

ImagineSydney

Live | 2018



Deloitte.

*Shaping
Future Cities*

A word from the collaborator

Over the next 20 years Infrastructure Australia¹ predicts that an extra 2.7 million people will call Sydney home, raising the city's total population to about 7.3 million by 2046. The urban strain on infrastructure and services is a serious threat to issues of housing affordability and congestion.

Sydney's long term strategy to create three thriving cities is a visionary solution to this trend. The NSW Government and Greater Sydney Commission have delivered the policy oversight to set us up for success that benefits everyone.

It is an exciting opportunity to leverage best practice from 'smart cities' around the world. Instead of jamming more people into the current eastern corridor, Sydney is poised to expand around the Parramatta growth corridor and further west in and around the new Badgerys Creek airport.

Through this collaboration with Deloitte, Westpac is committed to help realise the potential of this 30-minute city concept and economic dividend for the NSW economy.

Three economic centres, where people live 30 minutes to work is in sync with quality of life expectations, transport technologies, shifting retail habits, the rise of flexible working and the 'gig economy' where data informs everything.

As Australia's first bank and one of its largest companies, Westpac employs 40,000 people with 13 million customers. As a major financier to the housing sector and lead funder of infrastructure projects we are committed to supporting innovative partnerships with industry, the social sector and government to create more affordable long-term housing options as Sydney grows.

As housing affordability continues to move the population west, jobs growth and infrastructure needs to follow. If not, painful congestion and long commutes will shrink productivity and create social inequality.

Westpac is committed to help get Sydney's 30-minute cities strategy right, helping our people, customers and communities to prosper and grow.

NSW is leading the country in infrastructure investment with a pipeline in excess of \$70 billion to connect both to and between cities to improve accessibility and make the additional centres functional hubs. Projects include Sydney Metro, WestConnex, Parramatta Light Rail and further investment in hospitals, schools and the justice system.

A 30-minute city will require new modes of cooperation and thinking. It takes collaboration of public sector, private sector and individuals. If we get it right the opportunity is enormous.



Lyn Cobley
Chief Executive
Westpac Institutional Bank



Foreword

Exceptional quality of life and liveability are the pinnacle and privilege of modern day living. With its world famous harbour, beaches, vibrant culture, and its built and natural environment, there are a number of factors that contribute to Sydney being one of the most liveable cities in the world.

Residents, tourists and economic activity are drawn to Sydney precisely because of its liveability. But it's a delicate balance – we also need to manage our environmental impact, congestion levels and city density to maintain the liveability for which Sydney is known.

There are of course, many ways to define liveability, but the term generally refers to the extent to which “a place, be it a neighbourhood, town or city, supports quality of life, health and wellbeing for the people who live, work or visitⁱⁱ.”

Deloitte has been researching liveability over recent years and Deloitte Access Economics was a contributor to the Domain Liveable City 2016 Index, which ranks Sydney's suburbs by 16 indicators.

Deloitte sees the 30-minute city concept as a primary enabler of liveability. A city cannot be truly liveable if people cannot readily access the things they want to do and the places they want to be.

In this *Live* edition of our **Imagine**Sydney series, we present another way of thinking about liveability in Sydney and build on our previous work in three ways.

First, we have developed a 30-Minute City Index, which adds a focus on accessibility as a key aspect of liveability. We measure the number of jobs, shops, hospitals, and schools that can be accessed across the Sydney metropolitan area from each area (and by each area), within 30 minutes.

Second, we recognise there is a huge untapped dividend for the NSW economy – which could be **more than \$10 billion per year** – in reduced daily commuting time and productivity gains from agglomeration and infrastructure investments. We've analysed those economic benefits in terms of getting the 30-minute city right and have derived from the Index that accessibility to work has the greatest impact on liveability. A range of public transport investments will be required to enable a 30-minute city, both in linking the suburbs and providing transport options between some newly proposed city centres as well. While the infrastructure investments will be costly, they will also result in economic growth benefits for Sydney.

Third, we recognise that getting it right is not just about public transport investments. It's a big challenge for our community more broadly and we explore what government, the private sector and individuals can do to achieve a 30-minute city.

It will take a combined effort to make this a reality. And one that will require a shift in mindset so that we're living smarter and better connected lives. But deepening our understanding of liveability and working together to change the lens will determine a more prosperous future for Sydney, where growth and opportunities thrive.

Imagine a more accessible and liveable Sydney.



Nicola Alcorn
Managing Partner, Sydney
Deloitte



Contents

A liveable Sydney	6
A tale of three cities	24
Transport to the future	36
What's in it for Sydney?	46
<i>Live</i> : next stop action	50
Appendices	58
References	68



A liveable Sydney



The goal: a matter of need

Exercises in measuring or ranking the liveability of different cities and areas are attempts to capture the lifestyle that most people want, and are increasingly used as a basis for comparing the overall quality of life afforded by cities across the world.

While there is much discussion around these rankings, it's more important to understand what the desired liveability outcome is for our city and why. This includes a deeper examination of the role accessibility has to play for Sydneysiders.

The creation of liveable cities is not a new concept, either in Australia or internationally. When thinking about liveability in Sydney, the sun, sand and surf come to mind for many. People are also drawn to live in Sydney because of its thriving business districts and employment opportunities.

The accessibility of these opportunities is important. Congestion and the geographic spread of the city can make it challenging to access everything that people want when it comes to work (and play) and a 30-minute city can help make this possible.

Historically, people have tended to spend no more than an hour travelling each day, particularly for work – 30 minutes there and 30 minutes back. Where travel times were greater, people would adjust their behaviour accordingly and relocate as necessary¹.

The Greater Sydney Commission sees Sydney becoming a 30-minute city as a matter of need, given population growth, noting “jobs growth and opportunities have to be well distributed throughout our city so we do not become congestedⁱⁱⁱ.”

Of course, there are benefits on an economic level as well. Transforming Sydney into a 30-minute city through having a greater number of ‘hubs’ and clustering of business activity holds productivity and innovation benefits, as well as reducing people’s commute time every day.

¹ This is known as Marchetti’s constant – the average time spent by a person commuting each day is approximately one hour.

What is a 30-minute city?

Although there are different definitions of a 30-minute city, at its heart it is one where its residents can access places of work, study, services and play within 30 minutes.

Precise definitions might differ as to whether this 30 minutes must be the time it takes to walk, drive, travel by public transport or even cycle. Definitions will also vary as to what precise destinations need to be available within 30 minutes. In our analysis of liveability, we look at what people need access to most – work, school, public transport, shops and hospitals.

With a focus on accessibility, Deloitte Access Economics has developed a 30-Minute City Index that looks at which of Sydney's areas make the best '30-minute neighbourhoods'.

The Index brings together numerous quantitative sources to rank areas by general liveability and the ability of residents to access what they need to live, learn and work – within 30 minutes. A high-ranking area fares well on accessibility to these based on a 30-minute walk, ride or drive. It is also conventionally liveable – think open space, trees, low crime and low main road congestion, to name a few factors.

The Index builds and draws on the Domain Liveable City 2016 Index², which ranks Sydney's suburbs by 16 indicators, including open space, tree cover, topographic variation, crime, harbour and ocean views, telecommunications coverage, culture, main road congestion, proximity to employment areas, and proximity to schools, shops, cafes and restaurants. We also count the number of jobs, shops, hospitals and schools that can be accessed across the Sydney metropolitan area from each area (and by each area), as long as it takes no more than 30 minutes. We do this by looking at data³ on travel time by driving and public transport at peak hour. Hence, the 30-Minute City Index takes into account both density and distance. See Figure 1.1.

Appendix A presents a detailed methodology for the development of the Index.

Sydney's CBD is home to some of our most liveable areas. The main reason for this is that as Sydney's largest employment hub, the CBD exerts the greatest 'gravitational pull', giving all nearby areas high accessibility to work options.

Figure 1.2 shows that the most accessible and liveable areas are clustered in and around Sydney's urban centre and harbour.

