BULLETIN

VALUING THE REAL IMPACTS OF RAIL

MAKING A COMPELLING BUSINESS CASE

While we have an unprecedented pipeline of rail investment in Australia, it can still be difficult to justify rail investment on economic grounds through the Government business case process.

In this bulletin we explore why this problem arises and consider a broader economic narrative that should underpin most urban heavy rail investment. The bulletin also outlines the importance of carrying forward a base case from the planning phase to post-completion evaluation in order to robustly observe the marginal impact of a rail project and strengthen the evidence base.

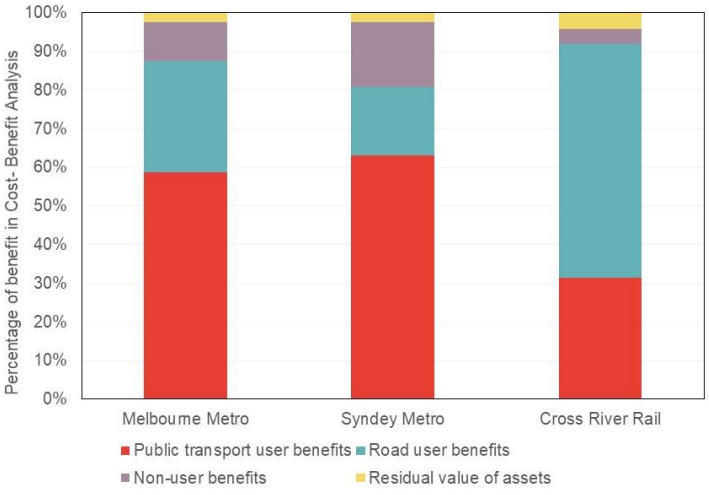
A previous bulletin on Value Capture looked at addressing the broader infrastructure needs and aspirations of Australia through alternative methods of funding.

Why it's hard to justify rail projects

Rail investment is hard to justify. It requires a large upfront payment in order to create an uncertain, long-term benefit stream. However, the current investment approval process doesn't do itself any favours. The key economic tool deployed to ascertain the economic merit of a potential public sector investment is a Cost-Benefit Analysis (CBA). As the name suggests, this analysis compares the benefits associated with a potential investment to the cost of the investment. The key issue for rail is that the benefits side of the equation focuses on the direct impacts of the rail journey itself with relatively little emphasis given to the flow on economic benefits catalysed by a rail trip.

Figure 1 shows the split of the benefits within the CBA used in the business cases for three city-shaping rail projects: Melbourne Metro, Sydney Metro and Cross River Rail in Brisbane. This shows that around 90% of the economic benefits stem from public transport and road user benefits. That is to say, the value that users place on improvements to their transport journey rather than the impact on the activities they undertake as a result of the journey (access to new employment opportunities, services etc.). Whilst calculations of indirect benefits – typically referred to as wider economic benefits – can also form a part of a CBA, they are not currently accepted by Infrastructure Australia as a means of justifying a project given the lack of Australian specific evidence (this applies to rail or any other infrastructure). Regardless, when wider economic benefits are included within sensitivity analyses they only comprise around 20-30% of total benefits.

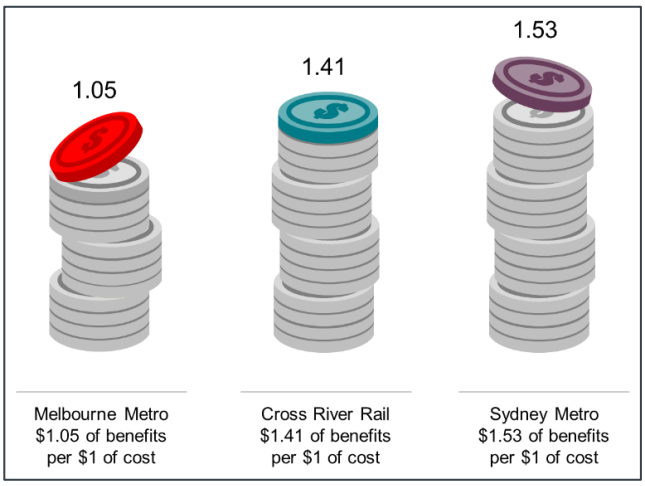
Figure 1: Composition of economic benefits in business cases of major rail projects



Source: Frontier Analysis based on published business case for each project

The upshot of the current partial analysis of the benefits of rail projects is that it makes it hard to justify projects using CBA. Whilst mega projects, like Melbourne Metro, Sydney Metro and Cross River Rail, all require a very large initial capital outlay, they are city-shaping projects. The impacts of these projects on the urban area will be far reaching, both spatially and temporally. This isn't reflected in the CBA results for the projects (See Figure 2) which suggests that Melbourne Metro will only provide $1.05 of benefit for each $1 spent.

