# Response to EIS on CSELR

**John Gerofi BE BSc PhD**

## 1. The Principle

In general, I am in agreement with the principle of providing a high capacity, energy- and labour-efficient public transport link from the CBD to the south-eastern suburbs. I agree that light rail is the appropriate technology for this link. Nonetheless, some changes are needed to make the concept work well.

## 2. The Stated Objectives

I do not believe that the EIS has demonstrated that all the stated objectives have been met, as follows:

1. *Improve reliability and efficiency of travel to, from and within the CBD and suburbs to the South East.*

It is not clear that this aim will be achieved, since the connections between the CBD and most residential areas in the southeast will involve a change of vehicle en route. According to the proposed journey times and current bus timetables, such people will actually have longer trips than at present. The term efficiency has not been defined. The reliability of the new system could be challenged by delays both in the CBD and in the Surry Hills precinct.

2. *Improve access to major destinations in the South East, including Moore Park, UNSW, Royal Randwick racecourse and the Randwick health precinct.*

This improved access is apparently intended to be the major benefit of the proposal, since direct connections are provided to them. On the other hand, the access to the major trip generators in Moore Park will be relatively poor, since the stop will be 300 to 800 m from the proposed stop.

Such an arrangement provides poorer convenience than buses can, and should be overcome by providing a loop track that runs from the proposed Moore Park stop across to Driver Avenue near the Allianz stadium, and then along Driver Avenue to near Lang Road, and back to the main track. This could provide for pick-up and set-down near to each operating venue, a turning loop and temporary stabling.

3. *Satisfy long-term travel demand between the CBD and suburbs to the South East.*

Travellers from the CBD to many southeastern suburbs, notably Coogee, Clovelly, Maroubra, Malabar and Matraville will have to change vehicles to reach their destinations, whereas now they have direct buses. In fact, the current direct services from the two outer LRT termini are actually quicker than the proposed LRT in off-peak times. Similarly, express buses are at least as fast as the LRT in peak times.

## 3. The Route and Alignment

The route as described attempts to combine a number of features:

1. A CBD distributor service, which is apparently intended to feed commuters from the south-eastern suburbs as well as many of the current southern and western bus services, using George Street as the alignment
2. A commuter link to replace most of the buses currently linking Central and the CBD with the south-eastern suburbs
3. A special event service which will primarily link Central Station to the major venues at Moore Park and Randwick Racecourse.

This has resulted in some compromises.

While a surface LRT line through the streets of Sydney will be a good thing, the pedestrianisation of George Street will require major re-organisation of other traffic. As Pitt and Castlereagh Streets are an alternative that would have less impact on other CBD activities, it appears that this option has not been adequately evaluated.

It must be recognised that one LRT line will not solve the city's transport problems, and that this needs to be part of a longer term strategy. For the south-eastern suburbs, this first line will involve some disbenefits, which should be compensated as far as possible and addressed as the system develops. The EIS does not foreshadow such future improvements.

While the two suburban termini point tantalisingly towards the suburbs and trip generators further to the south east, there is no long-term plan in the document to do the extensions.

## 4. The Surry Hills Link

The route chosen attempts to combine the two trunk bus route to the CBD into one. These are the Cleveland Street route and the Flinders and Oxford Streets route. While the line on the map is well chosen, the alignment, along Devonshire Street, is sub-optimal, and will increase travel times and reduce the operational efficiency of the line. It is the weakest point in the proposal.

Over the 1100 m segment from Central to Moore Park, there will be 5 or more significant signalised intersections and 11 or 12 minor intersections, of which some of the latter will be closed to motor traffic. Nonetheless, the potential for conflict with motor vehicles, bicycles and pedestrians is high.

It is noted that the maximum speed in pedestrianised zones is proposed to be 20 kph. It is likely that the operational constraints presented by the activity near the track in Devonshire Street will limit the maximum speed to around 30 kph. In practice, the vehicles will have to stop at some intersections, and slow down because of activity near the track.

Even under good operating conditions, the surface alignment along Devonshire Street would add approximately 1 minute to the journey time compared with a tunnel option that eliminated the intersections and the more unpredictable on-street operation. At times of major events at any of venues around Moore Park or Randwick Racecourse, it is likely that the higher frequency of LRVs would limit the extent to which the coordination of traffic lights could work in their favour, and additional delays would be expected. These will probably add 2 to 3 minutes to the normal journey time.