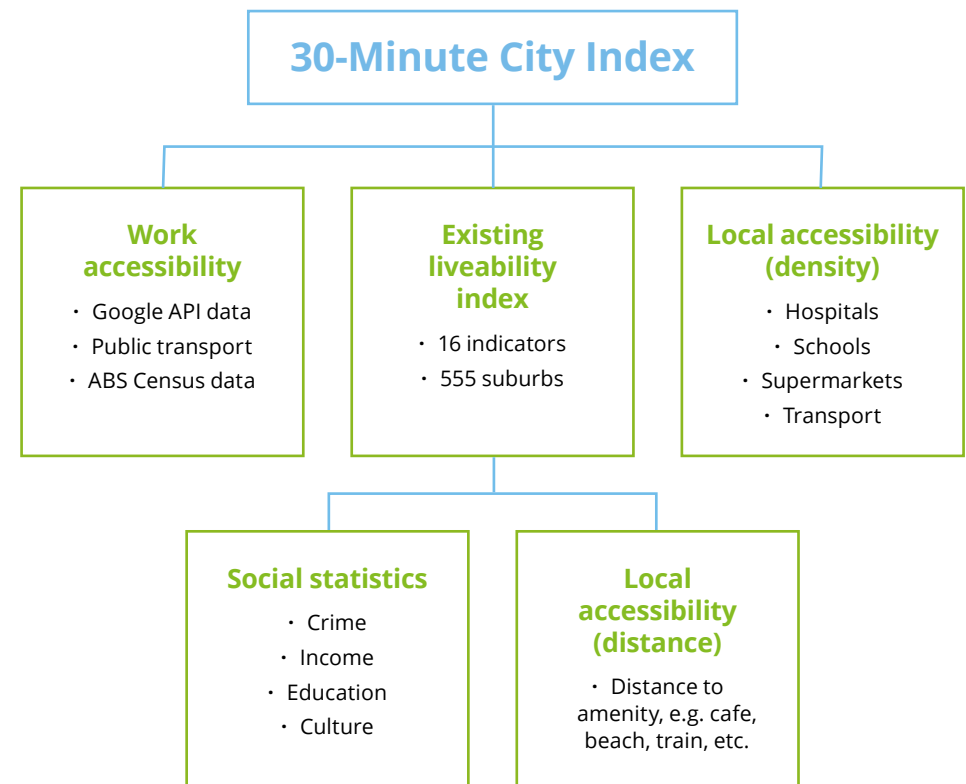


Figure 1.1: Components of the 30-Minute City Index

² Authored by Tract Consultants and Deloitte Access Economics

³ Google Maps API data

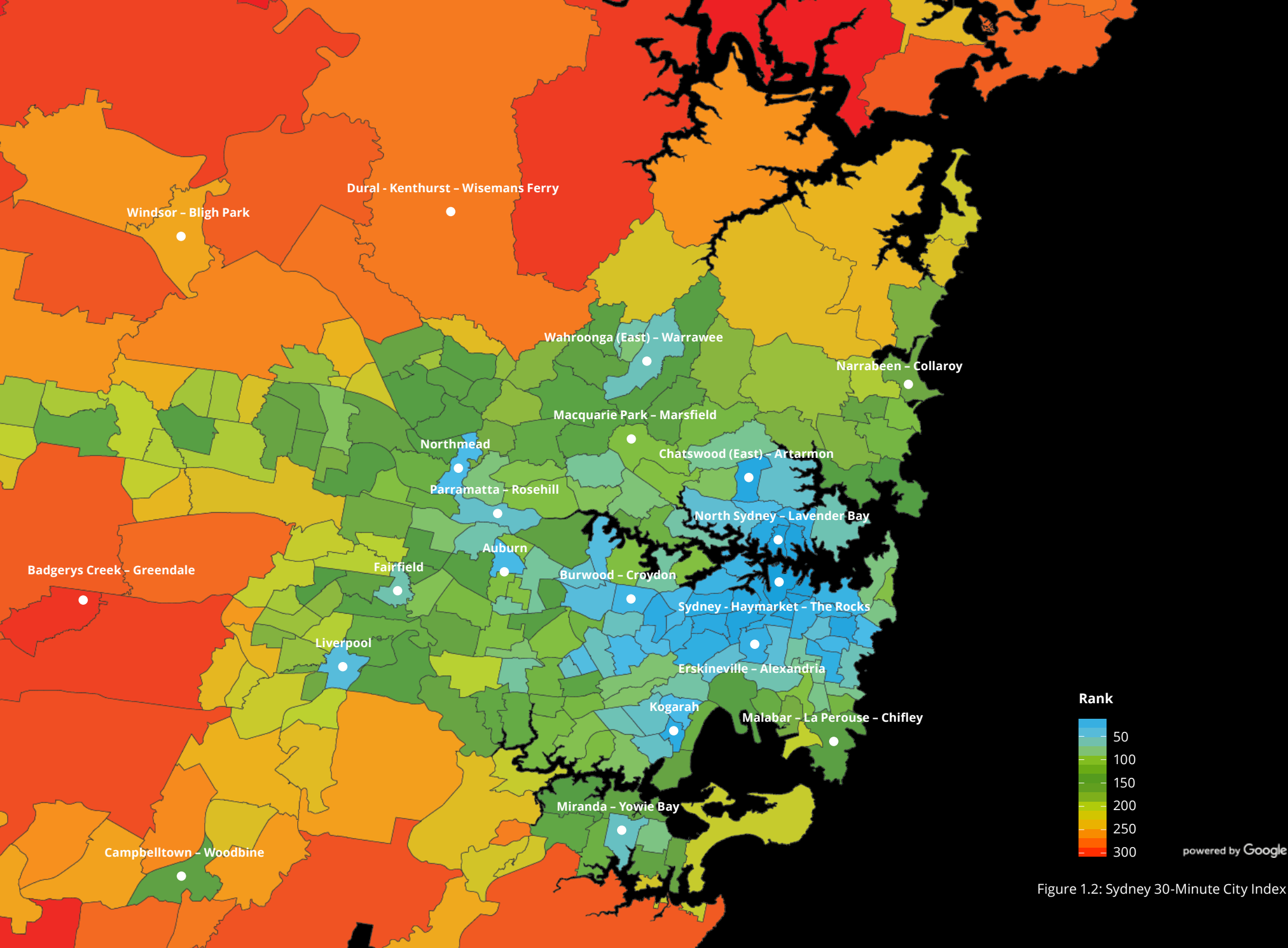


Figure 1.2: Sydney 30-Minute City Index

Sydney's 30-minute neighbourhoods

Where does your neighbourhood rank?

The highest ranking areas are:

- **Sydney – Haymarket – The Rocks**

The area encompassing Sydney CBD, Haymarket and The Rocks is unsurprisingly ranked highest in terms of accessibility to a large number of jobs, schools and supermarkets, along with access to buses, ferries, trains and light rail. Sydney's core urban centre also has a large retail, café and restaurant dining sector, and is a large cultural hub. The city's most iconic cultural infrastructure, such as the Sydney Opera House, the State Library of NSW and other museums and galleries are all located in this area, and are large employers of workers in the cultural and entertainment sectors.

- **North Sydney – Lavender Bay**

Offers high accessibility to jobs and public transport options such as buses, ferries and trains. In terms of the natural environment, this area also ranks highly with ocean and

harbour views. Local amenities such as schools (20), cafes, restaurants, and cultural activities are also aplenty. The area has access to hospitals including Royal North Shore Hospital and Mater Hospital.

- **Potts Point – Woolloomooloo**

Includes a high count of cultural amenities, cafes, restaurants and other retailers, and accessibility to these jobs and others in the CBD area.

- **Darlinghurst**

Provides close proximity to jobs in the Sydney CBD, is relatively close to public transport options, is home to St Vincent's Public and Private Hospitals and has around 40 primary and secondary schools within 30 minutes. Darlinghurst also boasts cafes, restaurants, retailing options and a rich cultural scene including popular theatres.

- **Surry Hills**

Enjoys high density of supermarkets (46), primary and secondary schools (37), cafes, restaurants and retail options and is a culture hotspot.

- **Newtown – Camperdown – Darlington**

Home to Royal Prince Alfred Hospital and a strong cafe and dining scene, this area surrounding Victoria Park is also serviced by a dense network of trains and buses. There are 35 primary and secondary schools within 30 minutes.

- **Neutral Bay – Kirribilli**

This area north of the harbour scores well on jobs due to its proximity to the CBD and North Sydney, shops (22), hospitals (4775 beds), schools (20) and access to public transport. In terms of general liveability, residents of the area also enjoy scenic views, open space and tree cover.

- **Bondi Junction – Waverley**

Very close to the beach and with ample ocean and harbour views, Bondi Junction offers considerable choice in primary and secondary schools (42), retail, cafes and restaurants. The area is serviced by the Bondi Junction bus and rail interchange.

- **Glebe – Forest Lodge**

Well serviced by buses and highly accessible supermarkets and grocery stores - there are 49 within 30 minutes – and 45 primary and secondary schools that can be accessed in that time. The area also has good accessibility to the Royal Prince Alfred Hospital.



A 30-minute city: Beyond old school thinking

Mark Scott AO,
Secretary, NSW Department of Education

It is easy to be dystopic about congested and crowded future cities. But it's also important to recognise the opportunities within that challenge. The Department of Education will soon be relocating from the Sydney CBD to Parramatta, which some may think is 'a long way away', but of course that's not the case for everyone – so we need to change mindsets.

Our move will create choice for those who will live closer to potential employment opportunities. But there are other opportunities for us – and other organisations too – like creating more flexible and agile work environments that make better use of technology and tools. These can support a mindset shift about the very nature of work – how, where and when – you need to work, as well as how work fits into our lives more broadly.

Because schools are everywhere, accessibility is also an affordability issue. Housing affordability will shape where teachers live (or don't live) and we may see a drift towards more affordable areas, as opposed to those areas where they might be most needed. Transport links are necessary to connect where teachers live to where the opportunities are for work, because teaching and established modes of classroom delivery are by their very nature, less conducive to telework and flexible work practices.

Another consideration is the extent to which peak travel hours are driven by the existing paradigm of the working day and the school day. Schools should reflect the communities in which they are based – and a question for us to consider is where new schools will be needed. For example, in areas that are centred around industries that rely on greater shift work, or in areas that centre on around the clock operations, such as around the new airport in Badgerys Creek, community needs may not be as tightly coupled to existing or traditional models. As such, 'split-shift' schools might not only provide a viable alternative, but importantly one which accurately reflects the community's needs. If we are to support the creation of a 30-minute city, it will be necessary to explore innovative solutions like these and to engage fully with communities in doing so.

Realising the potential of Sydney as a 30-minute city requires us to think in practical terms.

For example, what opportunities are there to think about existing school assets and infrastructure to create spaces that benefit the local community and families at the weekend or outside of school terms?

How can we nourish more joint planning with councils and private schools to optimise existing infrastructure (think playgrounds, pools, auditoriums or playing fields) to support increased access to amenities for local residents, which in turn would increase overall liveability?

A shift in mindset is going to be important too. Making a 30-minute city a reality requires new modes of cooperation and thinking – thinking that is collaborative, integrative and bold. It will require us to stay the course to realise the medium to longer term benefits of investing in the artistic, creative and cultural fabric of a place. A vibrant, liveable community – one which teachers experience and in turn, bring back into the classroom – is a worthy and important goal.

We need to find the simplicity on the other side of complexity in order to make the 30-minute city a reality and to think about it in practical terms, and that, requires people who can see further.



Current state of *Live*

Just how liveable is Sydney right now? And what are the most valuable changes, tangible or otherwise, that we can make to positively affect quality of life for everyone? To understand this, we take a look at the current state of Sydney with a spotlight on how areas fare on accessibility to jobs, shops, hospitals, schools and public transport.

In doing so we present a measure of density that reflects how more liveable neighbourhoods are ones that provide greater choice for residents.

For this research, Deloitte Access Economics also conducted a survey of 1,000 residents in Sydney to understand their travel patterns.

For those who reported travelling for work, the majority made 10 trips per week, which aligns with most people going to and from work on weekdays. Many others worked part-time as well, so on average, those who travelled to work made 6.7 trips per week (see Figure 1.3), taking an average of 37.5 minutes per trip⁴ (see Figure 1.4).

