RAIL VS. O-BAHN

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1. INTRODUCTION

It has been suggested that to debate on the issue of rail vs. bus for public transport systems is to deflect our energy from the real issue which should be public transport vs. private car usage.

This is the argument of those who have already made up their minds on the issue and who wish to stifle further debate which could challenge the validity of their preferred option.

In fact, I would argue that getting it right on the question of rail vs. bus is the most critical issue in winning the war against the private car. It is pointless to invest large sums of money in a transport system which is physically not able to transport a sufficiently large number of people to make any significant difference. It is equally pointless locking ourselves into a system which is not sufficiently attractive to road users to get them out of their cars.

Adelaide however seems determined to continue to neglect is rail system and to promote a public transport system based on buses. This is justified on the basis that the present O-Bahn appears more effective than our current rail systems. But the studies which present this viewpoint are basing their comparisons on a tramway utilising 70 year old rolling stock and a non-electrified rail system which terminates some distance from the center of the city.

This paper argues that in the Adelaide context we must not use our existing rail systems as they are now as the benchmark for evaluating rail options, but what the best of overseas experience indicates they could become.

2. O-BAHN VS. LIGHT RAIL: THE TECHNOLOGIES

O-Bahn is a guided busway. It shares some of the benefits of a rail system in having a dedicated right of way, but with the added advantage of flexibility in being able to run like a conventional bus through city and suburban streets.

This superior flexibility is O-Bahn's major – and only – advantage over rail.

There are no other significant or long term advantages. As to how much rail is disadvantaged by this flexibility will be considered below.

On the other hand electric rail solutions are being embraced by most other cities in the world at this time. The fact that it is "tried and proven" is both a strong point and, unfortunately, a weak point. The weakness lies in the centuries (literally) of inertia and baggage which can prevent the technology from achieving its potential in a modern environment.

There are many benefits which an electric rail system can provide:

Energy Efficiency

Rail systems generally are the most energy efficient means of surface transportation (except for bicycle). This is due to rail's inherent frictionlessness of a steel wheel rolling on a steel rail. Very little energy is required to keep such a vehicle moving whereas a rubber tyre vehicle requires the constant expenditure of energy to overcome rolling resistance.

There is typically a factor of 3 to 4 in favour of rail based on mass. These figures are not always achieved partly because of conservative traditions requiring very heavy vehicles and partly due to the effects of part loading. However, the fact remains that a railway system is potentially far more energy efficient than any road based technology.

Environmental Impact

A motor vehicle (or a diesel railcar) carries around its own power source, the "engine". This is a relatively small device and its thermal efficiency is constrained by size and mass to 25 - 30%.

On the other hand, the energy source for electric traction is a large power station which is not constrained by size or mass but has been designed to maximize thermal efficiency. Modern power stations achieve 35 - 40 % and higher thermal efficiency translates into lower fossil fuel consumption and Greenhouse emissions.

Where this energy conversion takes place is another critical issue. For cars, buses and to a lesser extent diesel railcars, it takes place in the worst possible place – the urban environment. For electric traction, it takes place in remote locations, like Torrens Island and Port Augusta, where noise, emissions and so on have little impact on lifestyle.

As an additional point, buses (and diesel railcars) run on oil – a limited resource and one which is an import for Australia. Power Stations which supply electricity for rail transport run on coal and natural gas, which are both home-grown products. Every dollar spent on a kW-h for electric traction stays in Australia, but for a litre of diesel fuel it goes overseas.

Lifestyle Factors

Standing on King William Street in Adelaide, the noise generated by diesel buses is most obtrusive. The noise of a modern tram, such as those in Melbourne and Sydney is minimal – equivalent to a few cars. We know that Adelaide's Glenelg trams have the subtlety of an earthquake, but that is 1920's technology.

Trams are not at all incompatible with the pedestrian precincts of the Bourke Street mall in Melbourne - nobody would suggest that Adelaide's buses would enhance Rundle Mall in Adelaide. In fact rail solutions are being used overseas as a means of revitalizing moribund city centers overseas by providing low impact accessibility.

Passenger Appeal

The simple fact is that people will get out of their cars and get into a modern railway or tramway, but they won't leave their cars behind and get into a bus.

That is, speaking generally, but not of Adelaide. The above refers to world wide trends where the majority of new heavy rail and light rail programs in North America and Europe have exceeded expectations. The lemons are few and far between. The general experience is that where busways have been implemented as an alternative on the promise of lower costs, public response has been much slower.

