



Trampower

Getting people back on track

**Submission of Evidence to
APPLRG / pteg – Inquiry into Light Rail**

Light Rail and City Regions: a 21st Century Mode of Transport



October 2009

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APPLRG / pteg – Inquiry into Light Rail**

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Light Rail and City Regions: a 21st Century Mode of Transport

1. Introduction

1.1 TramPower Ltd is a UK company dedicated to identifying sustainable Light Rail (LR) projects both nationally and internationally, and marketing and supplying affordable, safe and reliable equipment to make these feasible. The Principals of TramPower Ltd have considerable knowledge and experience of major project delivery, and of public transport planning and operations (bus and rail), and constructing economic (civil engineering) infrastructure.

1.2 TramPower believes that there are compelling environmental, energy and sustainability reasons for opening many new tramways, especially to replace busy bus corridors, and to provide an acceptable alternative to urban car trip-making.

1.3 TramPower products include...

- 'City Class' Light Rail Vehicle (LRV)
- LR55 track
- simplified overhead (OHL)
- analytical software to identify the business case for new LR lines

Further information on our products and projects are at Appendices A and B.

1.4 Much of the material we present is contained in appendices, and indicated within the body of the submission.

Below, we have responded to the specific issues listed by the Inquiry.

2. Our Response to the Inquiry

2.1 To review current progress with light rail schemes in the UK

What has been the experience in delivering light rail schemes in the UK?

What have been the issues which have helped progress schemes or acted as barriers to their development?

TramPower considers that the experience has been salutary – a case study on how not to deliver urban transportation projects. They have invariably exceeded their budgets and, in the main, delivered far below expectations.

TramPower believes that the issues have been well-canvassed in the National Audit Office report (2004), our commentary on which appears at Appendix C.

We record our concern that the lessons contained in that report have not been applied to related transportation projects, namely the Cambridgeshire Busway, now nearly £100m over budget and a year late and the Edinburgh Tram reported to be £200m over budget and three years late. Furthermore, it is not clear that the implications of the report have been absorbed by the responsible government agencies, primarily the Department for Transport (DfT), in their approach to new LR proposals.

i) What has been the experience in delivering light rail schemes in the UK?

The discussion in Appendix C covers this fairly comprehensively

ii) What have been the issues which have helped progress schemes or acted as barriers to their development?

Public support for environmentally benign light rail, and that most drivers are willing to make some trips by light rail are positives. The barriers were well discussed by the 2004 Report of the National Audit Office. Many of these barriers are within or caused by the actions of public authorities.

2.2 To compare the UK experience with progress on light rail schemes on the continent

What has been the experience in delivering light rail schemes on the continent?

What are the common issues and barriers, and how have these been addressed?

What are the key lessons from Europe in progressing light rail?

TramPower believes that the contrast between the mainland Europe and UK experiences with LR could not be more marked. Typically, LR projects on the continent are delivered on time and to budget. The planning processes appear to facilitate the development of LR rather than hinder and delay it.

We draw attention to four important issues (among many)...

2.2.1 Re-location of services

In France, central government pays a significant proportion of the total cost of the re-location of services, where required. Furthermore, there is an incentive to the providers of reticulated services to contribute towards the renewal of their service ducts, pipes and cables. Deals are quickly struck between the promoter and the services providers.

In the UK, the LR project is loaded with virtually all re-location costs, adding substantially to the total cost and the implementation timescale.

Re-location of services is not usually required below TramPower's LR55 track because the load is spread rather than concentrated by its novel state-of-the-art design (refer to Appendix 2), and physical access is available between rails and tracks, which can self support over 1m wide excavations. (refer to Appendix A.2).

2.2.2 Fuel Duty

There is a deeply perverse element in the evaluation of projects undertaken by the DfT, whereby any reduction in fuel duty paid, as a result of the modal shift from cars, is counted as a cost against the project!

The assessment methodology used by the DfT seriously undermines the oft-claimed national objective of sustainability in transportation, and is considered to be of dubious pedigree and credibility.

2.2.3 Engineering Design and Policy

The planning system and the requirements of the DfT, the RSSB, HMRI, HSE and other bodies add considerably to costs. LR systems in the UK are over-engineered and built to virtually heavy rail (HR) standards, largely because of the lack of experience and knowledge of LR.

France utilised Germany's hundred years of experience with LR in establishing their own LR projects and accompanying LR industry, which now flourishes. The short-sightedness and short-termism of rapidly changing (read 'unstable') government policy and procurement procedures have thwarted the development of a comparable industry and the deployment of LR technologies in the UK.

2.2.4 Affordability and Finance

The advent of low-cost TramPower technologies fundamentally alters the business case for Light Rail. There was already strong evidence that LRT is more cost-effective over 30y than BRT, and that LR running costs are lower than for buses. There is also long term proof that LRT attracts about 40% more passengers than BRT, and virtually all these extra passengers have been attracted from private cars.

TramPower LRVs are about half the cost of our international competitors, and a TramPower system (LRV, track and overhead) would cost about half that of any alternative supplier, for the same performance and service quality.

Typically, the UK Government, through the DfT, has funded LRTs in the UK. With government finance for almost anything difficult to obtain, alternative financing models are required.

A full-cost (ie. one supplied by our competitors and built to HR standards) would be difficult to finance from other sources. However, we have found that the lower capital cost of our TramPower systems and the Internal Rate of Return that our projects can therefore generate is attractive to private investors. Please refer to Appendix B.

i) What has been the experience in delivering light rail schemes on the continent?

