NWRL SEATING ISSUES

1 Introduction

There is a need to focus on longer term seating issues for the North West Rail Link to address a lack of quantitative information in both the Stage 2 EIS and the Submissions Report dated March 2013 for this EIS.

2 Background

The Report notes, on Page 7-133, that 15 different options were considered for the Sydney's Rail Future document, and that the one option containing all three features (differentiated service, some conversion of existing services to metro and a second (metro) harbour crossing) performed best.

However, while an outcome containing all three features as outlined above would plausibly be the best performing, this does not logically or necessarily mean that the chosen NWRL metro + second crossing + converting Hurstville/Bankstown combination is the best way for all three features to be assembled into the future metropolitan rail network.

It is therefore prudent to take a more detailed look at the specific longer term impacts of using metro style trains, rather than the existing double deck design, on the NWRL by considering seat numbers along with the related issues of displacement by future Chatswood-Parramatta services and the need to provide more trains.

3 Seating

Although the Report frequently repeats the Transport for NSW line of "plenty of seats" it also advises that the final number of seats per metro train has not been decided. Assuming 2+2 transverse seating and some longitudinal seating near wide doorways to promote circulation and good dwell time outcomes as suggested by the metro animation, along with the specified 24 doorways per 160 metres of train and 4 standing passengers per square metre, total capacity per metro train would appear to be about 480 seated/1,300 total.

Given the 19,000 passengers per peak hour requirement for 2026 advised to Infrastructure Australia (Page 7-90 of the Report) and the stated 20 metro trains per hour, this would average out at 950 passengers per train with 50% seated. By contrast, 15 double deck trains per hour could carry the same number of passengers with 70% seated (almost 900 seats and 1,267 total per train), noting that this total is within the capacity limit of 1,300 beyond which satisfactory dwell time outcomes can be more difficult to achieve.

Considering that the final number of seats has not yet been decided, a single deck train design with more seats can be hypothesised. Assuming 2+3 transverse seating throughout and 24 doorways, around 600 seats could be provided. However the standing area, and the total capacity (around 1,200), would be reduced as some capacity is converted from 4 standing passengers per square metre to about 2.5 sitting passengers per square metre. This design would raise the seated capacity with 20 trains per hour to 63% of the total for the 2026 peak hour demand; approaching the double deck figure of 70% achieved with 15 trains per hour but extending the dwell time compared with a 480 seat/1300 total capacity metro design.

While the above 600 seat single deck train design would appear to be more suited to the NWRL than the apparent 480 seat design, it may not be so elsewhere in a future rail network as the lower capacity per train and the fewer trains per hour would reduce the maximum hourly track capacity from 39,000 (1,300 x 30) to around 32,000 (1,200 x 27) under ideal conditions (see Section 3 below). This is similar to the present double deck stock which can achieve 31,000 (1,300 x 24) under similar ideal conditions, and accordingly there would seem to be no point in pursuing such a design where there is so little service differentiation from the existing double deck trains in terms of track capacity, seating and dwell time.

4 Displacement

The Epping to Chatswood Rail Link was designed and built around the needs and limitations of double deck train operation. Specifically, the safety arrangements for the North Ryde to Chatswood section are understood to be adequate for no more than 20 trains per hour, a figure consistent with the maximum utilisation then expected for the ECRL.

Although metro style operation with the apparent 480 seat metro train design can support 30 trains per hour given the ideal conditions of adequately wide platforms, modern (ATO) signalling and unrestrictive track alignments near stations, the lower ECRL safety limit of 20 trains per hour would be adequate for NWRL metro services only, and so would not allow for a future Parramatta-Chatswood service to also be provided. This is despite the Report advising (Page 7-133) that the NWRL design does still include a Parramatta Rail Link connection. The Parramatta-Chatswood service would appear necessary to support extending the Global Economic Corridor to Parramatta, as proposed in the new draft Metropolitan Strategy.

