

The Committee for
Sydney

SEEING THE CITY

TOWARDS A DATA-DRIVEN SYDNEY



ONEMAP

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INTRODUCTION

Michael Bloomberg, the former Mayor of New York, once famously said to his staff: 'In God we trust: everyone else, bring data.' Bloomberg's commitment to make his city a more data-driven one not only left a legacy for New York, it influenced many cities across the globe. Although a fragmented governance structure for Sydney has meant a slower uptake of Bloomberg's injunction, the Committee and its membership has been inspired to use data to improve public policy and investment decisions for Sydney.

Previously, we have published research into the economic performance and social and health outcomes of Sydney in our *Adding to the Dividend, Ending the Divide* series.¹ We have developed an innovative approach to *The Geography of Time* across Sydney, mapping both effective job and service density to establish the best value locations for accessibility.² In our

Benchmarking Sydney series, we examined Sydney against key city performance criteria and the outcomes being achieved by competitors globally.³

Similarly, our *#wethecity* series reviews relevant smart city interventions and strategies globally with the aim of inspiring a faster and deeper take up and scaling up of initiatives which will make Greater Sydney more data-driven and responsive. Our first edition, which was animated by the phrase 'if only Sydney knew what Sydney knows', influenced the creation of a pan-Sydney, cross-government integrated planning structure, the Greater Sydney Commission, which has developed the city's first 'digital dashboard' to promote both a greater understanding of Sydney's performance and greater community engagement.

It is in this tradition that we now publish *Seeing the City: Towards a Data-Driven Sydney*, developed in partnership with our members, Tract and OneMap.

Using recent data relating to housing, demographics, accessibility, and mapping technology, this report contains striking data visualisations of the way Sydney operates now across key planning and development themes such as our natural geography, land use and transport integration, demographic trends, relative density, access to infrastructure, housing tenure patterns, future job creation and housing development.

Each of the maps tells a story about Sydney. In each case we highlight that story, to provoke a debate amongst our members, stakeholders and the wider public about the needs of our city as we grow. It also seeks to remind policy makers and commentators on Sydney of the need

to rebalance our city between east and west; between the dense, public transport and job rich areas of our city, and those areas missing out on the opportunities of densification and vibrancy.

The maps tell the story of a big city undergoing extensive and speedy change that public institutions, governments, the private sector, and the community are attempting to understand and shape.

While the opportunity exists to make Sydney a better city as we become a bigger city, effective and appropriate interventions rely on the kind of data and analysis we present in this report. Too often, public policy and investment is attempted without deep and timely evidence or a grasp of the key trends shaping Sydney. This report is another contribution by the Committee with the aim of promoting a deeper understanding of key trends shaping the city.

1 Committee for Sydney, 2017, *Adding to the Dividend, Ending the Divide* #3, <http://www.sydney.org.au/wp-content/uploads/2015/10/CfS-Issues-Paper-14-Adding-to-the-Dividend-Ending-the-Divide-3-1.pdf>.

2 Committee for Sydney, 2017, *The Geography of Time*, <http://www.sydney.org.au/wp-content/uploads/2015/05/CfS-Issues-Paper-15-The-Geography-of-Time.pdf>.

3 Committee for Sydney, 2018, *Sustaining the Advantage: Benchmarking Sydney's Performance*, http://www.sydney.org.au/wp-content/uploads/2015/10/CfS_Benchmarking-paper2018_web.pdf.

A CITY BOUND BY MOUNTAINS AND MARKED BY DISTINCTIVE WATERWAYS

Sydney is world-renowned for its harbour and beaches, but its broader topography is equally as noteworthy.

It is a city surrounded by mountains which act as natural boundaries to urban development. To the west lie the Blue Mountains, with barriers of steep elevation that reach peaks of nearly 1200m. To the north and south of Sydney are famed national parks, which rise up to form sandstone plateaus that surround the city. Unlike Melbourne, Sydney has clear natural barriers that limit residential development and a sprawling urban form.

In contrast to Sydney's mountainous surroundings, the much flatter Cumberland Plain lies beneath most of the city's metropolitan area. The Plain reaches just above Windsor in the north, through to Picton in the south and extends east to the inner western suburbs of Sydney. While the Plain may be easier to traverse, it also tends to be a drier place. Much of the western suburbs exist in a rain shadow, hidden behind the elevated terrain which surrounds it. As a result, the western suburbs receive notably less rainfall than the hilly suburbs of the north, with an annual rainfall range of just 700–900mm.⁴

⁴ Office of Environment and Heritage, 'Cumberland Plain Determination', <https://www.environment.nsw.gov.au/determinations/cumberlandplainpd.htm>.

Sydney's topographical identity is also defined by its distinctive coastline and the waterways which weave through the city. The vast Pacific Ocean laps upon its shore, gifting Greater Sydney 70 harbour and ocean beaches that are beloved by Sydneysiders and visitors alike. Although a blessing, these bodies of water have also constrained the development of the city.

Today, the city has a Central Business District (CBD) that is situated in the east of Sydney, bordered by the sea and confined by national parks in both the north and the south. Where Sydney's distinctive harbourside location was once a gateway to the world, it now impedes balanced growth.

As one looks towards Parramatta as the geographic centre of Sydney, a new importance is placed on the city's waterways. Parramatta River extends west from Sydney Harbour, while Georges River winds its way towards Liverpool and Campbelltown. Further west, there are a number of less well known creeks. Between Penrith and Blacktown there is a blue-green line which rises from Sydney's south western suburbs and flows through to the north. This line represents South Creek.

South Creek is an important part of the Greater Sydney Commission's (GSC) vision

for the Western Parkland City. The creek will form the 'green spine' of the emerging western city, along which new communities will co-locate in a parkland landscape. Beyond the Western Parkland City, policy makers will need to consider Sydney's unique geographical and topographical identity when planning the future development of the city. Rolling changes in elevation can make walking journeys steeper and create costly obstacles for the development of new rail lines and roads. Varying rainfall patterns can have implications for the city's water management requirements. The urban form of Sydney must consequently be designed with its broader natural form in mind.

QUESTIONS FOR POLICY MAKERS:

- With further urban expansion limited by physical geography and the city on track to grow to 8 million people, is there a need to change the conversation with the community around density?
- What are the implications for Sydney's built form, transport network and water infrastructure as new development shifts further inland?
- How important will maintaining South Creek be to quality of life for residents in the Western Parkland City?

The South Creek catchment area spreads across Western Sydney

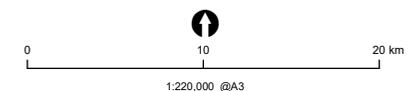
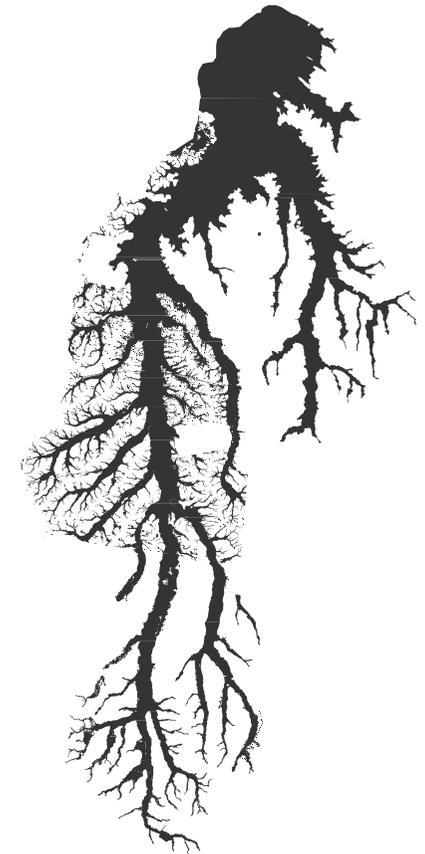
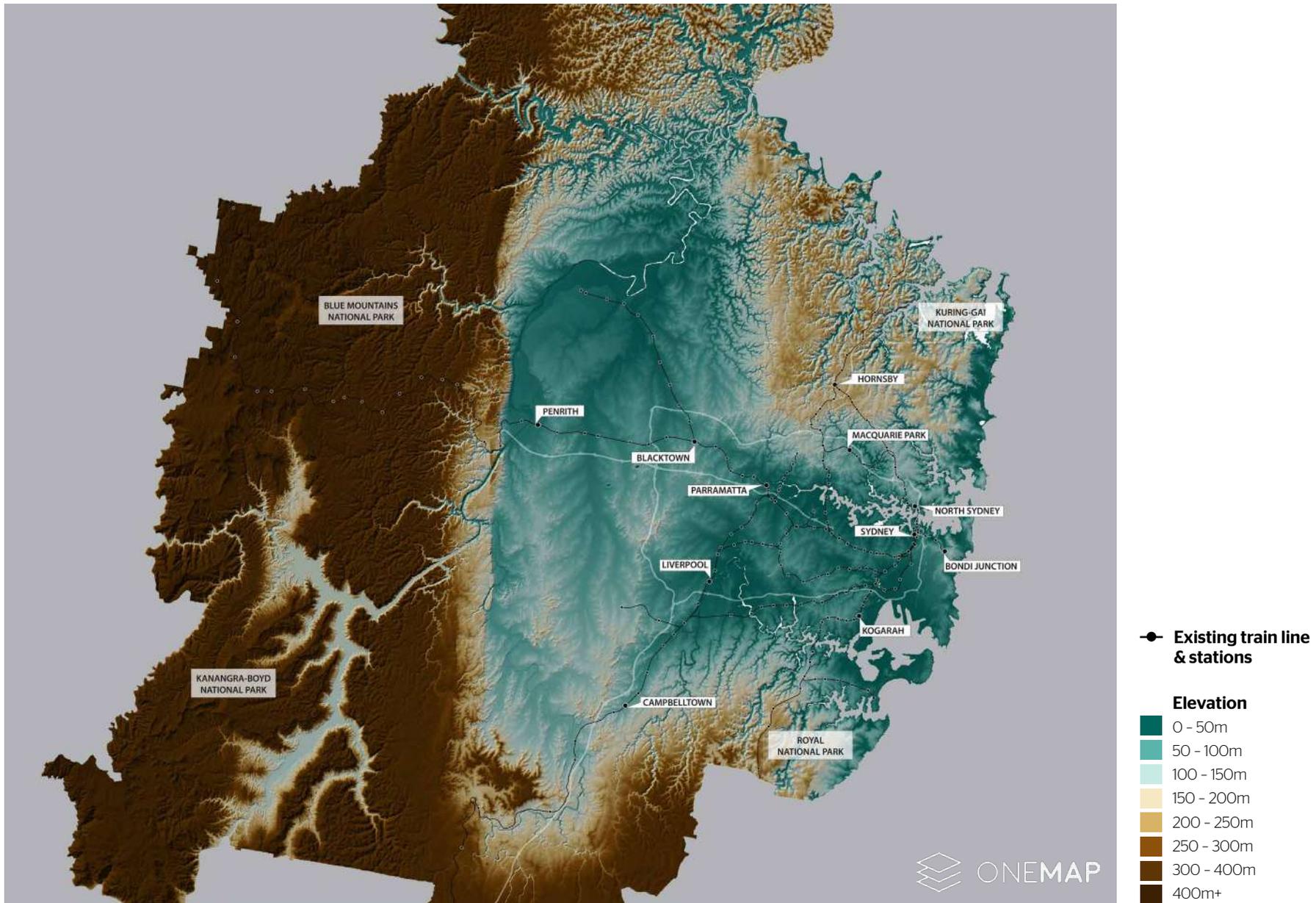


Figure 1: Greater Sydney's topography, expressed as elevation above sea level (Source: Land and Property Information 2016, OneMap 2018)



Metropolitan Sydney is surrounded by mountainous regions that place a natural boundary on the city's urban development.

WHERE ARE THE MOST POPULOUS AREAS IN SYDNEY?

Sydney is substantially less dense than most other comparable cities globally, both in terms of the average density across the city-region and in terms of the highest density parts of the city.

