



10,000 Friends of
Greater Sydney™

Fast Rail for Western Sydney

- A strategic business case

Key Points:

- Actions that encourage the growth of high-value jobs in western Sydney – especially Parramatta – could deliver more widespread and equitable access to jobs, increased economic productivity, improved housing supply and affordability, and reduced transport congestion.
- The most significant, or even only opportunity to drastically increase the attractiveness of Parramatta as a location for new high-value businesses, would be to effectively merge it with Sydney CBD through a very fast (12-15 minute) rail connection – thus offering similar or even greater “agglomeration” economic benefits in Parramatta as in Sydney CBD.
- A fast Sydney-Parramatta rail service could continue mainly on existing tracks to Penrith and Richmond and so would also provide substantial speed and capacity benefits to existing commuters travelling to Sydney CBD from Western Sydney.
- A fast Sydney-Parramatta rail service could also continue on a new, substantially surface line to a Badgerys Creek airport, bringing it within about 30 minutes of Sydney CBD. This could transform the economic growth prospects of South-West Sydney. In the longer term, this rail line could connect to an east-coast high-speed rail service, bringing Canberra and Newcastle within commuting distance of Sydney.
- A business case should be developed that assesses these strategic benefits and compares a new fast Sydney-Parramatta rail line to more limited upgrades of the existing rail service, in order to determine the optimal scope and timing of both investments.

Introduction – an integrated strategy for Sydney’s growth

Continued steady growth of Sydney’s population for the next few decades is probably an unavoidable reality and, if managed well, could support increased prosperity and quality-of-life for its existing citizens.¹

Planning for this growth requires an integrated assessment of the interactions between economic development and land-use, transport and housing. It also needs to be visionary in terms of long-term goals (40+ years), but realistic about economic constraints and the limited levers available to government to influence the decisions of households and businesses about where to locate.

The following sections consider:

1. The need to support high-value employment growth, currently focussed in Sydney CBD
2. How the housing market is distorted by inner city congestion
3. How encouraging more jobs in Western Sydney could improve Sydney’s overall productivity and housing affordability
4. How to grow Western Sydney jobs – at Parramatta and Badgerys Creek airport – through a new fast rail line.

It concludes by discussing the business case required to assess the economic merit and optimal investment timing for a fast Sydney-Parramatta rail service.

¹ Sydney's population growth will be determined by a combination of largely uncontrollable demographic change, national immigration levels (determined by the Federal Government, with a key objective being to attract “global talent” to support economic growth), and the relative attractiveness of Sydney as a place to live (which is a goal in it’s own right for existing citizens and not something one would deliberately degrade in order to reduce population growth).

1. Supporting high-value employment growth

Sydney's CBD, and the broader "global arc" from Macquarie Park to the airport, generates 41% of NSW's total economic output.² Supporting the continued growth of such businesses is critical to Sydney and Australia's economy.

The concentration of these high-value businesses in these areas – particularly in the CBD – is due to "agglomeration economies", which arise from the good access it has to a large proportion of Sydney's workforce (particularly via the rail network) and the daytime business interactions supported by close proximity.³

However, the downside of these concentration effects is that other areas of Sydney are less attractive for new businesses to locate in. This is especially a problem given the off-centre location of Sydney's CBD – far removed from the population centre of Sydney, which is now west of Parramatta. This results in excessive travel times for people commuting from the far west to Sydney CBD (especially for those that are not within walking distance of a train station) and can also present the problems of increased congestion or expensive new infrastructure requirements.⁴ Also, if commuting times are too excessive, then trips may be completely suppressed, which means people are unable to access the higher value jobs in Sydney CBD.⁵ This reduced access to high-value jobs is inequitable for those living in western Sydney, but it also reduces the city's overall economic output, because some people who could be more productive working in the CBD (taking advantage of the agglomeration economies) are unable to do so.

It would therefore be *desirable* from both an equity and economic perspective if more high-value jobs could be located closer to western Sydney – *if* a feasible and cost-effective means was available to make this happen.

² Infrastructure NSW's State Infrastructure Strategy, 2012

³ *The Triumph of the City*, Edward Glaeser, 2011

⁴ With longer trips from the west to the CBD in the east, rather than to the population centroid, total trip-kms are higher, which means there are more people (or cars) travelling at any one time, and hence a need for more infrastructure capacity.