The next most common trips were to access school (average of 5.4 trips per week with an average trip time of 14.1 minutes) and to access a station or bus stop (average of 4.8 trips per week for users). As expected, most people did not make a trip to hospital in the average week, but for those who did, they made an average of two trips – there and back – each week, and these trips took on average 21.6 minutes.

The average frequency of one-way trips reported by survey respondents ranged from twice weekly to or from the hospital, to between six and seven weekly trips to or from work, as shown in Figure 1.3.

On any given trip, the average respondent spends about 22 minutes travelling to or from the hospital, 17.5 minutes travelling to or from the shops, and 37.5 minutes to or from work. This travel time to work is approximately five minutes less than the average commute time derived from Google data, likely attributable to different sampling and estimation methods. These average travel times are shown in Figure 1.4.

⁴ This correlates with Google data on average commute times, with slight differences representing different estimation methods.

Number of trips per week

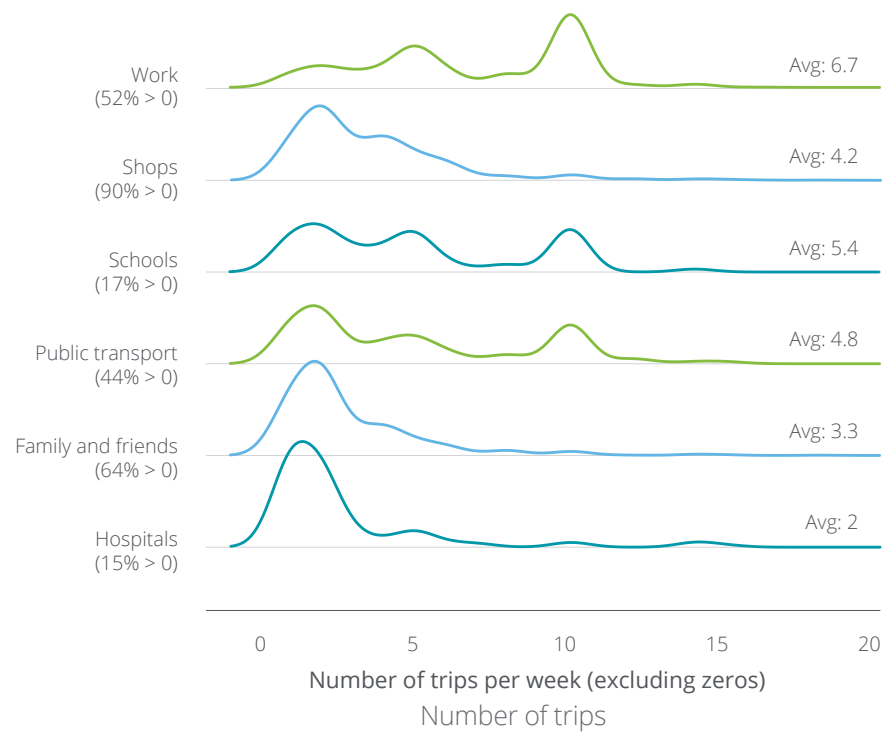


Figure 1.3: Average frequency of trips per week
Note: Responses of zero trips to the six destinations were excluded.

Travel time per trip

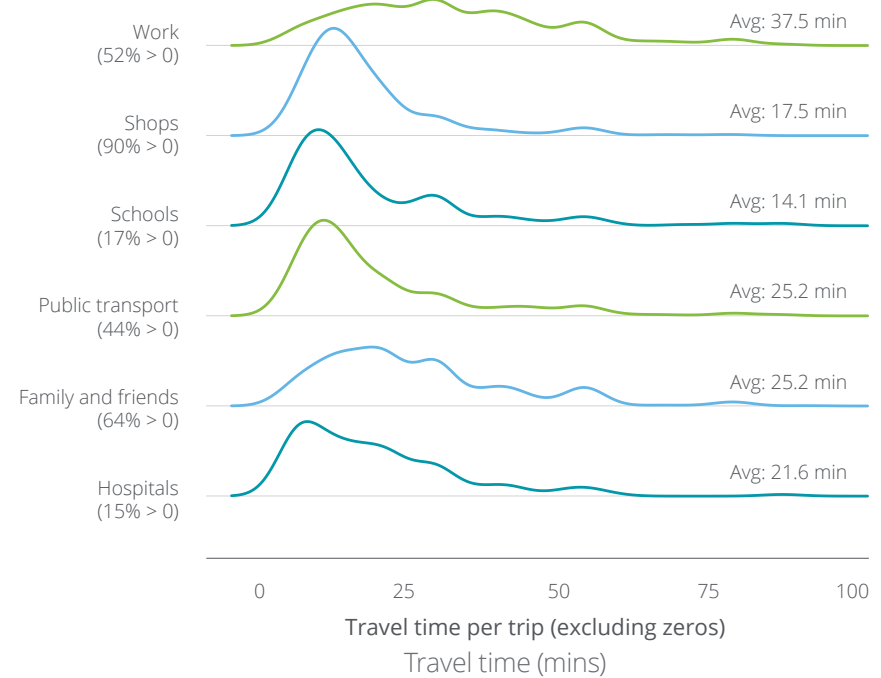
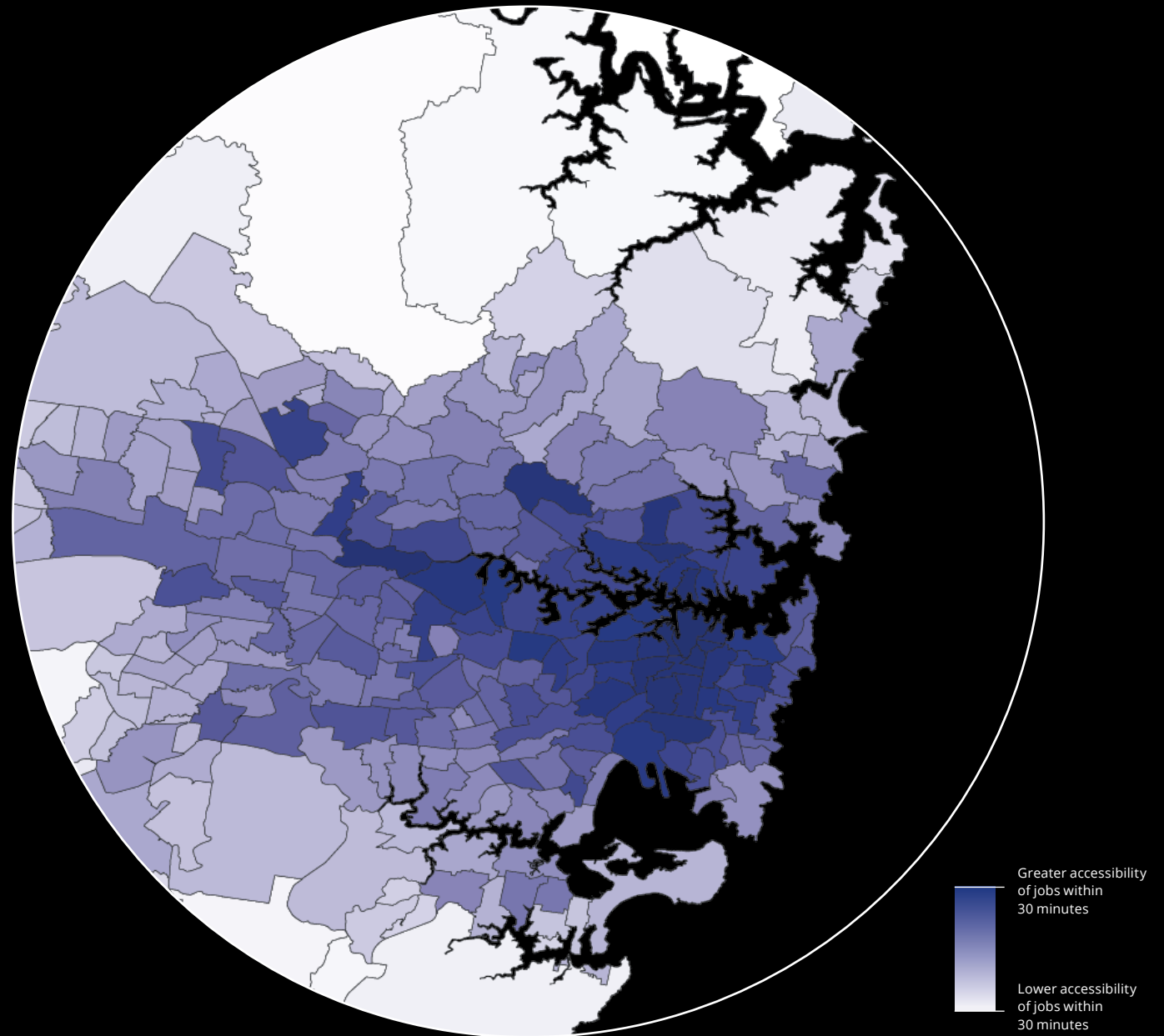


Figure 1.4: Average travel time per trip
Note: Responses of zero trips to the six destinations were excluded.

Accessibility to jobs

As shown in Figure 1.5 the areas shaded darkest (denoting the highest concentration of jobs within 30 minutes' access) are clustered in central Sydney and North Sydney. Macquarie Park and Parramatta are also employment hubs with high accessibility to jobs, with flow-on accessibility benefits for areas surrounding these hubs.



