was severely criticised by the (then) Royal Fine Arts Commission.

In addition, no serious attempt was made to use the opportunity of light rail construction to improve the environment of streets through which it passes.



Unsightly infrastructure in Manchester city centre. Photo: Tim Pharoad.

6.1.5 Conclusion

The great success of Metrolink in terms of its relation to planning is the way in which it has provided direct access into the city centre, thereby cutting out for many people the need to walk considerable distances from rail termini at the periphery of the city centre. The same benefits will be conferred on some of the towns to be served by future extensions, notably Oldham and Rochdale.

Other lessons that can be learnt from Manchester Metrolink include:

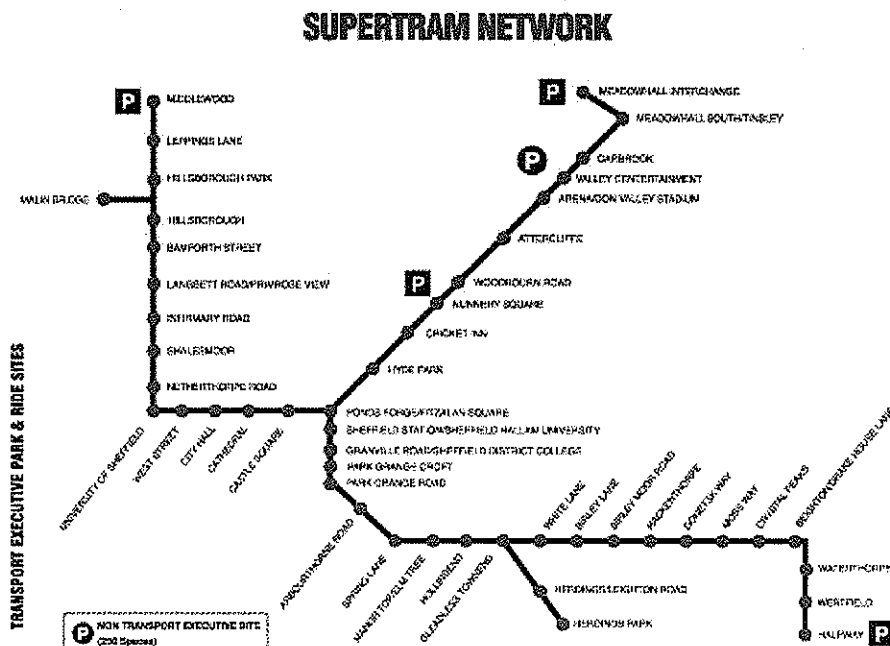
- Private sector finance can be encouraged to fund LRT, where a clear business case is evident;
- Light rail is perceived as a superior form of travel to the previous heavy rail;
- Design and quality may be compromised by an over-reliance on commercial considerations within the private sector;
- Certain revenue and other data are no longer publicly available since commercial risk has passed to the operator. (i.e. GMPTE who are responsible for integrating transport in Greater Manchester do not have full information on which to plan.).

6.2 Sheffield

6.2.1 The city context

Over the last three decades, Sheffield has seen a major change in its economic base from heavy steel to service and light manufacturing industries. This transition has been slow and there are still areas of the city in need of re-development, a task assisted by the Sheffield Development Corporation.

Sheffield has a population of about half a million people, but it forms part of the South Yorkshire conurbation with a population of 1,3 million.



Sheffield supertram network.

6.2.2 Motivation for Light Rail

A major transport study in the 1970's¹⁰ recommended that a fast, efficient, high quality public transport system should be considered, and this was followed by feasibility studies during the 1980's. Light rail was perceived as the mode most likely to attract car owners, whilst being more affordable than heavy rail systems.

6.2.3 Planning, Organisation and Funding

During 1989 a project team was formed with the appointment of a Chief Executive to South Yorkshire Supertram Limited (SYSL) a wholly owned subsidiary of SYPTE. In addition to SYPTE and SYSL the project team consisted of project managers and specialist consulting engineers.

Also during 1989 the Lower Don Valley line Bill received Royal Assent. There was a continuing dialogue with the DoT¹¹ on the financial and economic case for the project and the project team refined the estimates and progressed selection of the design and build contractor for the infrastructure and the rolling stock. By the end of 1990 financial approval for the project was given by the Department of Transport.

The approval was conditional on SYPTE meeting a number of conditions in order to secure the DoT grant under Section 56 of the Transport Act 1968. One of the major conditions was the undertaking that the operation would be privatised and the sale proceeds used to fund part of the capital cost. In order to meet the requirement the SYPTE set up two companies South Yorkshire Light Rail (SYLR) and SYSL. SYSL the operating company would be privatised.

The funding of the project was on the basis of a design and build (DB) contract. The operations and maintenance were separated to a wholly owned subsidiary of SYPTE with a view to privatising the operations later once a trading record had been established. This funding method was different to Manchester which was on a design, build, operate and maintain (DBOM) basis as one contract.

During 1991 contracts were placed with Balfour Beatty for the infrastructure and Siemens for the rolling stock, and construction was completed in October 1995.

For the first 3 years the system was operated by the (public sector) South Yorkshire Passenger Transport Executive (SYPTE). Funding problems of one kind or another have been reported since early planning in 1992. In 1996 it became clear that the local authorities were in debt, with Supertram losing GBP 4 m in the first 9 months of operation. It was privatised in 1997 when Stagecoach won the 26-year operating franchise. A year later, debts were reported, the sale not having raised sufficient funds to service the capital debt. Government reluctance to bail out the local authorities was resolved later by directing the SYPTE to become a "centre of excellence" for integrated services as a condition of resolving the debt.

Ridership has not met expectations. Original forecasts of 17–22 M passengers per year were subsequently revised to 12 M at the time of privatisation (1997).

¹⁰ South Yorkshire Transport and Land Use Study, MVA, 1976.

¹¹ DoT was the (central Government) Department of Transport, subsequently to become the DETR (Department of Environment, Transport and the Regions) and, in 2001, DTLR (Department of Transport, Local government and the Regions).

Actual ridership has risen from just over 5,3 M in the first year of full operation to nearly 11 M by 2000 (about 30 000 per day).

The general view is that the fortunes of Supertram have improved since privatisation. The private operators, Stagecoach, have improved the convenience and competitiveness of the system, for example by replacing station ticket machines with tram conductors, and by introducing a cheap "day rider" ticket. They are also proposing an extension to the system, which, it is claimed, will add passenger revenues for a relatively small increase in operating costs.

Nevertheless, the system suffers considerably from open competition from the bus services and no public organisation has the power to integrate the two. At the planning stage the claims that people would switch to the tram in large numbers and would pay a premium fare for the higher quality service were grossly over-optimistic. In the privatised and de-regulated bus environment, the bus companies have been able to compete successfully with the tram for the following reasons:

- Running times of trams on the street sections are little faster than competing buses
- In some cases bus routes are more direct than the tram, and bus operators can provide faster journey times.
- The tram has higher fares than competing buses. This is never the case in France where all urban transport modes share the same tariff.
- The trams have fewer stops than competing buses, and in some cases stops are less conveniently located

The deregulated bus system means that the operators of Supertram (Stagecoach) are in open competition with buses, and no public organisation has the power to integrate the two.

The following problems after the opening of Supertram were reported by SYPTE

- Land use changes leading to lower density residential developments on parts of the route;
- Negative local media due to the construction disruption;
- Poor financial performance due to patronage shortfalls against the original forecasts;
- Passengers unwilling to pay the premium fares (originally set 25–45 % higher than the bus fares);
- Higher than expected bus frequencies on competing routes, and lower overall demand due to job losses in the area;
- Initially poor traffic priorities leading to longer than forecast journey times and poor punctuality;
- Disruption during construction on the street sections (50 % of the Sheffield system);
- Resolving financial and funding problems and the privatisation of the operation; and
- Low level of economic activity along the route particularly in the city centre.

6.2.4 Relation to land use, regeneration and aesthetics

Supertram has been regarded as a means of boosting the economic re-development of the area. Through the Lower Don Valley (the former steelworks area), for example, Supertram is said to have improved accessibility to commercial developments for both employees and customers and is usually featured in company brochures, which may help to attract investment. There is some evidence of new business locating close to Supertram routes.

In view of these regeneration aspirations, a study was undertaken of the impact of Supertram on land use development and economic regeneration.¹²

This study found that less than one third of the predicted extra 1 135 jobs had materialised. It concluded that the impact of Supertram on land use development and regeneration was small. "Road investment remains a far more significant factor in accounting for planning applications and development projects than fixed (transit) links". This conclusion mirrored almost exactly the conclusions of an earlier study of the impact of the Tyne and Wear Metro.¹³ Both cities introduced LR in the context of economic decline, low car ownership and high unemployment, and both found that LR was insufficient to make any identifiable impact on this overall economic situation.

Mention must be made of the planning policy for retail, leisure and other development during the period of the Conservative Government in the 1980's and 1990's. This basically allowed private sector investors freedom to build large out-of-town retail malls, leisure centres and "business parks" on the American model, serving huge catchment areas and relying almost exclusively on access by private car. One such in the Tyneside conurbation (not served by the new Metro system, but very confusingly named the "Metro Centre") had the potential to severely undermine the strength of the traditional city centres of Newcastle and Gateshead. The impact studies concluded that the Tyne and Wear Metro LR had, by providing much better accessibility to these centres, managed to strengthen their competitive position.

In Sheffield, a similar regional out-of-town shopping mall (Meadowhall) was similarly a major threat to the retail strength of Sheffield city centre, with the potential to take people and their spending power away from the city centre. It seems ironic that the first phase of the Supertram system was the line linking the city centre to Meadowhall. The reason for this was pragmatic in that the Meadowhall investors contributed to the cost of the Supertram. Nobody seemed to take seriously the possibility that Supertram might further encourage a shift of customers from the city centre to Meadowhall. Further Supertram routes which link other parts of Sheffield to the city centre are claimed to help redress the competitive balance. But the possibility that they, too, provide more help to Meadowhall than they do to the city centre has apparently not been fully investigated. There is cause for concern, however, since one of the services has been re-configured to provide a direct link to Meadowhall instead of having to change routes in the city centre. Even so, public transport remains the minority choice of mode to reach Meadowhall, as a MORI survey found in 2000 (see Table 6).

¹² Haywood, R, "South Yorkshire Supertram: Its Property Impacts and their Implications for Integrated Land Use - Transport Planning" in *Planning Policy and Research*, Vol 14, No. 3, pp277-299, 1999.

¹³ Robinson, F and Stokes, G, 1987, "Rapid Transit and Land Use: the Effects of the Tyne and Wear Metro", Centre for Urban and Regional Studies, University of Newcastle-Upon-Tyne.



Meadowhall regional shopping mall. Designed for car users. Served by tram, but the stop is not convenient. Photo: Tim Pharoah.

Table 6 *Mode of Travel to Meadowhall Regional Shopping Mall.*

Mode of Arrival	Number of respondents	% of respondents
Car	15 691	94
Tram, bus, train	1 059	6
Total	16 750	100
Reasons for choice of car		% of car users
More convenient		80 %
Quicker		64 %
Bulky shopping		30 %
Public transport too expensive		17 %
Other findings		
Study calculated that only 1.6 % of the population required public transport to reach out-of-town shopping		

Source: MORI, 2000

Table 7 *Results of survey of 3 070 Supertram users conducted in 1999.*

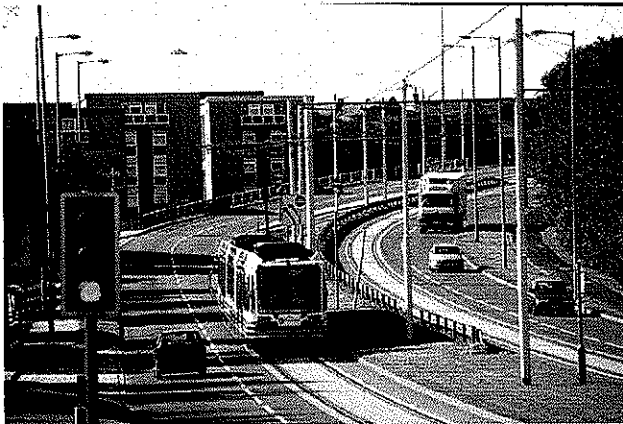
Q. Before you started using Supertram how did you make this journey?

	%
car driver	16,0
car passenger	6,3
Walk	6,6
Cycle	1,0
Bus	57,0
Train	1,5
Other	0,8
did not make the journey at all	9,0
no answer or multiple answer	1,8

Amongst the former car drivers 44 per cent were commuters.

6.2.5 Aesthetics and environment quality

The Supertram project has been used as means of upgrading the streetscape in areas through which it passes. The development of the route through the city centre has resulted in areas for pedestrians and trams only, with buses and service vehicles being restricted to limited parts of the street. Paving has been upgraded. A particular feature is that over 90 % of the supports for the overhead electrical system were placed on buildings to avoid the need to plant a significant number of poles in the city centre streets. Platform heights are also modest. This has resulted in much less intrusive infrastructure than in Manchester.



*Trams share dual carriageway with cars on main radial route.
Photo: Tim Pharoah.*

6.2.6 Conclusions

“At the moment, it is possible to argue that the (Supertram’s) principal benefit is in showing other people how not to develop light rail systems in the UK” (*Transit magazine*, 8th June 2001, page 10)

The experience in Sheffield is a reminder that over-optimistic forecasts, inadequate planning, and inability to control the land use and transport environment within which the system must operate are in combination likely to lead to failure.