⁵ There are limits to how far most people will commute each day – generally little more than an hour – which effectively means the marginal value of time dramatically increases for trips longer than this. This effect is not generally captured in standard transport economic appraisals.

2. Housing market distorted by inner city congestion

The loss of potential economic output noted above is linked to the issue of housing supply and affordability. A simplistic response to the desire to enable more people to work in the highly productive CBD is to advocate that these people live closer to the CBD, in eastern and inner city suburbs. There are additional advantages to this in Sydney, because most people would also prefer to live closer to the beach in the east. Clearly however, not everyone can squeeze into these limited areas, and the more that this strategy is pursued, the higher the cost of housing will be in these areas (even with the most ambitious high-density infill plans).⁶

The limited space available in the east means that adding more people to these areas will lead to exponentially increasing “congestion” costs (especially in the longer term) – whether that be smaller homes/gardens or flats, rising traffic congestion, new expensive underground infrastructure, insufficient capacity of public services (e.g. schools), or more crowded public spaces (parks, footpaths, sports fields etc.). These congestion costs underpin community opposition to increased densities, which ultimately in a democracy places a constraint on new housing development, which increases prices and reduces affordability.

In contrast, much of western Sydney currently has very low density housing (compared to most “global cities”) and so could readily accommodate a substantial increase in homes – most viably perhaps as still relatively low density additions (e.g. converting Sydney’s many large blocks with single storey homes to twin semis⁷). Moreover, although the increased travel demand from a higher population may incrementally increase road congestion (though not as badly as in the east), it should also increase patronage and cost-recovery on currently poorly utilised bus services, which could support a virtuous cycle of more frequent and better patronised services (within available funding limits), reduced car dependency and lower financial and congestion costs from the increasing population and travel demand.

Essentially, putting aside Sydney CBD’s superior agglomeration benefits, increased population in the western suburbs may offer economies of scale, whereas the east increasingly faces diseconomies of scale.

Realistically, looking at the long term growth of Sydney over 30+ years,⁸ the constraints and opportunities described above will mean that a greater proportion of housing supply will come from western Sydney. However, demand for housing investment in Western

⁶ Also many people currently living in western Sydney will face other costs or constraints to moving to the east, such as family ties, the need for access to existing jobs in the west for dual-worker households, or limited access to loans to buy into the more expensive east (even though this offers the prospect of a higher paid CBD job). Most of these constraints are personal or family-specific and so will not be reflected in housing market data (which will thus understate the “cost” of people moving east).

⁷ *The Housing We’d Choose*, by The Grattan Institute (2011), identifies a particular deficiency of semi-detached homes and higher density apartments in Sydney’s middle and outer suburbs (relative to demand).

⁸ *Liveable Sydney 2051*, 10,000 Friends of Greater Sydney (FROGS), 2013; www.10000friends.org.au/reports

Sydney is currently moderated by its relatively poor access to the high-value jobs in Sydney CBD. Moreover, because congestion costs are generally not priced appropriately (to reflect the costs imposed by new arrivals on others), land-use and transport choices and outcomes are less than optimal. In fact, a vicious circle has been created where inner-Sydney traffic congestion creates an increasingly large barrier to the CBD for commuters travelling from the west, thus increasing demand to live “close to the CBD”, which in turn worsens inner-Sydney congestion.⁹ Consequently Sydney is “turning in on itself”, to the point where rising inner-Sydney congestion constrains both housing investment and the CBD’s future employment growth. These market failures can justify government intervention.

The traditional solution to this problem, in all global cities, is to build fast rail lines that enable people to live in spacious outer suburbs but still commute quickly to the CBD. However, in Sydney this strategy is coming under strain because of the off-centre CBD and because CityRail’s double-deck trains are very slow (compared to modern single-deck metro trains in other countries). Hence commute times are beyond acceptable limits for many people living in western Sydney,⁵ especially those who have to drive or take the bus to a rail station (and where the buses are commonly infrequent and/or slow, “all-stops” services).

In addition, Sydney’s rail network is constrained by low service frequencies, which limits line capacity,¹⁰ and the extreme cost of tunnelling to the CBD increases the challenge of developing new, fast, economically viable and fiscally affordable rail services to the west.

3. Western Sydney jobs could improve overall productivity and housing affordability

At the margins (depending on the type of business), the incremental congestion costs noted above that arise from a growing CBD will outweigh the available gains from CBD agglomeration economies, and this will limit Sydney’s overall economic growth (Sydney’s slower population and economic growth over the last decade may be evidence of this¹¹). Therefore it may be desirable to pursue other options for giving more people in Sydney good access to high-value jobs (with agglomeration economies) without either requiring excessively long commutes from west to east, or having to move home to the east. i.e. by instead encouraging the creation of more high-value jobs within agglomeration centres in western Sydney.