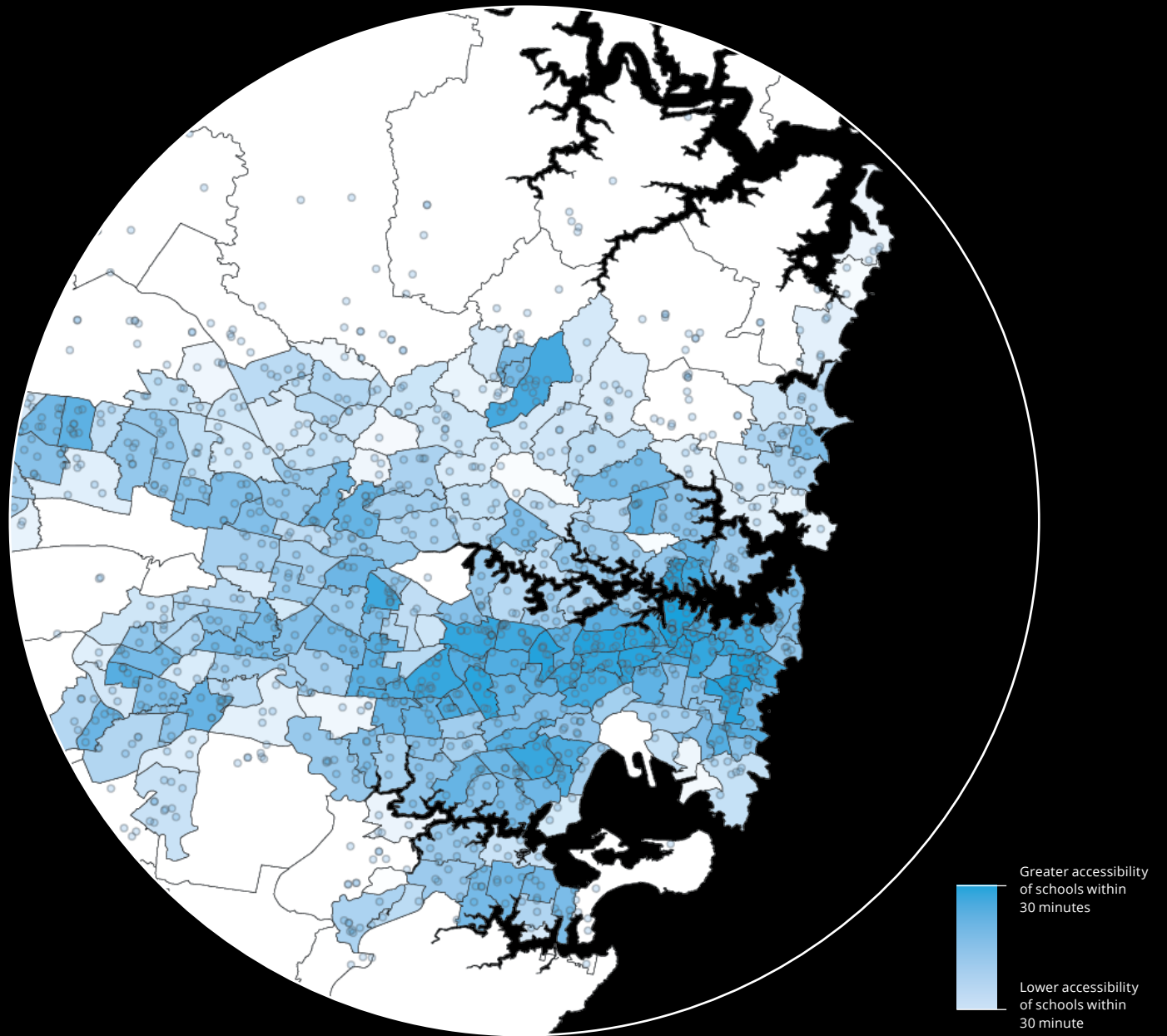
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Figure 1.5: Work accessibility across Sydney

Accessibility to schools

By and large, school and hospital locations are centrally determined based on demographic projections of demand. Similarly, businesses make decisions to open shops based on estimated demand for their goods and services. Areas that have high accessibility to these amenities likely reflect their large resident populations.

The inner city and surrounds have the highest access to schools within 30 minutes – the top five areas in terms of school accessibility are the Sydney CBD, Bondi Junction – Waverley, Randwick – North, North Sydney – Lavender Bay, and Darlinghurst. This is partly due to the small geographic areas of the inner city, which means travel time can be considerably less than in some larger areas, making a wider span of schools accessible, and partly because these areas have a greater number of schools than others. However, this Index doesn't take into account school catchment and the total number of school places actually available, which is a significant constraint in Waverley, Canada Bay, Sydney, Ryde and other areas in Sydney^{iv}.



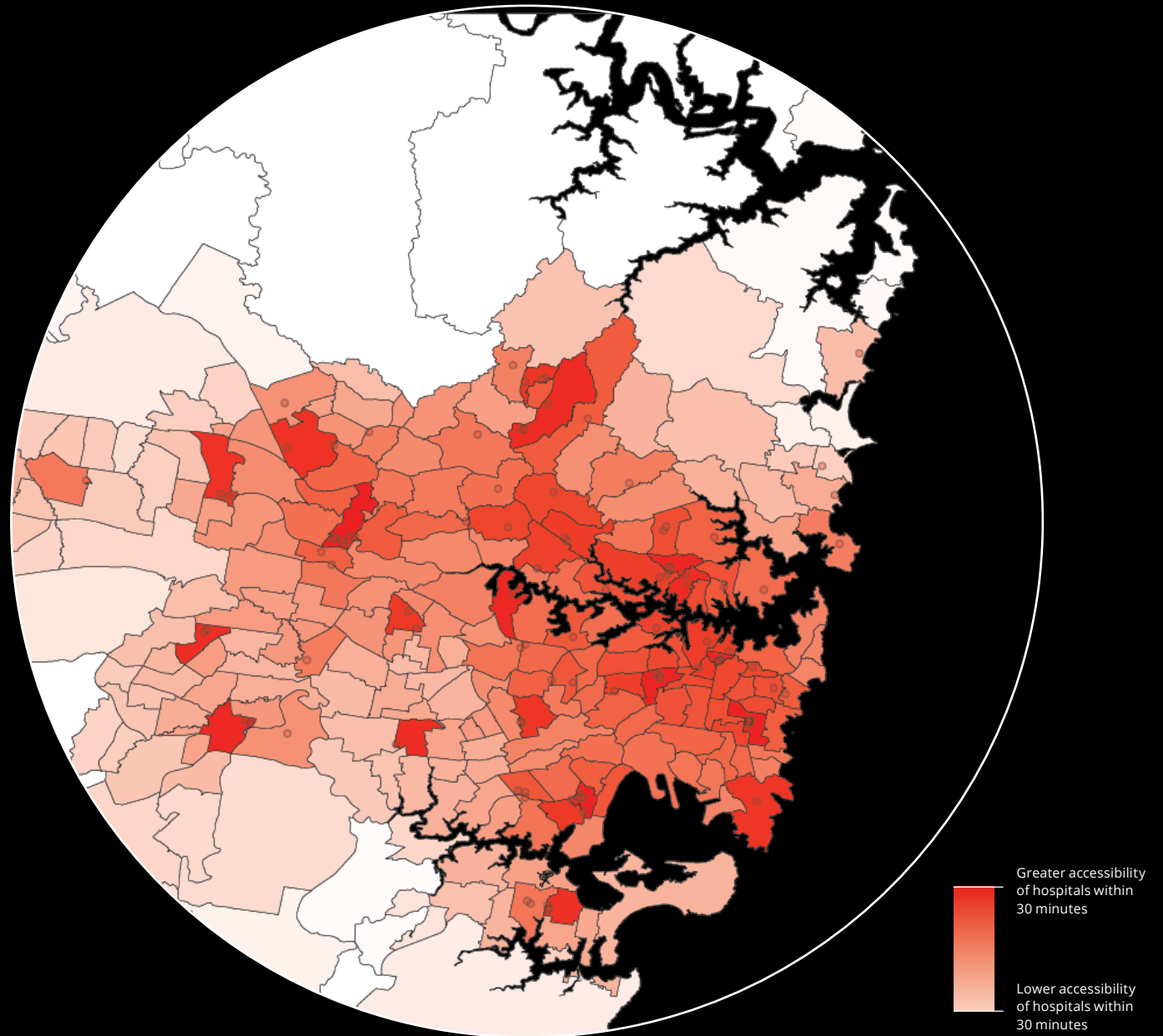
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Figure 1.6: School accessibility across Sydney

Note: Dots indicate location of schools.

Accessibility to hospitals

When it comes to hospitals, areas that enjoy high accessibility to these services are well distributed across the Sydney metropolitan area. This reflects the dispersed location of hospitals, which serve as local health districts or clusters. Areas with the highest accessibility (shaded red in Figure 1.7), in particular the top five areas, are located close to Westmead Hospital, Kogarah Hospital, St Vincent's Public and Private Hospitals, Royal Prince Alfred Hospital, the Sydney Children's Hospital and Prince of Wales Public and Private Hospital. The Index also takes into account the number of beds in the hospitals.