Figure 2: Benefit-cost ratio in business cases of major rail projects



Source: Frontier Analysis based on published business case for each project

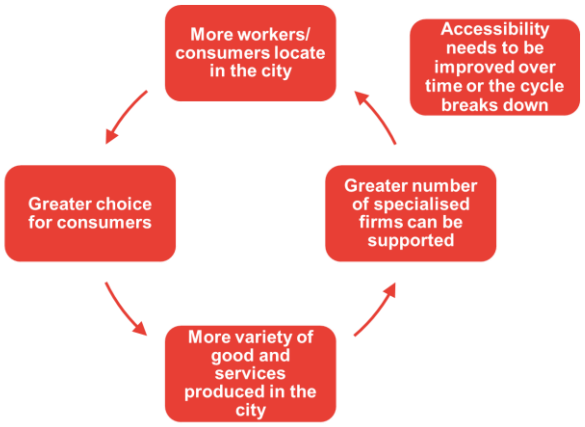
However, there is a reasonable evidence base showing that well-executed rail projects often realise a level of benefit which exceeded that projected during the planning phase. For example, a post-completion evaluation of High Speed 1 in the UK found that the benefits of the project exceeded the costs by a ratio of 3:1; double the original estimate in the business case.[i] A similar evaluation of the City Loop in Melbourne suggests an observed benefit-cost ratio of 6:1.[ii] The key driver of the higher benefit-cost ratios post-completion are the land use and regeneration benefits. These benefits primarily relate to increased value of land use for areas close to stations which experience a step change in accessibility.

What is the key economic driver behind rail projects?

It is worthwhile zooming out and considering what should be the ultimate driver of rail investment - urbanisation. On a global scale, the figures are staggering: in 1950 around 750m people lived in urban areas, today the number is around 4bn and the UN forecast it will reach 6.7bn by 2050.[iii] Whilst Australia is already highly urbanised, with about 85% of the population living in urban areas, population growth is heavily concentrated in Brisbane, Melbourne and Sydney. The most recent Australian Bureau of Statistics population projections forecast[iv] that two thirds of Australian population growth to 2050 will be concentrated in these cities.

From an economic point of view, the key phenomenon driving urbanisation is agglomeration: this is the concept that there are benefits of similar economic activity locating close to one another. The most practical example of this is the increasing density of skyscrapers in our city centres as firms see benefits of being a part of the dense urban core - being close to their clients and their collaborators.

Figure 3: Overview of agglomeration process



[v]

Source: Frontier Analysis. Adapted from Fujita and Krugman (1995)[vi]

As Australia's cities grow, and more people seek access to the dense urban core, peak-time commuting is an increasing strain on the transport network: this is a problem that rail is well-suited to address. High frequency metro services can move passengers far more efficiently than bus, light rail or private vehicles. Moreover, rail is well suited to being the key leg in a multi-modal trip, for example someone driving to their local station in the suburbs, getting a train in the CBD and then walking the last kilometre to their place of work.

How could things be done differently?

The current approach to economic assessment hasn't prevented the huge pipeline of rail investment, both planned and in progress. However, it could certainly be argued that many of the current rail investments are in fact long overdue and that policy makers should ensure that complementary rail investments are made to maximise the economic potential of the next generation of rail in Australia. Moreover, there is a clear opportunity to leverage the expertise that these mega rail projects bring to rail planning and delivery to then move on to future focussed, city-shaping rail projects such as Melbourne Metro 2 and intercity high-speed rail.

To do things differently, it is worth learning from the past. Rail projects are nothing new; in fact, we are approaching the two-hundredth anniversary of the opening of the Stockton to Darlington rail line in the UK. As such, it seems prescient to learn from previous projects.

There are some examples of post-completion evaluations of rail projects being undertaken but the evidence base is relatively thin. There is a clear opportunity here to undertake robust post-completion evaluations of the current pipeline of projects in order to learn for future projects.

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One element of post-completion evaluation which practitioners often struggle with is the counterfactual i.e. what would have happened in the absence of the project? However, this counterfactual, or base case, is a key element of the CBA in the business case phase. As such, it should be standard practice to document the base case in such a way that it can be reused in the post-completion evaluation. Having observed data of the impact of the major rail projects on people's travel behaviours, land use and property prices would be invaluable for the economic justification of future projects.

It is also important to be clear on the changing role of the transport agency. Their role is no longer simply providing transport for people to get from A to B. Increasingly they are looking to lead on transit-orientated development where they seek to leverage their land holdings for value capture while creating transport hubs which seamlessly tie in commercial, retail and leisure offerings. One example of this is that Transport for London now have a remit to provide housing.

Lines are being blurred in terms of transport and regeneration and economic analysis needs to keep up. For example, Melbourne Metro 2 will be as much about unlocking the economic potential of Fishermans Bend and sites in Melbourne's West as increasing capacity on the rail network. This needs to be reflected in the economic analysis. Otherwise, highly beneficial forward-looking rail projects may struggle to get off the ground.

Contact Us

Frontier Economics has been providing independent advice to businesses, regulators and governments for 20 years. From offices in Australia and Singapore, our team has a diverse range of skills and experiences to support the needs of our clients. This includes specialist econometricians and modellers.

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[i] Colin Buchanan (2009), Economic Impact of High Speed 1
[ii] Benefits stream from SGS Economics & Planning (2012). Long run economic and land use impact of major infrastructure projects. Cost element from Frontier Economics research.
[iii] UN Population Division, World Urbanization Prospects: The 2018 Revision
[iv] Australian Bureau of Statistics, Population Projects, Australia, 2017-2066
[v]
[vi] Fujita & Krugman (1995), When is the economy monocentric?: von Thünen and Chamberlin unified