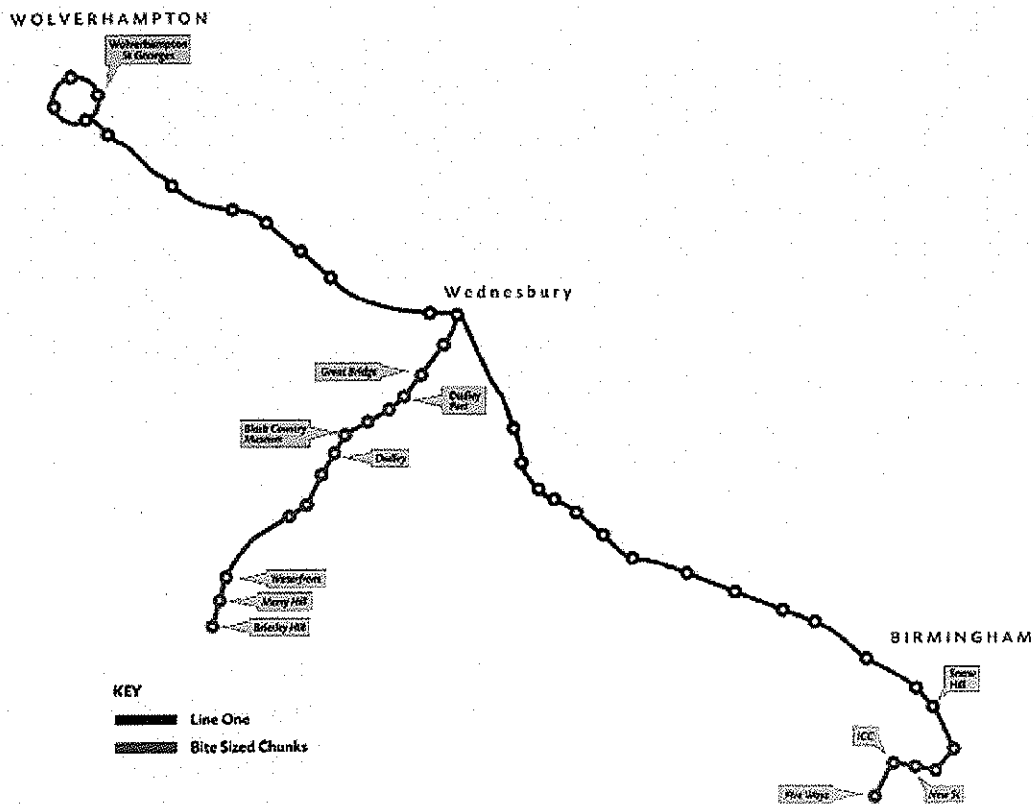
South Yorkshire authorities, in a desperate attempt to regenerate the economy following the major industrial decline of the 1970’s and 1980’s, allowed developments that are scattered, low density and with generous provision of road access and parking. The tram itself, even though street running in many places, has been routed to minimise disruption of general road traffic. In these circumstances, it is hardly surprising that the tram has been unable to provide a significant focus for regeneration, or to provide sufficient incentive for car users to switch to public transport.

6.3 West Midlands

6.3.1 The city context

The West Midlands County is home to 2,63 million people and 2,1 million people are employed in the area. The conurbation combines traditional heavy industry, including car, van and train manufacture, with office-based employment in a number of sub-regional centres. Although the West Midlands is at the heart of the

national motorway network, being served by the M5, M6 and M42 motorways, the roads in the region experience the highest levels of traffic congestion outside London. Environmental costs and poor air quality further compound the problems of traffic congestion for the local population. For many years, the West Midlands had been the largest conurbation in Europe without a light rapid transit system, and in the mid-1980's plans for a network of light rail lines began to be formulated.



West Midlands light rail.

6.3.2 Motivation for Light Rail

From the outset, a stated key objective for Midland Metro was to attract motorists out of their cars by providing a high quality, frequent and reliable form of public transport. Aspirations towards a high quality system were influenced by experience of the Grenoble tramway in France.

The concept of Midland Metro was developed by Centro and the West Midlands Passenger Transport Authority in response to an increasing demand for higher quality public transport and the improved mobility that it brings. The West Midlands conurbation was the largest without an urban metro or light rail system.

6.3.3 Planning, Organisation and Funding

The West Midlands Passenger Transport Authority comprises elected Councillors from the seven West Midlands local authorities and Centro is the Passenger Transport Executive that implements the transport policies set by the Authority.

Following parliamentary approval in 1991, an advertisement was placed in the European Community Official Journal inviting consortia to pre-qualify for

tendering for the project. At that time the system was hoped to extend over 100 km and the first Line 1 was targeted to open in 1994. In 1992 tenders were invited from a short list of three consortia and tenders returned in 1993 were subjected to rigorous assessment, which included an economic optimisation of the number of stops, service interval and number of trams required. Restrictions on the amount of section 56 grant available led to a delay in government funding being made available for the project. However, once the availability of government funding (in the form of grant and supplementary credit approval) was confirmed, a funding package of GBP 145 million was completed with the help of the European Union, Passenger Transport Authority and local authority funds. The successful tenderer also made a GBP 10 million financial contribution to the overall cost of the project in recognition of the value of the operating concession.

In August 1995 a 23 year concession was signed between Centro and Altram to Design, Build Operate and Maintain (DBOM) the 20km Line 1. A fixed price contract was agreed for virtually all the works. The "DBOM" form of contract provided for maximum risk transfer to the successful consortium and Centro was therefore protected from the majority of risks such as currency fluctuation, inflation, patronage levels, geotechnical/mining problems, planning risks and interface issues between consortium members. An example was the cost of a 10-month delay in opening being borne by Altram.

The involvement of Travel West Midlands as part of the winning consortium has helped to facilitate integration of bus routes and ticketing with the metro system. This highlights the "hit and miss" prospects for integration in the English de-regulated and privatised public transport environment.

Completion of the funding package, due to the lack of availability of Government funds, led to a delay of almost two years between the selection of the successful tenderer in 1993 and the award of the concession in 1995. The consortium itself had difficulties, with one of the original companies pulling-out before the concession was signed, incurring further delays while a replacement was sought.

Overall, the planning and funding history of Midland Metro is characterised by delay, indecision, and penny-pinching attitudes on the part of the public sector. It is a clear illustration of the slow and inefficient way in which public transport is planned in Britain. It is arguable, however, whether the main problems are due to over-reliance on the private sector, or to generally negative attitudes to public transport by central government.

Extensions currently planned, including street running through the centre of Birmingham to link with the main railway station (New Street), and an extension to the Merry Hill regional out-of-town shopping mall. More ambitious plans to create a larger network throughout the West Midlands have been explored but currently seem a long way from fruition.

6.3.4 Relation to land use, regeneration and aesthetics

Lack of certainty over funding resulted in a number of lost opportunities to capture developer contributions on Line 1 and other proposed lines.

Nevertheless, the system is perceived as a major asset in promoting regeneration. Centro have pressed the Government to include regeneration benefits as part of the quantified appraisal of transport schemes, in the expectation that this will help to justify future extensions of the system.

Some have argued, however, that restoring a conventional rail network (most of the route is on disused former heavy rail) could have offered different journey opportunities and wider benefits within the West Midlands, and help to overcome the region's lack of rail capacity. This could have been combined later with a light rail network based on the German shared track system used at Karlsruhe. Such an approach would have emphasised regional benefits as distinct from more local benefits.

The benefits of Line 1 on its own are not fully realised. The Wolverhampton terminus is convenient for the main shopping centre, but is remote from both the bus and rail stations. The Birmingham terminus (Snow Hill) is at the periphery of the city centre, and is poorly connected. The trams have no visible presence in Birmingham, being entirely on segregated former rail lines, mostly at low level. The so-called street running in Wolverhampton also offers little visible presence, since the trams run mostly in the central reserve of a dual carriageway.



Former heavy rail segregated track means poor access. Photo: Tim Pharoah.

6.3.5 Conclusion

The story of the West Midlands light rail is a rather sad one. There was a string of delays, and rows over funding between different public and private sector bodies. The original intention for a network of routes has not been realised, and the common reaction to Line one is that it is a tram to nowhere. While there are still ambitions to create a light rail network, this still seems a very long way from fruition.

Perhaps the most important lesson, as for Sheffield, is that light rail should not be planned in isolation, but as an integrated set of proposals that include not only

other forms of transport, but also land use planning and measures to influence travel demand such as car parking restrictions. In these two instances in particular, the light rail schemes have served to highlight the disastrous shift of urban structure to serve American-style car-dependent lifestyles. The message is clear: light rail and scattered low density development do not mix.

It is to be hoped that in the West Midlands the existence of Line 1 itself can provide the impetus for further expansion, and a catalyst for more public transport oriented development in the future.



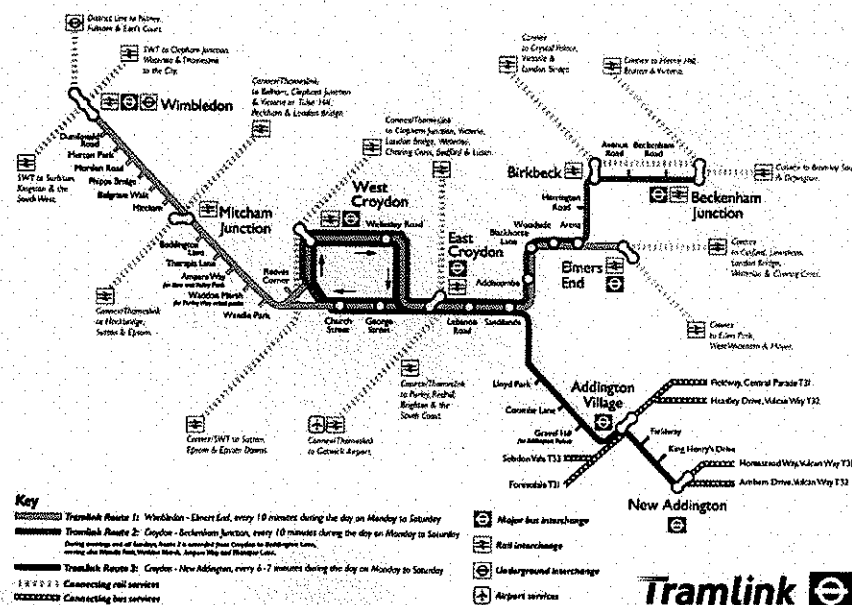
Public art on tram over-bridge. Photo: Tim Pharoah.

6.4 Croydon (Greater London)

6.4.1 The city context

Croydon is a suburb of Greater London, and one of its 33 boroughs (areas of local government). It has the largest of all the suburban town centres, the financial value of which was at one time estimated to be greater than that of central Birmingham, England's second city!

During the 1960's and 1970's Croydon developed a considerable office district, taking secondary office functions that were relocating out of central London, such as insurance and engineering companies.



Croydon Tramlink.

6.4.2 Motivation for Light Rail

Following a study of light rail potential in London, London Transport initiated a number of feasibility studies for the Croydon area. These showed that a light rail network would give a positive benefit to cost ratio and was worth pursuing. Discussions with the London borough of Croydon showed that the scheme would also fit in with their aspirations for the environment and the economic development of the town centre.

Whilst Croydon had experienced a boom in office development in the 1960's and 70's the attractiveness of the town centre had been reduced by:

- the construction of the M25 orbital motorway;
- investment in neighbouring town centres (Bromley and Kingston in particular);
- development within Croydon itself of major out-of-centre car-based retail facilities.

The light rail proposal was seen by the Council as a means to "put Croydon back on the map" and increase the transport capacity of routes to the town centre without the need for increased car traffic and possibly new road construction.

The project would also connect the residential estate of New Addington 8 km east of Croydon more closely and conveniently to Croydon town centre, thereby helping this area of 25 000 people with significant social and economic problems. Such a link had been a long-standing aspiration. Tramlink was expected to reduce the journey time from there to central Croydon from 35 to 17 minutes, a claim which seems excessively optimistic except perhaps at the "peak of the peak hour".

The Council also saw the project as a means of improving the quality of life of other residents of the Borough, by providing an additional, and particularly

efficient, mode of public transport. It was also seen as important for the Borough's economic development.

6.4.3 Planning, Organisation and Funding

The project was promoted by Croydon Council and London Transport from about 1990. It was taken through the design and development stages and through the parliamentary process by the Tramlink Project Development Group, consisting of the two public bodies, plus 3 private sector companies (Tarmac, AEG and Transdev), established in 1992. The Group produced the Performance Specification, but was disbanded in 1995 when Tramlink went out to tender. The parliamentary Bill was enacted in July 1994.

The project was taken forward under the Government's Private Finance Initiative and London Transport held a competition for a 99 year concession to design, build, finance, operate and maintain (DBFOM) the Tramlink system. Bids were invited against a Performance Specification produced by London Transport and the powers granted by the Act of Parliament. During the course of the competition, Government confirmed the award of GBP 125 million of grant including European grant towards the total project cost of around GBP 200 million in recognition of the "non user" benefits: i.e. wider benefits in terms of easing congestion, accidents and emissions. The proportion of Government grant is one of the lowest of the recent UK light rail schemes.

This project was pursued in line with the Government's Private Finance Initiative concept, which presupposes that the risks inherent in the construction and operation are transferred to the private sector. Because of this, government involvement during construction was limited. TCL were, however, under strong pressure from the banks funding their share of the project.

An assessment of the different transport options for the area concluded that Tramlink would produce a benefit to cost ratio of 2,7 to 1, and would be a more attractive option than bus-based improvements. Moreover, the benefits of the project might have been understated, since no estimate was made of the potential increase in property values or creation of jobs. Under British planning law there is no mechanism by which the scheme can capture betterment of this kind.

The Concession was awarded to Tramlink Croydon Limited (TCL) in 1996. The award of the government grant was not conditional on Tramlink opening to any particular timescale. The concession agreement which TCL signed with LT included a provision for opening within 12 months of 4 November 1999. This was in line with the Private Finance Initiative concept, which presupposes that the risks inherent in the construction and operation are transferred to the private sector. Because of this, government involvement during construction was limited. TCL were, however, under strong pressure from the banks funding their share of the project.