As the NAO observed there is a considerable consensus on the continent for the need for more light rail and less political problems in delivering the same. The fact that such continental schemes can be delivered for about 50% of the cost of similar UK schemes, makes those affordable. This is in spite of labour costs being higher on the continent.

ii) What are the common issues and barriers, and how have these been addressed?

There seem to be few common issues between the UK and the continent.

iii) What are the key lessons from Europe in progressing light rail?

(a) The promoting enterprises need to be staffed by dedicated light rail professionals

(b) These bodies need to have a clear focus and not “play politics”

(c) There needs to be a clear division of risk with the contractors

(d) Real consultation is needed to explain and reduce the risk of another “West London Tramway” residents’ revolt

2.3 To examine current UK government policy towards light rail

Where have we got to on government light rail policy?

What are challenges for light rail in the current and future policy context?

What has changed since the Transport Select Committee Report of 2004?

What might we expect of future governments?

With due respect to the responsible authorities, we consider that LR policy has been in stasis for some years. While some funding has been made available (eg. Nottingham), the DfT does not appear to have taken a pro-active stance in respect of the NAO report, nor has it shown much interest in our state-of-the-art technologies and what they could mean for sustainable urban transportation in the UK, let alone manufacturing and energy use.

There is some doubt whether the requisite level of expertise in LR lies within the DfT, or any other government agency.

i) Where have we got to on government light rail policy?

The cost over runs and poor performance of publicly promoted light rail projects highlighted by the 2004 Report of the National Audit Office have jaundiced the Government to funding any widespread programme for new light rail schemes, which would be needed if there is to be a serious effort to meet the EU Air Standards Directives, reduce transport carbon dioxide, reduce traffic fume deaths and illnesses, and reduce dependence on (imported) oil.

ii) What are challenges for light rail in the current and future policy context?

Clearly as a public sector enterprise delivering one light rail line every four years is not going to make a significant impact on the environmental problems that are affecting the UK. In terms of results per £ of public money spent, there are other more effective ways to achieve these objectives.

iii) What has changed since the Transport Select Committee Report of 2004?

The financial crisis has increased the public debt to a level where any major public investment programme in light rail must be unrealistic in the next 20 years ?

iv) What might we expect of future governments?

A new Government should be more open minded to the ways in which public services can be delivered or indeed what constitutes a public service. Is a public service one delivered by public sector workers ? Or is a public service a service that is provided for the benefit of the public. If the latter then telephones, electricity, gas, water, food, houses and cars are all services that benefit the public, but provided by the private sector.

New ways could include co-operative, not for profit companies and straight private (transport operating) companies. These all would have to satisfy safety, planning and other regulations but can be delivered by single interest enterprises that could concentrate on the new tramway.

2.4 To consider the opportunities and risks in developing light rail systems in the UK

What are the risks involved in developing light rail in the UK?

How are these currently addressed? Are there better ways of addressing risk?

What are opportunities that light rail offers?

These issues are well-canvassed in the NAO Report.

Our funding model – wholly privately- financed systems – ensures that many issues raised by the NAO fall away. The private sector is fully capable of assessing risk and accounting for it.

The evidence for the advantages of LRT over BRT in terms of cost is well-known. As important is the ability of LR to take modal share from cars, which buses cannot do.

Further investment in buses in an attempt to increase their modal share, and therefore justify conversion to LR, are doomed to failure, as has been demonstrated over 40 years by the Runcorn Busway. A more strategic response is required.

i) What are the risks involved in developing light rail in the UK?

The biggest risks at present are not revenue or construction problems, since these can be factored into the Business Plan. The biggest risk for new light rail schemes is the goal posts being moved by the public sector, either at a national level, or at a local level by a change of policy. The imposition of the National Pensioners Bus Pass is an example of the former. A similar policy was adopted by the Russian Government without adequate funding, causing local public transport companies to reduce maintenance, stop renewals, and gradually reduce services. An example of the latter is by not approving planning permission for a new development which would either generate a large part of the demand for a new tram system, or help fund it. Another local example would be the failure to deliver agreed revised traffic signal control plans to give tramcars priority routes.

ii) How are these currently addressed? Are there better ways of addressing risk?

The usual way for private developers to control their risks are by good planning, comprehensive negotiations and a measure of contingency funding. Only the public sector can address its own behaviour that has in the past led to increased risks being imposed on the private sector. Of course the ultimate public sector risk is a change of party (and policies) at an election. Provided the incoming Party implements its Manifesto, then the private sector can work with that.

iii) What are opportunities that light rail offers?

Bus operators are presently facing a pincer of continually declining patronage (and revenue despite the high levels of subsidies highlighted in a recent Office of Fair Trading Investigation), and increasing costs from higher fuel prices and the continuing problem of recruiting and retaining staff (bus drivers in particular have a high turnover).

Using the Tram Power Ltd. approach it is already commercially viable for a bus operator to invest his funds in converting busy bus routes to light rail/tramway. The rule of thumb is a peak bus service of ten buses an hour or more. Essentially the bus operator is trading off a higher (but fixed) capital investment in infrastructure, against much lower operating costs, and a more stable work force. In return the operator will now attract trips from cars, that previously would not have gone by bus. So the operator will increase his revenue and reduce his operating costs. This creates a new expansionist mentality, instead of the managed decline of bus services over the last 50 years. Once the busiest bus routes are converted, the next busiest would become viable, since many of the costs would become marginal, and by sharing overheads, the pioneer routes become more profitable.