City wide, Sydney boasts a population density of 2,800 people per square kilometre (p/km²), which puts the city marginally ahead of the sprawling city of Los Angeles on 2,600 p/km².⁵ In Europe, London and Paris hold an average of 5,200 p/km², while Munich and Barcelona hold averages of 4,200 and 6,400 p/km² respectively. Although Sydney possesses a more recently developed urban form than its European counterparts, it is worth noting that other 'new world cities' like Toronto and New York also hold higher densities at 3,600 and 3,400 p/km² respectively. Our Asian neighbours have opted for a model of substantially higher density, with Seoul, Singapore and Hong Kong holding averages of 8,800, 11,400 and 20,400 p/km² respectively. Although these higher densities are unlikely to be embraced within Australia, the gulf of difference is worth acknowledging, as is

Sydney's position towards the bottom of the global density league table.

However, city wide density figures often mask a more complicated picture. The figures for average density rarely capture the differing types of density across a city. For most cities, the density of the urban core will be substantially higher than that of the surrounding suburbs, often reflecting a desire by policy makers to house a substantial portion of a city's population in close proximity to their employment. But even on this metric, Sydney ranks well below its global peers, with a peak density of just 14,500 p/km². By contrast, London, Paris and Barcelona hold peak densities of 25,500, 45,200 and 26,800 p/km² respectively, while Los Angeles, Toronto and New York hold scores of 23,700, 26,400 and 56,300 p/km². Political conversations about density often conjure up images of cities like Seoul and Hong Kong, each with peak densities above 100,000 p/km², though the truth is that Sydney's peak density remains well below that of many European and American cities. Even if the city were to double the size of the population held within each suburb, the city would still hold density scores far below those of cities such as Paris and New York.

Sydney's density nonetheless remains geographically and spatially concentrated in the inner city and along the coast. More recently, areas of higher density have emerged around Sydney's middle-ring suburbs, including in Parramatta, along the Bankstown-Sydenham rail link, and the suburbs surrounding Kogarah and Bankstown. Other areas are notable for their surprising lack of density given their proximity to rail and employment hubs, including the suburbs to the east of Macquarie Park and along the rail line extending from Chatswood through to Wahroonga. Conversely, some areas are absorbing higher densities despite having less proximity to rail or employment hubs, including the suburbs to the immediate north-west of Liverpool. While Liverpool has been designated as one of the GSC's three 'cluster cities' which make up the Western Parkland City, it is notable that its partner cities of Campbelltown and Penrith still retain relatively low densities. Sydney's varying density is likely to be increasingly scrutinised as the geographically constrained city grows in size from 5 to 8 million.

QUESTIONS FOR POLICY MAKERS:

- Should policy makers prioritise density with proximity to key economic centres like Parramatta, Macquarie Park and the Sydney CBD?
- Will the city need to increase density around the Western Parkland City's three 'cluster cities' of Penrith, Campbelltown and Liverpool to deliver a 30-minute city?
- As Sydney has a significantly lower density than many other global cities, how can leaders demonstrate the benefits of higher density to areas with currently low density?

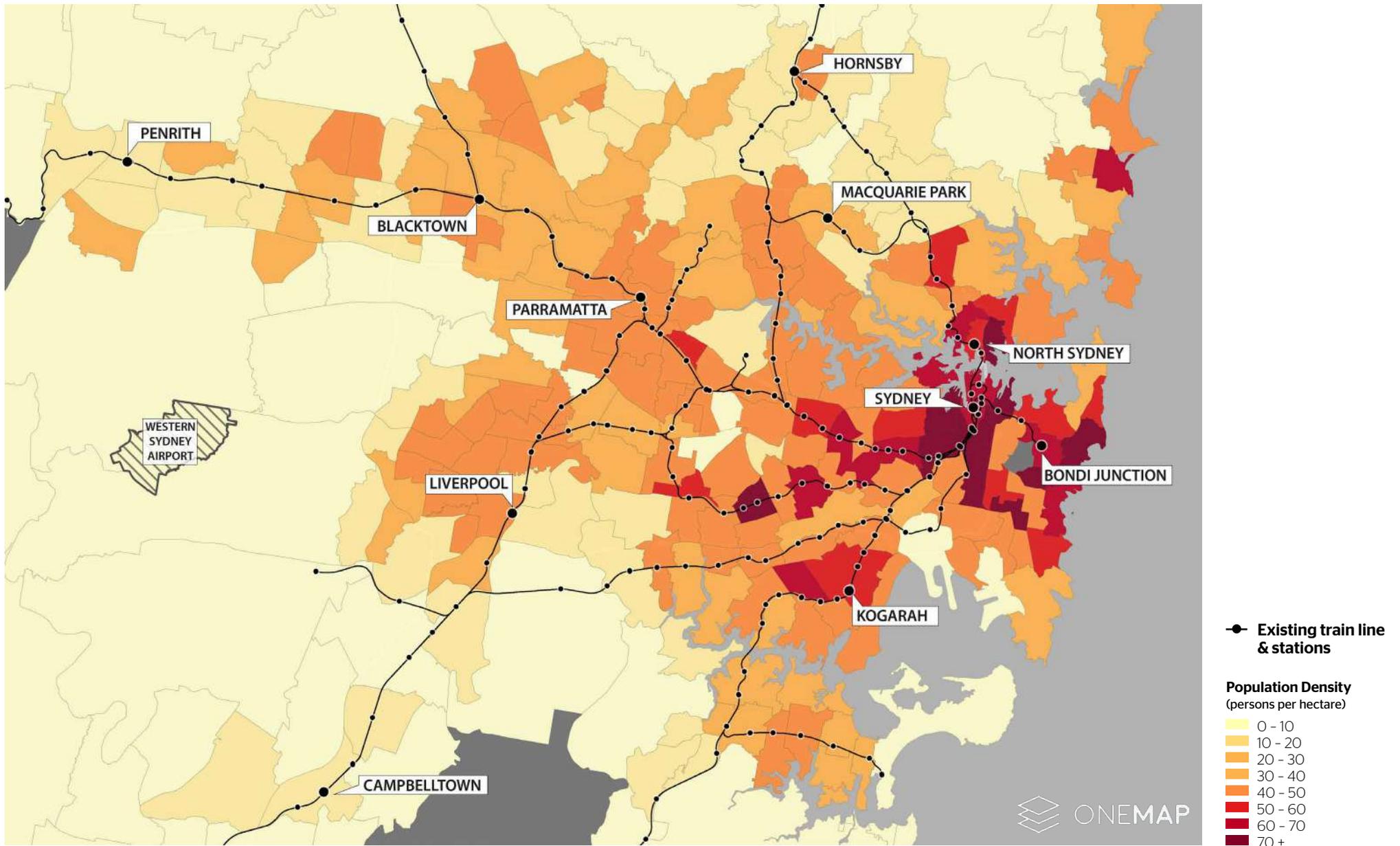
Table 1. Average density and peak density of global cities

City	Average p/km ²	Peak p/km ²
Sydney	2,800	14,500
Tokyo	6,200	23,000
Los Angeles	2,600	23,700
London	5,200	25,500
Toronto	3,600	26,400
Barcelona	6,400	26,800
Paris	5,200	45,200
Singapore	11,400	52,300
New York	3,400	56,300
Seoul	8,800	103,100
Hong Kong	20,400	107,800

Source: European Commission Joint Research Centre and CIESIN 2015

⁵ European Commission Joint Research Centre and CIESIN 2015, *Global Human Settlement Layer*, <http://luminocity3d.org/WorldPopDen/#3/45.15/14.06>.

Figure 2: Sydney's population density in persons per hectare by Statistical Area Level 2 (SA2) (Source: ABS 2016)



Density is spreading beyond the inner city into areas around Parramatta, Bankstown and Hurstville. By and large though, Sydney's density remains geographically and spatially concentrated in the inner city and along the coast.

TRANSPORT IN AND BETWEEN THE THREE CITY CENTRES

Sydney's train network, whilst extensive, was built to serve a pre-car era. Its coverage largely extends to Sydney's historic town centres that exist as radial points on a hub and spoke system. However, many people now live in areas of the city that grew as the car became the dominant form of transport and are therefore not served by the current train network. These areas are also not accessible by light rail, resulting in the public transport outcome where large parts of Sydney are currently only accessible by bus. This is consistent with a low-density sprawl model of development, where the city quickly expands before rail infrastructure can be established and there isn't the population density to warrant rail investment. Even within those areas only serviceable by bus, bus rapid transit (BRT) has been difficult to implement. The dispersed settlement pattern, the size of the metropolitan area, the congested road network, the long journeys between where people live and where they work, and the need to retrofit existing roads have all posed challenges to providing BRT.

As density increases and existing suburbs experience urban regeneration and infill, it is incumbent on policy makers to utilise this opportunity to reduce congestion by encouraging a modal shift towards mass-transit including both heavy rail and light rail. The impetus for action is strong. Prior research by the Committee for Sydney has identified that the knowledge economy is not a dispersed economic phenomenon but rather an agglomerating one. This means that policymakers will need to ensure that a transport network is in place to serve a spatially concentrated economy which will likely require more and more people to be able to access dense job locations.

The capacity required to deliver on this task can only come from mass transit. Although policy makers will no doubt need to continue designing city transport systems in a digital, shared economy and 'mobility as service' environment, the available evidence strongly suggests that mass transit will need to be at the heart of servicing the cities of the future.

For Sydney, the NSW Government has planned a significant improvement in the coverage of Sydney's rail network over the next few decades. As part of the Western Sydney City Deal, a north-south rail link will connect growth areas in the south-west and north-west with the Western Sydney Airport. Light rail and metro investment across the city will also fill gaps underserved by existing heavy rail. As Greater Sydney grows into a polycentric city, east-west rail lines will be vital for ensuring connectivity across the three cities, just as north-south rail lines will be important for improving connectivity within them.

These maps demonstrate the present public transport challenges facing Sydney. At present, only a small proportion of Sydney's developed land is within 800 metres or 10 minutes' walk of a train station. By contrast, the vast majority of the city's developed land is within 400 metres of a bus-stop. Despite this, Sydney's public transport mode-share remains low, indicating that many Sydney residents simply do not find the bus network reliable, frequent or fast enough to warrant a shift in mode.

The task of getting increasingly large numbers of people from their places of residence into centres of economic agglomeration without exacerbating congestion is a core challenge for policy makers moving forward.

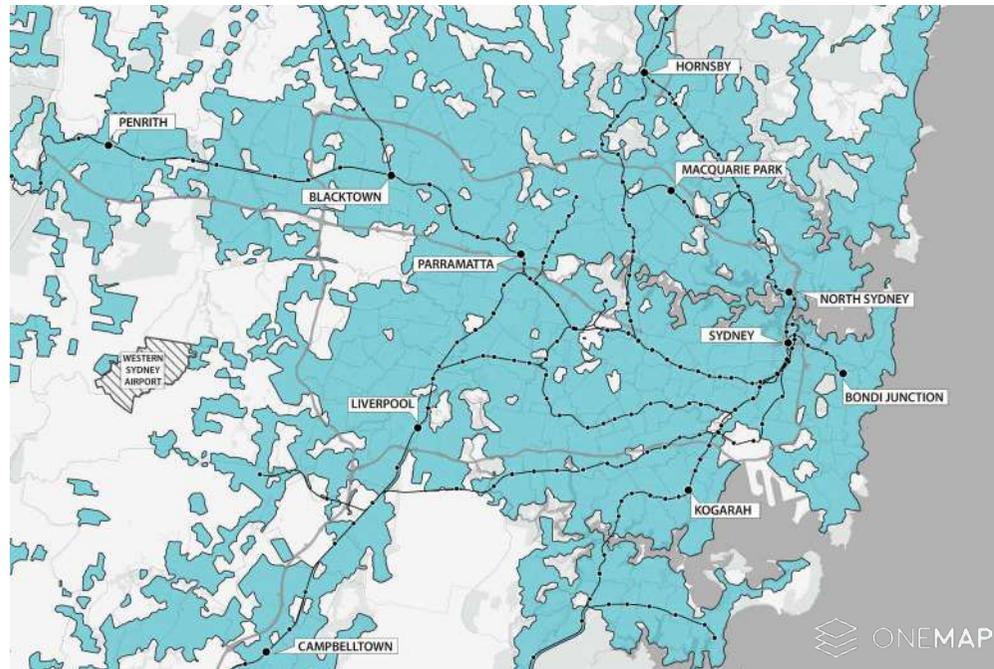
QUESTIONS FOR POLICY MAKERS:

- What are the implications for mode-share and travel times in the Western Parkland City if the north-south rail link and Metro West connections are delivered ahead of the expected boom in new housing supply?
- Does the overwhelming absence of public transport in the Western Parkland City give policy makers the chance to 'start from scratch' with a new model of public transport services, including new options for mobility as a service?
- Does Sydney have a broader problem with how it delivers bus services across the city? Is the challenge one of reliability, frequency, and connection to rail rather than one of access or proximity?