The reliability of the new service will inevitably be compromised by the degree of at-grade operation and interaction with both pedestrians and motor vehicles. These are most crucial between Central and Moore Park, particularly when events are in progress in the Moore Park area. Under these circumstances, the major task of the CSELR will be to act as a shuttle between the venues and Central, and it will be operating at capacity. Given that most people will be standing, it would be desirable to make the journey as quick as possible.

In addition, the longer journey times will necessitate more vehicles. One minute's extra journey time in each direction will necessitate one additional vehicle (or 2 if they are coupled) to maintain a 2 minute headway. Extra vehicles need to be bought, crewed, stored and maintained. This represents an on-going cost.

The Devonshire Street link is the weakest feature of the plan. Although the route makes possible to consolidate into one line service to Central, service to the CBD through the pedestrian-light rail mall and service to Circular Quay, the Devonshire Street link will be the part of the route with the highest traffic and patronage, both for UNSW commuters and for special events.

It is also worth considering the imposition of additional travel time on the passengers. A study by Booz, Allen and Hamilton in 2003 costed personal travel time in Brisbane at just under $ 10 per hour. It would thus be reasonable to assume at least $ 12 per hour in 2013 values.

If the desired modal split for special events is achieved, then it is likely for each capacity crowd at one of the venues, there will be an additional travel time cost of $12,000 per minute of additional travel time. A similar calculation can be done for normal commuter travel on a daily basis. If the daily patronage were 50,000, then the additional travel time cost would be $ 10,000 per day per minute of additional time, or about $ 3,000,000 per year per minute of additional time.

The presence of such a highly trafficked light rail line in the Surry Hills precinct will cause disruptions to residents and businesses.

The beauty of light rail is that it can work effectively on roads, median strips pedestrian malls and segregated rights of way. While light rail is capable of operating successfully in situations like Devonshire Street, that does not mean that it is the optimal choice.

In the case of the link from Moore Park to Central, the need for a segregated right of way is clear. It may well be true that bored tunnel in this location would be difficult and expensive. The Surry Hills station, if located where planned, would need escalators and elevators. But the EIS does not appear to have discussed the alternative of a shallow cut and cover tunnel. Such a tunnel could be built from the corner of Devonshire and Chalmers Streets to just east of Bourke Street. As a result, only one at-grade intersection would remain, at South Dowling Street. It would also be possible to sink the local lanes of South Dowling Street, to eliminate that intersection.

The cut and cover tunnel would involve relocation of a lot of services, but it would leave the Surry Hills stop near to the surface, and accessible by ramp. Cut and cover construction is widely used, and, for example, was used for the insertion of the Eastern Distributor lanes in South Dowling Street, and the Kings Cross tunnel. The trench in Devonshire Street would probably need to be about 7.5 m wide.

It is true that such a tunnel (about 900 m long), will be expensive. But the system as proposed is expensive at $ 1.6 billion. An additional $ 100 million (a first estimate at the cost) would represent less than 6 % additional cost. We certainly do not see design compromises like the use of Devonshire Street in the construction of roads and freeways, to save an amount that is probably within the margin of uncertainty of estimating the project cost!

Many cities operating light rail successfully use tunnels in selected locations to improve the reliability and running times of their systems, and these tunnels are generally used in congested areas, rather than simply to cross a park.

## 5. The Moore Park Precinct

Access to the major trip generators in Moore Park will be relatively poor, since the stop will be 300 to 800 m from the proposed stop, depending on the

venue. This effectively means 4 to 10 minutes' walk from the door of the venue to the vehicle under unimpeded conditions (worse in crowds). Elderly people and those with children will take longer.

Such an arrangement provides poorer convenience than buses can (and do), and represents a disincentive to use the system. It should be overcome by providing a loop track that runs from the proposed Moore Park stop across to Driver Avenue near the Allianz stadium, and then along Driver Avenue to near Lang Road, and back to the main track. This would provide for pick-up and set-down near to each operating venue, a turning loop and temporary stabling.

The former Sydney tram network had extensive tracks servicing this area more directly about 100 years ago!!

The intersection of Lang Road with the LRT line will also be a source of possible delays, and would be relatively cheap to eliminate by sinking the tracks under the road as part of the construction. As a result, there could be uninterrupted segregated track all the way from Central to near Darley Road.

## 6. The Vehicles

The EIS states that the vehicles will be 45 m long, and will have 80 seats and space for 220 standees.