With light rail supplied with renewably generated electricity, health threatening emissions in city streets are reduced, fossil fuel consumption reduced, and carbon dioxide reduced, especially if diverted car trips are factored in. This might be attractive to one or more of the major electricity generators to invest in light rail, and supply the power, both for commercial reasons, as well as public relations.

Light rail in the UK can also be part of the freight transport (delivery/collection) service. At one extreme, ISO Containers can be carried over tram networks at night to/from industrial/commercial premises, on modified tramcars. At the other end, wheeled pallets can be delivered to shops and supermarkets without the need for HGV blocking the street. With accessible low floor trams, pallets can be wheeled directly to the shop. All extra (freight) revenue will improve the finances of the tramway, provided there is no significant increase in operating costs.

2.5 To examine how a fairer, more effective and efficient framework could be established for the appraisal, development and implementation of modern tram schemes in the UK.

What can be done to take forward modern tram schemes?

How can government, promoters and industry work better together?

The environmental imperatives for sustainable urban transportation and lowering our carbon footprint requires strong action to be taken rapidly – not more of the same - and a different outcome. This clearly cannot be achieved by the present public agencies, heavily criticised by the National Audit Office, even if public funding was available ? Where present public agencies continue, their role must be to encourage and enable privately promoted and funded light rail schemes. Outside London this already is the role of the transport executives in respect of bus services.

The natural promoters of new light rail will be combinations of existing transport operating enterprises and power companies. These will utilise the high-level industrial, engineering and software skills in a UK-based LR sector. In time, and with initial assistance from German and French expertise, this should become self-perpetuating – a sustainable enterprise offering high-quality employment at all levels.

i) What can be done to take forward modern tram schemes?

- (a) *Local Transport Plans must include the principle of light rail lines, without necessarily prescribing the routes*
- (b) *Local (transport) Authorities must signal their willingness to encourage privately promoted schemes as a way of delivering desired transport objectives:
Reduce traffic congestion
Full accessibility
Environmental benefits.*
- (c) *Local authorities must be willing to co-operate over planning, highway and traffic grounds. (b) cannot be achieved if new light rail schemes have no priorities over road traffic.*

ii) How can government, promoters and industry work better together?

In most continental cities, the provision of high quality (rail based) public transport has a wide consensus and is not a political issue, as it is presently in Nottingham. The role of Government should be to reduce, or remove the legal impediments to innovation and the implementation of new light rail systems. It is the role of the public transport industry to provide services to meet the needs of passengers

and to attract new traffic (and revenue) from motor car trips. Public transport operators will not do this if they see their positions being compromised by the actions of public agencies.

3. Note on Air Quality, Pollution and Car ownership

3.1 Electrically-powered Light Rail emits no air pollution at the point of operation. LR may also be zero-carbon if the electricity is from renewable sources. Embedded renewable power generation is a feature of the new Galway tramway (www.gluas.ie) (Appendix B).

Electric tramways are part of the major reason why most Continental cities can satisfy EU Air quality Directives.

3.2 There is a paradox in that the UK has the lowest level of per capita car ownership in Western Europe but the highest per capita car usage. Major Continental cities have achieved lower levels of car usage, and with high levels of economic activity, without the need for Congestion Charges or other tax based penalties.

The main instrument for Continental cities having lower levels of car use is the comprehensive application of traffic restraint management and traffic calming which favour public transport, cycling and walking.

Many Continental cities now have levels of modal split to cycling that the UK has to buses. They have higher use of public transport, leaving less than 50% of trips by car. In the UK urban car usage is nearer 70% in all major cities, except inner and central London.

4.0 Role of Public Agencies

4.1 Central Government Policy

The Government has a duty of care for the health and welfare of the population. It also has some significant conflicts of interest. Maximising tax revenue is a major objective of Central Government, of which fuel duty is an important part. The consumption of fuel in motor vehicles is also a principal cause of unhealthy air quality and breaching EU Air Standard Directives.

The Government has also stated that it will reduce carbon dioxide emissions and traffic congestion. Yet one of the proven instruments for doing this, namely new light rail schemes, is not being encouraged because of the bad experiences of earlier schemes and the negative 2004 Report of the National Audit Office. These conflicts of interest are not unique to the present times.

Central Government must also implement EU Directives of which one on increasing renewable energy, and meeting the healthy air standards are the most relevant to light rail. To achieve these are need fiscal, regulatory and legal instruments. Central Government is hardly the most appropriate to deliver local transport services, and certainly should not to try to micro-manage enterprises that are delivering such services. Nor should Central Government try to second-guess private service suppliers or the market. Examples of doing this in the past have often ended with unintended consequences worse than the original problem.

4.2 Local Government

Local Government has to implement national policies, and to meet the needs of their local community. In terms of light rail systems, the two principal means are its planning powers, both over tramways and developments that are sympathetic, and through its Highway Authority function. Both of these should be used to assist new light rail projects, whether promoted by public or private bodies ?

4.3 Passenger transport executives

The Inquiry Panel could in terms of the public interest consider the role of the PTEs. These were set up under the Transport Act 1968, when all public transport (except taxis) were publicly owned and operated in a regulated controlled environment. The function of PTE's was to co-ordinate and integrate public transport services. This was never achieved in any sense that might be recognised elsewhere in Europe. Instead the PTE's presided over a managed decline of (bus) use with increasing subsidies to maintain a network, and so employed staff declined at a slower rate.

The Transport Act 1985 changed that outside London, where the majority of public transport services are operated by private companies in a deregulated environment. Ironically with fewer direct operating responsibilities, the total number of staff employed by the PTEs has increased.