These maps compare accessibility to bus and train services. The map on the left shows areas in which properties are within a 5-minute walk of a bus stop (400m), and the map on the right shows properties that are within a 10-minute walk of a train station (800m). These different measures of accessibility stem from an understanding of 'human-transit', where people are typically happier to walk further for a faster service.

We can see that there are vast areas in Greater Sydney that are only serviced by bus. Sydney needs more rail connections in and between its three cities to support a knowledge-based, agglomerating economy.

Figure 3: Properties within 400m of a bus stop
 (Source: Land and Property Information 2017, OneMap 2018)



● Existing train line & stations

400m to a Bus Stop

Figure 4: Properties within 800m of a train station
 (Source: Land and Property Information 2017, OneMap 2018)



● Existing train line & stations

800m to a Train Station

RENTING ON THE RISE

Although most suburbs in Sydney have a mix of tenure typologies, this map identifies the areas where the largest share of homes are owned outright, owned with a mortgage or rented. Older, more established parts of Sydney exhibit high outright ownership, while newer developed areas show a larger proportion of mortgaged homes. Home ownership remains the main tenure across the city – with 62% of Sydney-siders owning their home outright or with a mortgage – but the proportion of the population that is renting is increasing. Between 2006 to 2016 renting across Sydney increased from just under 30% to 34% of all tenures.

Across Greater Sydney, there are various rental trends at play. It now appears that the most economically dynamic parts of the city – those suburbs with both the highest proportion of value added and knowledge jobs, and with higher effective job density – are also the areas where renting is the most common form of habitation. For instance, in the inner-city Newtown-Camperdown-Darlington area, 62% of all dwellings are rented, an increase from 57% in 2011. The median rent in this area is \$500 per week, which is higher than the Greater Sydney median rent of \$450 per week.

Results in these and other similar areas suggest that wealthier professionals are increasingly opting to rent in places with good access to jobs, transport and services, as opposed to buying homes in locations with less amenity or connectivity to jobs. The rise of the wealthy renter mirrors a similar trend in the US, where within cities of more than a million residents a growing number of renting households are earning more than 120% of median income.⁶ Conversely, there also remain many people who rent out of necessity and not choice. There is a growing proportion of rental properties in Sydney's fringe suburbs which act to service lower income renters. These groups have been pushed away from inner city areas as wealthier tenants enter the rental market and use their purchasing power to absorb the better-placed rental stock.

This raises two key considerations. Firstly, whether demand from professional workers for rental properties with proximity to work provides added impetus to support the nascent build-to-rent sector. And secondly, whether more affordable rental stock is required across the city to support key workers and lower income demographics.

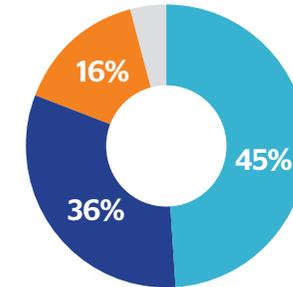
⁶ Misra, T. 2017. 'The Rise of the Rich Renter', *CityLab*, <https://www.citylab.com/equity/2017/10/the-rise-of-the-rich-renter/542007/>.

A final insight gleaned from this map is the relatively high proportion of mortgage holders located throughout the GSC's Western Parkland City. While this observation likely reflects the reality that housing in other parts of the city remains financially out of reach for younger generations of first home buyers, this does raise questions around the distributional impacts on local economies from future interest rate increases.

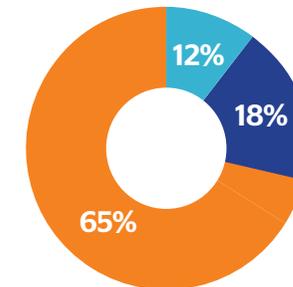
QUESTIONS FOR POLICY MAKERS:

- Does the high rate of renting in and around major employment hubs indicate that the government should consider reforms to support the build-to-rent sector?
- Does the growth in wealthier renters, coupled with a recent trend of lower income renters being pushed to the urban fringe, give impetus to reforms which encourage the development of more affordable and key worker rental housing?
- Does the Western Parkland City's mortgage profile leave the region more vulnerable to a sharper economic downturn in the event of an interest rate increase?

THE OWNERS: AVALON - PALM BEACH



THE RENTERS: REDFERN - CHIPPENDALE



THE MORTGAGERS: PARKLEA - KELLYVILLE

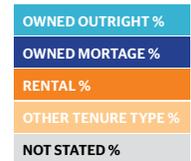
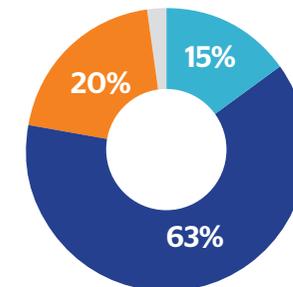
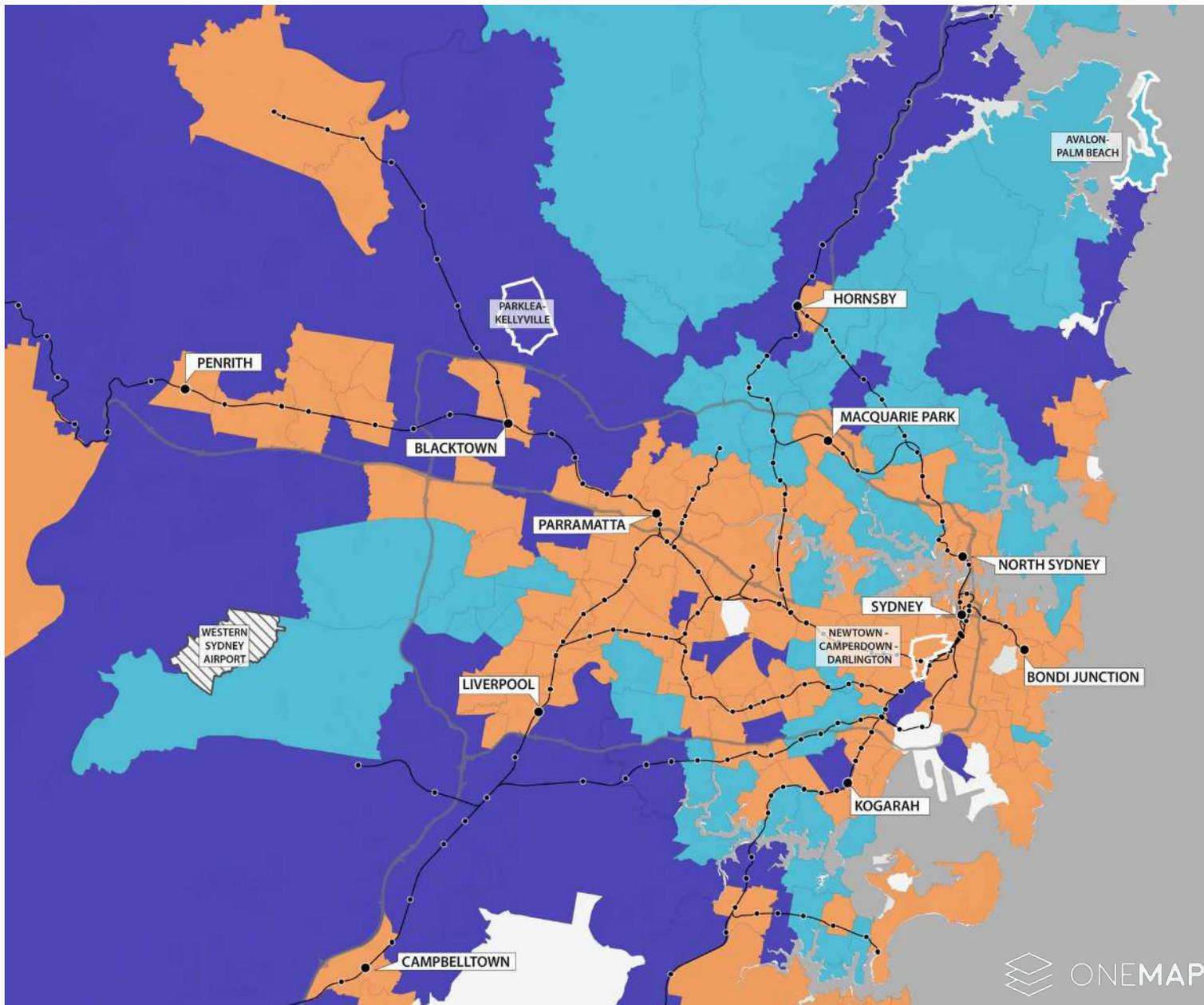


Figure 5: Dominant dwelling tenure type with the largest share in Sydney by SA2 (Source: ABS 2016)



This map illustrates whether the largest share of homes are owned outright, owned subject to a mortgage or rented, by SA2. It now appears that the most economically dynamic parts of the city - with the highest proportion of value added and knowledge jobs and higher effective job density - coincide with rental areas.

- Existing train line & stations
- Dwelling Ownership**
 - Majority owned outright
 - Majority owned with a mortgage
 - Majority rental
 - Majority not stated

INEQUALITIES IN THE CITY

Issues of tenure and income become even more pertinent when you examine a map indicating relative disadvantage across Sydney.

Tracking relative disadvantage through the ABS's Socio-Economic Indexes for Areas (SEIFA) clearly shows how the city is divided with an imaginary line splitting the city along Parramatta Rd and the M4. Suburbs west and south of this line have significantly more disadvantage than those to the north and east.

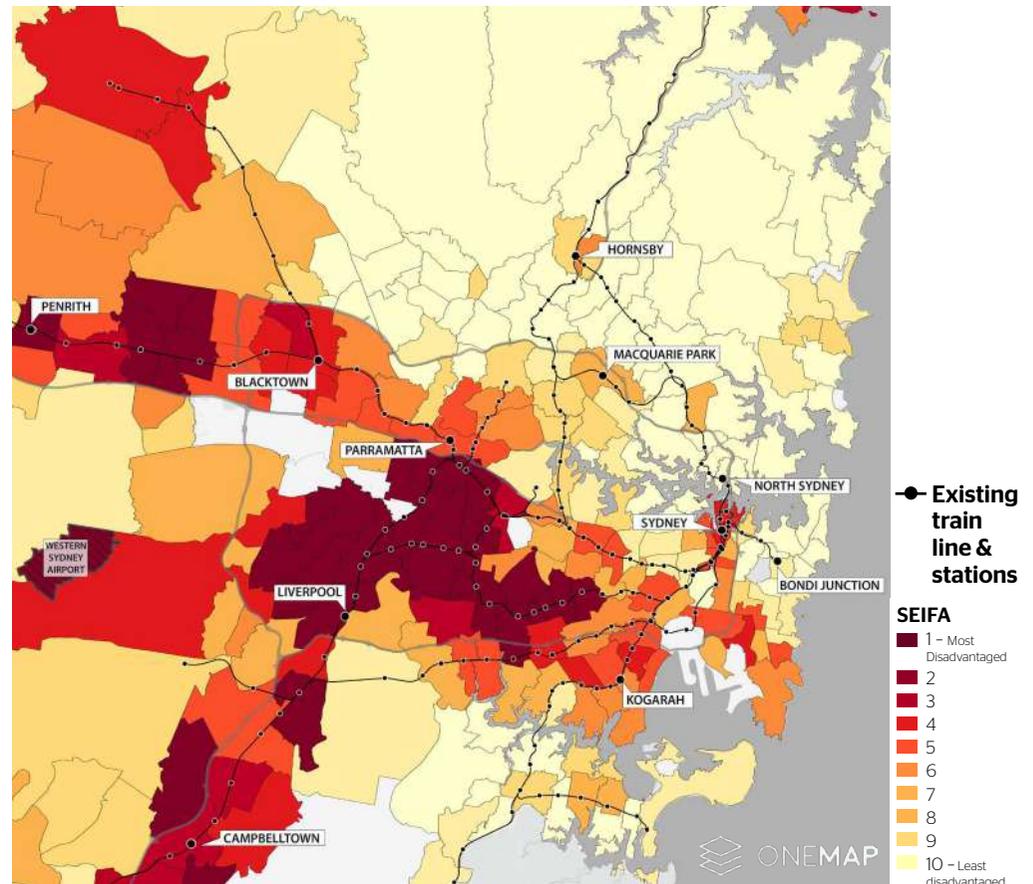
This has enormous implications for our city and reminds us of the need to invest in Sydney's Central and Western City regions, where the majority of the areas of disadvantage lie. Investing to bring jobs closer to where people live has transformative effects on wellbeing.