It is possible to regard an LRV as replacing 5 buses, as is done in the EIS. On the other hand, the seated capacity is different – one LRV only has the same number of seats as fewer than 2 buses. While the system will provide extra capacity, it must be recognised that the seating configuration chosen may result in reduced comfort for many patrons.

While the large vehicles may be useful for special events and peak hours, it is improbable that the cars will be anywhere near to filled in off-peak periods unless the frequency is severely reduced. This represents an unnecessary waste of energy and creation of greenhouse gases, since two shorter cars could be coupled to provide for peak demand, and then de-coupled and stabled later. Cars between 25 and 30 m long seem more practical in this

regard. They are also more compatible with on-street operation and with the existing inner-west light rail line.

The 70 kph maximum speed seems unnecessarily low, given that LRVs in other countries operate at up to 100 kph. The dedicated right of way from South Dowling Street to Lang Road, and then from there to Darley Road gives ample opportunity for speeds higher than 70.

The EIS talks of wire-free operation in the CBD (except for charging purposes at the stops).

It seems therefore that the LRVs will carry batteries that are intended to power them over the segment mentioned. On this section, there are apparently 3 stops, Town Hall, QVB and Wynyard. As the LRVs are each 45 m long and may be coupled into pairs, the overhead wiring on this stretch will be apparently be absent for less than 800 m. It is difficult to see why the wiring would not be present from Bathurst St, when it recommences at the Town Hall, stops again for the Park St intersection, and then re-appears for part of the QVB frontage.

The use of the wire-free system means that all vehicles will have to carry a set of batteries at all times, and these will add to the cost, maintenance requirements, weight, greenhouse emissions and energy consumption of each vehicle. Is this really worthwhile?

If wire-free operation is truly desirable, then there are alternative systems available with road level pickup. On the other hand, the additional complexity and cost of either system should be taken into account.

## 7. Bus integration

The EIS seems uncertain about the way in which the buses will connect with LRT. On the one hand, it talks about eliminating buses to the city via Flinders Street completely, yet it suggests the retention of the bus roadway in addition to the LRT corridor.

Given that most buses operating from the south-eastern suburbs will be replaced by the LRT, it is difficult to see the future need for the busway.

Adequate provision could be made by providing additional bus lanes at the key intersections, or by allowing some bus operation on the LRT track.

The EIS talks about retaining bus services via Cleveland Street and via Foveaux Street. These are 200 to 400 m from the LRT corridor. The Flinders and Oxford Streets route currently used by most buses is more than 1 km from the LRT route, yet complete removal of these is proposed.

As integration of the bus route network and coordination of services and interchanges is essential, these matters need to be resolved.

## 8. Passenger service in general

There can be various complementary aims in introducing a light rail service. However the most important one should be service to the passenger. The south-eastern suburbs are currently served by a network of buses focussed largely on the CBD via Cleveland Street and via Taylor's Square. The proposal would consolidate these into one corridor.

The new route to the northern CBD will be slightly longer than the existing one. It will require commuters from all points south-east of Randwick and south of Kingsford to change vehicles. It is a normal and acceptable process in using public transport to change vehicles but such changes inevitably introduce a delay of around 2 minutes even in the best organised facilities.

When a change of vehicle is introduced where a direct service was previously available, one should expect a return in terms of reduced overall journey time, added comfort, better reliability, etc. The reduced journey time should come from faster and more reliable service, due to higher speeds or reduced conflict with other traffic. The published running times for the LRT indicate that in many situations, commuters who will need to change at Kingsford or Randwick will actually have longer journey times than they currently have.

The proposal as it stands therefore needs to:

1. Provide a greater proportion of seats in the LRTs

2. Improve the service speed and reliability between Moore Park and Central,

in order to overcome the disadvantages introduced by the change of vehicle.

Further, commuters should be assured that on the major trunk routes, to Coogee and Maroubra, the LRT will be extended to provide direct service in the foreseeable future.

Although stops are located relatively close together in most f the CBD, there is a relatively large gap between the QVB and Wynyard. This should be reconsidered.

## 9. Integration with Inner West LRT

It appears that although the new LRVs would be able to access the maintenance facilities in Rozelle, there is no turnout being provided to allow inner west LRVs to turn north towards Circular Quay.

One major drawback of the present inner west line is its lack of penetration of the CBD, and a turnout from Campbell St westwards to George St northwards could greatly enhance the inner west service. It would also provide added capacity for people to change from buses from the western suburbs.