London Transport awarded the Concession to construct and operate Tramlink to a private sector consortium Tramlink Croydon Ltd. in November 1996. The Concession Agreement also sets out the division of risks between the parties. In essence the risks transferred to TCL include:

- the design, construction and commissioning of the system;
- operation and maintenance of the completed system; and
- ridership and general business risk.

London Transport took the risk on the diversion of statutory utilities equipment and the compulsory acquisition of property.

Changes to local bus services in the area were planned to provide an integrated network of feeder and complementary services. In particular direct bus services from New Addington that used to penetrate the large housing estate were reduced and a system of feeder routes was introduced to link people to the tramstops. Tramlink tickets include the feeder bus ride. This degree of integration is in sharp contrast to the conspicuous lack of integration between bus and LR in other English cities such as Manchester, Sheffield, and Newcastle (Tyne and Wear). This highlights the value of the regulated public transport system in London, which is more closely comparable to the management and control systems in other parts of northern Europe.



Route from tram stop to shops in New Addington. Photo: Tim Pharoah.

6.4.4 Relation to land use, regeneration and aesthetics

The system was seen as strengthening the competitive position of Croydon town centre. There are no monitoring results at the time of writing.

There were environmental concerns that initially were addressed with environmental studies, and proposals for minimising disruption of wooded and other natural areas. Some of the proposed measures (such as grassed track areas) were subsequently abandoned in order to reduce the overall costs of the scheme. This attracted criticism that environmental assurances by had been broken.



A tram in Croydon town centre. Photo: © S.J. Parascandolo.

6.4.5 Conclusions

Croydon Tramlink has demonstrated the potential when there are favourable circumstances. Relatively dense catchment area, available former rail alignments, and growing congestion and parking pressures in central Croydon all helped to produce a good commercial case. This enabled the system to be promoted with the private sector providing a high proportion of total costs and taking a large share of the risks.

A further interesting aspect of the Croydon scheme is that having demonstrated the possibility of converting suburban railways to light rail operation, the vast south London suburban rail network has become the subject of interest for potential further conversions.

7 English Conclusions

7.1 Conclusions from the English case studies

- The objectives of the English light rail schemes were somewhat limited, and never very specific.
- Private sector involvement has led to complex and sometimes lengthy negotiations.
- Private sector operation has not produced major complaints of inefficiency or incompetence.
- Transfer of financial risk to private sector consortia can reduce public liabilities, and may increase incentives to complete projects on time and to budget.
- Deregulation of bus services leading to open competition with light rail schemes has undermined the role of light rail where the light rail and bus services are subject to different private sector operators (i.e. made integration difficult).
- Integration depends on private sector cooperation, providing no guarantee of success.
- The time taken from inception to opening of schemes has in most cases been excessive, due in most cases to lack of public commitment to funding.
- Light rail schemes in England have mostly been planned as transport projects, not as a means of delivering integrated transport and land use.

7.2 Further comments

The development of rail-based public transport needs to be planned in the context of the travel market it is intended to serve, including the way in which this market may be developed through land use and social planning.

Too often schemes are promoted without due regard to these contextual aspects. The following are common faults of light rail (and other) schemes:

- A transport solution looking for a problem.
- A transport solution to a transport problem.
- A standard solution applied to a non-standard problem.
- An individual transport solution planned in isolation from other aspects of transport.

Light rail can supply many benefits, but proper planning can maximise the benefits and reduce the chances of failure. This planning needs to include all the aspects of light rail:

- Land use context
- Future urban development
- Integration with other public transport
- Integration with private transport
- Light rail as a component of urban design
- Light rail as a catalyst for regeneration and social development
- Light rail as a means of environmental improvement

The role of light rail within the overall public transport system of a city is of key importance. There have been criticisms (for example in Manchester and Sheffield) that light rail promotion has been at the expense of improvements in parts of the city not served by light rail.

The remaining question returns to the basic issue of what is light rail? The report has highlighted both the historic context of modern light rail development, and how this can be distinguished from traditional urban tramways.

Light rail in England has been promoted as the modern successor to the tram. This was a deliberate and understandable attempt to overcome the anti-tram prejudices that had become a barrier to urban rail development. But it was not just a change of title. The new light rail systems have in most cases been planned to perform the function of suburban rail systems. In most cases the light rail is based on a conversion of a former suburban rail route.

These schemes are very different from the former urban tram systems. The following points are important:

- Trams serve short distance trips within and between urban neighbourhoods, light rail less so.
- Trams thrive on and encourage high density, mixed activity areas, light rail less so.
- Trams are easily assimilated into the townscape, light rail less easily so.

Most of the light rail systems in England have the character of suburban rail, with the important distinction that they mostly provide much better access into or through the city centre. They have in most cases succeeded in improving access between suburb and centre. But they have mostly not been planned in conjunction within a context of promoting the "urban renaissance" agenda of high quality, high density, high vitality urban living. No where is this more apparent than in Sheffield, where the light rail has been planned to link suburbs and centre, only to find itself sidelined by almost two decades of out-of-centre north American style business, retail and leisure development. Attempts are being made to revitalise the city centre, which the light rail system is well placed to serve, but it is too little too late. Sheffield demonstrates that laissez-faire land use planning is incompatible with successful light rail. Competition from the car, where its use is unconstrained, is simply too powerful for light rail to compete effectively.

This point was highlighted in a Select Committee Report in 1991¹⁴, which concluded that the two keys to the success of light rail were:

- Traffic restraint
- Coordinated design

¹⁴ "Urban Public Transport: The Light Rail Option", report of the House of Commons Select Committee on Transport, May 1991.

So the conclusions are:

- Plan land use and light rail together.
- Distinguish tram and suburban rail, and plan development to fit.
- Restrict the development of car-based land uses and focus investment around the tram/light rail stops.
- Limit provision for the car (such as parking controls and charges) and provide incentives to use public transport (quality, convenience, price).
- Provide certainty in the planning and funding of schemes.
- Ensure that private sector involvement is not at the price of quality or public sector control of service levels and price.

Table of data for English case study cities

	Manchester	South Yorkshire (Sheffield)	West Midlands (Birmingham)	Croydon
Opening dates	First 2 lines opened 1992 Eccles branch opened July 2000	First line opened 1994, remaining lines 1995	Line 1 Opened Summer 1999	All lines opened May/June 2000
Initiation of proposal	Around 1985	Initiated 1978–79, approval of funding 1991	1987	1990
System name	Metrolink	Stagecoach Supertram (formerly South Yorkshire Supertram)	Midland Metro	Croydon Tramlink
Physical data	<ul style="list-style-type: none"> – 31 kms (1st 2 lines) – 8 kms (3rd line to Eccles) – Further extensions will add 57 kms to the network.¹⁵ – 26 stops plus 10 on Eccles branch – Street running in city centre, otherwise taken over former suburban heavy rail lines – Tram capacity 232, including 82 seated – Fleet of 32 trams including Eccles branch 	<ul style="list-style-type: none"> – 29 kms – 47 stops – Street running in city centre and about 50 % of the remainder of the network – Fleet of 25 trams – Tram capacity 250, including 88 seated 	<ul style="list-style-type: none"> – 20,4 kms (1 line) – (18,4 kms ex mainline rail, 2 kms within highway in Wolverhampton) – 23 stops – Fleet of 16 trams – Tram capacity 152 including 56 seated 	<ul style="list-style-type: none"> – 28 kms (3 lines) – 38 stops – Street running in town centre; other sections a mix of former heavy rail, street running and new alignment – Fleet of 24 trams – Tram capacity 200
Organisation – PTAs, operators, etc.	<ul style="list-style-type: none"> – Metrolink was promoted by the PTA and PTE, following a long history of rail proposals for the city centre – Metrolink is owned by Greater Manchester PTE – It is operated by Serco Metrolink (part of the Altram group, see below) under a 17 year contract from 2000 	<ul style="list-style-type: none"> – Originally promoted by South Yorkshire County Council (abolished in 1986) – South Yorkshire PTE own the assets of Supertram – Stagecoach Supertram is an operating company owned by Stagecoach Holdings plc. It holds the operating franchise (a 29 year contract to 2023) and pays to SYPTE an operator licence and leasing fees for the assets. 	<ul style="list-style-type: none"> – Line 1 was promoted by Centro¹⁶ and the West Midlands Passenger Transport Authority – Planning began in the late 1980's – Altram consortium DBOM 23 year contract¹⁷ – Line 1 is managed by Travel West Midlands and operated by a separate division called Travel Midland Metro 	<ul style="list-style-type: none"> – Promoted by Croydon Borough Council and London Transport from 1990 – 80 % public support in consultation 1991 – Act of Parliament for construction 1994

¹⁵ Rochdale 24 kms, Manchester Airport 21 kms, Trafford 7 kms, East Didsbury 5 kms, Ashton-Under-Lyne 10kms.

¹⁶ Centro is the West Midlands Passenger Transport Executive

¹⁷ DBOM = Design, Build, Operate, Maintain

	Manchester	South Yorkshire (Sheffield)	West Midlands (Birmingham)	Croydon
Funding criteria	<ul style="list-style-type: none"> - Government grant in recognition of the "non user" benefits: i.e. wider benefits in terms of easing congestion, accidents and emissions. - Grant eligible through Transport Act S56 cost benefit criteria 	<ul style="list-style-type: none"> - ??Government grant in recognition of the "non user" benefits: i.e. wider benefits in terms of easing congestion, accidents and emissions. - Grant eligible through Transport Act S56 cost benefit criteria 	<ul style="list-style-type: none"> - Private sector GBP 11,4M contribution to cost in recognition of the value of the operating concession. - "DBOM" contract provided maximum risk transfer to the successful consortium. Centro was therefore protected from the majority of risks¹⁸ - An example was the cost of a 10 month delay in opening being borne by Altram. 	<ul style="list-style-type: none"> - Government grant in recognition of the "non user" benefits: i.e. wider benefits in terms of easing congestion, accidents and emissions. - Most risks were carried by the private sector, in line with the Private Finance Initiative concept. - Tramlink was attractive to the private sector with a benefit to cost ratio of 2,7 to 1.
Cost breakdown	<ul style="list-style-type: none"> - Cost of first phase (2 lines) GBP 145m at 1992 prices. - The Eccles branch costs are not clear. Sources vary from GBP 110 M to GBP 160 M - Breakdown of costs not available 	<ul style="list-style-type: none"> - Out-turn cost GBP 240 M (1991 cost estimate GBP 230 M) - Breakdown of costs not available 	<ul style="list-style-type: none"> - Total cost (1999) GBP 145M - Original estimate (1992) of GBP 100M, of which cost of relocating underground utility services estimated at GBP 6M for the street running section (2km). - Other cost breakdown not available 	<ul style="list-style-type: none"> - Out-turn capital cost estimated at GBP 205M at 1999 prices - <i>Of which utility services diversion GBP 20M (paid by London Transport), and GBP 35M for tram fleet</i> - (This compares with the cost of GBP 160 million at 1992 prices estimated during the passage of the Croydon Tramlink Bill.)
Sources of financing	<ul style="list-style-type: none"> - The first phase was funded by: <ul style="list-style-type: none"> - GMPTA (GBP 69M), - Government (GBP 48M) - European grants (GBP 28M) - Private sector (GBP 5M) - The Eccles extension was funded by: <ul style="list-style-type: none"> - Public sector GBP 52,6M, (including ERDF GBP 9,8M) - Private sector GBP 77,8M 	<ul style="list-style-type: none"> - Government Grant GBP 50M - European Bank loan GBP 100M - Remaining funding local authority sources (not confirmed) 	<ul style="list-style-type: none"> - Government grant GBP 40M - Government approved loan GBP 40M - European ERDF grant GBP 31M - West Midlands PTA GBP 17,1M - Altram GBP 11,4M (most of the risk) - Local authorities GBP 4m - Centro GBP 1M - Utility services GBP 0,3M 	<ul style="list-style-type: none"> - GBP 125M from Central Government and European Regional Development Fund - Most of the remaining costs met from private sector

¹⁸ Risks transferred to private sector consortium included: currency fluctuation, inflation, patronage levels, geotechnical-mining problems, planning risks and interface issues between consortium members.