Putting this in the context of 'the Great Inversion', where jobs and opportunity move from the suburbs to the CBD, it makes sense that poverty and disadvantage are moving from inner city areas to outer suburban areas. To combat this, we must ensure that investment in infrastructure creates new job opportunities and aligns with an education and training strategy that allows local communities to fill these jobs.

However, broad economic growth will likely not be enough. This map also shows a number of areas of advantage and disadvantage side by side. For example, Hoxton Park and Prestons; Chipping Norton and Warwick Farm; Quakers Hill and Blacktown East; Emu Plains and Penrith – reminding us that while access to jobs and transport are important, they are not sufficient to remove disadvantage. The investment in new university campuses across Western Sydney will be important for the development of new innovation districts. Innovation districts create high productivity knowledge jobs, which in turn may be a catalyst for a shift in disadvantage.

Another metric for considering disadvantage in the city is the lack of Effective Job Density (EJD). EJD is a measure of how many jobs are accessible to a person within a set time (typically 30 minutes). As the Committee has previously noted in its report, *Adding the Dividend, Ending the Divide*, areas of higher EJD can access more jobs and the consequent benefits of agglomeration.

Figure 6: Socio-Economic Indexes for Areas (SEIFA) index by Statistical Area Level 1 (SA1)
(Source: ABS 2016)



This map illustrates socioeconomic advantage and disadvantage, highlighting the strong spatial inequality divide in Sydney.

Looking at this map and the previous map, we can see that there is an inverse correlation between access to jobs and disadvantage. EJD is highest in and around Sydney Airport, the CBD, North Sydney and Parramatta, which make up Sydney's 'Global Economic Corridor' of knowledge jobs.⁷ Most of the Eastern City has relatively high EJD, with the Northern Beaches being the exception. Meanwhile, EJD falls quickly in the suburbs surrounding Parramatta, with most of Western Sydney experiencing very low EJD.

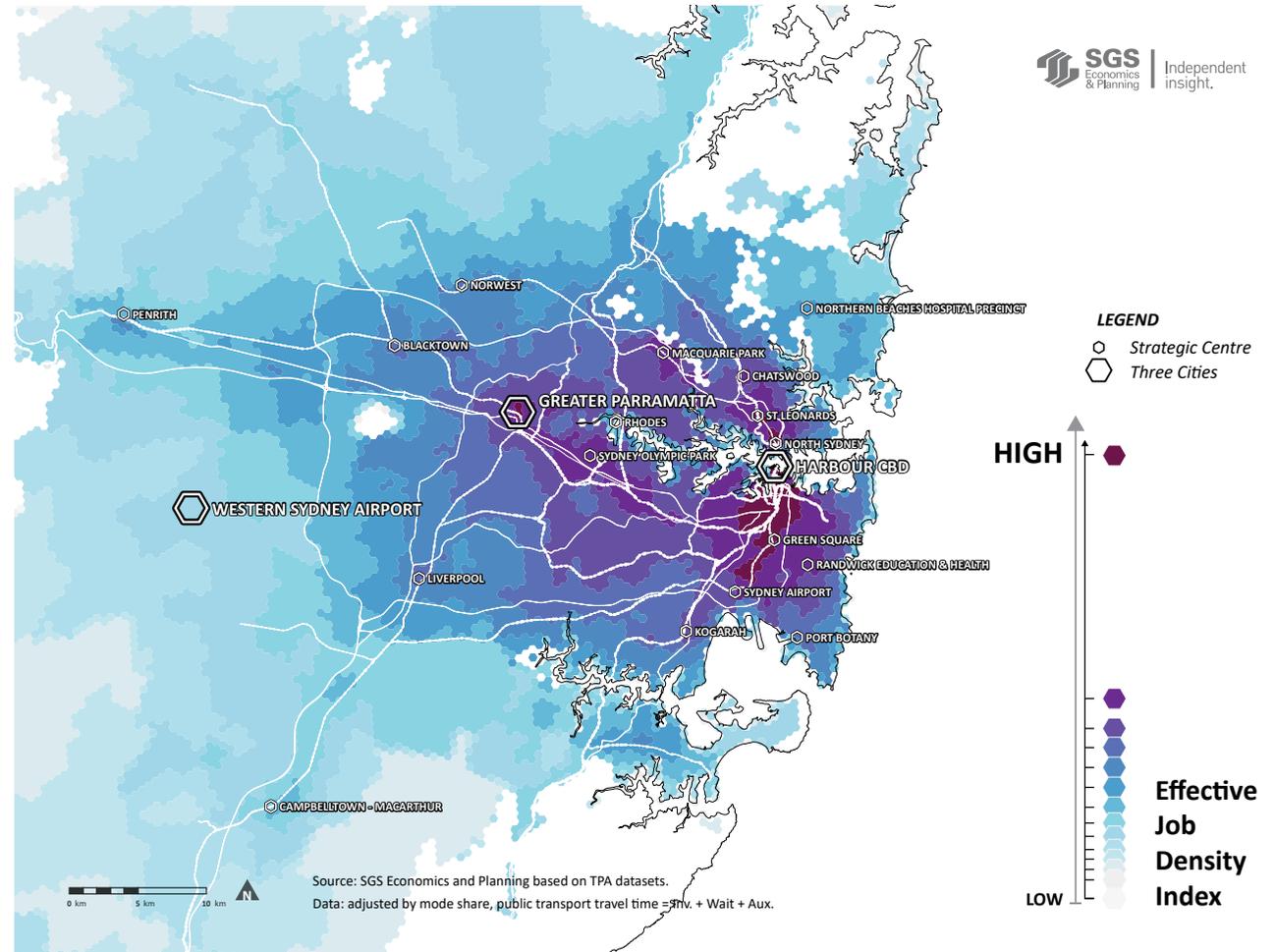
Along with Western Sydney Airport, we need to stimulate the creation of knowledge jobs in Western Sydney by investing in and revitalising its town centres and improving the metropolitan and regional transit links to those centres.

QUESTIONS FOR POLICY MAKERS:

- Does the high number of suburbs with both good access to rail infrastructure and relative socio-economic disadvantage indicate that public transport on its own is insufficient to provide access to higher-paying jobs, and that a more broad-ranging economic strategy may be required?
- Does the higher incidence of socio-economic disadvantage in Sydney's Central City indicate that there needs to be a more targeted effort to improve outcomes in those suburbs?
- Will increasing the presence and number of tertiary institutions in Central and Western Sydney improve the relative SEIFA scores of those areas?
- How well does our record investment in infrastructure match areas of disadvantage?

⁷ Department of Planning and Environment, 2014, *A Plan for Growing Sydney*, page 44

Figure 7: Mapping the city's effective job density (Source: SGS 2016)



EJD is highest in the CBD and North Sydney; Parramatta is above average but the EJD falls off quickly in the surrounding suburbs.

SYDNEY'S PROGRESS TOWARDS TRANSIT-ORIENTED DEVELOPMENT

Across the world, Transit Oriented Development (TOD) has become an important planning approach for achieving sustainable urban growth. TOD refers to development built around transport nodes in order to reduce car dependency and road congestion. In growing cities like Sydney, TOD is vital for housing people in locations where they can efficiently access jobs by use of public transport, and thereby increase EJD. The principles of TOD have already been adopted by the GSC in its Greater Sydney Region Plan. Investment in new transport corridors is tied to density and a new 'Growth Infrastructure Compact' model, which will be piloted in the development of Greater Parramatta and the Olympic Peninsula. However, in examining this map, it is apparent that there is scope for the GSC to consider increasing housing in and around under-utilised transport corridors.

In this map, population density within walking distance of train stations is measured to provide insights into whether Sydney is concentrating development in locations that are well serviced by mass public transport.

This map seeks to categorise Sydney's local density characteristics into three distinct groupings. The first grouping, represented by blue colouring, highlights those parts of Sydney which have densities higher than the city wide average and which are within 800 metres of a train station.

The second, represented by purple colouring, also represents above average density but within areas that are further than 800 metres from a station.

The final category, represented by no colouring, highlights the parts of Sydney which have below average density, both within and beyond the 800m boundary.

The map shows that there are clear higher density areas near to train stations, in which TOD is being achieved. Concentrations of higher density can be seen in and around the CBD and Parramatta, and around many train stations in the Inner West. There are also some emerging TOD hubs near Kogarah between Rockdale and Mortdale Station, and in the Bankstown area between Campsie and Bankstown Stations.

There are also many areas of higher density that are notably located away from train stations. Concentrations of higher density away from existing train stations are seen in the Eastern Suburbs along the coastline, and in the Leichhardt-Balmain area west of the CBD. There are also small pockets of higher density west of Parramatta. Notably, there are more higher density areas located away from train stations in Western Sydney than there are close to them.

The map also demonstrates that throughout Sydney there are numerous train stations that have little to no areas of higher density surrounding them.

Most of these stations are in Sydney's middle to outer ring suburbs. One notable example is the Northern Train Line below Hornsby, which has lower than average density despite access to heavy rail and the region's relative proximity to the major employment hubs of Macquarie Park and North Sydney. It is notable that despite being well positioned near to Sydney's Global Economic Corridor, there is limited density around the train stations between Lindfield and Waitara.