The main responsibilities of the PTEs are...

- concessionary travel pass scheme administration
- tendered (socially necessary) bus service
- Local Transport Plan
- public transport service information provision
- network ticketing

With the abolition of the Metropolitan Counties and the creation of more unitary (city) councils there is at least a *prima facie* case to consider whether the present PTE functions are needed. If the functions are still needed, whether other agencies may be better placed to deliver them.

5.0 Reducing costs through innovation:

Some of the most relevant points have been made above but this is a short summary and reminder.

5.1 Technical

Technical innovation in terms of the engineering and operation of light railways continues. Some innovations are difficult to introduce not because they do not work but because of the conservatism of the bodies which presently promote and regulate tramways. The history of innovation in light rail is stronger on the continent and in North America. Learning from those experiences would save time and money. There are small companies in the UK also trying to get their innovative and cost saving products into the market.

Some of these companies have received public grants to research and develop their products but the purchasing Authorities preclude them either because of a lack of a trading record, or no earlier (fleet) use. TramPower Ltd. undertook a joint bid with Parry to Northern Rail to supply tram-trains for the Huddersfield trial. The vehicles were technically compliant. Our price at £1.8million was lower than the only other bidder but was not accepted because neither company had a trading record. If one of two bids is disqualified, how can the remaining bid be considered without contravening EU Procurement Law ?

5.2 Organisation

Historically the first generation of tramways in the UK (and railways) were nearly all promoted, funded, built and operated by (local) private companies. Today there is a confused position of a mixture of public and private ownership, public and private control of services. The private sector can generate the funds needed to invest in new tramways if there is a clear signal from the public sector that this can be done on a commercial basis.

Another 19th century tramway model is where the local authority installed, owned and maintained the tram tracks, and private operators leased them. This could be another approach, except under the EU Railway Directives, any private companies have the right to open access use of such tracks. There are

many examples on the continent where different tram operators inter work over the tracks owned by different authorities. This would be analogous to local Highway Authorities maintaining the roads that any bus operator can use. As none of the existing tramways is profitable, there is little danger of “on track” competition.

6.0 Other ways to deliver new tramways

If the UK is to meet health, environmental, energy and resource issues then there will have to be a major change in the way we travel, with less car trips and more by foot, bicycle and sustainable public transport. The last 20 years has shown that the public purse cannot support more than a new tramway every four years. The present state of the public finances means that there is even less chance of any significant expenditure in tramways in the near future ?

Given the right framework, private investment can be mobilised to fund new tramways. That framework includes dedicated and ring fenced companies, and getting a suitable reward for the investment, whether in shares, interest or a combination. Those investors will also want some control of their investment. This is probably one reason why the PTEs have been unsuccessful in attracting private funding to new tramways. PFI projects are not private investments, only mortgages to public bodies, which count against the PSBR.

7.0 Conclusion

TramPower Ltd welcomes the initiative of APPLRG and PTEG in mounting this Public Inquiry into Light Rail. We hope that our contribution to that debate will be considered seriously. We would also be willing to supply witnesses to give evidence to the Inquiry.

Submission prepared by...

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TramPower Ltd

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Appendix A - TramPower Technologies

A.1 TramPower 'City Class' Light Rail Vehicle (LRV)

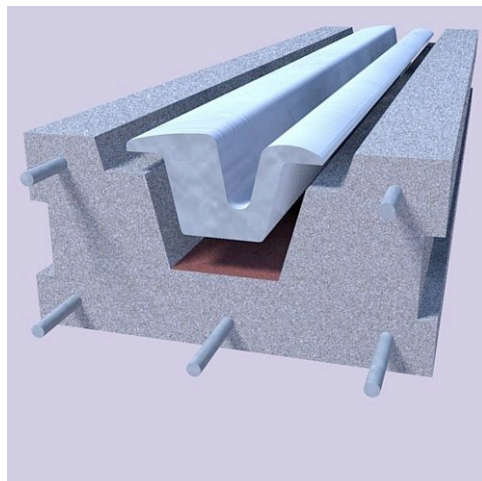


TramPower offers high-specification, high-performance, low-cost and low-energy LRVs. They use 1kWh/km, about one-third of those of our competitors. Independent axles eliminate 'wheel squeal'.



Design assistance is being provided by Tata Motors (UK).

A.2 TramPower LR55 Rail



Our patented and technically advanced high-durability LR55 track (set in a concrete trough that may be laid in prefabricated 6m lengths) can be constructed at 200 - 500m/week, reducing installation and disruption time and costs. Most underground services do not require re-location under LR55, as access is available between rails and tracks. The track is self supporting over 1m wide trenches dug across streets. Because of its damping attributes LR55 helps to reduce noise and vibrations in city streets.

LR55 also has specialist applications in tunnels, in heavy rail (HR) stations and approaches where its low profile creates valuable extra headroom. LR55 track has been tested to 80t axle loading. LR55 also can be for crane tracks, eg. in rail/road transshipment depots and industrial premises, where a flat floor is important.

A.3 Tram Power OHL



We also hold patents for our OHL, which is simple and quick to install. It is suitable up to 160km/h. In the background of the photograph are the West Coast Mainline (WCML) gantries and overhead (at Carnforth, England).