⁹ Traffic congestion worsens with increased densities despite the superior public transport in inner Sydney because there are still many car trips made that are not suited to public transport (e.g. local non-CBD jobs, trips to school, child care, shops, the gym etc.).

¹⁰ Current double deck services have service frequencies limited by the higher station dwell times required for passenger loading and unloading – currently about 18 trains per hour with a possible maximum of about 24 (subject to more efficient operations) with a train capacity of 1200 passengers including 890 seats. Single deck trains could comfortably carry 1200 people with 550 seats, giving 36,000 passengers per hour and 16,500 seats per hour for a service frequency of 30 trains per hour. This offers 67% more capacity and about the same number of seats as current double deck services.

¹¹ *Sydney Issues Paper 1*, The Committee for Sydney, 2013

Ideally (subject to prioritising within resource constraints), this approach of moving jobs to the people should be pursued *as well as* trying to improve the movement of people to existing CBD jobs.

So, *if* a feasible and cost-effective means of creating more high-value jobs in western Sydney can be identified, it could potentially:

- Reduce transport travel times, costs and congestion for Western Sydney residents accessing high-value jobs.
- Through improved access to high-value jobs, increase Sydney's total agglomeration benefits, thereby increasing overall productivity and wealth per capita.
- Encourage increased housing investment in Western Sydney, particularly from higher wealth individuals (who may otherwise choose higher cost housing in the congested east or inner city),¹² with flow-on benefits to total housing supply and affordability.
- Support a less divided Sydney, with a more even geographic mix of socio-economic groups (i.e. more wealthy people in the west) and higher levels of "social capital", thus reducing the social costs of areas currently suffering from concentrated levels of socio-economic disadvantage (and the further economic costs that flow from this).
- Reduce the congestion impacts of population growth (transport, house prices & other) by dispersing it across existing low-density areas, and hence also reduce the congestion barriers to higher total levels of Sydney population growth – thereby supporting higher growth and compounding agglomeration and productivity benefits.

4. But *how* can we grow Western Sydney jobs?

The NSW Government has for many years supported the concept of creating more high-value jobs in western Sydney. However, the reality is that governments have few "levers" by which they can effectively influence the decisions that businesses and households make about where to invest.

For example, moving government offices to regional centres may help to incrementally build the centre, but may not provide the critical mass and agglomeration economies that would attract serious levels of private business investment and support self-sustaining growth. Such moves are also resisted for the same fundamental reasons that many private companies prefer to operate in the CBD – the desire to retain agglomeration benefits. Equally, local transport improvements (e.g. rings roads or improved buses or light rail) may at the margins improve the attraction of a non-CBD centre to prospective employees and employers, but they are no substitute or competition for the overwhelming agglomeration economies offered by Sydney CBD. At worst, such measures could distract attention and resources from more effective initiatives.

Strategies adopted have also suffered from a lack of focus or common agreement about what options would be most effective in achieving the desired outcomes. Politically, the

¹² New housing investment in Western Sydney could be lower cost than the higher density developments required in the east and inner city, and so with adequate demand (supported by improved access to high-value jobs), Western Sydney may provide more opportunities for commercially viable investments.

desire to please all stakeholders across Sydney can result in effort and resources being too thinly spread across too many areas to be really effective in any.

A more concentrated focus of effort can help clarify and build stakeholder support for the preferred direction, although inevitably it also requires saying “no” in some areas. A focussed effort is also especially important for supporting agglomeration centres, because the very nature of these things is that they are more attractive with scale (hence the overwhelming attraction of Sydney CBD, and a focussed effort on one centre will be more effective than the combination of diluted efforts on multiple centres).

Recently however there has been growing recognition of two stand-out opportunities:

1. The emergence of Parramatta above all other regional centres as a centre at a threshold level of employment and future opportunity – supported by years of incremental growth and its ideal location at the geographic and population heart of Sydney (giving good access to the majority of Sydney’s workforce even via existing road and public transport networks).
2. A second Sydney airport at Badgerys Creek, which would directly provide a much-needed employment boost to south-west Sydney beyond any other plausible measures, and, more fundamentally, provide improved access for western Sydney residents and businesses to aviation services, facilitating valuable trade with other parts of Australia and abroad.