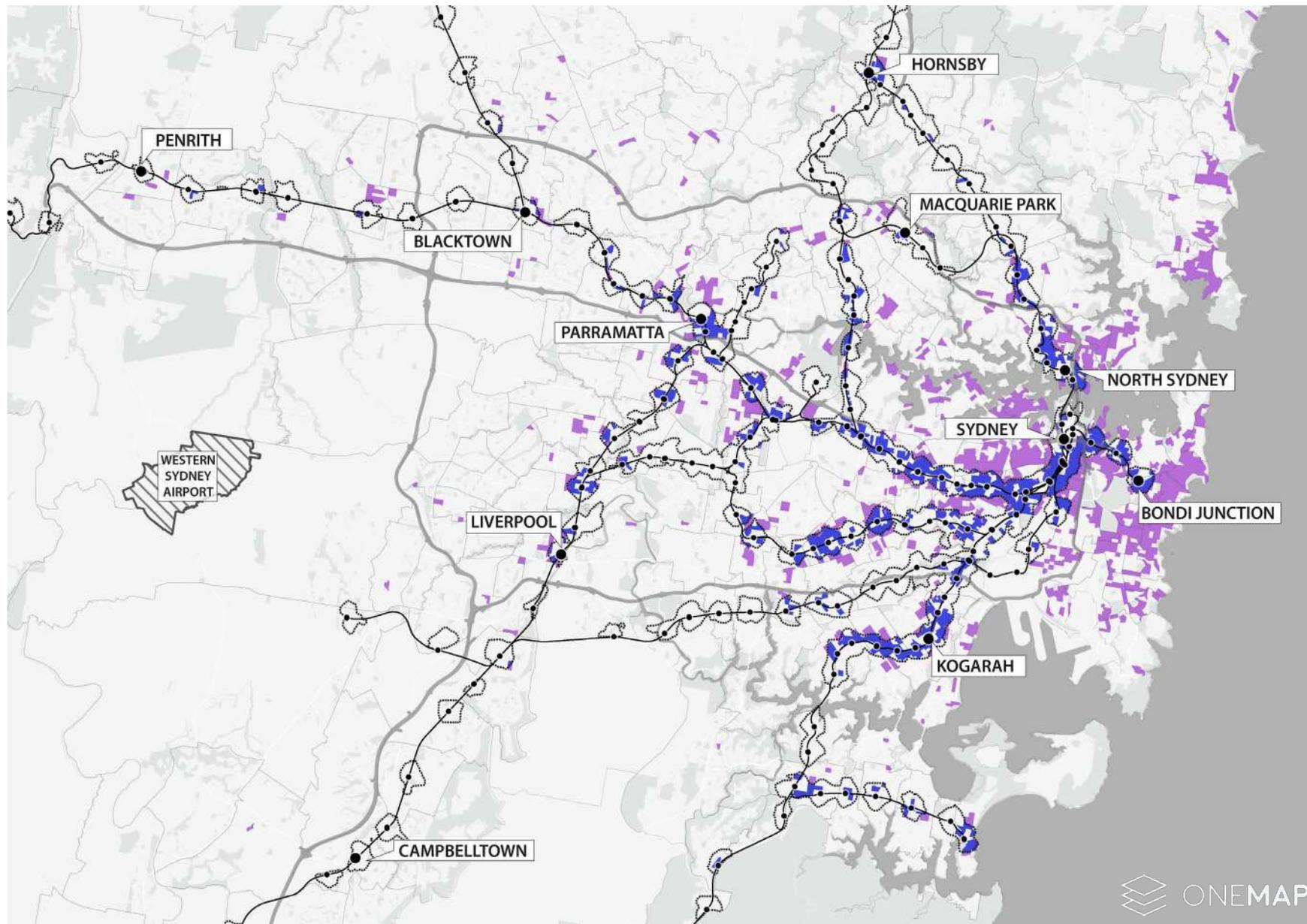
Areas like this represent an opportunity for improving EJD in Sydney. In particular, the 5-year housing target set by the GSC for Sydney's North District may not fully be utilising the opportunity of the existing Northern Train Line. The 25,950 new dwellings earmarked for the North make up just 13.7% of Greater Sydney's total housing target, and the lowest proportional increase in housing stock among the GSC's five districts.

Finally, this map demonstrates that across parts of Sydney there is a need to improve mass-transit connectivity to presently under-serviced parts of the city with higher than average density.

QUESTIONS FOR POLICY MAKERS:

- Should areas of the city that currently hold lower than average density around their train stations be made denser?
- Is there more of a need for investment in mass-transit in suburbs that have higher than average density but which are not connected to rail infrastructure?
- What are the congestion implications of failing to pursue such outcomes?

Figure 8: Sites within 800m of train lines over areas with above average population density for Greater Sydney (currently 51 persons per hectare) by SA1
 (Source: ABS 2016, Land and Property Information 2017, OneMap 2018)



This map highlights the areas where there is above average population density in proximity to a train station, as is seen along the Bankstown and Inner West train line corridors. It also helps to identify areas where there is under-utilised land close to train stations.

WHERE ARE THE NEW HOMES GOING?

Much of the data presented throughout this paper has identified the state of Sydney as it is today rather than what it might look like in the future.

The following two maps seek to capture how Sydney may develop over both the short term and the long term. The first map draws on recent housing approval figures to determine the changes that Sydney suburbs are likely to witness over the next few years as new housing supply comes on-line. The second map draws on zoning data to provide insights into whether different parts of Sydney are likely to embrace increases in housing density within 800 metres of a train station over the medium-term.

When examining the first map, it can be determined that there is substantial development in the pipeline for the large maroon areas north of Penrith stretching through to Cudgeong Road, and then flowing through much but not all of the planned route for the North West Rail Link. There is also substantial new housing supply planned for the regions surrounding the new airport at Badgerys Creek, adding impetus to the delivery of the North-South Rail Line and the South West Rail Link Extension.

Housing supply is also set to be delivered to areas likely to benefit from the new West Metro line, as well as along the Bankstown to Sydenham rail corridor, which will benefit from increased passenger capacity courtesy of the planned conversion of the line.

There are good signs of residential development coming in some areas of job concentration – around key economic centres of Parramatta, Macquarie Park and the CBD. Balancing substantial new housing supply from Greater Parramatta to the Olympic Peninsula with new transport infrastructure needs will be tested with the new Growth Infrastructure Compact model. This area has already experienced growing pains with residential developments in Wentworth Point being delivered before adequate public transport connectivity. It remains to be seen whether this model can be improved to better plan for and sequence land use change and transport and infrastructure investment. This remains particularly important in areas where new rail will take over a decade to deliver.

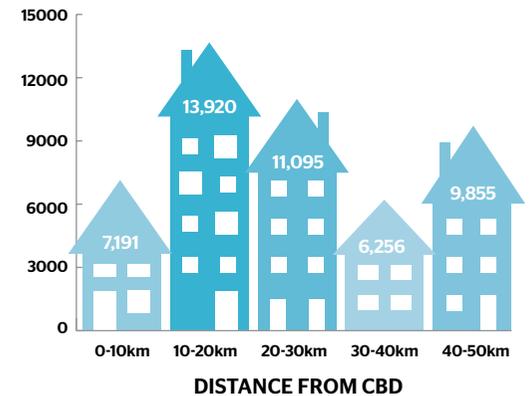
There are also some current job centres that are not projected to see much housing growth, such as the North Shore. There is a strong public policy argument to pursue stronger housing development around areas that are close to existing job centres. This is particularly important while transport infrastructure is still being developed in the west. It is noteworthy that over half of all forecast housing development is expected to occur more than 20km from Sydney CBD despite many of these suburbs at present being under-served by both rail and bus.

QUESTIONS FOR POLICY MAKERS:

- Are there parts of Sydney which could take more housing supply due to their proximity to rail stations and major employment hubs?
- Is the sharp increase in housing approvals for the Western Parkland City appropriate for the region's current level of public transport?
- Is Sydney pursuing the right balance of infill versus greenfield development?

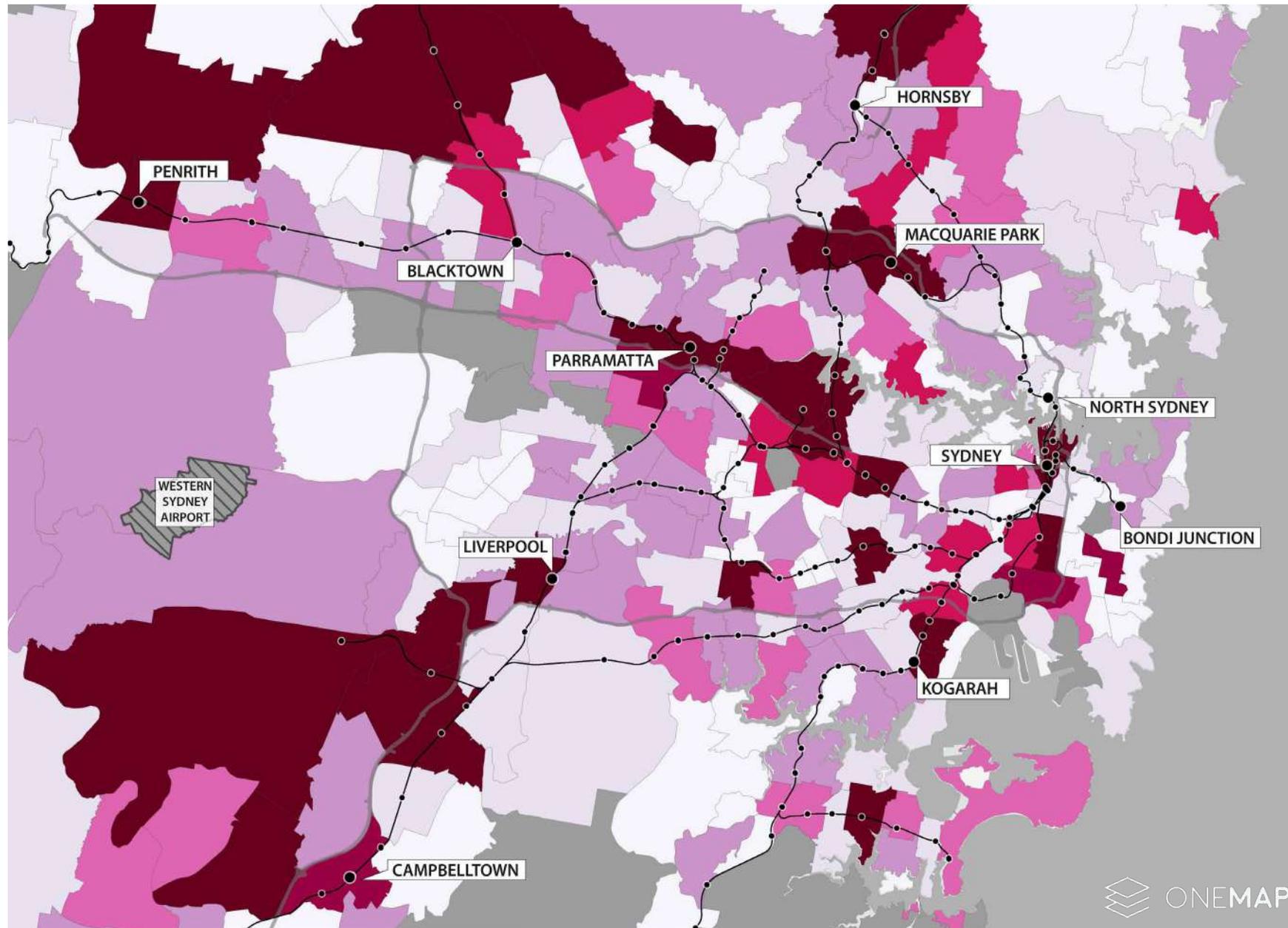
Table 2. Estimated dwelling approvals by distance from the CBD, July 2017–July 2018

DWELLING APPROVALS



Source: ABS 2018

Figure 9: Map of dwelling approvals by SA2 (Source: ABS 2018)



This map illustrates the pattern of dwelling approvals across the city. As shown in table 2, the majority of approvals are for homes more than 20km from the CBD.

- Existing train line & stations
- Building Approvals (July 2017 - July 2018)**
- 0
 - 1 - 50
 - 50 - 100
 - 100 - 200
 - 200 - 300
 - 300 - 400
 - 400 - 500
 - 500+



ZONING AND THE MISSING MIDDLE

This map looks at the zoning that underpins where and what type of development is allowed to occur within 800 metres of a train station, with the express purpose of identifying areas which are a reasonable walking distance from job-connecting heavy rail and yet still maintain lower density R1 and R2 zoning. The red squares represent areas close to train stations that possess these lower density zones.

Substantial areas of Sydney are not zoned in a manner which is consistent with reducing car dependency and its associated congestion. As can be determined in previous maps, this failure to permit higher density supply around train stations is pushing new development to land release areas and growth precincts where zoning allows for higher density and where lot sizes are larger. Such outcomes are not consistent with delivering the GSC's stated goal of a 30-minute city. While not every train station requires zoning that allows for high rise development, R1 and R2 zoning is arguably too restrictive for a growing city seeking to tackle congestion and accessibility issues. The Committee for Sydney's report, *Making Great Places: Density Done Well*, identifies that density can be achieved using many different formations.⁸

Potts Point, Darlinghurst and Paddington have achieved some of the highest densities in Sydney without resorting to substantial high-rise development and as such have thrived as high demand locations. Yet the current planning controls would make it impossible today to replicate the character of those highly desirable places. The Committee for Sydney has long advocated for so-called 'missing middle' style housing, which provides an amenable mid-way level of development that sits between the low-density, large-lot housing model and the high-rise, high-density development model. The NSW Government has recently attempted to encourage this style of density through the release of the Low-Rise, Medium-Density Housing Code and its associated design guide, while amenity and place making objectives have been strengthened through the Government Architect New South Wales' *Better Placed* policy. These documents indicate that the NSW Government recognises that density, good design and quality place making can be delivered concurrently as part of a strategy to replicate the amenity and housing outcomes of Sydney's east.