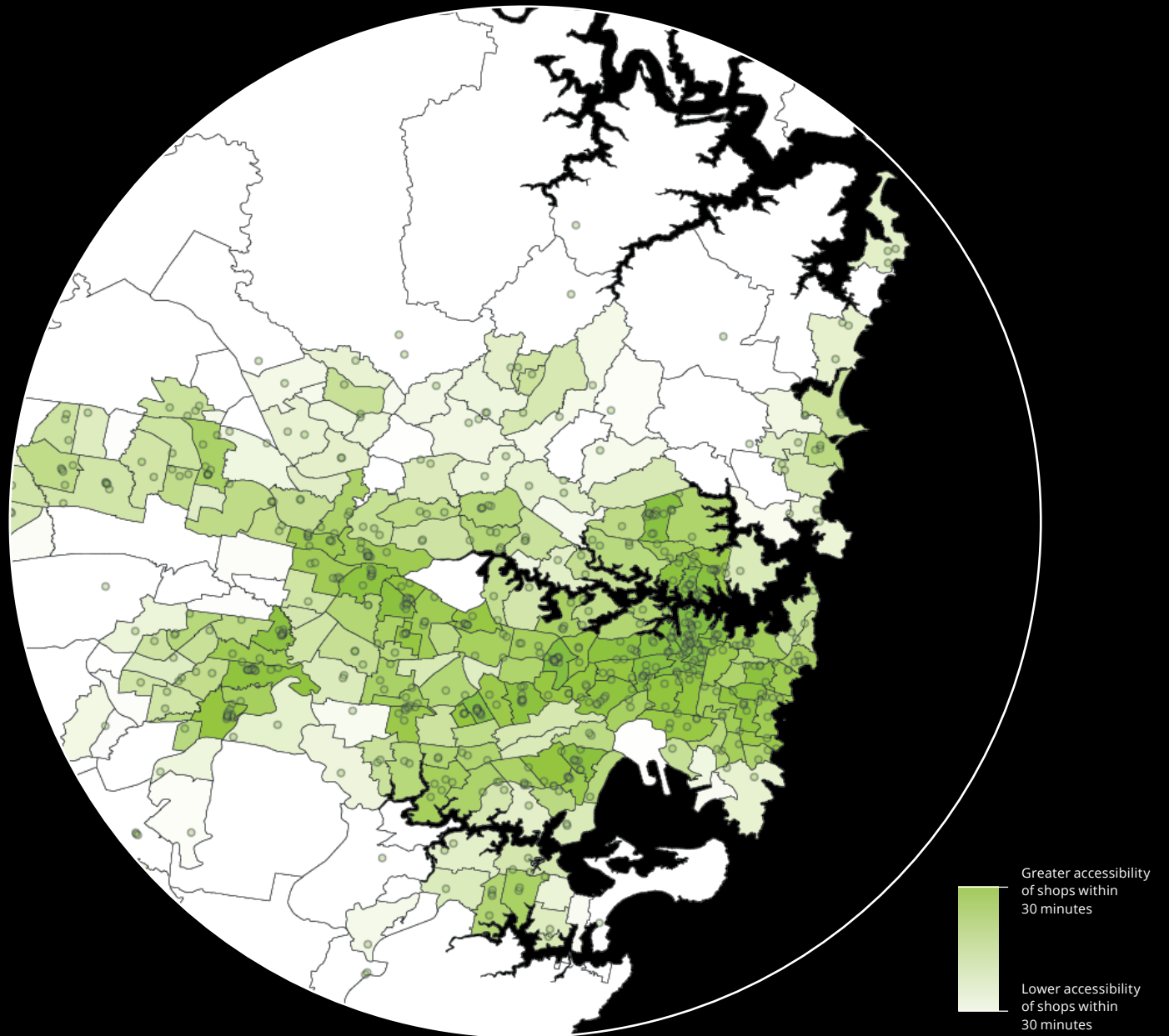
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Figure 1.7: Hospital accessibility across Sydney

Note: Dots indicate location of hospitals.

Accessibility to shops

Areas with high access to supermarkets and groceries are well distributed throughout Sydney (as shown in Figure 1.8). This reflects the everyday needs of people to shop for necessities conveniently and how businesses shape and react to this demand in their location decisions. Shops in and around the city face the highest competition: Sydney – Haymarket – The Rocks, Surry Hills, Ashfield, Pyrmont – Ultimo and North Sydney – Lavender Bay have the highest number of shops that can be accessed within 30 minutes.



powered by Google

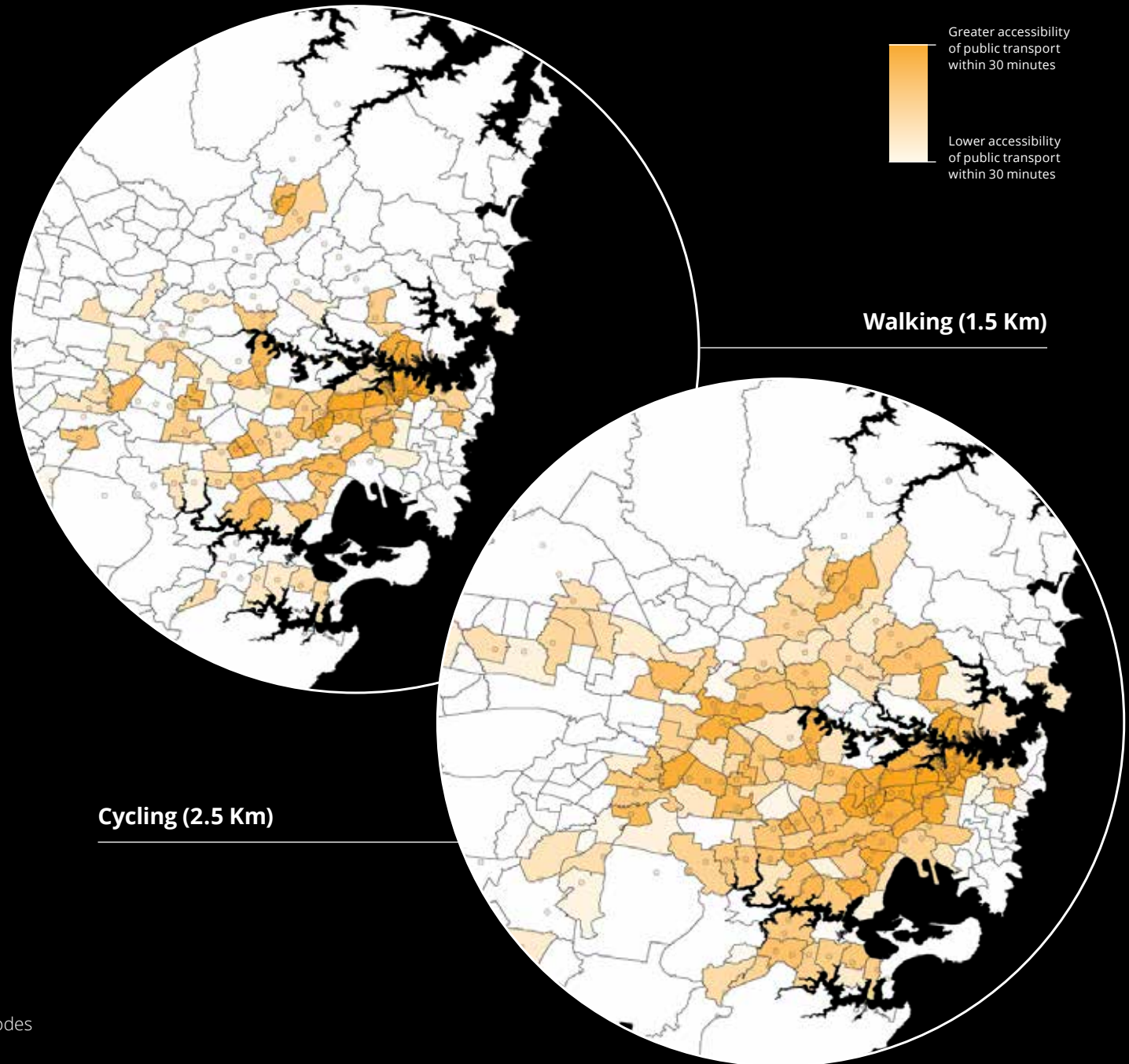
Figure 1.8: Grocery/supermarket accessibility across Sydney

Note: Dots indicate location of shops.

Accessibility to public transport

In terms of public transport, Figure 1.9 shows areas by the number of train, light rail and ferry terminals that can be reached within a 30-minute walk (1.5km), cycling trip (2.5km) or drive (5km)⁵.

It is worth keeping in mind that this Index considers only the current stock and location of transport infrastructure. This assessment of Sydney's accessibility to public transport is in reference to a single point in time – but this is likely to change substantially as infrastructure investment evolves over the next few decades. With the rise of on-demand transport, facilitated by smart cities infrastructure, public transport accessibility may instead vary to meet demand, rather than being based on fixed routes and pickup points.

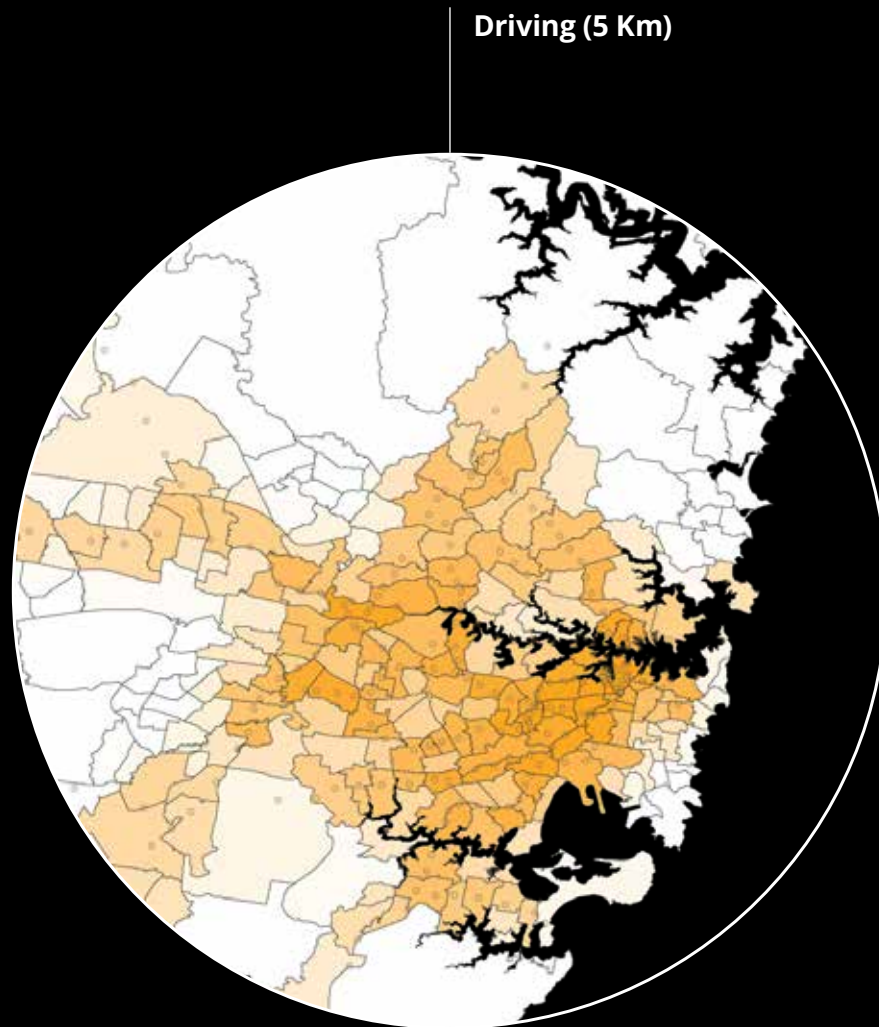


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Figure 1.9: Access to public transport by different transport modes

Note: Dots indicate location of public transport terminals.