A.4 Summary

LRT component	Cost impact	Other
City Class LRV -	one-third cheaper than other manufacturers' LRVs - one-quarter of the energy use of contemporary LRVs	- state-of-the-art OTS components - lower costs possible through re-engineering and mass production - easy upgrades
LR55 track	- one-third of the installed cost of equivalent rail	- fast installation - specialist applications potential
OHL -	half of the installed cost of equivalent OHL	- simple design - fast assembly on site

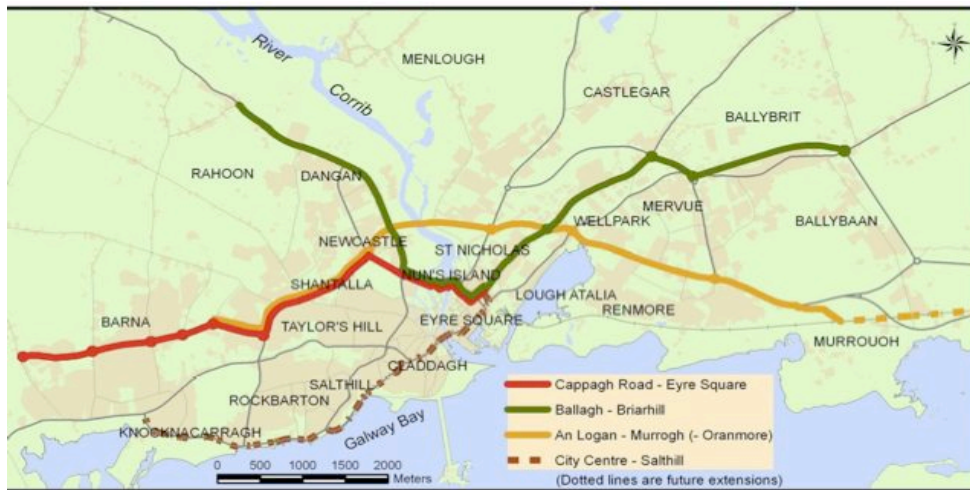
A typical LR network (say, 2lines, 30km, 22 LRVs) would ordinarily cost £600 – 700m, but using TRAM Power technologies only £250 – 300m.

Further information is available on our website – www.trampower.co.uk.

Appendix B - Our Galway and CROST Projects

B.1 Our most mature Light Rail proposal, for Galway, Ireland (www.gluas.ie), will be wholly commercially-funded. It is strongly supported by the local business community, Galway City Council and the Irish Government. We anticipate that approvals to proceed will be announced within the next few months.

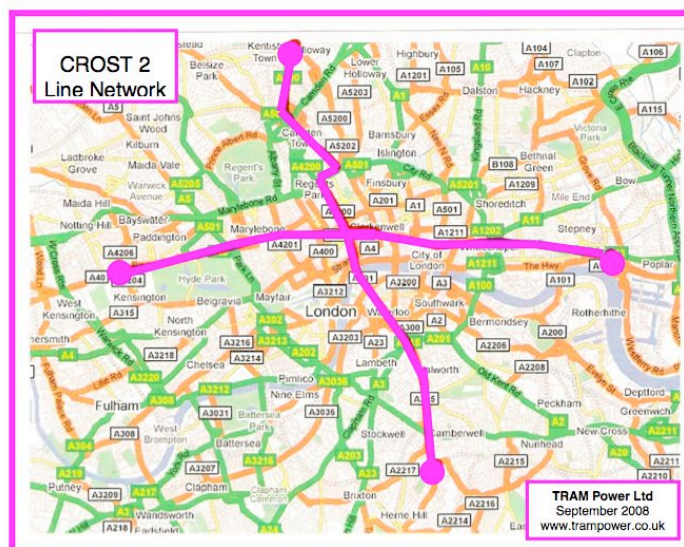
Initially, two lines are envisaged intersecting in the centre (the green, red and orange routes shown below). Embedded within the proposal are five iconic wind turbines located at P+R sites and a small hydro scheme to provide electricity. The IRR of our proposal exceeds 13%. Freight revenues will be additional.



The GLUAS Project consists of two lines, 21km long, needing 17 City Class trams to provide a 6min frequency service. The capital cost of €200m has been validated independently by MVA for Galway City Council.

B.2 Tram Power Ltd. offers renewable energy supply as an inherent part of our projects to help restrain future rises in operating costs. This gives a number of significant advantages to the LR operator/owner, as well as environmental and health benefits for the community.

B.3. The CROST Project is at the evaluation and feasibility stage for central London. This is a proposal for a privately funded, commercially operated tramway network to offer most of the benefits of the abandoned and unaffordable but advanced Cross River Tramway and the Oxford Street Tramway. Cross River Oxford Street Tramway (CROST) is in discussion with the Mayor's Office, Transport for London and the Cross River Partnership.



Appendix C – The National Audit Office Report

Improving public transport in England through light rail HC: 518 2003-2004, ISBN: 0102927871, 23-4-2004

C.1 The National Audit Office (NAO) Report was prepared considering only publicly promoted and funded schemes, although one of the recommendations was to use funds other than taxpayers for new light rail schemes. The NAO comments below therefore are directly addressed to the PTEGs that promoted the light rail schemes investigated. The principal NAO conclusions are shown in bold, followed by a TramPower comments in italic.

C.2 Complexity of the delivery chain, where delivery of light rail schemes depends upon several partners to be fully effective

Every light rail scheme considered by the NAO was undertaken by a different contractual regime, including turnkey, design, build, operate, fund design build, design build/maintain and operate. Thus legal costs were greater than the engineering design costs, as there was no body of experience built up, as there has been with the standard Highway construction contracts for example .

This complexity was further compounded by the aim of transferring risks from the public to the private sector. The biggest risk in such projects comes from the public sector in changing the rules part way through the project, na experience noted all too often in the NAO Report. In order to accept these risks the private sector bidders added further contingency costs.