Following advice from the GSC, the NSW Government recently delayed the introduction of the Low-Rise, Medium-Density Housing Code by 12 months to give councils more time to plan for the anticipated level of change within their local areas. While there is merit in a delay to ensure that density is done well and that housing supply is supported by complementary investment in transport and social infrastructure, the Committee for Sydney cautions against indefinitely delaying the introduction of this otherwise commendable public policy. This paper also notes that the policy is drafted to apply only to those areas which have been zoned by council for medium-density housing. While some councils may wish to use this delay to rezone their land to target new supply closer to public transport and services, the Committee cautions against decisions that would reduce the delivery of new supply overall, and particularly within those areas that are within 800 metres of a train station.

The 30-minute city is a laudable goal worthy of support. However, it is highly unlikely that such an outcome could be achieved while there remains so much R1 and R2 zoning even within those areas that are five stations or less from major employment hubs – including the CBD, Parramatta and

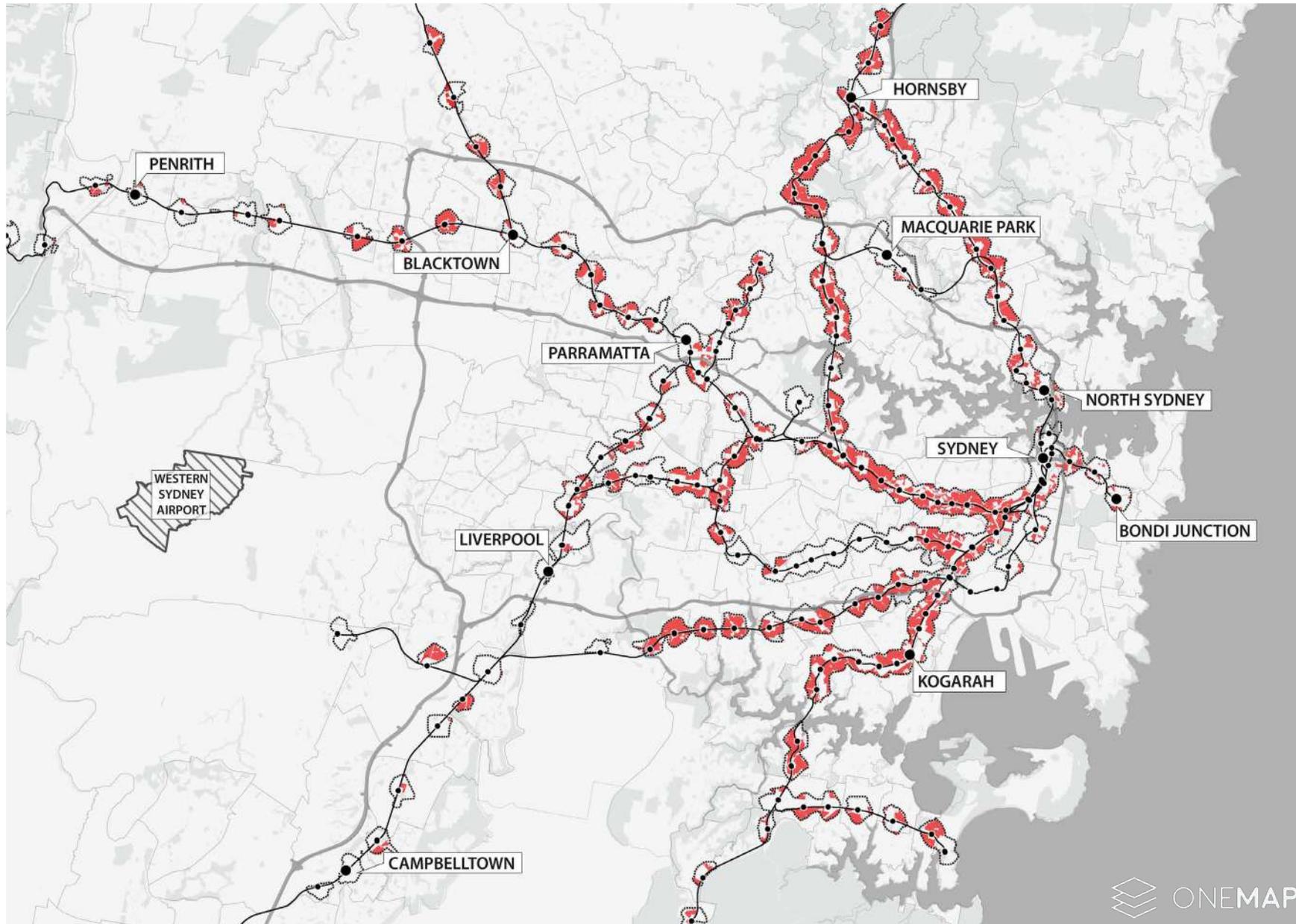
Macquarie Park. It almost certainly will not be achieved if councils move to introduce even more restrictive zoning around these stations. Such an outcome would lock the city into a situation where the only remaining areas available for new housing supply are greenfield areas on the city's urban fringe and far from jobs.

QUESTIONS FOR POLICY MAKERS:

- Is the current zoning profile of the city consistent with the GSC's ambition for a 30-minute city and the desire by Transport for NSW to reduce car dependency by pursuing policies which enable a modal shift towards mass public transport?
- Does a lack of zoning for higher-density around train stations force the city to build more housing supply on the urban fringes of Sydney and in car dependent parts of Sydney that are poorly serviced by rail infrastructure?
- Should we be championing missing middle style low-rise, medium-density housing options within walking distance from train stations, especially when those train stations are within a 20-minute journey of major stations like Parramatta, Macquarie Park and CBD locations?

⁸ Committee for Sydney, 2016, *Making Great Places: Density Done Well*, <http://www.sydney.org.au/wp-content/uploads/2015/10/CfS-Discussion-Paper-Making-Great-Places-Density-Done-Well.pdf>

Figure 10: Properties in low density R1 and R2 zones within 800m of a train station (Source: Land and Property Information 2016, OneMap 2018)



The highlighted areas in this map show the many places across Sydney with good access to train stations where only low density development is allowed. It illustrates that we are missing an opportunity to provide housing where it is needed, and as a result, pushing housing to places with poorer job accessibility.

- Existing train line & stations
- ⋯ 800m catchments to train stations
- R1 or R2 Zone within 800m of a train station

A TALE FOR YOUNG AND OLD

Seen alongside earlier maps, this map of the most common age groups by locality provides a richer understanding of lifestyle and lifecycle dynamics in Sydney. The map does this by identifying the mode, or most frequent, age demographic within each area.

The map highlights that many areas with good accessibility to jobs and amenities are dominated by people aged 15-29, and 30-44. These groups represent 'young workers'. Clusters can be seen in and around Sydney CBD, North Sydney and Parramatta. As identified in an earlier map, these areas also tend to hold a high proportion of renters, reaffirming the data which indicates a higher level of demand for job-proximate rental housing from younger, working professionals.

In contrast to these younger professionals, children aged 0-14 are the most common demographic group in the outer suburbs, particularly in the newer suburbs of south-west and north-west Sydney. These areas tend to be more affordable than the inner-city and as such would be attractive to families with children. Many of these areas are also located further from train stations,

lengthening the likely journey time to and from work for families with young children who may be of pre-school age.

Another interesting trend is that West of Parramatta, there are very few suburbs where the mode demographic was for individuals aged 45-59, which is more likely to capture those householders where children have recently moved out of home or where there is only one teenager remaining in the house. This is likely the result of two factors. The first is that the relative affordability of housing for generations of Sydney residents that purchased their first home 20-30 years ago meant that there was less financial need for younger families to relocate so far westward. The second factor is that this same demographic may well have 'upgraded' to a more desirably perceived region as their relative earning capacity increased and their familial liabilities decreased. This likely also explains, to some extent, why this age demographic is so prominent in many of Sydney's prime locations, either near the waterfront or in the leafier suburbs of the north.

Interestingly, there are almost no parts of Sydney where either the 60-75 or 75+ grouping is the most common demographic. Despite their relative numbers, retirees do not proportionally dominate any individual part of Sydney.

This likely reflects the growing number of baby boomers who pursue a sea change or tree change in their retirement, no longer requiring a home that is located within close proximity to an employment hub. Given the high price of Sydney dwellings relative to other parts of NSW, the incentive to relocate is substantial. This is further incentivised by the more expensive cost of living for Sydney residents, which would be more noticeable to a retired couple without the benefit of a salary income stream.

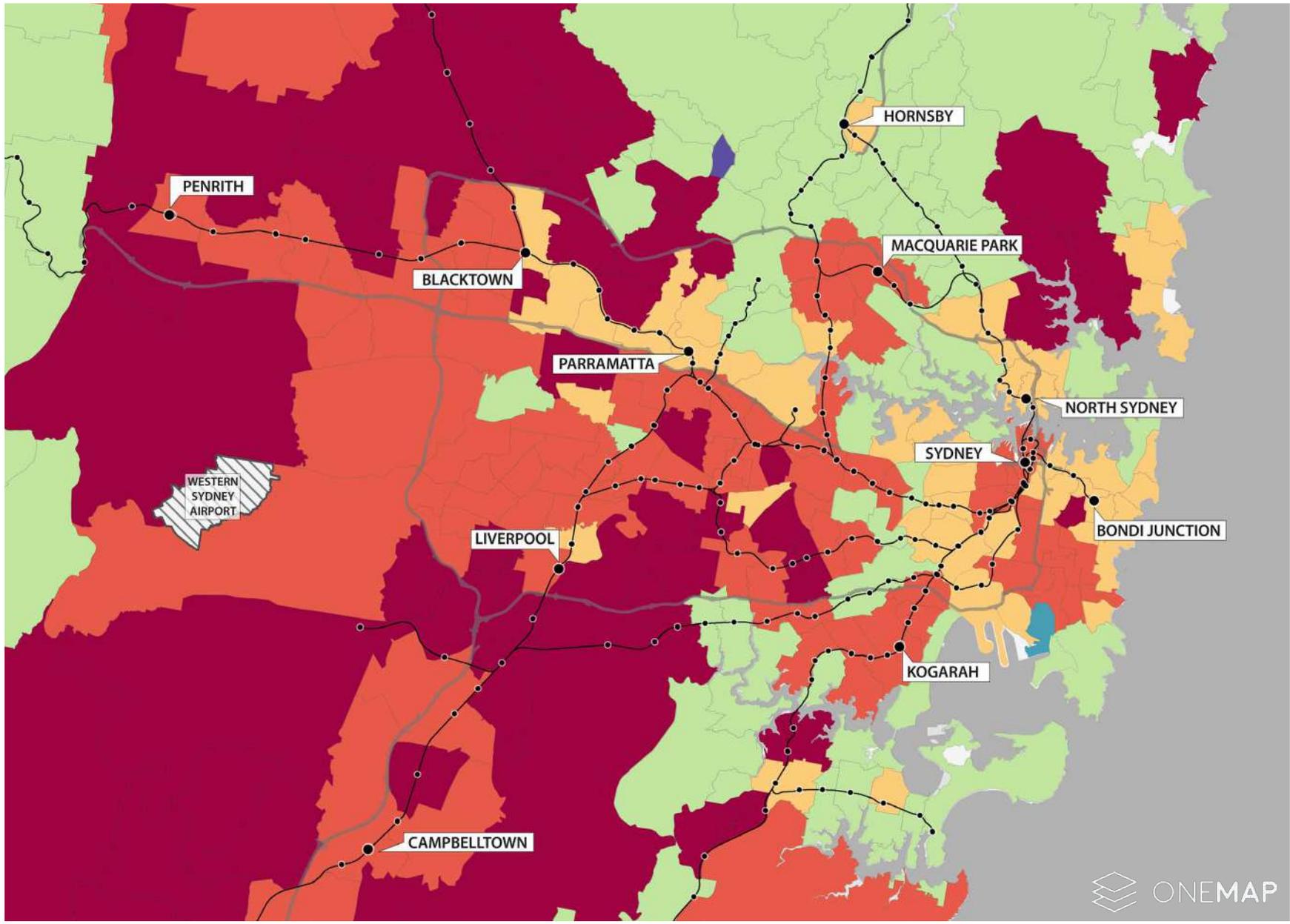
However, policy makers may not want to see Sydney continue to evolve into a city that is not financially inclusive for older residents. The map shows that there is just one SA2 area where the most common age group is people aged 75 years and over. This area covers the locality of Castle Hill East, which is home to a cluster of senior living facilities. A situation where the

only affordable housing options for older generations are on the city's urban fringe is not desirable. As such, policy makers will need to come up with innovative solutions to expand the availability and suitability of land for retirement villages, nursing homes and aged care facilities. There will also need to be a continued emphasis on reforms that facilitate more ageing in place.