	Manchester	South Yorkshire (Sheffield)	West Midlands (Birmingham)	Croydon
Operator – chosen through competitive tendering etc	<ul style="list-style-type: none"> System initially operated by Greater Manchester Metro Ltd. With 15 year DBOM contract. This was terminated in 2000 and replaced by... Altram 17 year operating concession including the new Eccles branch. 	<ul style="list-style-type: none"> Privatisation of the system was a condition of Government funding Stagecoach takes over operations in 1998, paying GBP 1,15M for all the share capital 	<ul style="list-style-type: none"> Built and operated as a joint venture between Centro (West Midlands PTE) and a consortium (Altram)¹⁹ Altram won a 23 year concession (DBOM) 	<ul style="list-style-type: none"> Tramtrack Croydon Ltd (TCL)²⁰ have a 99 year concession to run the system The contract is DBFO²¹
Projected ridership	<ul style="list-style-type: none"> Metrolink forecast maximum patronage of 12 million. 7,5 million annual trips had been made on the two heavy rail lines that were converted to Metrolink. Actual ridership (whole system) had reached the target by year 3, and 14M ppa by 2000. Passenger kilometres have tripled since Year 1: from 53m to 153M in 1999/2000 The 11 kilometre Eccles line forecast 6 million passengers a year. Actual ridership for the first full year was 2M 	<ul style="list-style-type: none"> Ridership has not so far met expectations Original forecasts 17–22 M pass p a, subsequently revised to 12M at the time of privatisation (1997) Actual ridership grown from 2,2 M pass p a in Year 1 (1995–95) to 11 M pass p a in Year 6 Passenger kms have risen from 20M in 1995 to 37M in 2000. 	<ul style="list-style-type: none"> Forecast of 1991 for 10M passengers in first year, rising to 14M by 2023 Actual ridership Year 1 – 5M (1999-01) 	<ul style="list-style-type: none"> 20 million passengers a year after 18 months of operation predicted, rising to 25M Passenger figures of 50,000 a day (18 million a year equivalent) were reached after only 8 months of operation. This is believed to be about 50 % higher than predicted growth.
Average tram load	– 42,5 in 1999	– 15,4 in 1999	– ??	– ??
Projected revenue	<ul style="list-style-type: none"> Projected revenue is not available Passenger receipts at 1999 prices doubled in the first 6 years of operation, from GBP 7M (1992-3) to GBP 14M (1998-9). Receipts since 1999 are not available²² 	<ul style="list-style-type: none"> Projected revenue is not available Passenger receipts at 1999 prices (GBP) <ul style="list-style-type: none"> Year 1 – 1,8M (1996-7) Year 2 – 4,1M Year 3 – 5,1M Year 4 – 6,3M Year 5 – 6,2M Year 6 – 6,8M 	– Not available at time of writing	<ul style="list-style-type: none"> GBP 13–15M against operating costs of GBP 7M (1994 prices)

¹⁹ Altram consortium includes Ansaldo Trasporti of Italy; John Laing (UK) and Travel West Midlands (a bus company who are part of the National Express Group and control 85% of buses in the West Midlands).

²⁰ TCL includes: CentreWest Buses Ltd - part of the First Group. They have now become the tram operators as "First Tram Operations"; Bombardier EuroRail who designed, built and now (as Bombardier Transportation) maintain the trams; Royal Bank of Scotland and 3i who financed the project; and Sir Robert McAlpine/Amey Construction Ltd who constructed the system.

²¹ DBFO = Design, Build, Finance, Operate

²² Passenger receipts not publicly available because of "commercial confidentiality" provisions of the private sector operator contract.

	Manchester	South Yorkshire (Sheffield)	West Midlands (Birmingham)	Croydon
Covering of losses	<ul style="list-style-type: none"> - The operator (Altram) recoups its operating costs from fare and other revenues - Concessionary fare costs, however, are met by the GMPTE 	<ul style="list-style-type: none"> - Operating loss of GBP 9,8M in 1997, reduced to GBP 0,66M by 2000. - Losses borne by private operator (Stagecoach); GBP 0,66M in 2000, reduced from GBP 1,29M in 1999 - Operator's lease and licence fees (GBP 11,6M in 2000) are offset, however, by SYPTE concessionary fare support. 	<ul style="list-style-type: none"> - The operator (Altram) recoups its operating costs from fare and other revenues - Concessionary fare costs, however, are met by the PTE (Centro) 	<ul style="list-style-type: none"> - TCL is expected to cover costs from fare revenues
Motivation for LR, especially added costs of LR compared to bus	<ul style="list-style-type: none"> - Saving on subsidy and renewal costs of suburban rail - Long-standing desire to link rail lines across central Manchester - LR cheaper than earlier plans for underground heavy rail link - LR in Manchester seen as an alternative to heavy rail, not the bus, but bus does suffer from transfer to LR 	<ul style="list-style-type: none"> - The aim was to provide high quality public transport, and light rail was considered to be more affordable than conventional rail. 	<ul style="list-style-type: none"> - An aim was to provide a high quality public transport system capable of attracting car users. 	<ul style="list-style-type: none"> - Tramlink was seen by the Council as a means to "put Croydon back on the map" and increase access to the town centre. - The project would also meet a long standing aspiration to connect the residential estate of New Addington, thereby helping this area of - 25 000 people with significant social and economic problems.
Land use Development/ Cityscape /Aesthetics	<ul style="list-style-type: none"> - Original network not seen in terms of land use development - Aesthetics were not given any priority (e.g. catenary is supported mostly on unsightly poles rather than secured to buildings) - Later lines have an urban regeneration element, especially the branch to Salford Quays and Eccles 	<ul style="list-style-type: none"> - First line linked out-of-city regional shopping mall (Meadowhall) with the city centre - City centre business suffered from this competition, and also from street disruption during Supertram construction - Regeneration effects of LR have so far been small - New roads in Sheffield have had more visible impact on development patterns - Some evidence of new business locating close to Supertram 	<ul style="list-style-type: none"> - Forecast in 1991 to regenerate 10 hectares of land and create 1 500 jobs - Aesthetics given high priority, as means of attracting car users - Involvement of artist in all aspects of design - Standards modelled on Grenoble system - Investment included GBP 3m in landscaping and public art 	<ul style="list-style-type: none"> - Land use development has not been a central aspect of Tramlink. - The design of the system has received generally positive responses.

	Manchester	South Yorkshire (Sheffield)	West Midlands (Birmingham)	Croydon
Private car or parking restrictions	<ul style="list-style-type: none"> - There is generally ample public parking available in the city centre, with all-day charges from around GBP 3,00. Many commuters have free parking available. This compares to Metrolink return fares up to GBP 4,40. - There are few other limitations on car use other than relatively modest congestion. - Metrolink is claimed to have reduced demand for long-stay car parking by 700 spaces, and short-stay by 500 spaces. - But 1 000 extra short-stay spaces proposed in city centre masterplan (1996) 	<ul style="list-style-type: none"> - No restrictions planned as part of scheme - Generally ample parking available subject to charges and controls in city centre - Park and Ride provided at two locations 	<ul style="list-style-type: none"> - No restrictions planned as part of scheme - Generally ample parking available subject to charges and controls in city centre - Small Park and Ride facility at one intermediate stop. 	<ul style="list-style-type: none"> - No restrictions planned as part of scheme - Generally ample parking available subject to charges and controls in the town centres
Co-operation with residents, shopkeepers, chambers of commerce etc.	<ul style="list-style-type: none"> - A consultative committee was established representing a range of interest including disabled people, women, pensioners, transport user groups etc. - The private nature of the contract was reported to have limited the role of the consultative group - Bus companies have objected to Metrolink extensions because they fear loss of revenue 	<ul style="list-style-type: none"> - Disruption during construction of street running sections (around 50 % of the total) had a severe impact on city centre trade, leading to dissatisfaction and protest 	<ul style="list-style-type: none"> - Some public opposition at the planning stage - Private utility companies varied in the degree of cooperation - There is strong business support for expansion of the system 	<ul style="list-style-type: none"> - 80 % public support in consultation 1991 - Consultation produced concerns about environmental impact, especially in areas where the trams run on new alignments - Business community generally supported the tram
Security matters	<ul style="list-style-type: none"> - Street violence problem means pedestrianisation in city centres is to be limited 	<ul style="list-style-type: none"> - Safety concerns after cyclist killed 	<ul style="list-style-type: none"> - One person operated trams abandoned, partly for security reasons. - All trams now have a conductor. - Ticket machines at stations are being phased out. 	<ul style="list-style-type: none"> - None reported

	Manchester	South Yorkshire (Sheffield)	West Midlands (Birmingham)	Croydon
Traffic impact and reduction	<ul style="list-style-type: none"> - Metrolink is estimated to have removed 2.6M passengers trips from cars each year. - This means about 1,32 million car trips were removed from the road per annum, giving a reduction of around 1,9 % of all peak traffic and 0,7 % of off-peak traffic entering the city centre. - However, traffic has also reduced on some non-Metrolink corridors - Passengers from: <ul style="list-style-type: none"> Walk 1 % Car 10 % Train 50 % Bus 25 % New trips 14 % - 65 % of Metrolink passengers have access to a car for their Metrolink trips - Within station catchment areas (2 km) the proportion of journeys to destinations served by Metrolink that have switched from car ranges from 14-50 %. 	<ul style="list-style-type: none"> - 16 % of users were previously car drivers - This means saving of 1,6m car trips per annum. - This equates to around 1000 cars not being driven into the city centre each day²³ - 11 % of passengers claimed to be making new trips - 89 % of passengers transferred from other modes: <ul style="list-style-type: none"> Car 22 % Bus 57 % Walk/cycle 8 % Other 2 % 	<p>Forecast of 1991 to cut 3,3m car trips per annum (11,000 single car trips per day)</p> <p>Monitoring results not available at time of writing</p>	<ul style="list-style-type: none"> - Predicted to take 2 million trips by car a year off the congested roads (10 % of passengers transferring from car). Reduction in car traffic would be less when car passenger transfers are deducted. - Monitoring results not available at time of writing

Notes:

1. All money at 1999/2000 values unless stated otherwise
2. Shaded boxes contain information in addition to that included in the table of French schemes

²³ An official estimate of 2500 less cars being driven to the centre each day appears to be based on a mis-reading of the data.

8 France – Introduction

All figures in French Francs, FRF, have been converted to Euro, €, at a rate of 1 € = 6,56 FRF. Adhering to the definitions in Section 4.1 the English and French word tramway or tram will be used as consistently as possible.

8.1 Why France?

France (like England) has been in the same position as Sweden. All but three tramway systems were abolished by the middle of the 20th century. The survivors were found in Marseille, Saint-Etienne and Lille. In the early 20th century France had about 100 tram systems²⁴. Many of them served fairly small towns, while some of them reached far into the sparsely populated countryside. These systems or lines did not survive very long but with hindsight it is surprising that Paris, for instance, abandoned its trams during World War 2.

In 1985 Nantes was the first city to redevelop and build a tramway system from scratch, followed by Grenoble, Strasbourg, Rouen and Paris. For this report Lyon, Marseille and Montpellier were chosen for this report as they had reached various stages in their reintroduction of trams. Bertil Hylén visited the cities in 2000²⁵. It was intended also to include Nice but it was not possible to establish any contacts or obtain any data. Material and data obtained from the three cities mentioned have since been complemented. In 2001 Nantes was visited, partly for other purposes, and certain construction data were obtained.

8.2 The French transport scene in a European perspective

	Area, km ²	Inhabitants
Sweden	450 000	9 M
United Kingdom ²⁶	244 000	58 M
France	545 000	58 M

The population of France is not expected to increase within the foreseeable future (the same applies to most of the EU Member States). There are, however, fairly important population changes taking place within France. The regions Languedoc-Roussillon (with Montpellier), Provence-Alpes-Cote d'Azur, PACA, (with Marseille and Nice) and Rhône-Alpes (with Lyon) have shown the largest population growth in the 20th century. Ile-de-France (with Paris) has not increased as much as before, northern France sees no change at all and the Massif Central is losing people²⁷.

France is divided into 22 Regions, 96 Departements and about 40 000 Communes or local authorities. Quite often a large city with > 500 000 inhabitants (such as Lyon) is surrounded by a fringe of small communes (< 1 000 inhabitants). (See Section 11)

²⁴ World Gazetteer of tram systems, Peschkes, R., London 1993

²⁵ VTI Notat 10-2001 Light Rail i Frankrike, Planering organisation och finansiering

²⁶ Includes Wales, Scotland and N. Ireland.

²⁷ INSEE homepage

The passenger transport market can be described in various ways, some examples are shown in the following Tables.

Table 8 *Cars per 1 000 inhabitants*²⁸

	France	Sweden	Germany	UK	EU average
1970	234	284	194	214	184
1980	341	347	330	277	291
1990	415	421	447	360	393
1999	465	440	515	414	460

For a long time Sweden led this "league" but has now dropped behind many other EU Member States.

Table 9 *Car use – Passenger km per year per inhabitant*²⁹.

	France	Sweden	Germany	UK	EU average
1999	11838	9506	9129	10647	10066

Indeed, the French public transport sector has to compete with very car minded customers.

For this report, public transport patronage in the towns with TCSP is of special interest. TCSP denotes Transport Collectif en Site Propre, (public Transport on its own right of way).

²⁸ Eurostat

²⁹ Eurostat

Table 10 Public transport in towns with TCSP³⁰, million of passengers per year 1999.

Tram	Bus			Metro
Bordeaux	65			(Tram not yet in service)
Grenoble	52		26	
Lille	102	54	8	
Lyon	227	131		
Marseille	137	54	3	
Nantes	82		35	
Rouen	39		15	
Saint-Etienne	39		15	
Strasbourg	62		21	
Toulouse	75	31		

Metro refers to both “conventional” metro with steel or rubber wheels Paris, Lyon Marseille) and VAL = driverless metro on rubber wheels (Lille, Toulouse).

³⁰ GART homepage

9 Urban Mobility Plans (PDU)

The French law of 1996 (96-1236) on air quality and use of energy states that all conurbations with over 100 000 inhabitants are obliged to draw up an Urban Mobility Plan, Plan de Déplacements Urbains (PDU). This legislation is perhaps unique in Europe. The conurbations generally – but not necessarily – cover the same areas as the AOs (See Sections 10+11.) The main objectives of the PDU are to:

- Reduce car traffic
- Develop public transport and walking/cycling
- Improve circulation on the main urban roads
- Reorganise and improve parking. Reduce delays due to insufficient information.
- Promote the use of environmentally friendly modes of transport i. a. through differentiated parking fees
- Improve the transport of and delivery of goods
- Encourage companies and public authorities to promote staff use of public transport or car-sharing

The PDUs for Lyon, Marseille and Montpellier also stress improved traffic safety, especially for pedestrians, cyclists and motorcyclists. The recent trend towards reduced market shares for these “unprotected” modes has caused great concern.

Seventy French conurbations were required to draw up PDUs, in April 2001 about 45 had been finalised³¹. Improved public transport (including tramway and other TCSP, public transport on its own right of way) figures in most plans. The novelty, environmental friendliness and general attractiveness of tramways are often stressed. However, the report points out that other measures such as enforcement of parking rules seem less popular even though surveys have shown their effectiveness. Furthermore, although practically all PDUs aim at a higher market share for public transport they also envisage the building of more roads.