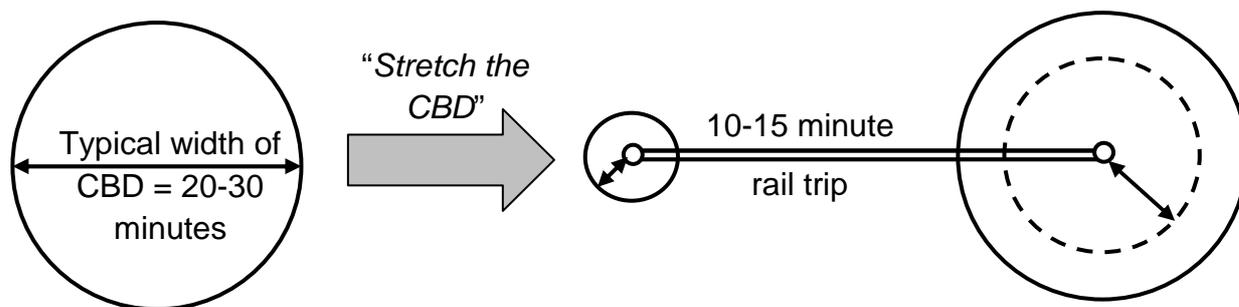
For both these opportunities, there is one potential project that could make the difference between their slow and distant realisation, versus a “game changing” scenario where the economic attraction of these locations to businesses would be fundamentally transformed.

The first critical stage of this project would be a new, fast and very frequent rail service connecting Sydney CBD to Parramatta in about 12-15 minutes. This would effectively merge the two centres (or “stretch the CBD to Parramatta”), so that any business currently in or considering location in Sydney CBD, could locate instead in Parramatta and enjoy practically the same or even better agglomeration benefits (i.e. wide access to Sydney’s workforce and opportunity to meet and “do business” with other CBD businesses) – but for about half the rent.¹³

This concept is essentially the same as that behind the highly successful transport links provided to connect Canary Wharf to the City of London, which resulted in the former growing dramatically – now boasting more financial services jobs than in the original City.¹⁴

¹³ It is recognised that the very “top end of town” will still be willing to invest in Sydney CBD and its harbour views, but for the large number of mid-range businesses currently in Sydney CBD (with no harbour views), a better connected Parramatta could be a compelling option.

¹⁴ Financial Times, 13 May 2012



A subsequent extension of a new Sydney-Parramatta line could go directly to Badgerys Creek, with a similar travel time of about 15 minutes, which would then make an airport at Badgerys Creek just as well connected to Sydney CBD as Kingsford Smith Airport (KSA). Besides the benefits for Western Sydney, the benefits to eastern Sydney from airport competition and potentially reduced noise from KSA could also be significant.

The first and most expensive stage of this rail line would be a new tunnel between Sydney CBD and Parramatta – probably with two CBD stations at Wynyard and Central, and one other at Olympic Park before surfacing at or near Parramatta. Beyond this the express train service could split, going to Badgerys Creek on new surface track and also on existing lines (mainly) to Penrith and Richmond (with some track sections duplicated).

Importantly, whilst a CBD-Parramatta rail investment could support the desired land-use development strategy for Sydney, a new “western express” service to Parramatta and beyond could also provide immediate and substantial benefits in terms of time savings and crowding relief for the large numbers of existing commuters travelling to Sydney CBD (and also indirect capacity relief for other services on a re-optimised rail network). These near-term transport benefits, which are described further in references 15 and 16, will be critical for developing a viable business case for investment.

In the longer term, the effective merging of Parramatta to Sydney CBD would enable a future east-coast high-speed rail line to connect at Parramatta rather than Sydney CBD, thus massively reducing the tunnelling costs involved in the proposal currently specified by the Commonwealth study.¹⁷ This could make the staged development of high-speed rail more affordable and economically viable, with initial stages bringing Canberra and Newcastle within commuting distance of Sydney, thus effectively supporting the growth of Sydney’s high-value economy, but without the congestion impacts (on housing, transport & public spaces) that results from inner-Sydney densification.

