INQUIRY INTO CURRENT AND FUTURE PUBLIC TRANSPORT NEEDS IN WESTERN SYDNEY

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Submission to the "Inquiry into current and future public transport needs in Western Sydney"

Submission from David M. Levinson

Introduction

I am pleased to respond to the "Inquiry into current and future public transport needs in Western Sydney"

I am a Professor of Transport at the University of Sydney, and have worked in the field for 35 years. I lead the TransportLab Research group in the School of Civil Engineering.

Process

The first comment I will make is about process. All too often plans seek to be the final word on what should happen, even though they are created at a time with far less information about the state of the future than the future will have. They aim to be deterministic, and make very precise forecasts about population and travel demand for years very distant into the future. This approach is not especially productive, and generally misleading.

Instead plans should lay out a vision, consider many alternative possible futures, preserve options, and recommend the first steps to move in the direction of the preferred vision. Soon thereafter, the vision should be updated. The next steps should follow from that revised vision. Repeat.

While this is largely what happens, that this is the process is buried under an impossible desire for exactitude and certainty. This uncertainty should instead be acknowledged and embraced.

I believe also that the certainty about the future we may have once thought we had, when we were simply deploying a known technology across the market (building highways across the metropolitan area) vanishes in a world with rapid technology shifts. We have already seen major changes in the past decade with the beginning of the electrification of the automobile and bus fleets, the emergence of e-bikes, new app-based ride-hailing services, and a pandemic providing a shock to the system enabling and requiring many office workers to work from home who previously would have commuted five days a week. Technologies that we can see coming, in particular vehicle automation and artificial intelligence are likely to have even more profound shifts in how people work, travel, and choose to use the transport system. Technologies beyond that, but well within the 40 year planning horizon, including urban aerial transport and drones, are impossible to reasonably plan for at this time, but also unwise to ignore.

Access

The core idea underlying transport-land use planning is accessibility, a measure of how easy it is to reach valued destinations (Levinson et al. 2020). Making the network more accessible means bringing origins and destinations closer in space, and making the connections between them more direct and faster. To maximise access for the most people means we need to spend scarce dollars wisely. This requires good designs (Levinson 2019). Examples include things like making sure train stations have entrances at both ends of the platform, to maximising the amount of space (and thus the number of people) who are within walking distance of trains.

Generally, maximising access per dollar spent requires taking advantage of existing infrastructure first, before building new facilities. The rest of this submission is organised with this framing.

Land Use

The *best transport plan is a good land use pattern*. From the point of view of minimising the total amount of transport required, ensuring a job/worker balance across space (roughly the same number of jobs and resident workers in each geographical area) will at least allow all residents to work locally, rather than having to make long distance commutes across the metropolitan area, as they do now, with large daily tidal flows of workers from Western Sydney eastward in the morning, and the reverse in the evening. To the extent we can reduce this, we can reduce the need for expensive infrastructure, reduce the amount of congestion and crowding that users of existing infrastructure suffer, and give time back to people to live their lives rather than commuting.

Similarly, ensuring people can walk to achieve their daily needs (school, shops, doctor, and so on) also will reduce automobile travel and make more efficient use of existing infrastructure.

Shorthand versions of this idea, including the "*30-minute city*" and the "*15-minute neighbourhood*" are useful headline ideas, but insufficiently rigorously specified in current plans. These should be formalised, and accessibility should be front-and-center.

School sizing and location policy is an under appreciated aspect of this. Much travel is related to the school run, rather than allowing children the independence of walking to school on their own. This can

only be achieved if schools are smaller and more dispersed, rather than than concentrated into fewer schools aiming to achieve economies of scale.

Buses

To reduce person delay (and thus increase transit accessibility and use), buses should be given *traffic signal priority* throughout the network, and have exclusive bus lanes where needed.

To speed up boarding, bus passengers should pay (tap on) before boarding buses, and all-door boarding should be allowed. This is already the case for light rail. This initiative would bring the two systems into line and reduce confusion for passengers. A fare reader at every bus stop with multiple passengers boarding will pay for itself in operational efficiencies.

As technology changes over the planning horizon, *our conception of the "bus" will also change*. Currently we run large buses at low frequencies with circuitous routes that are designed to reduce walk access time at the expense of running time. This is because labor is expensive. In a world of automated vehicles, buses can be much more like shared taxis, running right-sized vehicles on fixed routes at high frequency, with other vehicles providing flexible on-demand service. While this is extremely costly now, we should expect this cost to fall. This can be rolled out more quickly in areas with networks that are easier to navigate (just as today automated vehicles do better in the suburbs of Phoenix (similar in many ways to Western Sydney) than the City of San Francisco (more like the Sydney CBD).)