Multimodal fare schemes and other related matters also play an important role in many PDUs. Unlike for instance Sweden, Denmark, Germany, Switzerland and other countries where multimodal ticketing has been quite common for many years this is still unusual in France.

The PDU ambitions are certainly high but the implementation and the actual effects still remain in the future. In the final comments in the report of 30 June 2000 GART (Groupements des Autorités Responsables de Transport) and CERTU (Centre d'Etudes sur les réseaux, les transports, l'urbanisme et les constructions publiques) stress that the first generation of PDUs instils a new culture of mobility that permits going beyond the sector based frameworks for road and public transport. These intentions now have to be transformed into actions.

³¹ Suivi national des PDU, GART et al. Report 30 June 2000. English Summary available on GART web-site.

10 French Public Transport

10.1 Organisation

In many European countries, public Transport has been characterised by a fairly sharp dividing line between urban and regional or interurban transport with different organisations, operators and financing arrangements. This applies very much to France. French urban public transport must be considered of fairly high quality but outside the city boundary public transport is quite poor with very infrequent services. Timetable- and fares co-ordination is unusual (at least outside Ile-de-France), and a 45 minute journey to work by bus-train-metro may often involve three tickets or passes.

The description in section 10 does not refer to the Paris region (Ile-de-France) unless specifically stated.

10.1.1 The regions

As in many other European countries loss-making regional train traffic has been supported directly by the central government with little regional influence. Regional train services have often been poor; they seem to have been a stepchild falling between high profile services such as TGV and local public transport. However, the 22 French Regions (such as PACA with Marseille and Rhone-Alpes with Lyon) have now got the responsibility for regional train services. Competitive tendering is still out of the question; the Regions can only buy services from the French State Railways (SNCF). Despite this constraint the regions have been able to obtain more train services for the same amount of subsidy and also certain novel quality incentives. Regional train services are not further dealt with in this paper.

10.1.2 The Départements

Rural bus services outside the scope of the Autorités Organisatrices (see below) are the responsibility of the 96 Départements. These services, which are often of low standard and frequency compared to Scandinavia, are not dealt with further in this paper.

10.1.3 Autorités Organisatrices, cities and communes

The Autorités Organisatrices (AO) resemble the British Passenger Transport Authorities (PTA) or the Swedish Trafikhuvudmän (THM). France has about 200 AO, although they do not cover the whole of the country in the same way as the Swedish THM do. In some, the AO covers only one city or commune (smaller local authority) but quite often an AO covers a large city such as Lyon and 20–30 small surrounding communes. The AO is generally responsible for urban public transport planning and sets the fares within the limits approved by the national government.

Compared to the Swedish Trafikhuvudmän and some of the British PTAs the typical French AO covers a fairly small and predominantly urban area, in the case of Lyon 20 x 30 km. The advantage is that operating within such a (geographically) restricted area may entail close links not only between public transport and urban planning in general, but also with urban (transport) politics. The latter has probably

been very important for the swift implementation of new French tramway schemes. The disadvantage is restricted regional responsibility; the area covered is much smaller than today's car commuting area.

10.1.4 Operating models

With the overall responsibility of the AO there are three French models for the operations themselves:

1. Publicly operated, Régies – This is the least common model (10 % of the AOs). Mostly found in smaller AOs but also in parts of Marseille (RTM). (RATP in Paris may also be assigned to this group)
2. Mixed economy – Societe d'économie mixte (20 % of the AOs). See below.
3. Contracted operator – Operator chosen after competitive tendering (70 % of the AOs). Net-cost contracts are mostly used.

In the Mixed economy model there is a form of competitive tendering at regular intervals. In the case of Montpellier, TAM, (owned by the communes), together with Transdev and a number of banks, were given the contract. If TAM were to lose the contract after a future tendering process the company might submit a bid elsewhere or even enter other non-transport markets. With the Mixed economy model the public authorities can be regarded as sitting on two stools – buyer and operator. For other companies, entering such a market would probably be difficult.

The range of operators bidding in competitive tendering processes and taking part in Mixed economy schemes is narrowing. The French market is dominated by Keolis (ex. VIA-Cariane), Transdev and Connex/Vivendi, all of which are active across Europe. In Lyon there was only one bidder in the latest tendering round – the incumbent operator. Some senior public transport officers in France claim that competitive tendering is meaningless, as it is impossible to reduce the wages of drivers in any case. The French debate on the proposed EU Regulation concerning public service contracts (where competitive tendering is set out as the norm) is quite fierce but somewhat outside the scope of this paper. VTI intends to deal with this area in a forthcoming project.

As in Sweden and in the UK France has seen a concentration towards fewer and larger operators. Many of them operate bus, metro and tram services but heavy rail services are still the privilege of SNCF, the French State Railways. Keolis (36 %), Transdev (16 %) and Connex (15 %) dominate the French public transport market³². GART describes these companies as private but it should be borne in mind that Keolis is mainly owned by SNCF.

³² GART homepage

10.2 Financing

10.2.1 General

The cost recovery ratio, measured as the percentage of costs covered by passenger fares, is notably lower than in the UK (or Sweden):

	%	
Passengers	23	
Versement Transport	39	(see below)
Local authorities	27	
State	4	
Borrowing	<u>7</u>	
TOTAL	100	

Source: CERTU Report on TCSP etc.³³

The employers' tax, Versement Transport, plays an important role, and has the purpose mainly of financing public transport. It was introduced in Paris in 1971 and spread successively to other towns and cities. Today employers in towns with more than 20 000 inhabitants must pay a certain percentage of the total amount of salaries. Some examples:

	Versement	
	Inhabitants	Transport, %
Lyon	1 350 000	1,63
Marseille	1 000 000	1,75
Montpellier	300 000	1,75
Nice	350 000	1,20 to be increased to 1,50

10.2.2 Government Support for TCSP Funding

The rules for government support have been set in a recent Circular³⁴. Further information comes from a Memorandum³⁵ written by Cecile Torsat, seconded to VTI from Ecole Nationale des Travaux Publics de l'Etat, ENTPE, in Lyon, France, and from Benoit Thomé at CERTU, also in Lyon.

³³ Maitrise d'ouvrage et financement des TCSP, CERTU, Lyon, Octobre 1999

³⁴ Circulaire n° 2001-51 du 10 juillet 2001 relative aux aides de l'Etat à la mise en œuvre des plans de déplacements urbains et aux transports collectifs de province

³⁵ Torsat, C., Light Rail in France. VTI Memo June 2000

The ambitions as presented in the Circular are quite high, as are the ambitions in the PDU legislation. Through financial support the Government desires, among other things, to improve

- the service quality of public transport in general
- integration of public transport in the urban regeneration
- intermodal co-ordination
- the productivity of public transport
- the image of public transport
- accessibility for the mobility impaired
- energy consumption

In other words the Government supports measures to improve the market share of public transport. Further cases may be support for improvement of urban economic growth, especially in peri-urban decay areas. The Paris line T1 and the ambitions for Marseille's city centre (see French spreadsheet Note 5) can be seen as examples.

This section focuses on support for TCSP, Transport Collectif en Site Propre, or public transport on its own right of way in the urban environment. Support for regional or rural schemes follows slightly different rules.

	Support as % of the construction costs	Maximum support per km in M €
Busways, guided bus systems, Tramways	35	4,5
Metro, VAL etc.	20	8,0

Major obstacles such as rivers may motivate higher support.

Support is also available for passenger security improvements (maximum 50 % of costs) studies and research & development (maximum 50 %) public transport related urban environment improvements (maximum 40 %), terminals, road signal priorities for public transport, information/ticketing systems and improvements for the mobility impaired (maximum 35 %). However, there is no government support for rolling stock, land purchase and urban improvements not related to public transport.

The total support for 2001 is estimated at 198 M €³⁶. This covers only a small part of the investment costs since most of the money comes from the AOs. (See French spreadsheet).

To obtain government support the applicant must submit a detailed description of the measures and investments planned. A socio-economic cost-benefit analysis in a 30-year perspective with estimates of how the urban environment will be affected, alternative traffic flows etc. must also be made.

In order to assess the benefits of reduced car traffic the following cost/benefit values are used³⁷.

Air pollution in city centres is valued at

³⁶ La Vie du Rail 11 juillet 2001, p. 28

³⁷ Transports : choix des investissements et cout des nuisances. Rapport du groupe de travail présidé par Marcel Boiteaux. Juin 2001.

Private cars	0,029	€ per vehicle km
Lorries	0,282	"
Buses	0,249	"

Car travel time is valued at (Higher values apply to Ile-de-France)

Business travel	10,50	€ per hour
Commuting	9,50	"
Average	7,20	"

The human costs are estimated as follows:

Fatality	1 500 000	€
Seriously injured	225 000	€
Otherwise injured	33 000	€

Further values are used for the calculation changes in carbon dioxide emissions and noise.

VTI hopes to be able to analyse the French system of cost benefit analysis (CBA) in a further study of public transport (investment) and CBA.

CERTU has been assigned by the French Government to monitor and evaluate the steadily growing TCSP developments. CERTU points out³⁸ that

- The major reason for choosing TCSP in one form or another is the population volume and density.
- TCSP's share of public transport in the cities concerned is about 1/3. However, it must be borne in mind that TCSP is chosen for the heaviest traffic flows, often connected to a restructuring of the bus network.
- TCSP has in many cases meant a substantial increase of travel by public transport. Only rarely, however, has public transport managed to increase its market share over the whole urban area (Lyon 1975-1985, Grenoble, and Strasbourg). Some cities have managed to increase the share of public transport in the TCSP corridor
- There is no systematic effect on the financial situation of the public transport systems concerned.

³⁸ Evaluation des TCSP, CERTU web-site

Finally, public-private partnerships (PPP) do not seem to be attractive for TCSP investment in France. PPPs would mean granting some form of exclusive concession for a certain scheme for several decades. This has not been considered attractive by the AOs and others; instead the special local tax for transport improvements, *Versement Transport*, has been increased where possible. It is very difficult to point out any particular reasons for this attitude. These matters, as well as other organisational and financial aspects, are dealt with in detail in a CERTU report³⁹.

³⁹ Maitrise d'ouvrage et financement des TCSP , CERTU, Lyon, Octobre 1999

11 Case studies

Nantes was the first city to redevelop and build a tramway system from scratch, followed by Grenoble, Strasbourg, Rouen and Paris. Lyon, Marseille and Montpellier were chosen for this report as they had reached various stages in the reintroduction of tramways. These cities are also fairly located fairly close to each other, which facilitated the visit made in 2000. It was intended to include also Nice in the study but it was not possible to establish any suitable contacts. Material and data obtained from the three cities mentioned have since been complemented. In 2001, a visit was made to Nantes, partly for other purposes, and certain construction data were obtained.

11.1 Lyon

11.1.1 The city concept

Lyon is the capital of the Region of Rhone-Alpes, one of the more expansive French Regions. Its history is mainly industrial although not as explicitly industrial as the northern regions of France.

Unless otherwise indicated, the following general information has been supplied by SYTRAL, principally through their annual report(s).

Table 11

Inhabitants		1 350 000	The entire SYTRAL area	
		800 000	The city of Lyon	
Public transport passengers per year (all modes)		227	million	
Bus		Lines	90	
	Length	1 136	km	of which 77 km in bus lanes
Trolleybus	Lines	8		
	Length	37	km	
Metro	Lines	5		
	Length	28	km	
Tramway	Lines	2		
	Length	19	km of which 90 % on dedicated right-of-way	
	Stations	39		
	Vehicles	39		

Lyon's Metro has certain characteristics worth mentioning:

- The Metro network is fairly small and compact, with 4 lines totalling 30 km and served by 38 stations.
- Many lines and stations in central Lyon are very close to the surface giving easy access.
- One line has rack traction. However, the rolling stock is hardly different from the other lines'. (There are also two funiculars).
- Line D is fully automatic, with no drivers, on board staff or glass screens between platform and train. A system of lights and mirrors is installed to detect people falling off the platforms. The minimum interval between trains is advertised as 80 seconds.
- A three-station extension of Metro line B was opened in September 2000. At present no more extensions are planned. The Metro is not dealt with further in this report apart from certain cost and performance comparisons.

11.1.2 Motivation for tramways

As was generally the case in France, the Lyon area had a large urban and regional tram network. It used all forms of traction: horse, steam, battery, AC, DC. There were also different gauges. The last of the earlier generation trams ran in 1957⁴⁰.

Firstly, it should be pointed out that the Lyon Tramway system was inaugurated in December 2000 after a decision made in 1997. Compared to any other tram scheme known to the authors this must be considered to be a record time. SYTRAL considered that speed was essential, people want to see results quickly, with a minimum of physical disruptions during the construction phase, etc. SYTRAL did not deny the political aspects – it was important to present a new tramway system in the 2001 local elections. (However, the ruling party lost).

The first two lines of Lyon's new tram system are T1 Perrache – La Doua (9 km with 19 stations) and T2 Perrache – Porte des Alpes (10 km with 20 stations). Important points for choosing a tramway instead of other means of public transport were:

- Suitable capacity – 2 500 pass/h and direction for each line. This is higher than bus transport but lower than metro. Each line is forecast to have 50 000 pass./day (quite likely to be achieved⁴¹).
- Lower (construction) costs than for a metro (see below). A tramway was assumed to cost 19 M € per km, a metro 76 M € per km. The tramway costs include rolling stock, etc., see below.
- Improvement of the urban (street) environment. In certain parts of the city this was rather dilapidated.

⁴⁰ Bouchard, G., Histoire des Transports Urbains de Lyon

⁴¹ Interview with Jean-Yves Pascal, SLTC, April 2001.