Finally the cost of bidding for such complex scheme contracts was typically £2million per company, with at best a 1 in 4 chance of success. The cost of lost and aborted scheme bids, are then loaded on to later bids. Such was the experience of this process that one major construction company was bankrupted, and two others withdrew from the market.

C.3 Capacity of delivery organisations, where local authorities that promote schemes need to have the capacity in terms of staff with the right skills to deliver new light rail systems

The use of consultants to advise public bodies over light rail schemes was criticised by the NAO both for the proportion of scheme costs consumed and that the public bodies often did not have enough and of the right calibre of supervising officers to ensure that value for money was obtained, and in fact whether much of the work done was necessary. This criticism was subsequently picked up in separate District Auditors Reports.

C.4 Targeting of resources to improve public transport where there is greatest need, and for the most effective use of resources

The NAO noted that some schemes focused on low income, low car ownership and high unemployment areas as a “social exclusion” objective. These areas are by definition those with the highest public transport use, including taxis. The areas with the lowest public transport use are those with high levels of car ownership and employment levels, where existing bus use is low and improving the public transport offer should attract car trips, and lead to significant modal shifts.

C.5 Monitoring and evaluating performance, to determine the extent to which evaluation of existing systems was incomplete

The NAO noted that incomplete “Before and After” studies had been undertaken to demonstrate that the light rail scheme objectives had been achieved, and that claimed benefits were often unsupportable.

C.6 Anticipated benefits have been over-estimated passenger numbers, and therefore passenger benefits, have been lower than expected

In economic terms the under or late achievement of passenger forecasts for new light rail schemes was severely criticised by the NAO, since this meant that new systems were operating at a loss. When the capital cost of the schemes was also factored in, this gave very poor value for the public money invested.

C.7 Light rail systems are not fully integrated with other forms of public transport

The NAO noted that with few exceptions there was little effort at the promotion stage to achieve modal integration, and what did occur was a result of public pressure on an ad hoc basis. Some transport authorities have claimed that in a deregulated environment integration is not possible.

The NAO observed that integration between several different private public transport companies in Continental cities was possible. UK examples were where LR stops do not match up with railway stations, or existing bus stations, and where no attempt was made to have bus or taxi facilities at LR termini. There is often no user-friendly source of cross-modal service information.

C.8 Light rail has had a limited impact on road congestion, pollution and road accidents

Because typically UK light rail schemes have been one or perhaps two lines, there is not comprehensive coverage of the urban area, and therefore it is physically impossible to attract trips for the majority of travel corridors. Until light rail networks have many lines, with synergy effects covering the whole urban area, then the modal shift will be small from car traffic.

It is however gratifying that in the corridors served by LR, there is evidence of significant modal shifts from cars, so that when there is a network, accumulating these will have a bigger impact on road congestion, provided that the highway capacity released is not filled up by suppressed car trips. There needs to be an integration of policy between LR provision and traffic management of the highway network. A 10y programme in Barcelona of reducing road capacity as new light rail lines have been built, demonstrates that this is possible.

C.9 It is not clear what impact light rail has had on regeneration and social exclusion

This is a development of the NAO's earlier comment on monitoring. If the new LR scheme has not managed to link the unemployed people with job vacancies, then social exclusion is unlikely to reduce. Is LR a cause or effect of regeneration?

A tacit criticism was of competing Government departments and their budgets. If one funds a new LR scheme and another does not fund a regeneration project there is a lack of policy co-ordination.

C.10 Light rail systems in France and Germany are designed differently to their English counterparts

In Germany there is over 100 years of continuous tramway and light rail provision, so that there is a body of knowledge and experience and a body of professional engineers and operators who design on an economical basis new lines and extensions.

When the French started in 1980 a programme of new light rail schemes they enjoyed the benefit of German know how. The NAO noted that new continental tramways cost about 50% of those in the UK.

C.10.1 Light rail lines are usually segregated from, and given priority over, other forms of traffic at junctions

The NAO noted that continental tramways enjoy a high level of priority over other traffic, including pre-emption of traffic signals. Highway engineers often think that roads are for the movement of vehicles. Roads should be for the movement of people and freight. A light rail lane has a 300% greater passenger capacity than an all car lane. Priority to light rail therefore increases the passenger capacity of the road, and policy should be integrated over all modes.

C.10.2 Systems are fully integrated with other forms of public transport

In mainland Europe, tram and bus stops are shared, park and ride stations also have taxi stands and bus bays. In a deregulated market bus operators do not have to be controlled to provide these links. It makes no sense to run buses slowly along congested city streets, when they can be more productive serving outlying suburban areas linking to rail and tram stations or terminii.

C.11 Systems in England have been running at a loss

The two main reasons for this are...

- new tram operators (up to 2004) were often heavy rail (HR) influenced, using HR customs and costs*
- the projected ridership and hence fare revenue did not materialise.*

In fact, the passenger forecasts were often unrealistic and such schemes could never be commercial, with the operating revenue greater than the operating costs.

C.12.1 Light rail systems in France and Germany have higher reported patronage levels than similar systems in England

Having linked systems and larger networks, continental tramways enjoy network synergy effects that are impossible in one- or two-line UK systems.

C.12.2 Larger patronage base

Although many continental cities have higher levels of private car ownership than UK cities, these are used less than UK cars. This therefore means that although the number of journeys made per capita is about the same, a larger proportion are available to be attracted to public transport, or ride bicycles. In most UK cities the public's main means of transport is the private car.