⁵ Bus stops are not included in this map as publicly available data for this locational mapping are not available.



Implications for Sydney

All things considered, the most accessible and liveable areas are clustered in and around Sydney's urban centre and harbour. The CBD, as Sydney's largest employment hub, is the key driver of this.

So, how do we create greater liveability for more Sydneysiders? As a global gateway to Australia, the future of our city requires more accessibility, networks of infrastructure and consequently more connectivity for all people. If we want to achieve a 30-minute city for more of the population and spread the benefits to neighbourhoods that are not as close to the CBD, Sydney needs to consider developing alternate employment centres, including the future of transport infrastructure to get people there.

Improving accessibility will be key to making a 30-minute city a reality.



Better ways to a healthy life

Rohan Hammet

Asia Pacific Health Care Leader, Deloitte

Sydney is one of the great cities of the world, with a number of attractive elements. This is particularly so if you have good access to them. Beyond bricks and mortar, Sydney is following global trends in healthcare delivery.

Virtual healthcare and mobile care centres will allow patients to interact with healthcare professionals 24 hours, seven days a week and reduce the number of hospital beds required by an ageing population.

St Vincent's Hospital is currently developing a virtual care centre, which will provide monitoring for remote patients using wearable technology and Prince of Wales Hospital is trialling Apple watches and machine learning to manage high-risk cardiac patients to deliver better outcomes. Cognitive technologies, software robots, avatars, artificial intelligence and sophisticated data analytics that provide new insights into patterns of healthcare utilisation are transforming the way we think about healthcare and enabling better ways of helping people live a healthy life.

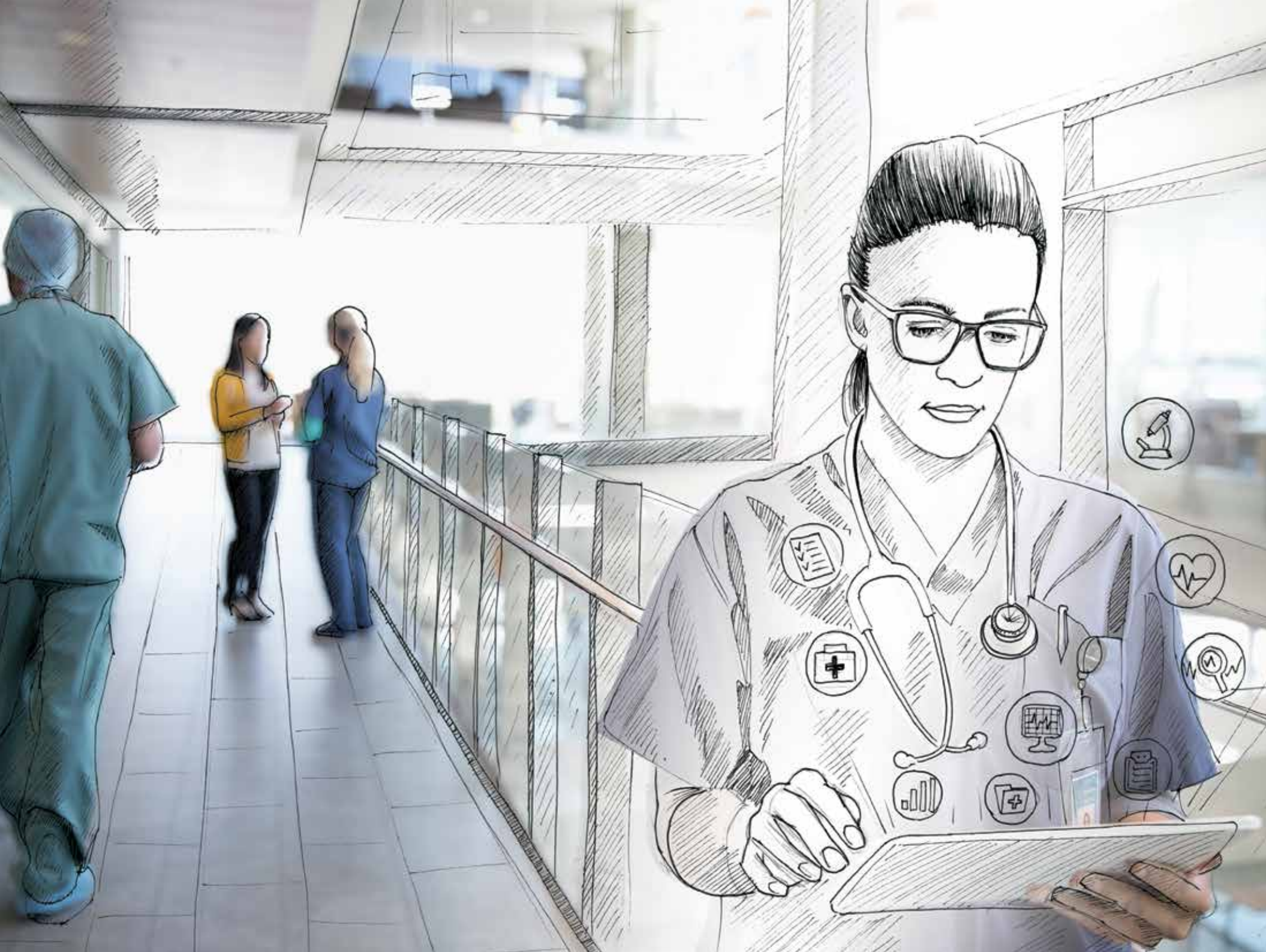
It is important to recognise that healthcare is not just an expense to the public, but a key enabler of economic prosperity. Research shows that a one-year increase in a population's lifespan equates to a net increase of GDP of 1%. Further, a healthier population requires less expenditure on healthcare resources.

There is a role for both federal and state governments to provide the right incentives for innovation, including the necessary funding, policy and regulatory drivers, to encourage hospital managers, clinicians and the private sector to engage in building smarter health systems that make best use of health spending to deliver better health outcomes.

Active transport also needs to be considered as the government plans for a polycentric city as it seeks to ensure its ageing population remains healthy and active and avoids the frailty that can accompany ageing where activity is not maintained. Activity should be built into the routine of life, and enabling this regular exercise, along with continuing to reducing smoking rates and moderating consumption of alcohol and sugar will encourage health and wellness in the community.

Healthcare is an important contributor to wellbeing and an enjoyable life, and Sydneysiders generally have good access to healthcare. That said, with a growing population and historical patterns of healthcare provision in and around the CBD, healthcare services have not always increased in line with the population growth in Western and South Western Sydney.

Investments by government and the private sector will help achieve 30-minute access to hospitals, with hospital redevelopments slated for Liverpool, Westmead, Blacktown, Nepean and Campbelltown, and planning for a new hospital at Rouse Hill is underway.





A tale of three cities




The Eastern City includes the traditional Sydney CBD and main business district. The Greater Parramatta area is a growing economic hub and the heart of the Central City. The third city, known as the Western City, will centre around the Western Sydney Airport and will include the suburbs of Camden, Campbelltown, Liverpool and Penrith.

A polycentric Sydney

For most, Sydney is not yet a 30-minute city. But with the right planning and smart city thinking, it can be. To support that goal, we need to recognise where the problems and challenges lie and what benefits – economic and otherwise – can be unlocked by exploring specific solutions.

As observed in the Index, the CBD's employment opportunities are by far the strongest factor in determining liveability. An analysis of where people work shows an interesting story – that people are most likely to work either in the CBD, or in the same SA2* that they live in.

Given the rising population in Sydney's west, a 30-minute city reality requires greater accessibility to employment near where people actually live. And a three cities approach to Sydney can help achieve that.



*The Australian Bureau of Statistics (ABS) develops standard statistical geographies and frameworks used to collect, release and analyse geospatial data. The Australian Statistical Geography Standard (ASGS) Main Structure defines Statistical Areas (Levels 1-4) among other geographical categories. Statistical Areas Level 1 (SA1s) are the smallest, while Statistical Areas Level 4 (SA4s) are the largest. Statistical Areas Level 2 (SA2s) are aggregations of whole SA1s, and have an average population of around 10,000 persons (but can range from around 3,000 to 25,000 persons). SA2s are designed to reflect functional areas that represent a community that interacts together socially and economically. SA2s are the smallest area for the release of many ABS statistics.

The centre of the problem

At present, Sydney is a monocentric city. The City of Sydney Local Government Area (LGA) alone generated almost a quarter of Greater Sydney's GDP in 2011^v and is the largest employment centre in NSW, with over 400,000 jobs or 18% of Sydney jobs^{vi}.

Geographically, the CBD is naturally constrained by the harbour and eastern beaches. A worker who lives in the Sydney CBD can access 53% of all metropolitan jobs within a one-way 45-minute car trip or 60-minute public transport trip. But in other parts of Sydney this falls to only 14% of jobs by car and 11% by public transport^{vii}. Properties available in the east are already scarce and further population growth will continue to push people out west.

There is also the issue of congestion. Figure 2.1 shows how congestion affects accessibility at different times of day. Thirty minute accessibility denoted in dark green is, perhaps not unsurprisingly, possible for more areas at midnight compared with the morning and afternoon peak hours.

Population projections suggest this pattern of time-based congestion will worsen, which will have a negative impact on the liveability of Sydney neighbourhoods. Currently, three fifths of Sydney's employment activity is in the east, but if current population trends continue more than 50% of the city's population will live west of Parramatta by 2036^{viii ix}.

This means people will live further and further away from the main economic centre. As this continues, we are likely to reach a tipping point where the economic gains from concentrating economic activity in a monocentric city are outweighed by the loss in productivity from travel time and congestion. At this point, the monocentric city model will no longer be economically efficient.