- Improved speed, performance and reliability compared to buses in bus lanes. Bus lanes and parking restrictions are poorly respected. It was expected that tram reservations would mean high average speeds (Line T1 18 km/h, Line T2 22 km/h) and better reliability. In April 2001 these speeds had still not been reached, traffic lights co-ordination and driving practice still needed fine tuning but improvements were made day by day.
- A "positive" way to reduce parking space and car space in general. This is not mentioned in any official publication but was often pointed out by SYTRAL and SLTC staff.

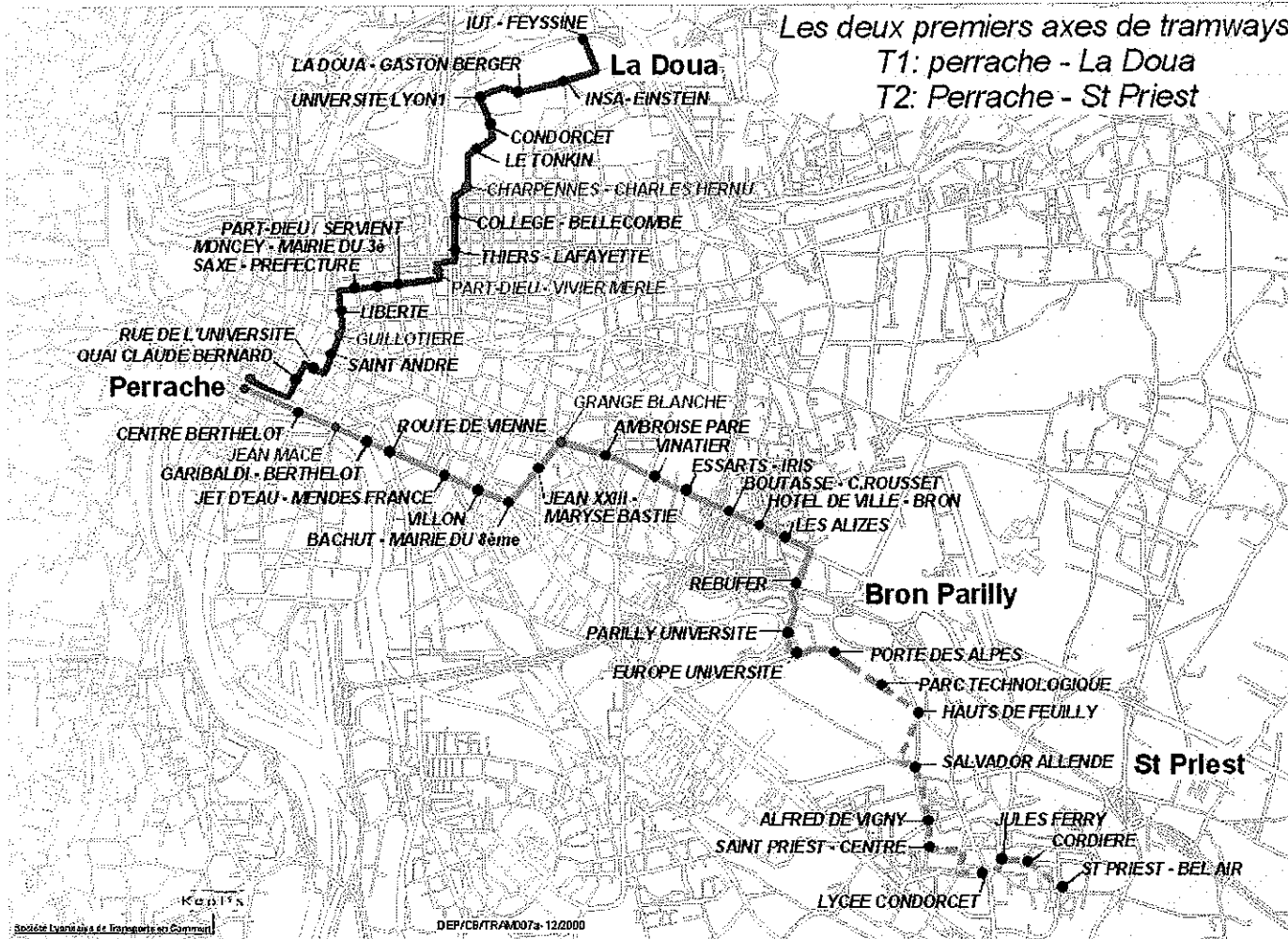
SYTRAL mentions five tram key words in the context of trams and tramways:

1. Comfort – 100 % low floor vehicles with level boarding at stations, large windows, air conditioning etc.
2. Ecological – Electric traction, Park&Ride facilities, planting of 1 000 new trees.
3. Low noise – Silent running vehicles, noise reducing rail embedding.
4. Modernity – Automatic station announcements through public address and displays. Cycle space in vehicles, CCTV on board and in the stations.
5. Performance – Since trams run (mainly) on their own right of way and with traffic signal priority the tramway becomes a surface metro with average speeds of 18 km/h and 22 km/h respectively⁴².

When Lyon decided to build a tram system in 1996 other "intermediate" modes, such as those now being built in Nancy and Rouen, were still on the drawing board. Lyon therefore decided to choose proven technology. In 2001 Lyon notices the problems facing the new intermediate modes in for instance Nancy.

⁴² SYTRAL's Annual Report 1998

Les deux premiers axes de tramways
T1: perrache - La Doua
T2: Perrache - St Priest



11.1.3 Planning, organisation and financing

PDU in Lyon

The starting point for modern tramway development in Lyon was the PDU, which was approved in 1997. During the preparation of the PDU several attitude surveys were made among the population as a whole, i. e. not only among present public transport users. The surveys showed that there were many potential journeys that could best be made out by tram. Many interviewed persons also stated that private car traffic in central Lyon was unsustainable and ought to be restricted. Better and safer cycling routes were also requested. In some origin-destinations pairs a tramway was deemed to be the most suitable means of public transport together with the extension of some metro routes. The PDU also changed the urban parking norm. Previously there was to be 1 parking space per 50 m² office space, this was changed to 1 parking space per 300 m² within 300 m of one of the 75 metro/tram stations.

Organisation

The AO of "Greater Lyon" is SYTRAL, Syndicat Mixte des Transports pour le Rhône et l'Agglomération Lyonnaise. SYTRAL is owned by the city of Lyon, about 60 suburban communes and the Department of Rhône. This rather resembles the Swedish model with Trafikhuvudmän but the area covered is only about 20 by 30 km well below the commuting perimeter of today. This report is based mainly on information and views supplied by SYTRAL, complementary information have been obtained from SLTC.

SYTRAL owns the Metro and tramway infrastructure, the depots and all vehicles including all buses. Every six years there is a competitive tendering process. The number of bidders has gradually been reduced, in 1999 only the incumbent Société Lyonnaise de Transports en Commun (SLTC) owned by Keolis submitted a bid.

Traffic is operated under the "brand name" TCL, Transports en Commun de l'Agglomération Lyonnaise – sometimes popularised as Tous les Couleurs de la Ville. A net-cost contract applies. Fares cover about 23 % of costs – it is not possible to discern between the cost recovery rates for tram, bus or metro. The chain SYTRAL-STLC-TCL-Keolis chain may seem complicated but the passenger needs to deal only with TCL.

Unlike their Swedish counterparts SYTRAL is not engaged in regional train traffic, which is a matter between the Region Rhône-Alpes and SNCF. Recently a number of multimodal passes valid on SNCF and local public transport have been introduced. The small size of SYTRAL's area has also been discussed, as more and more commuters come from outside this area.

Financing

Per December 2000, the Lyon tramway system as cost 350 M €. The costs and sources of financing are as follows:

Costs (M €)		Financing (M €)	
Perm. way	129	SYTRAL	255
39 vehicles	64	State	61
Conduits	34	City of Lyon	33
Buildings	27	Others	1
Depot etc.	<u>96</u>		
Total	350	Total	<u>350</u>

The Lyon tramway was financed entirely by public means. According to SYTRAL a PPP solution would have meant some kind of concession which in practice would have entailed handing over operations to the private sector. SYTRAL was not interested in this. Furthermore, it considered that the low cost recovery rate would attract little private capital.

Additional costs

The construction of the Lyon Tramway has meant an extensive remodelling of the urban street space. As a rule the trams run on a reservation on one side of the street, the remainder having been converted into a one way street with cycleways. The entire street space from building to building has been thoroughly remodelled. Street parking has been reduced, 500 trees have been felled, 1 000 new trees have been planted, and new lighting and new urban furniture have been added. Last but not least underground conduits have been moved.

Included in the table above are additional costs for "improved urban aesthetics" compared to "back to normal" after the construction of the tramway. They are estimated at 34 M €.

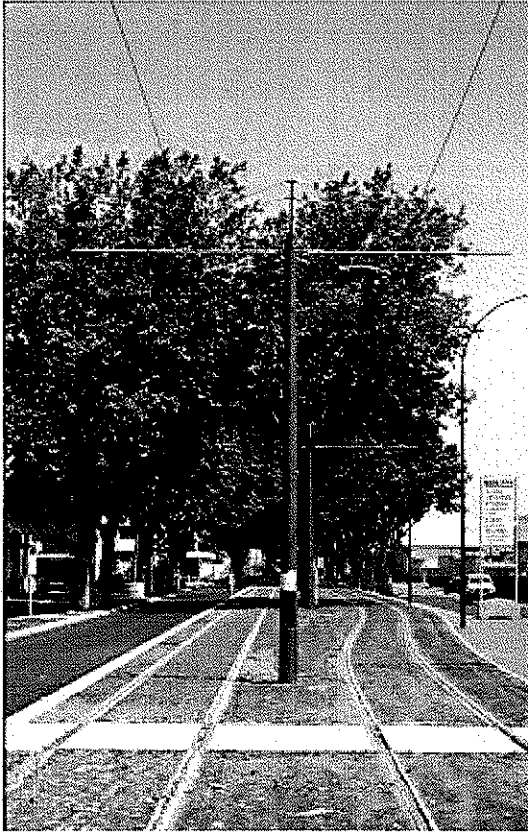
Constructing the "tramway pur", i. e. without any urban improvements and without taking into account the underground conduit relocations has thus cost (129-34): 19 = 5 M € per km.

Breakdown costs for underground conduit etc.

Water	12
Sewage	15
Heating	5
Others	<u>2</u>
Total	34

The above amount was financed by SYTRAL, while other costs were born by the companies responsible for electricity/gas (12 M €) and telecom (11 M €).

In Nantes (not part of this study) it was stated that the "pure tramway costs" amounted to about half of the construction costs per km, the remainder being urban regeneration costs.



*The new tram line in Lyon has been well adapted to the existing line of trees.
Photo: Bertil Hylén, VTI.*

11.1.4 Relation to land use, regeneration and aesthetics

As already mentioned the tramway was seen as a good way of improving the urban (street) environment, which was rather run down in certain parts of the city. It was also seen as a "positive" way to reduce parking space and car space in general.

In order to convince residents, shopkeepers and others, a virtual reality presentation of the future street environment was created. This was expensive but highly appreciated. Committees representing residents and shopkeepers were also taken on free trips to Nantes and Strasbourg to see for themselves and to speak to their opposite numbers. They were able to see that the tramway was not a threat but an improvement of the urban environment. Since the urban street environment became rather messy during the construction period, street festivals with entertainment, fairs etc. were arranged. Up to date construction information has been available on a special web-site /www.infotram.com/. Through the remarkably short construction period SYTRAL explicitly wanted to minimise disruptions.

It should be mentioned that the major opponents to the tramway in Lyon were the taxi drivers. In Lyon they have the right to use bus lanes, which is especially attractive where these are "contre-sens", i. e. running against the flow of traffic in a

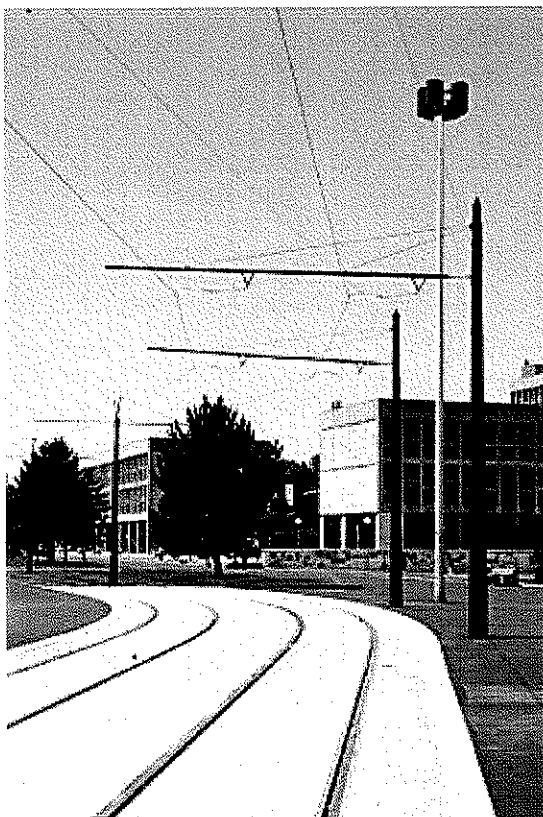
one way street. When bus lanes were converted to tramway reservations taxi drivers lost their previous fast lanes. This made taxi drivers so angry that they threatened to disrupt or block the opening of the tramway in December 2000. To calm this group the city built a small number of new "contre-sens" bus lanes in streets parallel to those with tram reservations.

Security

There have been no surveys of the views of passengers/non passengers concerning public transport security. However, as security improvements SYTRAL mentioned CCTV in vehicles/on stations and the possibility to shut off the rear part of the vehicle in the evenings. The latter means that all remaining passenger space is close to the driver.

Rolling stock

Lines T1 + T2 are operated by the Lyon version of Citadis, Alstom's standard tram. Key data: length 32 m, width 2 400 mm, floor height 350 mm (100 %), 56 seats, 140 standing passengers, v/max 70 km/h, price 1,7 M €.