C.12.3 Systems connect centres of social and economic activity

LR route planning needs to start with the origin-destination matrix of all trips made in the urban area, in order to maximize the potential number of trips that can be attracted to light rail. The all-bus network in Metropolitan Houston carried about 3% of all trips. In 2004 a LR line was opened to serve the main University and hospital campuses linked to the city centre. This now carries itself 10% of all metropolitan trips.

The primary purpose of a light rail system is to carry passengers, and as many as possible from private cars. Any other benefits are helpful but secondary. Sadly too many LR schemes in the UK are proposed because it is easy to install, on an abandoned rail line, or a highway alignment, say, with poor accessibility thus generating fewer trips.

C.13 The Department needs to do more to improve value for money and there are barriers to the wider take-up of light rail

The Department's response to this has been effectively to withdraw funding for new light rail schemes. Nor has it made any efforts to remove, or at least reduce the barriers, one of which is the statutory approval process. Why should a new light rail line approval be much more complex than a new road or bus route ?

C.14 Barriers to LR Development

C.14.1 Cost is the most significant factor discouraging the further development of light rail - 43 per cent of local authorities consider light rail is too costly when compared with other options, such as buses.

As other European countries demonstrate LR can be economical, provided those promoting the scheme know what they are doing, and provide what is needed to run a safe and attractive tramway.

UK tramways do not enjoy high costs exclusively. The St. Ives Busway was originally costed at £65m when construction began. It is over a year late and is costing £140m, without the buses. Similarly the Cross Rail project in London was costed at £4bn in 2003, is now costing £16bn, which could fund a new light rail system in all eight PTE areas.

Comparing bus and tram costs is not comparing like-with-like, since they deliver different things, most notably the ability to attract car trips. The Scotthall Busway in Leeds reported a 50% increase in ridership compared to the previous on road service. Most of this was attracted from parallel (non-busway) bus services. A statistically insignificant 3% was attracted from cars. The Runcorn Busway attracts virtually no trips from cars.

TramPower Ltd. has developed more cost-effective and proven LR products, which reduce capital and operating costs.

Another barrier to more economic LR schemes is the public sector contract mentality requiring several satisfied customers and many years of trading. How then can innovation that reduces costs be introduced? How can new (small) entrants come into the market and compete than existing (high cost) large companies.

Trying to get sub contract work from large companies is also impossible because they use the basic public sector contract, and they have no incentive to show how things can cost less.

C.14.2 Poor financial performance of some existing light rail systems is discouraging interest in supporting light rail and the costs of new systems are increasing partly as a consequence.

The NAO reported that as well as operating costs and revenue causing poor financial performance, confused and contradictory management structures resulted in a mismatch between the power to make decisions and responsibility for carrying them out.

C.14.3 Local authorities are concerned about being able to secure sufficient funds at local level to promote a system and help pay for its construction.

Local authorities have a duty to ensure that their areas enjoy a full range of services and facilities that their residents need. As an example people need fresh affordable food. This is provided by private sector retailers, with intense competition over prices, products and store location. What funding does a

local authority have to secure to have affordable fresh food retailing ?

There is no reason to suppose that left to themselves, private operators would not promote, fund and operate new LR schemes, and in doing so select routes that would be commercial and affordable. The Local Authority statutory duty to consider planning applications should be adequate insurance that the public is being fairly served by such new LR schemes. In the UK only about 10% of all the capital investment in transport is funded by the public sector. The private sector has adequate investment capital for commercial tramway schemes, if local authorities are prepared to undertake an enabling and approving role.

C.14.4 It takes too long for local authorities to be granted the necessary legal powers for light rail systems and whether schemes will be funded is uncertain.

If new LR schemes were promoted by private operators, then the funding issue immediately disappears. The largest part of the Transport and Works Act powers relate to deemed planning consent. If a new privately promoted and funded tramway does not require Compulsory Purchase Powers, then the promoter can apply for planning consent to the relevant Local Authority, or if the scheme is very large to the new Strategic Planning Commission. Both of these approaches have statutory timescales, so processing is predictable, and because the Local Authority is not the funding body, there is no conflict of interest.

C.14.5 There is insufficient in-house expertise in some local authorities to develop light rail and a lack of steer from the Department.

This should reinforce the above point. If new LRTs are developed by private sector transport professionals, then only the planning issues need be addressed, for which Local Authorities are already adequately resourced.

C.15 Issues to be addressed

C.15.1 Lack of standardisation in systems' design drives up costs.

Standardisation is not the only way to reduce costs. If standardisation is technically prescribed then it can lead to ossification and higher costs as fewer manufacturers are willing to produce. The German BoStrab tramway standards are performance based, which gives manufacturers and constructors freedom to innovate to achieve the required performance of safety, comfort and economy. Real competition between providers is another way to achieve lower costs, especially where innovation is welcome and encouraged.

C.15.2 Costs are also inflated by applying heavy rail standards to light rail.

This is still seems to be the case in the UK.

C.15.3 The diversion of utilities is expensive.

Utility diversions are needed because of the above in installing a track form based on a ~ 6m wide concrete slab that sterilizes the under road space. Where the utilities can get physical access to their plant they would prefer to leave in place. The LR55 track allows that and does not require the whole road to be rebuilt, since it uses the existing structure to carry the load of track and trams.

C.15.4 There are barriers to the development and adoption of new and cheaper technologies. For example, there are no government grants available to develop innovative, energy saving light rail technologies.