Western Sydney already has busways, which are an under-appreciated transport investment. These should be extended, including along the Fifteenth Avenue (FAST) corridor connecting Liverpool with the WSA, which can be built much sooner than a Metro can be extended, and can serve as a feeder to the Metro once that opens.

A gridlike bus network complementing existing and planned light and heavy rail services is shown in the figure. This can be extended deeper into Western Sydney as the area develops, with services provided *concurrently* with development. An example is shown in the figure, with light-blue east-west routes, and violet north-south routes.
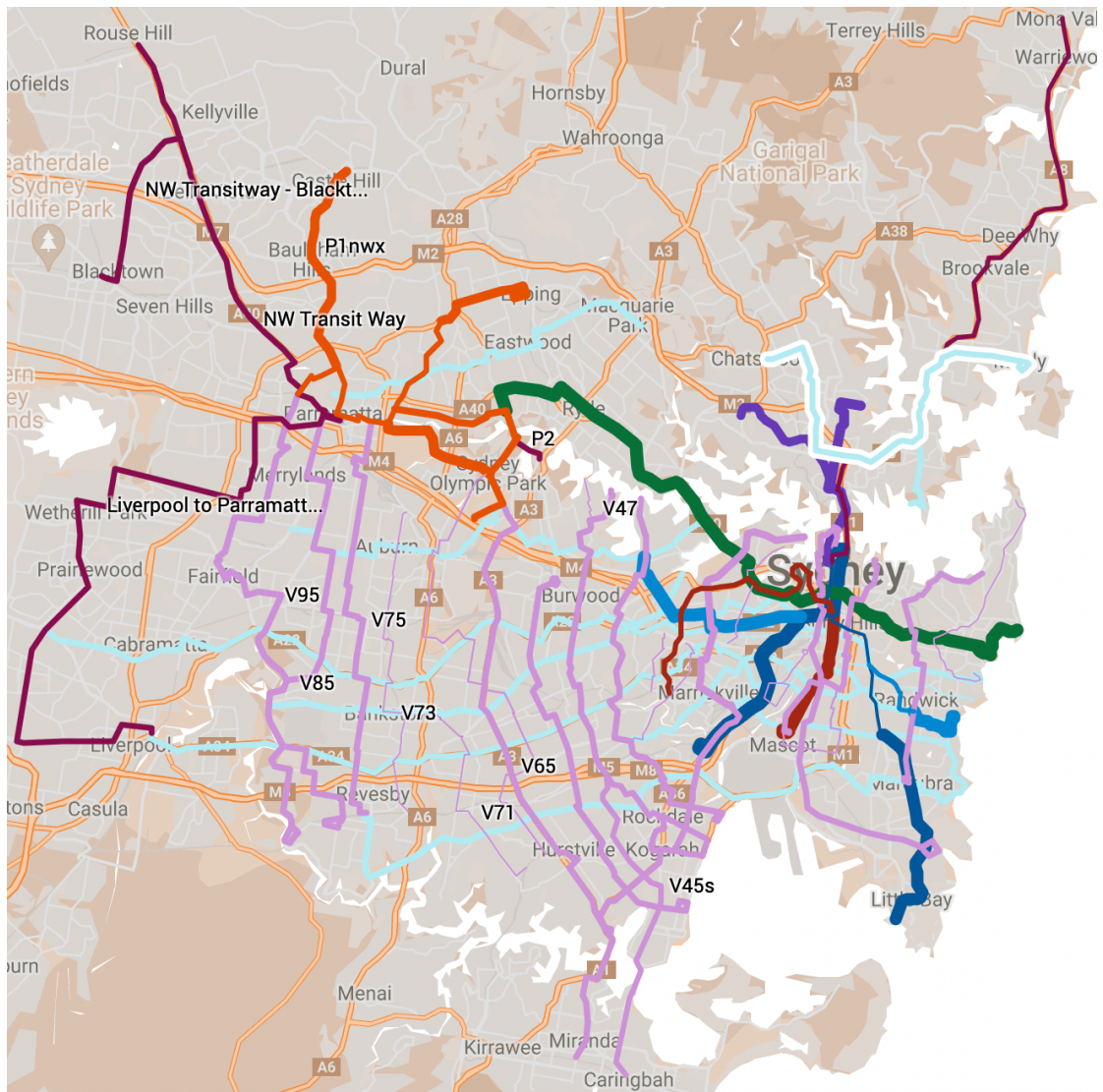
Figure 1: SYDNEY FAST 2030: A PROPOSAL FOR FASTER ACCESSIBLE SURFACE TRANSPORT (FAST) .