¹⁵ Why does Sydney need a new fast Metro to the West? (FROGS New Fast Rail Plan), 2010

¹⁶ Sydney Rail Plan stage 1, (FROGS Revolutionary New Rail Plan), 2009

¹⁷ FROGS High Speed Rail Submission in response to the Commonwealth Phase 2 Report, 2013

5. Developing a business case for fast Sydney-Parramatta rail

The potential strategic benefits discussed above do not justify any magnitude of investment. Rather, these benefits should be estimated and compared to costs in a business case.

Many of the benefits can be converted to estimated economic values (albeit with significant uncertainty), whilst others may be of an equity (fairness) nature, which can be quantified but ultimately in practice will require a degree of political judgement on their value.

Incorporating strategic benefits such as increased business investment in Parramatta and resulting impacts on transport systems and housing demand and supply, will unavoidably require some subjective judgements about the degree and timing of impacts, which should be tested with sensitivity and scenario analysis. However, uncertainty in these benefits should not be a reason to exclude them (as is often the case in transport project appraisals), since they fundamentally underpin the project rationale and could therefore constitute the greatest proportion of benefits.

Potentially critical parameters affecting estimated project benefits could be the extent to which additional new businesses are encouraged to establish in Parramatta (both in place of and in addition to what would otherwise occur in Sydney CBD). Estimates of this could be improved by market research of existing CBD businesses' willingness to move to Parramatta, depending on the quality of the rail connection. It is likely that there will be a threshold of about 20-30 minutes journey time, including walk access/egress time, as this is about the "diameter" of most CBDs (i.e. the maximum "distance" for business to business connections). Below this 20-30 minute threshold (requiring a train travel time of less than 15 minutes), the attractiveness of Parramatta to businesses will dramatically increase as it effectively becomes a linked part of Sydney CBD.

The benefits and costs of a project investment also need to be compared to an alternative – typically the "base case" of what may otherwise happen. In this case, an appropriate alternative would be to enhance train services between Sydney and Parramatta on the existing rail line. This option would have reduced investment costs, but would involve greater implementation risks (with financial and other community costs) due to requiring work on an existing "live" line, and would offer lesser benefits in terms of increased speed, service frequency and capacity – given the constraints of existing service needs. It is unlikely that improving the existing rail service, without a new tunnel, would bring journey times below the threshold required for dramatically improved agglomeration benefits in Parramatta. In the longer term, continued growth of Sydney will mean that at some point the existing track simply can not provide adequate capacity. The issue then becomes a matter of determining the optimal investment *timing* for new track.

Discount rates and the importance of near-term benefits

Although the key anticipated benefits of a fast Sydney-Parramatta rail service would be long-term improvements to Sydney's economy, this cannot justify massive investments that fail to deliver a return on the cost of capital, otherwise these long-term benefits will effectively be outweighed by the accumulated cost of interest on debt. This would be no favour to future generations.

This means that projects of economic merit (i.e. of net benefit to society) need to be just as concerned with the short and medium term as the long term, and the relative importance of each *should* be evaluated using the standard tool of the discount rate. Sometimes the pathway to the "ideal" long-term solution is too costly and it is better to choose a better short or medium-term solution even at the expense of a second-best long term future.

Consequently "leading infrastructure" projects that are *exclusively* designed to promote new demand patterns and influence long-term land-use ("build it and they'll come") are very difficult to justify economically. Not only are the benefits very distant and heavily discounted, they are also often highly uncertain (which can justify a higher discount rate to adjust for the risk).

In this respect, a major advantage of a fast Sydney-Parramatta rail line is that in addition to its long term "city-shaping" benefits it can also provide large and immediate benefits (time saving and congestion relief) for large and pre-existing (and hence low risk) demand patterns flowing from western Sydney to Sydney CBD. These benefits are likely to be critical for justifying a multi-billion dollar investment.

Timing of investment and future extension options

A key purpose of a business case, besides helping to select the best solution to the problem, should be to identify the optimal timing of investment, including for any subsequent stages.

From a capacity planning perspective, if Sydney continues to grow as expected, then new track capacity will be needed anyway between the CBD and Parramatta at some stage. The time when this is required (regardless of other project benefits) varies depending on the assumed rate of growth in western Sydney's population and Sydney CBD's employment, the alternative options for upgrading the existing track, the risks, costs and benefits of those options, and, in practical terms, which professional expert is consulted on these matters.

In the absence of clear evidence otherwise, new track might be needed somewhere between 20 and 30 years from now, implying major construction starting at least 5 years earlier, or somewhere between 2030 and 2040. Perhaps 10-15 years after first operating, around 2050, Sydney's population will likely be over 7 million, and with no extra road capacity able to bring more people into Sydney's CBD (by car or bus), the rail task required will have probably more than doubled.