There is no shortage of LR innovation in the UK and abroad. The barriers to adoption are ignorance and institutional. The technical literature and patents awarded chronicle the development of new technologies for LR. All competent professional will keep abreast of such developments and be familiar with their characteristics. There also appears to be a short retention span as mistakes are repeated, rather than rectified. Similarly rarely is the historical record studied for earlier experiences, the application of which would save time and money.

C.15.5 Better sharing of risk and alternative forms of procurement contract could help to reduce costs and attract private sector investors.

The private sector is good at controlling its risks. If the public sector accepted the risks posed by its behaviour, then contract in the classical mould would be most economic. Alternatively if the public sector encouraged the private sector to promote, fund, construct and operate new light rail schemes, most of the criticisms of the NAO would be resolved.

C.15.6 Improved pre-costing of passenger numbers would provide a firmer basis for assessing systems' financial viability before contracts are let.

The above comment is also relevant here.

C.15.7 Revenue collection also needs to be improved.

A private sector LR operator taking the full risk of promoting a tramway will be most assiduous to maximize revenue collection.

C.15.8 The costs of promoting light rail schemes can be substantial, while revenue funding generally for the development of local transport is limited.

If Local Authorities were prepared to take a more strategic role by specifying the need for light rail in Local Transport Plans, and then encourage the private sector to provide new commercial tramways, this NAO comment is fully addressed.

C.15.9 Local authorities need to harness sources of funds other than the taxpayer. They have powers, as yet unused, under the Transport Act 2000 to raise funds to improve public transport through congestion charging schemes. The scope for local authorities to share in the wider economic benefits arising from light rail schemes, where schemes increase the value of local trade and land values, also needs to be explored.

The failure of congestion charging referenda in Edinburgh and Manchester shows that the chances of getting this accepted are small. The private non residential parking tax proposed to underwrite the tramway extensions in Nottingham have yet to be tested in the European Court. The Congestion Charge Zone in London has reduced traffic in that Zone by about 25% but increased it in the rest of London by 3% through displacement. Traffic is still rising in London. Like the 18th century Window Tax, people find ways to avoid unpopular taxes.

If however new light rail schemes were privately promoted and funded, then these taxing issues become irrelevant. When HM Treasury considers car trips diverted to public transport as a disadvantage in their calculations, because of less fuel duty received, then the Government will always have an incentive not to fund new light rail schemes, especially where these are seen to need annual subsidies to cover uneconomic operations.

C.15.10 The planning and approval process needs to be speeded up and decisions over funding approval need to be made clearer and more stable.

If the funding of light rail is not a public sector responsibility, then like any other private sector development, the public sector will have an incentive to expedite planning approval in order to benefit from the investment and the kudos of attracting it to their area. As tramways have significant civic cachet, this will be doubly true.

C.15.11 The Department maintains an arm's length approach to where light rail might be developed. Against this background local authorities do not know which schemes have a realistic chance of gaining approval. And, some local authorities are not always best placed to assess whether a light rail system would be suitable or practicable for their locality, lacking the knowledge about what has worked well elsewhere in this country and abroad.

If the private sector is encouraged to be the principle instrument for the delivery of new light rail schemes, then Local Authorities will be the approval body, so any delay to the opening of a new scheme will be down to them. The private sector will be very keen to deliver new tramways as economically as by learning from previous experience in this country and abroad.

C.15.12 The forecast costs of schemes currently under development have risen.

If a private sector promoter faces rising costs, as in any other development, ways to reduce the costs will be sought or the development amended. The same would apply to privately promoted tramways so any cost changes would not be a problem for the Local Authority.

C.15.13 There are fewer barriers to light rail in France and Germany

Part of the reason for this is that tramways are known and understood by most people, so there is less of a NIMBY problem. There is also more unanimity between public authorities.

C.16 Recommendations

C.16.1 Assessing whether value for money is being achieved

If the private sector promoted and funded new light rail schemes, these would cost zero to the public purse, giving exceptionally good value for taxpayers' money.

C.16.2 Realising more benefits for passengers

The private sector would not be satisfied with just one line but would rollover profits to develop a network. In order to maximize revenue, the maximum number of passengers must be attracted from car use. The private operator would use a battery of soft and hard marketing techniques to maximize revenue. Large easy-to-use tram networks deliver significant benefits to passengers in terms of speed and comfort of transit, reliability of service and predictability of journey times.

C.16.3 Improving the financial viability of light rail

The private sector promoters of new tramways have enough motivation to ensure that only viable schemes are built.

C.16.4 Reducing the costs of implementing light rail

A private sector scheme would cost the Local Authority little apart from staff time in handling planning applications and in reorganising traffic management. This is the best position to be in. The private sector would not allow costs of their schemes to rise, as has been the case of some public sector schemes.

C.16.5 Developing sources of funds, other than the taxpayer, for LR

The private sector route is the ideal for public authorities and the taxpayer ?

C.16.6 Adopting a more strategic approach to the development

The (approval of the) location of major traffic generators, eg. schools, hospital, shopping centres, factories etc. needs to be co-ordinated within a Local Authority. There also needs to be sectoral co-ordination within central Government, between departments, that agreed strategies are delivered together. The private sector, in taking the principal role in delivering new LR schemes, should make public sector co-ordinations easier.

What is clear that across the developed world people with cars are not attracted to bus transit. This was proven by the US Transportation Research Board Report 1221 of 1989. Based on an analysis of 40 years of data of buses replacing rail, and then rail replacing buses, the TRB Reported that rail carries about 40% more passengers than the same quality bus service. This difference was made up by the transfer of trips from car, which had not been reported for bus transit trips.