QUESTIONS FOR POLICY MAKERS:

- Has unaffordability in Sydney reached the point where families with multiple young children are increasingly unable to live in areas with close proximity by public transport to major employment hubs?
- Does the higher rate of younger, working-age professionals around major employment hubs indicate that young professionals have an established desire to live close to where they work, even if those same areas are only finally accessible through renting?
- Does the fact that there are so few areas identified as hotspots for those of retirement age indicate that Sydney is not inclusive or financially accessible for older Australians?

Figure 11: Age group with the largest share by SA2 (Source: ABS 2016)



This map reflects what we know about lifecycle stages and how they shape housing choice. 'Young workers', that is persons aged 15-29 and 30-44 are concentrated in high rental areas with good accessibility to jobs. Meanwhile, households with young children (0-14) are found in the more affordable outer suburban areas.

- Existing train line & stations
- Most Common Age**
- 0 - 14
- 15 - 29
- 30 - 44
- 45 - 59
- 60 - 75
- 75+



WHO HAS ACCESS TO EDUCATION?

These two maps attempt to craft a picture of accessibility to education across Greater Sydney. The Committee for Sydney's earlier report, *Adding to the Dividend, Ending the Divide*, identified that across every educational metric there was a distinct divide in outcomes in Eastern and Western Sydney. These maps add to that research by considering the question of educational accessibility from a geographic perspective. One map marks the location of primary schools, while the other marks secondary schools.

As can be witnessed, areas west of Parramatta are vastly under-served when it comes to access to schools. This imbalance in distribution forces families to head east to get to schools, creating longer commutes for those living in the west and creating a drain on quality family time. This inequality of access needs to be addressed if Sydney is to have balanced development and greater equity for the Western Sydney population in terms of their share of public goods. The Committee for Sydney notes that the NSW Government has announced significant investment in providing new and upgraded schools over the next few years and remains optimistic that the balance of these schools is directed toward areas which are presently under-served.

The maps also reinforce the conclusions of a separate Committee for Sydney report, *The Geography of Time*, which identified that one contributor to the Inner West's perceived attractiveness as a place to live and work is close proximity to schools, with walkability between house and school also identified as an important factor.

Across Greater Sydney, there is a growing strategic challenge around maintaining and enhancing walkability to school, though this challenge is starker in Western and Southwestern Sydney, where most of the city's growth and younger populations are now agglomerating. As the city has extended outward, policy makers have allowed for the creation of low density suburbs where houses are located far from school. This has generated significant concern within the community around children walking to school. Concerns are frequently raised about road safety. The sheer distance from home to school has grown to the extent that travel time itself has become an issue, resulting in a situation where two-thirds of children are now driven to school.

Polling conducted by the Heart Foundation has found that 50% of parents believe it is important that children be able to walk to school without an adult,

but fewer than one-third believed it was safe for them to do so. The poll found that 69% of parents felt there was too much traffic on the roads to encourage walkability, while 60% said that the distances were simply too far.

The Premier has identified childhood obesity as one of the Premier's Priorities, with one in five NSW children now overweight or obese. Australia's Physical Activity and Sedentary Behaviour Guidelines recommend that school-age children need one hour of moderate to vigorous exercise every day to maintain healthy outcomes. Encouraging a culture of walking to school amongst children and adolescents will go a long way towards tackling obesity rates across NSW, indicating that the geographically dispersed nature of schools in Sydney's west may be contributing to the observed imbalance in health outcomes across the city. Earlier research by the Committee for Sydney identified that deaths attributable to BMI and diabetes hospitalisations are substantially higher in Western Sydney than in the east.

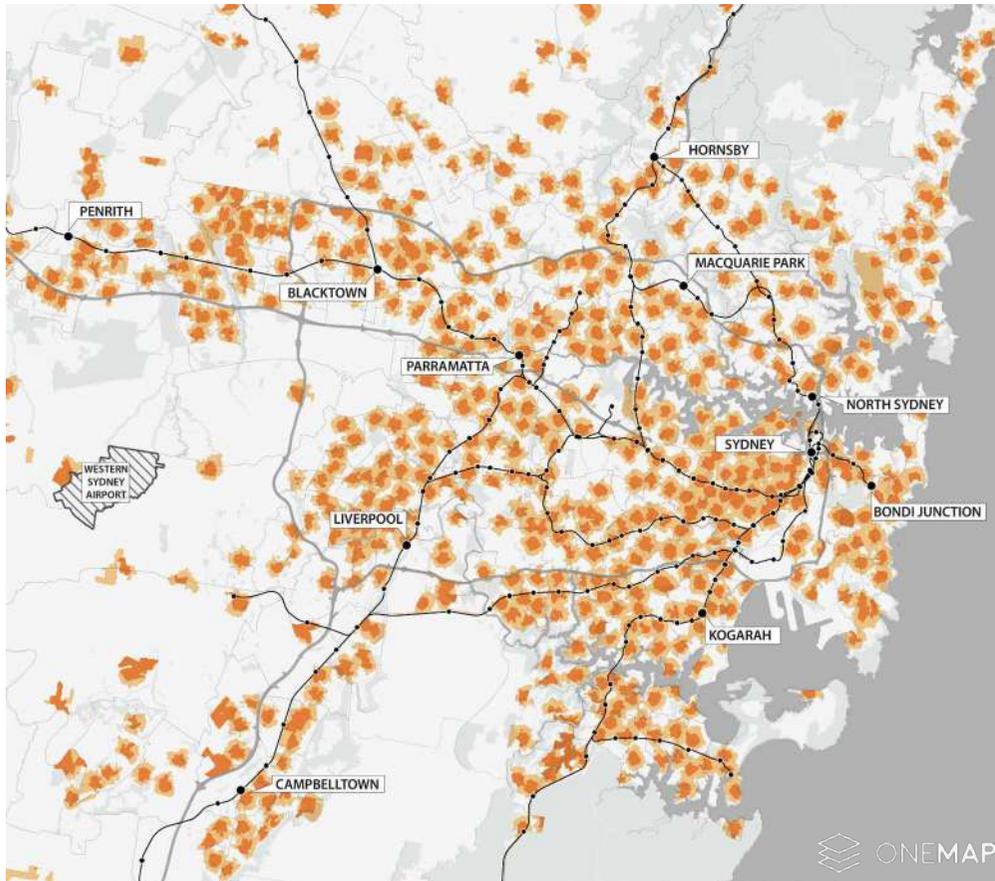
Creating safe, walkable distances to schools will go some way towards addressing this challenge, though the Committee for Sydney has also identified that the lack of street trees can make for hostile walking environments.

In the City of Parramatta there is less than 26% tree canopy cover, and most routes have little to no shade along streets. To address this and to deliver on the Premier's Priority, there will need to be a more coordinated multi-agency strategy to facilitate walkability more broadly.

QUESTIONS FOR POLICY MAKERS:

- Would building new schools in existing town centres with higher densities increase walkability outcomes while tackling community concerns around distance of journey?
- Should Roads and Maritime Services be directed to ensure that the city's roads and streets aren't being developed in a way which undermines community concerns around safety of journey?
- What should be done to ensure that new schools delivered for the Western Sydney Parkland City are both walkable and safe despite the region's presently lower density profile?

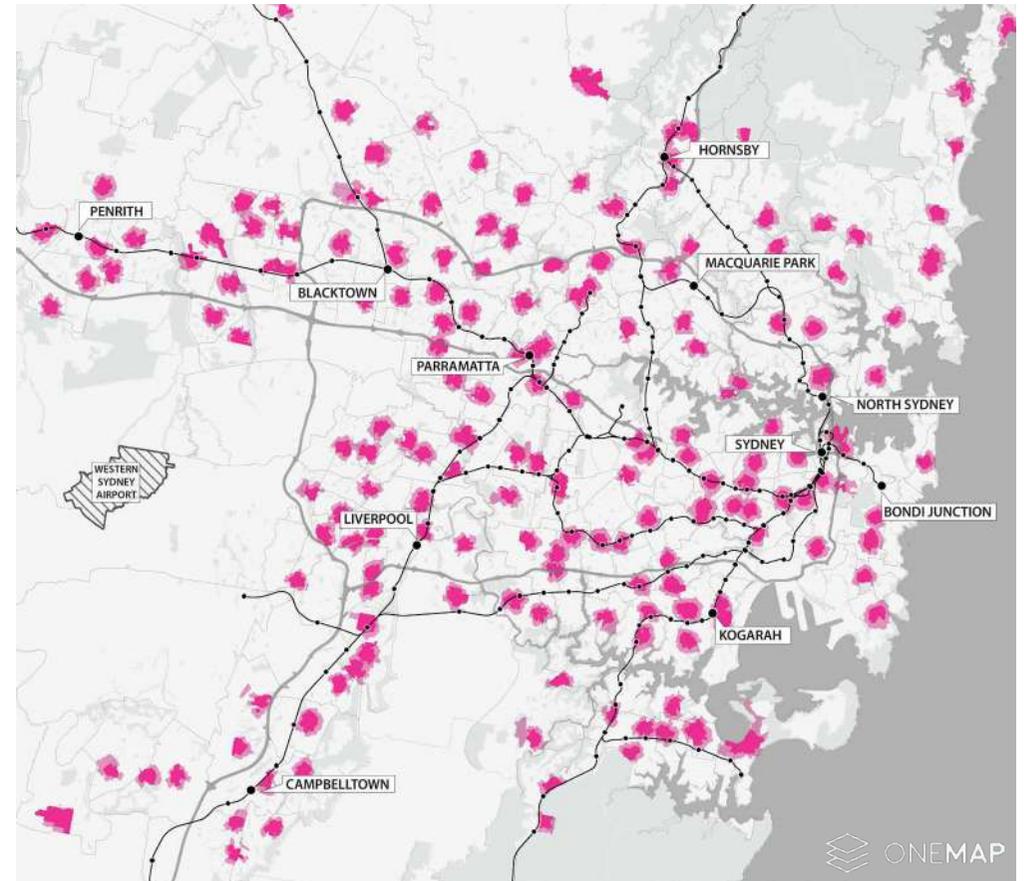
Figure 12: Properties within 400/800m of a primary school
 (Source: Land and Property Information 2017, OneMap 2018)



- Existing train line & stations
- 400m
- 800m

These maps show where primary and high schools are located across Sydney, illustrating that areas west of Parramatta are vastly under-served when it comes to access to schools.

Figure 13: Properties within 400 / 800m of a high school
 (Source: Land and Property Information 2017, OneMap 2018)



- Existing train line & stations
- 400m
- 800m

ARE THERE ANY 'AFFORDABLE' HOMES IN SYDNEY?

The Committee for Sydney has long urged policy makers to address Sydney's affordable housing crisis. Sydney is one of the least affordable cities in the world. Demographia's 2018 Housing Affordability Survey evaluated 293 urban markets across nine countries and found Sydney's market to be the second most expensive, outpriced only by Hong Kong. The city's median house price to median income ratio was rated as 'severely unaffordable' with the median house price costing 12.⁹ times the gross annual median household income.⁹ While Sydney has always been Australia's most expensive city, the price-to-income ratio of 12.9 is the city's worst ever recorded result. Just five years earlier, Demographia's 2013 Survey recorded a ratio of 8.3.¹⁰ That same year, Sydney had 159 suburbs with a median house price below \$500,000, whereas five years later there were none. To demonstrate Sydney's geographic price differential, this map shows the median prices recorded across Greater Sydney broken down by brackets of \$100,000.