Earlier construction may be desirable due to the benefits of significant travel time savings and crowding relief for existing travel demand to Sydney CBD, the avoided cost of alternative capacity upgrades, and due to the strategic "city-shaping" economic benefits

described at length in this paper. The economic benefits of such an investment will need to be considered over at least 30 years of operation,¹⁸ i.e. out to beyond 2070, and over this period the forces driving western Sydney's population growth and employment and infrastructure needs will continue to increase. This reinforces the need for *current* investment planning to align with and support a very long term vision for Sydney.

From an affordability perspective, government funding is likely to be very limited over the next decade, but with the potential for at least partial private financing of a fast Sydney-Parramatta rail line (refer below), a realistic timeframe for investment may be in about 15 years for the first stage to Parramatta (e.g. major construction occurring by 2030). Extending the service to Penrith may be appropriate almost immediately after, depending on the complexities and benefits of doing so. This may be resolved by the business case.

At the CBD end, the new line could terminate at Wynyard, or potentially connect to the planned second harbour crossing. This possibility should be investigated and resolved before the operating plans and network interconnections for a second harbour crossing are finalised.

The timing of any extension to Badgerys Creek may remain uncertain during the initial business case, as it depends on the unknown timing of investment in an airport (which may be in the 10-20 year timeframe) and whether a rail connection is warranted during the early years of airport operation. For this, and for the even more uncertain connections to high-speed rail lines, a "real options" approach may be appropriate in the business case, which would recognise the value of being able to build these connections whenever the demand and economic circumstances warrant it (if ever).

Replicating competitive markets

A key feature of transport provision is the "lumpy" nature of major investments, which affects land-use investments, demand for travel and the viability of investing in alternative transport services (thus inhibiting competition). These impacts, along with the market failures noted in section 2 and the major environmental consequences of large infrastructure projects, justify governments taking an active role in strategic land-use and transport planning, rather than simply "leaving it to the market".

Nevertheless, government planning strategies can usefully be guided by a view of what an "ideal competitive market" might otherwise deliver. In this respect, it is notable that the only major rail project that has been proactively proposed by commercial business over the last decade (as an unsolicited proposal) is the "Western Fast Rail" proposal, put forward by a consortium led by Leightons. This proposal for an express, single-deck Sydney-Parramatta-Penrith rail service would have been privately financed to a significant degree on the basis of high existing demand levels on the corridor (with relatively low demand risk) and premium fares that could be charged for the dramatically improved service.

¹⁸ Although the physical infrastructure may last much longer than 30 years, increasing uncertainty into the distant future, both with regard to the project case and "base case" comparator scenarios, means that the future benefits evaluated (relative to the potential alternative future) should be increasingly discounted.

However, under standard deterministic evaluation practices, a shifting of patronage and revenue from the existing government rail service counts against the proposal, as does the perceived difficulties of integrating with CityRail operations west of Parramatta. This highlights the need for a broader framework for assessing private sector project proposals that recognises the *dynamic* benefits of competition, or even “creative destruction” – where business losses in an incumbent supplier (the currently entrenched government monopoly), which may result from new market entrants, provide a longer term incentive for the incumbent to make sound investments and deliver competitive performance.

Conclusions for business case development

A new fast rail line between Sydney CBD and Parramatta may not be warranted for capacity reasons or realistically deliverable for affordability reasons for another 15 years or more, but there are strong reasons for commencing a detailed business case sooner rather than later:

- Earlier project delivery may be justified by the economic benefits of major travel time savings, decongestion relief/avoided alternative upgrades to existing lines, and the “city shaping benefits” that could deliver broader benefits to workforce productivity and housing affordability.
- Plans must be developed now to upgrade capacity on the existing main west rail line, but these may be avoided or changed if earlier delivery of a new line is shown to offer a higher economic benefit.
- Increasing attention is being given at present to the prospect of an airport at Badgerys Creek, and the infrastructure links that could be built to service this. An extension of a fast CBD-Parramatta rail line directly to Badgerys Creek is one such option that should be considered.
- Current planning for a second rail harbour crossing needs to consider the potential options for it to connect into the rail network in the CBD, whether on immediate completion of the harbour crossing, or some years (but perhaps not many) after. Connecting into a future fast link to Parramatta (both using single-deck metro trains), is one option to consider.



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