The alternative would be to run only 15 metro trains per hour on the NWRL in the longer term with the other five displaced by Parramatta-Chatswood services, however the average NWRL loading would then rise to 1,267 per train (almost the limit for 4 standing passengers per square metre) with only 37% seated. This would be equivalent to crowded inner city conditions and, at little more than half of the 70% seated for double deck trains, is questionably appropriate for the NWRL. If the hypothetical 600 seat single deck train was used instead, 47% of passengers could be seated but the lower total capacity of 1,200 per train would then be exceeded.

By contrast, using 15 double deck trains per hour on the NWRL would allow 5 Parramatta-Chatswood services to also run through the ECRL with no displacement of NWRL services. Alternatively, 12 double deck trains per hour could be used on the NWRL to achieve 56% seated (still better than metro) and total loading of around 1,600 per train (below the same 4 standing passengers per square metre limit as applied to the metro trains) but with adverse dwell time impacts. This would then allow four Parramatta and four Hornsby services (total 20) to also run on the ECRL, provided ATO is introduced to cope with the extended dwell times. In each case, suitable double deck pathways south of Chatswood would then also need to be provided through metro conversion of other north side services to use a new metro harbour crossing and through some truncations of longer distance services at Chatswood.

5 Additional Trains

It has already been shown above that more trains would be necessary for a metro service, compared to a double deck service, to contribute partially towards the “plenty of seats” commitment for the NWRL. Despite more trains, the safety limit of 20 trains per hour seemingly imposed by the ECRL means that the number of seats per hour in the longer term will still be a lot less than for an adequately frequent double deck service. This comparison would be even less favourable if a Parramatta-Chatswood service is also operated.

Many submissions to the EIS have objected to the imposition of changes at Epping and at Chatswood on a presently direct service between stations on the outer Northern Line and stations on the lower North Shore Line. Some additionally discerned (Page 7-85) that the passengers making such changes would be unlikely to find a seat at either interchange point, adding to the perceived degradation in service quality from their present one seat journey.

In the short term, the seating issue can be ameliorated by providing more trains than would be needed with double deck services, albeit at additional cost, however the ECRL safety limit of 20 trains per hour and the need to provide for Parramatta-Chatswood services puts a limit on the effectiveness of this approach in the longer term.

6 Summary

It is clear from the above that Sydney's existing double deck trains, when compared to the apparent 480 seat/1300 total capacity metro train, would enable many more seats per hour to be provided on the NWRL in the longer term. It is highly questionable if the reduction in seating from 70% to 50% of passengers with metro, or to 37% with metro and a Parramatta-Chatswood service included, would be considered to be "plenty of seats" by future NWRL users if this was directly explained to them today. Accordingly, making provision for a future conversion to enable double deck trains to be run on the NWRL in the longer term would appear to be necessary.

It is true that dwell times would be somewhat longer and overall journeys somewhat slower with double deck trains, however this is not so significant for the average station spacing of 3 km and needs to be balanced against the customer benefit of additional seating for the many longer journeys.

A tabular summary of long term hourly seat numbers for NWRL services under the key rolling stock and service frequency combinations covered above for peak periods is as follows:

Network	Metro Trains	Seats	Percent	DD Trains	Seats	Percent
NWRL alone	20	9,600	50%	15	13,400	70%
NWRL + PRL	15	7,200	37%	15	13,400	70%

7 Observations

There is a distinction between short term and long term issues that needs to be made, as the case for double deck trains is stronger in the longer term because some of the shorter term concerns can be ameliorated by providing more metro services initially to raise the number of seats. However the Report, by its principal focus on the short term issues of establishing the NWRL, reads somewhat evasively about the adverse longer term implications of using single deck metro trains.

As another example of being evasive, this writer expressed concern that the specified 3 doorway/8 car metro train design would not be suitable for some of Sydney's legacy curved platforms, and that an articulated design using shorter elements with only two doorways per element should be used. Despite such a design having already been proposed internally by RailCorp previously, the Report notes unhelpfully (Page 7-76) that the design for the new NWRL stations, and the existing stations between Epping and Chatswood on the Epping to Chatswood Rail Link, do not have curved platforms!

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