As the map illustrates, there is a clear spatial relationship to housing prices. East of Parramatta, there are almost no suburbs with median prices below \$1 million. West of Parramatta, prices are somewhat lower but still relatively unaffordable. In new suburbs like Oran Park, which is a remote 60km from the CBD and completely disconnected from rail services, a three-bedroom house will still, on average, cost at least \$700,000. The complete dearth of even moderately affordable housing in locations closer to the Sydney CBD goes some way towards explaining the results on the ageing demographic map, which demonstrated that households with multiple children were being pushed towards the outer suburbs.

A lack of affordable housing not only affects individual households; it has repercussions for the functioning of the city at large. In Sydney, many key workers – including emergency workers, teachers and nurses – cannot afford to live near to the places where they work. Between 2006 and 2016, the local areas of Parramatta, the Eastern Suburbs, Inner South West, Inner West and Ryde experienced a 10-22% net loss of key workers.¹¹

Meanwhile, the regional areas of the Illawarra, Southern Highlands and Hunter Valley experienced substantial net gains.

Sydney is also experiencing a loss of prime working age Sydney-siders moving to other cities in Australia. In 2015-16, Sydney experienced a net loss of 72,749 persons aged 25-44 years old, with the cost of housing cited as one of the key challenges of living in Sydney.¹² Cities need workers to keep them moving, and they particularly need key workers to support the health and wellbeing of the population. As such, affordable housing needs to be understood as an issue for all Sydney-siders – not just those without. Recent state policy developments show promising steps forward. The NSW Government has adopted the GSC's proposal of a 5 to 10% affordable housing target on new residential developments and is planning to expand the Affordable Housing SEPP 70 to five additional local councils. As argued in the Committee for Sydney's submission to the GSC's Draft Greater Sydney Region Plan, NSW Government should build on

this momentum with a renewed focus on delivering more affordable housing and key worker housing across the city. Government should also consider reforms to support the nascent build-to-rent sector in order to deliver choice in housing for professionals seeking to access rental housing in amenable areas close to their place of employment.

QUESTIONS FOR POLICY MAKERS:

- Is an inclusionary zoning target of 5-10% of new residential developments appropriate for Sydney given the scale of the affordability challenge facing the city?
- Does the city need to protect and grow social and affordable housing east of Parramatta to prevent the creation of a cash curtain between east and west Sydney?
- What are the implications for commuting, childcare and community cohesion in a city that fails to deliver affordable housing or rental options for young workers?

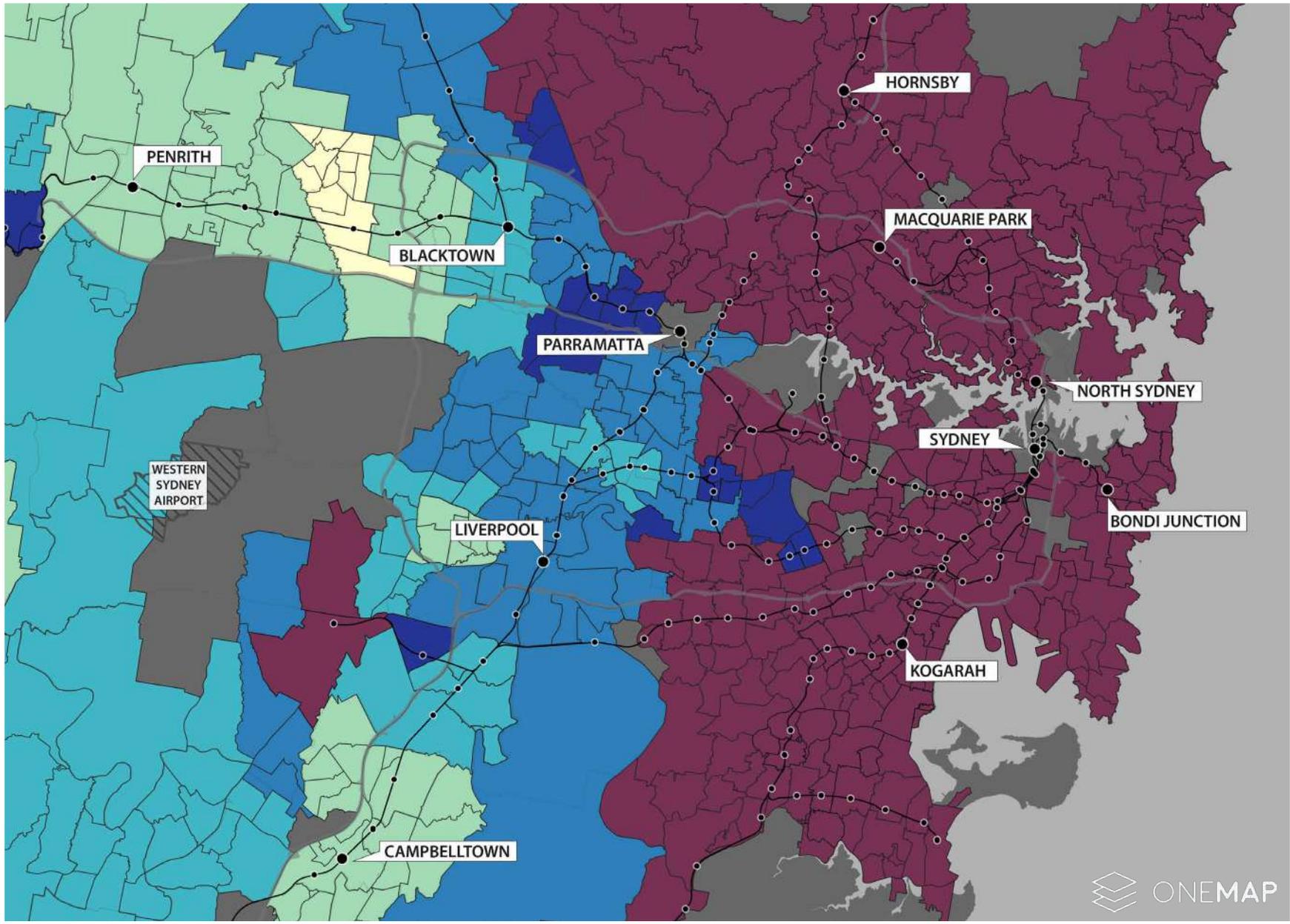
9 Demographia, 2018, 14th Annual International Housing Affordability Survey, <http://www.demographia.com.au/14thHousingSurvey2018.pdf>.

10 Demographia, 2013, 9th Annual International Housing Affordability Survey, <http://www.demographia.com/dhi2013.pdf>

11 Gurrán, N. Gilbert, C. Zhang, Y. and Phibbs, P. 2018, 'Key worker housing affordability in Sydney', Report prepared for Teachers Mutual Bank, Firefighters Mutual Bank, Police Bank and My Credit Union, *The University of Sydney*, <https://www.tmbank.com.au/-/media/community/news/pdf/2018/tmb-key-worker-housing-affordability-report-part-1.ashx>.

12 Hanna, C., 2018, 'The world loves Sydney. Australians aren't that fussed', *The Sydney Morning Herald*, 25 February, <https://www.smh.com.au/interactive/2018/the-world-loves-sydney-australians-arent-that-fussed/>.

Figure 14. Average house price under \$1m by suburb (Source: NSW Department of Family and Community Services 2017)



This map of houses valued under \$1m illustrates the premium for proximity to the CBD and also to Parramatta.

-  Existing train line & stations

- Median House Price (September Quarter 2017)**
 -  Insufficient data
 -  0 - \$600K
 -  \$600 - \$700K
 -  \$700 - \$800K
 -  \$800 - \$900K
 -  \$900K - \$1M
 -  Greater than \$1M

CONCLUSION

Sydney remains divided along geographical lines. The further west and south you travel, the lower the SEIFA index and the poorer the access to education and transportation. Meanwhile, the North-West and South-West Growth Areas on the urban fringe are experiencing significant growth while other areas in the north and east appear to have latent and under-utilised capacity for additional housing and density. This divide threatens to split the generations – as younger families and students will struggle to access home ownership and areas of high effective job density.

At the same time, we cannot simply conclude that these problems are not being addressed. The value of mapping our city is to test the ongoing effectiveness of policy interventions. The recent NSW Budget included a number of excellent announcements that will address this divide – including \$750 million for a new Health Innovation Precinct for Liverpool, bringing high quality jobs to the South West at a time of significant population growth. The Growth Infrastructure Compacts being trialled by the Greater Sydney Commission, which look to deliver local services and local infrastructure to match areas of significant growth and investment in Sydney Metro West, will dramatically increase the effective job density of areas along its corridor – and start to rebalance the alignment of our transport network towards our Central City.

The purpose of this exercise is not simply to critique the work being done or to declare our city 'divided' – rather it is to demonstrate the value of real-time data and a smart-cities approach to measuring impact. Mapping of this type can easily and effectively deliver a complex message about our urban systems at a time when scepticism is on the rise.

APPENDIX

Tract is a national practice specialising in town planning, urban design, landscape architecture and associated digital media. Our charter of building communities, delivering sustainable and memorable solutions, shaping places for living, leisure and work, and the infrastructure that supports and connects these places is aligned with The Committee for Sydney's focus areas of: *An Inclusive City*, *Managing Sydney's Growth & Prosperity*, *A Smarter, Data-Driven City*; and *Keeping Sydney Moving*.

In line with this charter, Tract has worked in partnership with a large and diverse range of clients across Sydney to deliver key land marks such as the Echo Point Revitalisation in Katoomba, the Manly interchange and Taylor Square, providing compelling solutions for major infrastructure projects, public realm improvements, active transport strategies and masterplanning for both government and developers. A recent highlight was providing pro bono assistance to the Marrickville Public School in the development of their concept proposal to the "My Park Rules" competition (2016), which we're pleased to say they won!

OneMap, *The Property Intelligence & Site Finding Platform*, was borne out of helping Tract's expert consultants to better meet the needs of their customers in the planning and property community. Developed in-house at Tract over 5 years, OneMap is now a market leading geospatial mapping platform that brings together a vast array of complex data on a single visualisation web-based platform that is fast and simple to use.

OneMap can rapidly analyse sites, suburbs and entire municipalities. It is powered by a large property database containing unique information for every single property in Metropolitan Sydney, Melbourne, Brisbane City, Geelong and Ballarat (over 4.2 million properties). The property specific information includes distances (measured along the street, not as the crow flies) to public transport stops, schools, open space and shops - linking in with the "connecting people and place" theme in a previous Committee for Sydney report - as well as planning controls associated with the property, land slope and property dimensions.

The tool can be used to undertake strategic planning, by filtering in or out properties based on the above characteristics, and analysing demographic and development statistics for large areas.

Comprehensive site reports are generated at the click of a button containing information ranging from accessibility through to site context, planning controls, contours and land slope.

Our offering also has over 30 mapping layers that can be turned on or off and analysed in more detail. These include all of the planning zones and overlays, demographics, population density, recent and future development activity and topography. All maps that are generated can be quickly and easily exported for use in reports (as illustrated in this publication) or presentations.

OneMap is being utilised by consultant planners, property developers, transport consultants, real estate firms, architects and state and local government. It is bringing significant efficiencies to these organisations and providing them with real-time data not previously available - thereby making a contribution to The Committee for Sydney's *A Smarter, Data-Driven City* focus area.

Tract and OneMap are very proud to be members of The Committee for Sydney and appreciate being given the opportunity to partner with it to develop this informative and thought provoking report.

For more information on Tract, please visit www.tract.com.au and for more information on OneMap, please visit www.onemap.com.au.





The Committee for
Sydney

“The Committee for
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THE HON. GLADYS BEREJIKLIAN MP
PREMIER OF NSW

The Committee for Sydney

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