Lyon's tramway infrastructure is visible but not intrusive. Photo: Bertil Hylén, VTI.

11.1.5 Conclusions

In late 2001 it is too early to judge Lyon's tram system. Passenger numbers are steadily growing and SLTC expects the objectives to be met. The problems with taxi drivers have been mentioned above. Planned average speeds have yet to be achieved. In view of the amount spent on street remodelling etc. it may be seen as somewhat strange that traffic light priorities etc. are not working as well as they should.

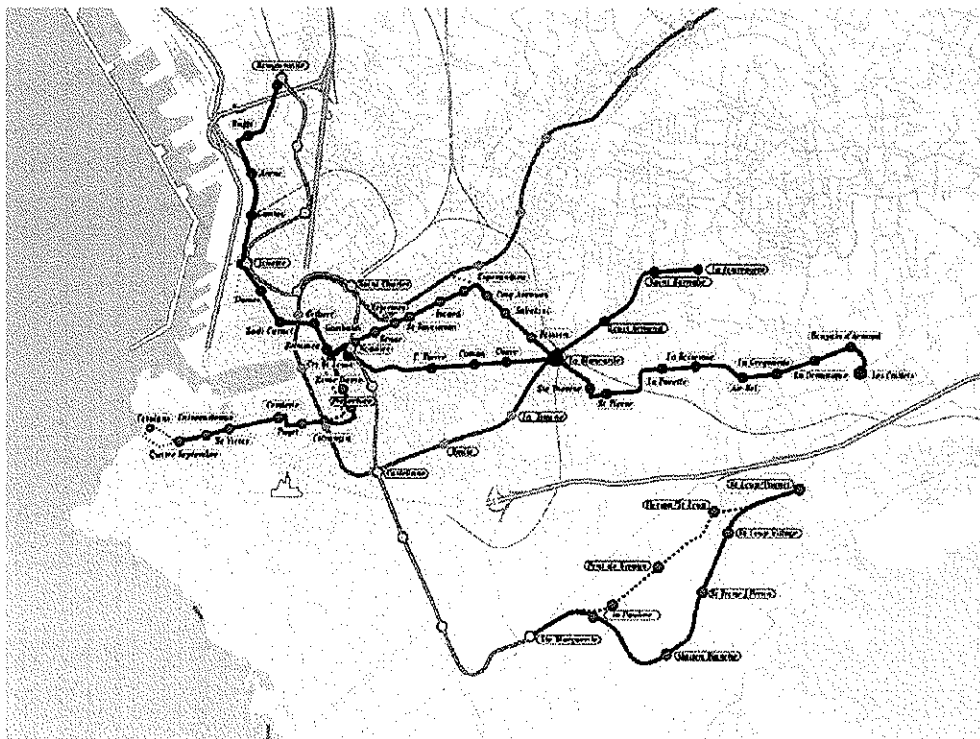
The plans for further expansion are dealt with in section 12.

11.2 Marseille

11.2.1 The city concept

Unless otherwise stated, the information has been provided by the Transport Directorate (Direction des Transports) of the City of Marseille.

During the French colonial era Marseille was an extremely wealthy and expansive city. Marseille is still the second largest city in France but has, broadly speaking, decayed since the Second World War. As in many large ports where the huge docks were constructed during the colonial era the shipping activities have moved further out (towards the Rhône estuary) and the old area is now in decay. Unlike many other French cities the inner city is also very much decayed. Transport-wise, the most important development for many years has been the opening of the new high-speed railway line Marseille-Valence (-Paris). This opens up new regional possibilities as will be described below.



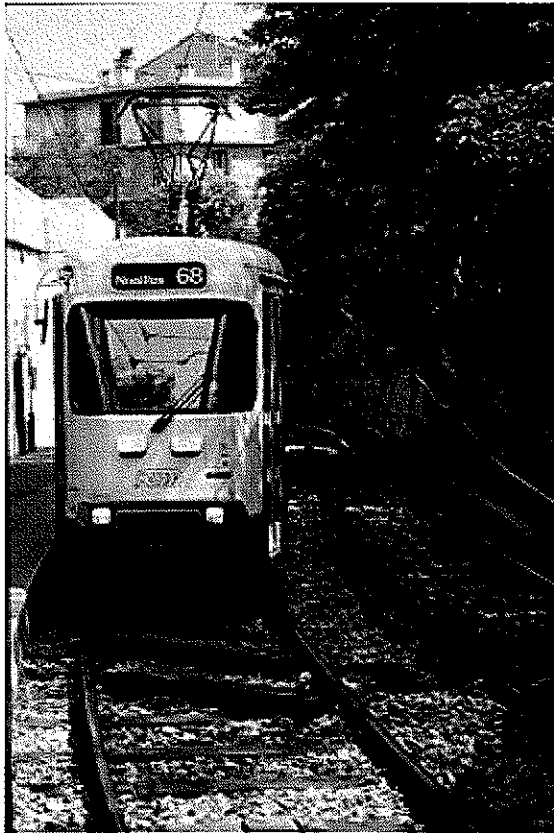
Marseille – New tram lines are shown in orange and green.

Table 12 Basic facts⁴³

Inhabitants		1 000 000 (approximately)	
Public transport passengers per year (all modes)		137	million
Bus	Lines	77	
	Length	575	km of which 25 % in bus lanes
Trolleybus	Lines	3	
	Length	19	km
Metro	Lines	2	
	Length	19	km
	Stations	24	
Tramway (present)	Line	1	
	Length	3	km
	Stations	9	
Tramway (after new constr.)	Lines	2	
	Length	16	km
	Stations	42	

The present tramline 68 is a remnant of an extensive urban/inter-urban network. About 1 km runs in tunnel, and the loading gauge permits a vehicle width of only 2,06 m. The inclusion of the present tunnel section makes an almost entirely new construction necessary.

⁴³ Jane's Urban Transport Systems 1999/2000, French Transport Ministry homepage



*The existing tramway in Marseille. Note the narrow vehicle gauge.
Photo: Bertil Hylén, VTI.*

11.2.2 Motivation for tramways

In the PDU the city of Marseille clearly states three objectives:

- Reclaim the city centre
- Improve the quality of life in the inner city
- Connect the city to the region

Marseille's city centre is much more run down than the centres in other major French cities. Marseille wants to see more affluent residents in the centre than today, as has been achieved in nearby Aix-en-Provence. In order to accomplish this the centre must be made more attractive, partly by means of the tramway. The Marseille Transport Planning Directorate states that urban redevelopment is the first objective of the tramway, transporting people comes second.

11.2.3 Planning, organisation and financing

The PDU in Marseille

Apart from the objectives stated in Section 11.2.2 the PDU mentions more stringent parking restrictions (and monitoring of these), and better use of existing off-street parking facilities. These go hand-in-hand, instead of using a multi-storey car park the Marseille driver parks in the street or on the pavement. More efficient distributions of goods is also mentioned in the PDU

A survey showed that 80 % of the respondents wanted less car traffic in the city centre, where there are very high levels of noise, pollution, congestion and accidents. An accepted means to achieve these ends is the introduction of a tramway, Nantes and Strasbourg are mentioned as good examples. The tramway is also expected to create the same increase in public transport use that was been experienced when the Metro opened.

Organisation

On 1 January 2001 the Communauté Urbaine Marseille Provence Métropole with 18 communes and 1 million inhabitants formed the new Autorité Organisatrice des Transports (AO). In Marseille and four neighbouring communes the operator is the city-owned Régie des Transports de Marseille (RTM). In the other communes there is a range of other bus operators basically contracted on a net-cost basis per bus-km by the AO. Fares cover about 40 % of operating costs.

Creating an AO-wide tariff, developing a regional train network (RER) and providing intermodality in general will be important tasks for the new AO.

Tramway and Metro expansion

In June 2000 the principal decision to build two tramway lines and extend the Metro lines was taken. It is expected that the tramway construction will start in 2002/2003 and that traffic will start in 2006⁴⁴.

The new tramway lines are:

Les Calliols – Bougainville (23 stations) with (forecast) 59 000 passengers per day. This line will include the present line 68 which has to be rebuilt in order to accept wider vehicles. Place 4 Septembre – Blancarde (19 stations) with (forecast) 33 000 passengers per day. (The details of the lines are not yet fixed).

Cost breakdown (M €):

Permanent way	146
32 vehicles	51
Conduits	20
Buildings	24
Depot + misc.	64
TOTAL	305

⁴⁴ Transport Public septembre 2000 and brochures from the Transport Directorate

Sources of financing (expected):

State	64
Region	24
Département	24
Miscellaneous	5
AO Marseille	<u>188</u>
TOTAL	305

The June 2000 decision also concerned two Metro extensions; La Timone => La Fourragère and Sainte Marguerite Dromel => Saint Loup. These 8 km extensions are expected to be finished in 2006/2007 at an estimated cost of 472 M €.

11.2.4 Relation to land use, regeneration and aesthetics

Marseille wants a "richer city centre". After the colonial era the city centre has decayed and today characterised by a low-income population with i. a. three times the average French unemployment rate. (The city centre of Marseille resembles Manchester rather than Lyon). Marseille looks with some envy at Aix-en-Provence (50 km away) where the inner city is exclusive, elegant and wealthy. The city also wants a general enhancement of the streetscape in order to improve conditions for pedestrians, cyclists and public transport.

The planned tramline 1 will run partly through the Marseille docks area. As in many large ports where the huge docks were constructed during the colonial era the shipping activities have moved further out and the old area is now in decay. The city now hopes that the tramway will foster regeneration although there seems to be no concrete plans to link building rights to tramway investment etc. Furthermore the former dock area also has a very large railway network, much of which is electrified double track, and in a longer perspective there are plans to use this as part of a regional rail network (RER).

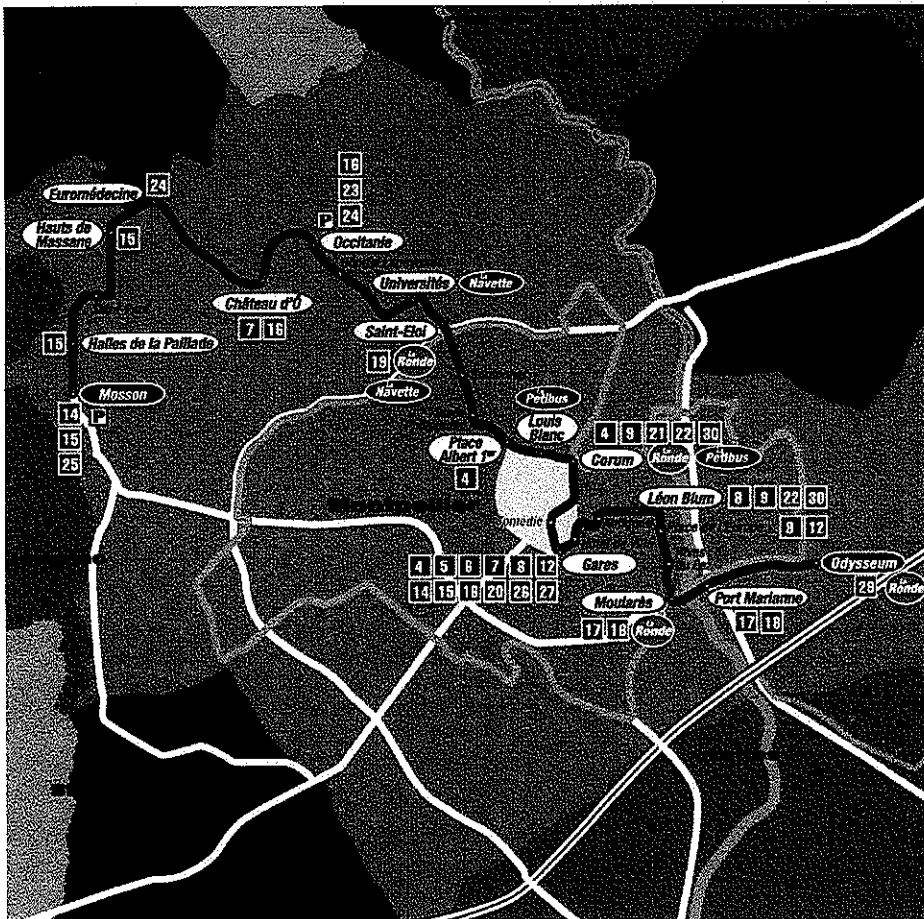
11.2.5 Conclusions

Since the tram renaissance in Marseille has only just begun, it is not really possible to draw any firm conclusions. However, it is noteworthy how much Marseille points to the tramway as a tool for inner city regeneration. It is striking how much the planners and politicians in Marseille, as well as as other cities, look to the "trendsetters" (Nantes and Strasbourg) for inspiration and good examples.

11.3 Montpellier

11.3.1 The city concept

After World War II, Montpellier was transformed from a sleepy Mediterranean town (although not quite on the littoral) to a centre of learning and development. Within 30 years it has advanced from being the twenty-fifth largest town in France to being the eighth largest. It has not had the same legacy or burden of heavy industry as many other major French cities. Although Montpellier now has an urban tram network, it is relatively small for a tramway town even after its expansion.



The first new tram line.

Unless otherwise stated, the information has been provided by the operator, Transports de l'Agglomération de Montpellier (TAM).

Table 13 Basic facts⁴⁵

Inhabitants	230 000	City of Montpellier
	330 000	AO area

Public transport passengers 29 million (before the tramway)
per year (all modes)

Bus	Lines	28	km	after the tramway of which 5 % in bus lanes
	Length	320		
Tramway	Line	1	km	
	Length	15		
	Stations	28		

The regional train services are very limited.