Perth, a city of similar size to that of Adelaide and with a suburban rail system far more neglected and performing less for the community than that of Adelaide, was faced with the prospect of closing its entire system and building an O-Bahn to its northern suburbs. But the Government of the day bit the bullet, electrified the entire system, provided modern rolling stock and user friendly stations and constructed a railway to the northern suburbs.

This Northern Railway is now the “Jewel in the Crown” of that city’s now increasingly effective rail based public transport system and demonstrates that the bogey of “people will not get out of a car or bus at an interchange to get into a train” was unfounded.

3. THE ISSUES FOR ADELAIDE

But we do not see anything like this in Adelaide, and in our more sober moments, we must admit that we are not likely to see anything like this as things stand in Adelaide. The O-Bahn is a relatively effective people mover – our rail systems are not.

Why is this so? Are Adelaideans different to every body else in the world? I suggest the following two reasons.

1. Firstly and foremost: Access to the city.

Unfortunately, the Adelaide Station, for all of its facelifts in recent years, is a long way from the real heart of the city and the tram terminus also. The O-Bahn on the other hand gets you right where you want to go which is somewhere near the Hindmarsh Square / King William St area.

This must not be seen as an inherent advantage of bus transport, but rather as a lack of investment and development in our rail options.

Until Adelaide develops rail systems to get people into the heart of the city, we will always relegate rail to a minor role. We will always have a bus-based public transport system and this translates into a car-based system, because people will not support buses in large numbers.

How do we get rail access to the center of Adelaide? For the tram, it is relatively easy to extend the tramline to North Terrace, connect with the rail system at some point north/west of the station and to convert the Port Line and the Grange Lines to light rail (with an extension to West Lakes).

But we cannot put the whole of our rail based transport system in trams down King William Street even on today’s low patronage levels. We must sooner or later provide an extension to the suburban rail system such as the underground that was proposed in the 1960’s.

Sales of assets notwithstanding, Governments do not have loads of money. But the private sector does. The role of Government today is increasingly becoming to facilitate the private sector to develop these capital intensive schemes. As the Sydney Airport link shows, Governments can provide the base for private enterprise by granting rights to develop station properties for example. In this way the investor shares in the total benefits of the system and not just what can be recovered from the fare box.

2. Station Interfaces.

People do not want to be standing and waiting at stops by the side of the road or on exposed platforms and huddling around tiny wind-swept shelters while cars go flashing past.

This interface is currently a major part of the public transport problem. It must be made into a key part of the solution. People will park their cars in secure, well lit and undercover car parks in the suburbs adjacent to a rail station if they can walk in a secure walkway to a fully sheltered rail interchange. With private sector funding, this can feature shopping and other amenities. The interchange can become a source of revenue in its own right to supplement the total operation.

As an analogy, the air terminal is an event in itself and part of the total experience of flying.

4. THE PLANNING PROCESS

How should Adelaide go about meeting its transport needs. Options include: build another freeway, put in another busway, extend the tramline, etc.

What these options all have in common is that they are all knee-jerk reactions – decisions made to solve a particular problem but without any long term planning framework.

Adelaide lacks a comprehensive blueprint for the future. The time is now for undertaking a major study and to address the issues:

- What are other cities in the world doing. In particular, what makes some cities successful and others not so.
- What do we want Adelaide to look like in (say) 20 or 50 years time, given not too many funding constraints.
- How do we get there.

Such a plan, I suggest, will acknowledge that:

- The most successful cities are those have put in place a modern public transport system.
- Almost without exception, this has three ingredients
  - Heavy rail for high passenger volumes over longer distances
  - Light rail for lower volumes over shorter distances
  - Bus transport for lower volumes and to supplement the rail systems.
- The rail system must access the city center and the rail interchange will become a center in its own right, more than just a ‘station’.
- With major traffic flows off the roads, the quality of life can improve considerably, and moribund city centers can be revitalized.

5. CONCLUSION

This paper has argued that the debate relating to rail vs bus technology is the critical issue in advancing the cause of public transport against the excessive use of the private car.

An electric rail public transport system offers the community increased mobility with reduced environmental and lifestyle impacts. Worldwide it has been demonstrated that rail systems will be more effective at getting people out of their cars than buses and busways.

Adelaide, however, must first address the issue of getting both the tram and the heavy rail system into the city centre. Until this, and the companion issue of providing user-friendly rail interfaces, is resolved, there will be no significant role for rail. The Adelaide public transport system will continue to be bus based, underutilized and Adelaide will continue to be a car based city.

Both light rail and heavy rail systems are being implemented worldwide but nobody is building an O-Bahn. So what does the rest of the world know that we don’t know ?