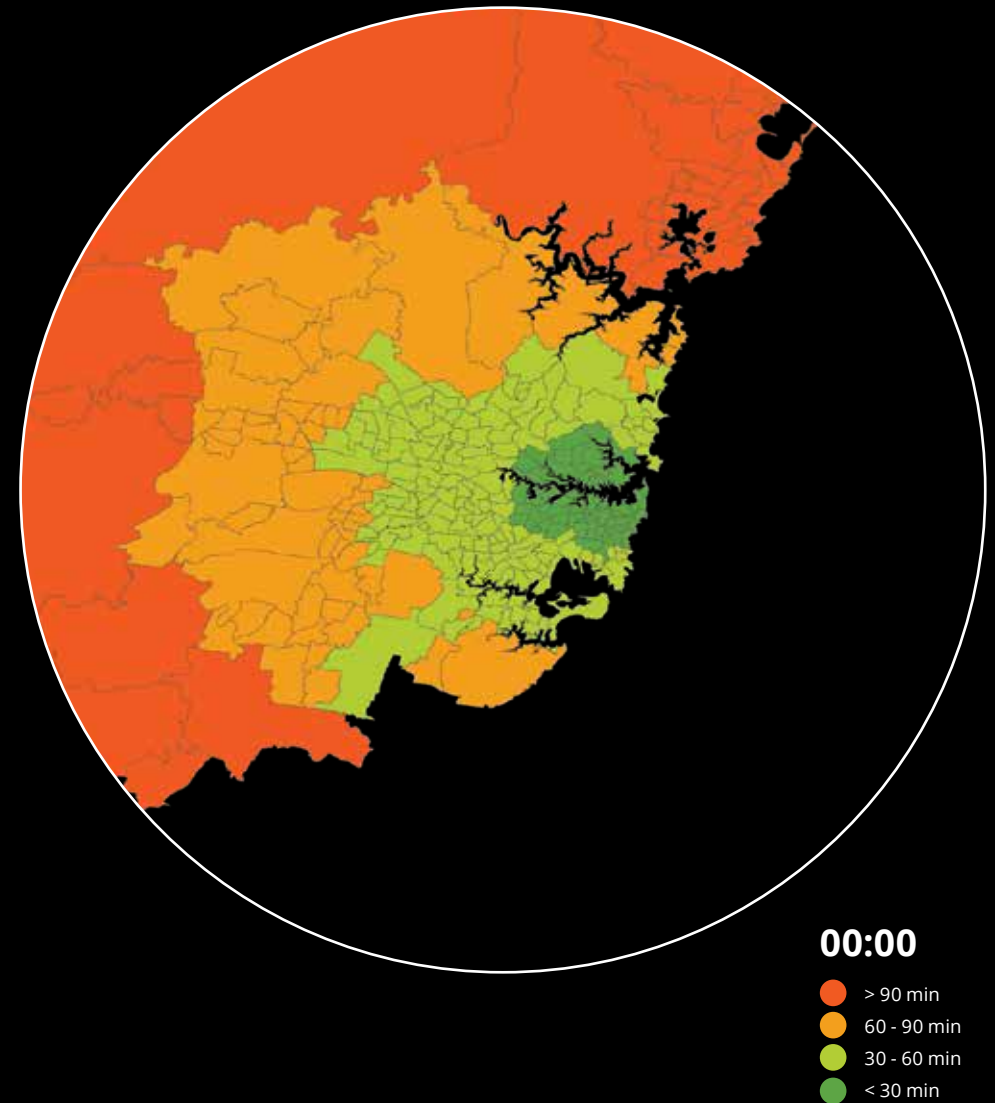
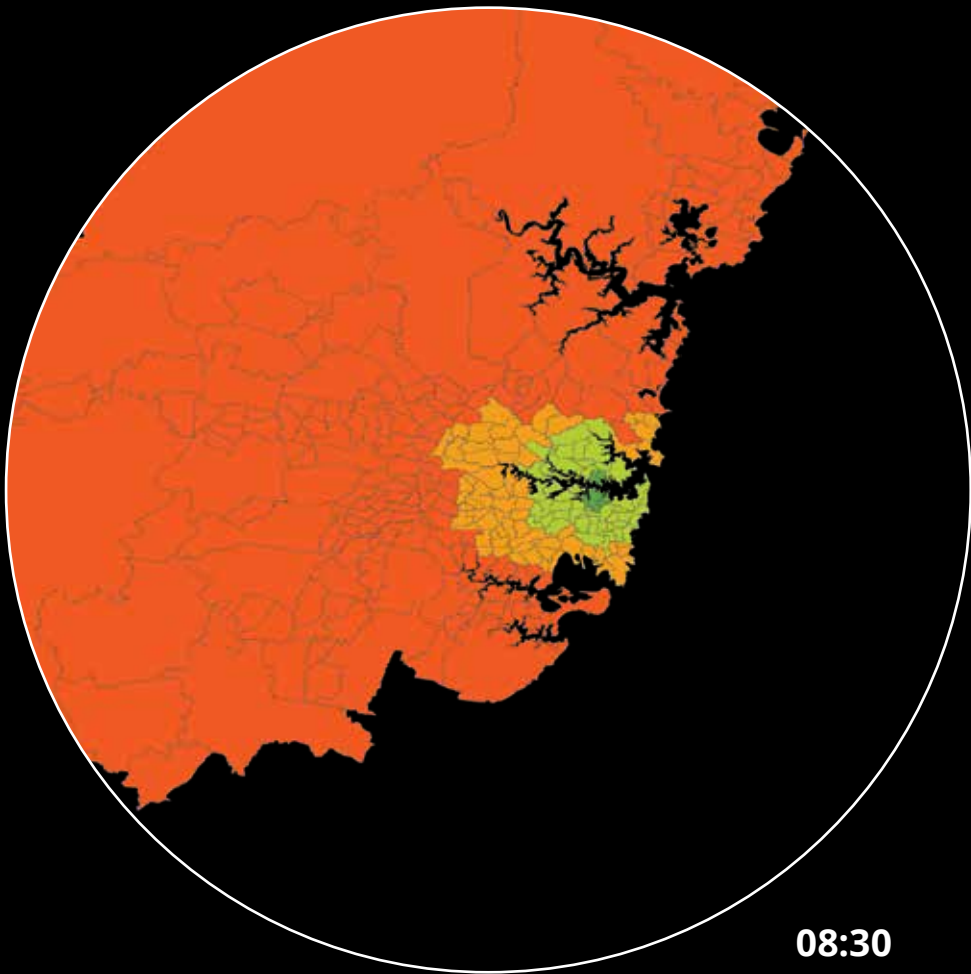
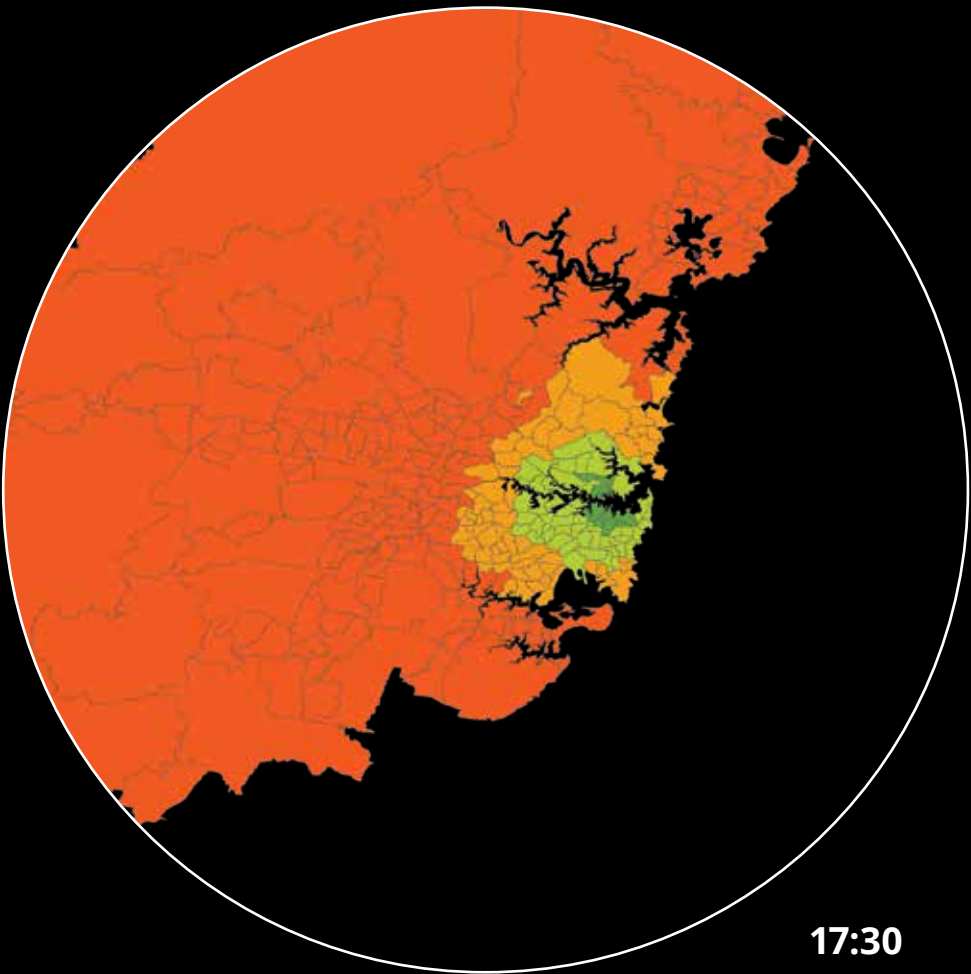


Figure 2.1: Travel time towards Sydney CBD
(Source: Google Maps API data, Deloitte Access Economics analysis)



08:30

- > 90 min
- 60 - 90 min
- 30 - 60 min
- < 30 min



17:30

- > 90 min
- 60 - 90 min
- 30 - 60 min
- < 30 min

An all access, smarter solution

Smart cities, smart workplaces and smart workers. For our city to promote liveability, productivity and equality, Sydney needs to reimagine the ways in which to redistribute people and assets away from the centre. This includes reframing the notion of distance and embracing work accessibility through flexible work practices that are the norm rather than the exception.