Each route should have *nightrider* buses at least every 30 minutes from midnight to 5am.

Shelters and shade need to be provided urgently. Utilities should be placed underground progressively, to avoid the chain sawing of street trees that provide shade.

Real-time information is of great benefit to public transport passengers, but there is no real-time information at most bus stops. The system used for the B-line should be rolled out across the entire bus system.

Infill Stations

One of the best ways to take advantage of existing infrastructure is through infill stations. The following rail segments relevant to the

Western Sydney area have very long inter-station spacings, suggesting opportunities for infill (Levinson 2023).

- T1 Western Sydney University, near Burton St/Victoria St. Current walking distance to Werrington station:1400m. Current walking distance to Kingswood station: 2400m

- T1/T5 Blacktown North, near Bessemer St Current walking distance to Blacktown station: 1900m, Current walking distance to Marayong station: 3100m

- Sydney Metro Northwest   West Pennant Hills   Current walking distance to Epping station: 5600m, Current walking distance to Cherrybrook station: 2900m

- Sydney Metro West   Silverwater, near Silverwater Road at Derby Street   Current walking distance to Olympic Park station: 3600m, Current walking distance to Parramatta station: 5700m

- Sydney Metro West   Camellia/Rosehill, near James Ruse Drive at Hope Street, Current walking distance to Olympic Park station: 7800m, Current walking distance to Parramatta station: 2100m

Last mile connections

An important part of Public Transport service is access and egress. In lower density areas, some of this will be by automobile. But with the advent of e-bikes a much large catchment area around stations is possible without relying on autos. Each station should have access from a 5km radius by either travel on low-speed roads, or by separated bike/e-bike/micromobility lanes on all roads with speeds higher than 30 km/h. There should be direct footpath connections for everyone within 2 km of bus or rail station.

Compatibility

Compatibility on Metro technologies (train size, power) should be insisted upon. Metro Lines should use interoperable vehicles. The reasons for this are made clear in Gooding (2023).

Investments

One major investment that is being considered is the extension of the **Southwest Rail Link** from Leppington to Aerotropolis/Bradfield/Western Sydney Airport (or the extension of the WSA Metro eastward to Leppington or Glenfield) (UDIA 2022). Whether this is done using conventional Sydney Trains or as Sydney Metro technology doesn't matter a lot from an accessibility perspective. But there are differences, primarily in where people will have to transfer. For instance, a Sydney Trains extension enables people from Edmondson Park to travel eastward on the existing train services (T2, T5) as well as westward to Aerotropolis or the Airport without a transfer, while a Metro service would require Edmondson Park travellers to transfer at e.g. Glenfield to go eastward. The same issue applies to different stations with a different configuration. But generally, either technology will provide sufficient capacity, and can be run at a high enough frequency to serve demand, and can be automated (Sydney Trains can be increasingly automated over time).

More importantly, planning should incorporate an optimal number of stations as possible (at about 1.0 - 1.5 km spacing) (Wu and Levinson 2021), at least now, or provisioning for future infill, as more stations will increase the number of people who can take advantage of the service with only minor costs to running time.

Our evaluations suggest this extension is beneficial if it can be built for a reasonable cost and is coupled with higher density development around the stations.

Longer-term Metro Investments include extending the currently under construction *Western Sydney Metro* from Westmead to the Western Sydney Airport, and extending the soon-to-open *Southwest Metro* from Bankstown to Liverpool, and eventually on to the WSA. Those ideas should be preserved and carried-forward, and rights-of-ways reserved so that in the future, when the demand materialises, those lines can be constructed with a minimum impact.

There are many potential infill stations on the existing Sydney Trains System that should be considered and formally analysed.

The **Parramatta LRT Extensions** are under construction with a Phase II planned. These lines should be considered for further extension to
• Castle Hill,

- Epping,
- Lidcombe, and
- along Victoria Road toward Ryde and Sydney.

Transparency

Planning and decision-making should be conducted openly, with transparency, and nothing should be considered "cabinet-in-confidence" or "commercial-in-confidence", as those help avoid the mistakes of secrecy.

Disclaimer

These opinions represent my own views and not that of my employer, the University of Sydney, nor any clients I may have worked for.

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