11.3.2 Motivation for tramways

Problems: Montpellier's bus traffic was declining, buses became stuck in traffic, reliability suffered and patronage declined. Car traffic in the small and compact town centre became more and more difficult.

Solutions ruled out: A Metro was ruled out for cost reasons, its construction would have been very difficult too. A Metro is not visible (seen by the citizenry) either. Buses were considered not to be attractive enough for motorists (even with bus lanes).

Solution chosen: The Nantes tramway became the role model. According to TAM Nantes claims to have stabilised and even increased the market share of public transport. Furthermore, the PDU requires actions to improve the air quality and to reduce emissions; the tram satisfied these criteria well.

11.3.3 Planning, organisation and financing

The PDU for Montpellier has not been approved pending the creation of the new Communauté de l'Agglomération de Montpellier, see below.

Since 1986, the AO is le District de Montpellier comprising 15 communes with 323 000 inhabitants of whom about 230 000 live in the town of Montpellier. As in many cases the population in the surrounding areas and the commuting from these areas has successively increased. A new and larger AO, la Communauté de l'Agglomération de Montpellier is therefore to be implemented in 2002 and will comprise 41 communes with 480 000 inhabitants. There are discussions about the Département Hérault, with almost one million inhabitants, taking over responsibility for public transport. However, these discussions are only at an initial stage.

Operations are tendered out every five years. The present contract holder is Transports de l'Agglomération de Montpellier, TAM, which is a so-called Société d'économie mixte. This means that it is owned by the communes (55 %) and the large

⁴⁵ TAMs Annual Report 1999

transport company Transdev (20 %), with banks and various organisations making up the remainder.

At the next round of tenders it is quite possible that another company will win the contract. TAM will then continue to exist but not as the Montpellier public transport operator. It would even be possible for TAM to operator public transport elsewhere. However, TAM is responsible for the planning and construction of tramline 2 in Montpellier regardless of the operator to whom the contract is awarded.

Cost breakdown (M €)		Sources of Financing (M €)	
Vehicles	50	Dep. Hérault	23
Infrastructure		District of Montpellier	100
and buildings	230	State	64
Other	70	Others, borrowing etc.	163
Total	350	Total	350

TAM mentioned operating costs (incl. capital costs) of 2,28 € per bus km and 3,05 € per tram km.

11.3.4 Relation to land use, regeneration and aesthetics

The Montpellier tram protagonists soon realised that a thorough lobbying campaign was necessary. However, after convincing the mayor, few problems remained. The president of the Chamber of Commerce was given special treatment. As in Sweden, French Chambers of Commerce are negative towards public transport, particularly if it involves the reduction of parking or other measures to curtail car traffic.

All shopkeepers along the suggested route were visited in order to convince them that the tramway would not cause any harm to their businesses. Shopkeepers who could prove that their business had been harmed during the construction period were compensated after assessment by a special committee comprising representatives from the city, shopkeepers, chamber of commerce etc. The total compensation paid amounts to less than one percent of the tramway construction costs. There is no possibility of claiming compensation for harm to your business after the opening of the tram service.

Residents along the proposed route were subjected to special information campaigns. Their attitudes towards the tramway were surveyed several times during the construction period. A few months before the opening 86 % stated that they had a generally positive attitude towards the tramway. Men were slightly more positive than women.

2 000 new trees were planted, new cycleways were built and 2 000 new bike racks as well as several works of street art were added to the cityscape. 700 public car-parking spaces disappeared but no private ones. No figures for the additional costs were available.



*Graffiti removal, an important part of an attractive urban environment.
Photo: Bertil Hylén, VTI.*

Rolling stock

Montpellier ordered its own version of Citadis, Alstom's standard tram. Key data: length 30 m, (to be lengthened to 40 m) width 2 650 mm, floor height 350 mm (70 %), 220 passengers, v/max 70 km/h, price 1,7 M €. Bicycles are permitted off-peak.



Alstom's Citadis in the Montpellier version. Photo: Bertil Hylén, VTI.

11.3.5 Conclusions

After just over than one year of operations it is still too early to draw any definite conclusions. A few highlights should be mentioned however:

- Montpellier is probably the smallest of the "new tram towns".
- The first Montpellier tramline was expected to carry 75 000 passengers per day. According to TAM it carried about 60 000 passengers per day after six months operations, which was considered quite acceptable.
- Even before the opening of the first line it was decided to go ahead with the second line.
- Because of the large number of passengers a decision to lengthen the vehicles was made less than a year after the opening of the tramway.

12 The future for Tramways in France

The French tramway expansion of the last decade seems to continue. However, it should be remembered that, apart from the traditional tram or LR with steel wheels on steel rails France has become the homeland of new intermediate modes such as trams on rubber tyres. These new modes and their advantages and disadvantages are dealt with in another on-going VTI study. They are described in a conference report⁴⁶ from a seminar held in Sweden in 2000.

This list of "fairly certain expansion schemes" is an attempt to summarise information provided by a GART survey⁴⁷ and the Mai 2001 and Octobre 2001 issues of Transport Public. The systems are various forms of TCSP, which includes tram, or LR, "rubber tyred tram" or guided bus, conventional metro, VAL-metro and busways.

Location	New or extended lines	Length Km	Vehicles	Cost €	Opening date and other Comments
Bordeaux	2	21	44	500	2003
Caen	1	16	34	200	2002, rubber tyre tram
Grenoble	1	12	35	n.a.	2005
Ile-de-France	1	3			Line T2 extension, opens 2004,
La Rochelle	1	1,5	1		Alstom demo line, runs once/ week
Le Mans	1	14	17	210	(probably) 2006
Lyon	1	6	5	70	Line T2 extension, opens 2003
Marseille	2				See section 11.2
Montpellier	1	18	24	420	2006
Mulhouse	2	19	24	340	2005
Nancy	2	15		110	2003/6, rubber tyred tram
Nantes	1	6		130	2004/6
Nice	1	9	20	290	2006
Rouen	The present tram will be complemented by a Teor guided bus system				
Saint-Etienne	1	8	5-10	60-120	
Strasbourg		11	25	220	
Toulon	1	17	26	400	2008 (earliest)
Valenciennes	1	9	15	200	2005

Apart from the schemes described above there are several TramTrain schemes, for instance in Mulhouse, Strasbourg and Saint-Etienne. TramTrain denotes the operation over both tram and heavy rail lines with the same vehicle, the best well known example being Karlsruhe in Germany.

⁴⁶ Avancerade kollektivtrafiksystem, KFB-Rapport 2000:61, Lund 2000

⁴⁷ Enquête TCSP, GART 2001

13 French conclusions

Based on VTI's pilot study entitled Light Rail – Light Cost⁴⁸, analyses of the professional press etc. the differences and similarities in Light Rail (LR) developments between the European countries were noted. Subsequently it was decided to study in greater detail how positive developments might be transferred to the Swedish transport environment.

France was chosen for the first study. Several French cities where the tram has been absent for several generations now develop and build tramway systems from scratch. Orleans, Lyon and Montpellier have recently opened new systems, Marseille plans to extend and rebuild the present short line; Nice, Bordeaux, Paris and several other cities are in the planning or construction stage. To study some of these developments the author (Bertil Hylén) made a visit to France in June 2000. Additional material was obtained in 2001.

In France tramways and urban public transport in general are very much connected to the city in a broad sense, to city politics and politicians, urban environment matters and urban planning. This seems to make the rapid implementation of tramway projects very much easier; in Lyon, for instance, two new lines were built in four years. It is also important to note the important role of tramways for urban regeneration. Although tramway financing has hitherto been exclusively public, private financing is being discussed (as in Sweden), but there are present no such schemes.

The French urban transport legislation (PDU), which probably has no equivalent in other countries, demands a reduction of urban car traffic. This is a political objective and tramway development has become one of the means of achieving it.

The following reasons for choosing the tramway were mentioned in Lyon, but also apply in general to other French cities:

- Economy – Reasonable costs for the passenger volumes in question (compared to metro).
- Comfortable – Low floor with level station access, large windows, air conditioning.
- Green – Electric traction, Park&Ride, many new trees.
- Silent – Quiet vehicles running on rail embedded in noise-reducing material.
- Modern – Automatic audio/video station announcements, bicycle space, CCTV surveillance of vehicles and stations.
- Visible (Conspicuity) – Bus lanes are ignored by motorists, the metro (below ground) is not seen as an alternative to the private car.
- Performance – Separate right of way and signal priorities makes the tram an above ground metro with a high degree of reliability and punctuality.

The links to the city, its politics, urban planning etc. may be favourable for tramway development, but less so for public transport in a wider geographical sense. Public transport responsibility is split between various organisations and commuting over longer distances often requires a number of tickets or passes. Multi-modal or multi-operator passes or tickets are still rare in France. Public transport in the countryside is

⁴⁸ Light Rail - Light Cost. KFB & VTI forskning/research 26A 1999

often quite sparse and is mainly aimed at serving schoolchildren. The growth of long distance commuting has certainly been noted but there seems to be no serious attempts at organising or reorganising public transport on a more regional (instead of urban) scale. The Swedish Tågplus scheme (a seamless journey through co-operation between PTAs and operators) is very difficult to explain in France.

Competitive tendering certainly exists in France, for instance in Lyon. However, this Swedish/Scandinavian model where the public sector commitment is limited to financial support and tendering out of operations in competition where private operators are the norm is viewed with mixed feelings. On the other hand – acting as both buyer and provider in the form of a Société d'économie mixte is seen as quite acceptable.

The French opposition to the proposed EU Regulation⁴⁹ on Public Service Obligations etc. has been fierce and an interesting range of objections have been presented. VTI intends to deal with this area in a forthcoming project.

⁴⁹ Proposal for a Regulation of the European Parliament and of the Council on action by Member States concerning public service requirements and the award of public service contracts in passenger transport by rail, road and inland waterway. COM(2000) 7 PROVISIONAL 2000/0212 (COD)

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French spreadsheet

All figures in Euro if not otherwise stated

		Lyon – opened 18 December 2000	Marseille (proposed network)	Montpellier –opened 30 June 2000
1	Physical data	2 lines 19 km, 39 stations, approx. 90 % on reservation	2 lines 16 km, 42 stations. Expected to open 2006.	1 line 15 km, 28 stations
2	Organisation – PTAs, operators, etc.	PTA is SYTRAL representing 60 communes (1 350 000 inh.) and the Département of Rhone. Operations are tendered out to SLTC owned by Keolis.	City-owned RTM runs PT in the core area. Peri-urban bus services are contracted out	PTA is District of Montpellier (15 communes), new PTA with 41 communes (480 000 inh.) being formed. (See Note 8)
3	Funding criteria	See Section 10.2.2 Govt. support	Section 10.2.2	Section 10.2.2
4	Cost breakdown	Perm way 129 39 Vehicles 64 Conduits 34 Buildings 27 Depot + Misc. <u>96</u> TOTAL 350	Permanent way 146 32 vehicles 51 Conduits 20 Buildings 24 Depot + misc. <u>64</u> TOTAL 305	Vehicles 50 Infrastr and Buildings 230 Other <u>70</u> Total 350
5	Sources of financing	SYTRAL 255 State 61 City of Lyon 33 Others <u>1</u> TOTAL 350	State 64 Région 24 Département 24 Miscellaneous 5 AO Marseille <u>188</u> TOTAL 305	Dep. Hérault 23 Distr.Montpellier 100 State 64 Others, borrowing etc. <u>163</u> Total 350

		Lyon – opened 18 December 2000	Marseille (proposed network)	Montpellier–opened 30 June 2000
6	Operator – chosen through competitive tendering etc	Yes, but at the latest round of tendering only Keolis bid	Publicly owned RTM most likely	See section 11.3.2
7	Projected number of Passengers	50 000 pass./day for each line 35 000 reached in April 2001 according to SLTC. (According to Transport Public, mai 2001 issue, the objective was 34 000 pass/day for each line – this was reached in March 2001)	Line 1 Les Calliols – Bougainville 59 000/day, line 2 Place. 4 Sept. - Blancarde 33 000/day	Forecast 75 000/day. 60 000/day reached after six months of operations. PTA finds this quite acceptable. Lengthening of trams to increase capacity decided
8	Projected revenue	Not possible to separate from other public transport	Not possible to separate from other public transport. 40 % cost recovery expected	Not possible to separate from other public transport
9	Covering of losses	30 % cost recovery rate, 70 % borne by SYTRAL and "Versement Transport" (Uncertain figures!)	No data available, probably not different from Lyon or other similar French cities	Probably 30 % – no details available
10	Motivation for tram, in particular added costs of tram compared to bus	Several aspects mentioned. Sections 11.1.2 and 11.1.4	Firstly – rejuvenate the city centre Secondly – transport people Section 11.2.4	Section 11.3.4
11	Land use Development/ Cityscape /Aesthetics	Extremely important! Additional costs about 34 M €. Section 11.1.3	See above	See above
12	Private car or parking restrictions	Tram seen as a positive way to reduce parking. (Never mentioned in print but often in interviews)	Mentioned in the urban transport plan but no details yet available	700 public parking spaces disappeared but no private ones. (2 000 new cycle racks.)

		Lyon – opened 18 December 2000	Marseille (proposed network)	Montpellier —opened 30 June 2000
13	Co-operation with residents, shopkeepers, chambers of commerce etc.	Apparently highly successful. Section 11.1.4	No details available. Project still at design stage, city stresses that alignments etc. are still not fixed.	Section 11.3.4
14	Security matters	CCTV in vehicles and on stations. Security in Lyon is not seen as difficult as in Paris or Marseille	A severe problem! The Metro has shut down at 2100 for security reasons. Traffic until 0030 three nights/week now being tried.	Not specially mentioned by the PTA
15	Expansion plans	Extension of line 2 decided, several other lines under discussion		Line 2 to be completed in 2006, Jacou – Saint-Jean-de-Védas