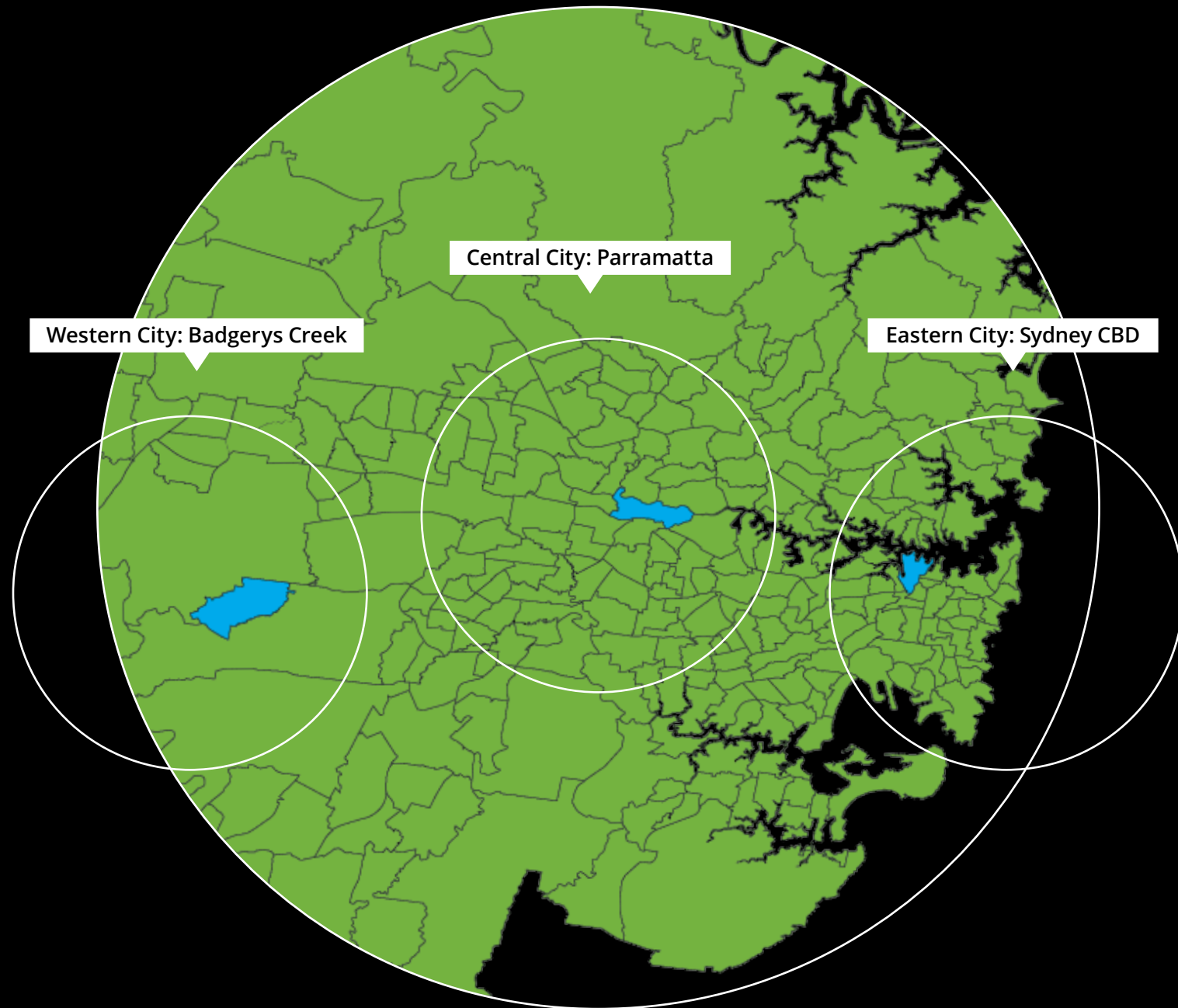
In doing so, infrastructure capacity issues of the future can be addressed and we can ensure accessibility for a diverse range of communities in Sydney. The Greater Sydney Commission's *Directions for a Greater Sydney*⁶ vision to 2056 outlines shifting economic activity away from the Sydney CBD and shaping three 30-minute cities within greater Sydney: the Western Parkland City, Central River City and the Eastern Harbour City. Each of these three cities is envisaged to be a networked cluster of social, economic and leisure activity. So what do these three cities look like?

The Eastern City has been the dominant business district for Sydney and includes the largest business hubs such as Sydney CBD, North Sydney, and Macquarie Park. The future three cities model will see the Eastern City as the global hub for professional services and technology.

The Central City consists of a growing economic hub in Parramatta, as well as Blacktown and Sydney Olympic Park. Supporting the growth of the Central City is crucial to manage the forecasted population growth forecasts in Western Sydney. Current workers living west of Parramatta are more likely to work in Parramatta rather than the Sydney CBD.

The third and final city is the Western City. Centred on the future Western Sydney Airport in Badgerys Creek, the Western City includes suburbs such as Campbelltown, Leppington and Liverpool. There are around 200,000 jobs spread across the south west region, but no current centre or cluster where these occur^x. Western Sydney Airport also has the potential to service air freight around the clock, which could promote businesses and industries within the area.

⁶<https://www.greater.sydney/directions-greater-sydney>





Retail: Increasing everyday access

Russell Zimmerman

Executive Director, Australian Retailers Association

A liveable city comes down to a number of things, and access is key when it comes to retail

To make a 30-minute Sydney a reality, we'll need to improve current access to all types of retail services.

This will require expansive thinking that includes strong collaboration where we haven't necessarily seen collaboration before. If we take the example of the rapid growth in apartment living and mixed use development assets – we are seeing the rise of micro communities within these developments including residential, office, retail and community spaces such as parks and open spaces. We are seeing increased infrastructure investments and more opportunities for services, but are we unlocking the greatest access potential for the people of Sydney?

Because of the rate of population growth and because people will progressively be located in different areas, having foresight will be important. We're already seeing new developments near transport nodes and more high-rise developments with small retail centres underneath, that include a major supermarket and a number of small shops like delis, dry-cleaners and coffee shops. The Australian Retail Association strives to work with urban planners and transport providers to provide a forward view, but there are always challenges along the way.

Government, private sector and individuals can help to create a 30-minute city through a change in mindset. We've lived for so long in a 9-5 society. Is there an opportunity to challenge norms as to what a 'normal day' looks like? The benefits are evident and explicit – better for the environment, there's less travel time and more family time.

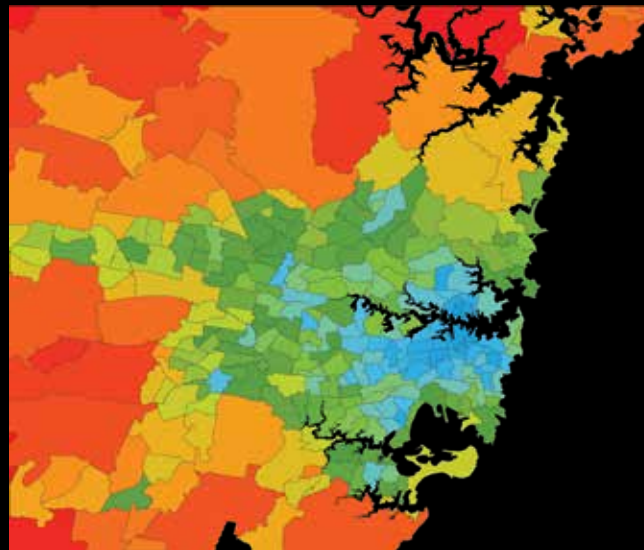


Cities with bountiful benefits

The three cities model replicates the polycentric cities approach undertaken in other parts of the world. In short, the idea behind polycentrism is that jobs are dispersed into multiple economic hubs where economic and agglomeration outputs are maintained, but with lower congestion and emissions. This also encourages productivity through innovation – because it promotes networks of infrastructure, parity in amenities, and subsequently the improved dispersion of knowledge workers and talent.

For example, polycentrism could significantly improve the liveability of areas in Western Sydney. With jobs closer by, individuals living around the Parramatta precinct will greatly benefit from shorter commute times. This is seen in the greater coverage of blue and green areas in the three cities map (Figure 2.3) indicating improvements in the 30-Minute Index when applied to a future polycentric Sydney.

One city



Three cities

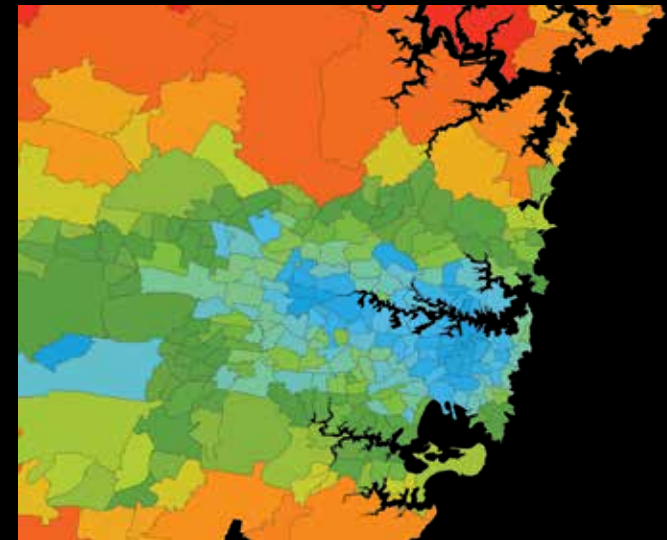


Figure 2.3: The 30-Minute Index comparison between a single city and three cities model

Note: In a polycentric cities model, more areas benefit from improved accessibility. No area is made worse off in terms of accessibility, but it is possible that some areas experience a fall in their Index ranking as other regions closer to the new 'cities' benefit more.

powered by Google

A challenge worth choosing

Creating a polycentric city is not, however, a silver bullet solution. While cited benefits are reduced travel time and improved productivity, in reality this is not always the case.

For example, San Francisco has gone through extended periods of decentralisation and employment growth. A 10-year study showed travel time in fact increased by 5%, which correlated with the shift towards it becoming more polycentric^{xi}.

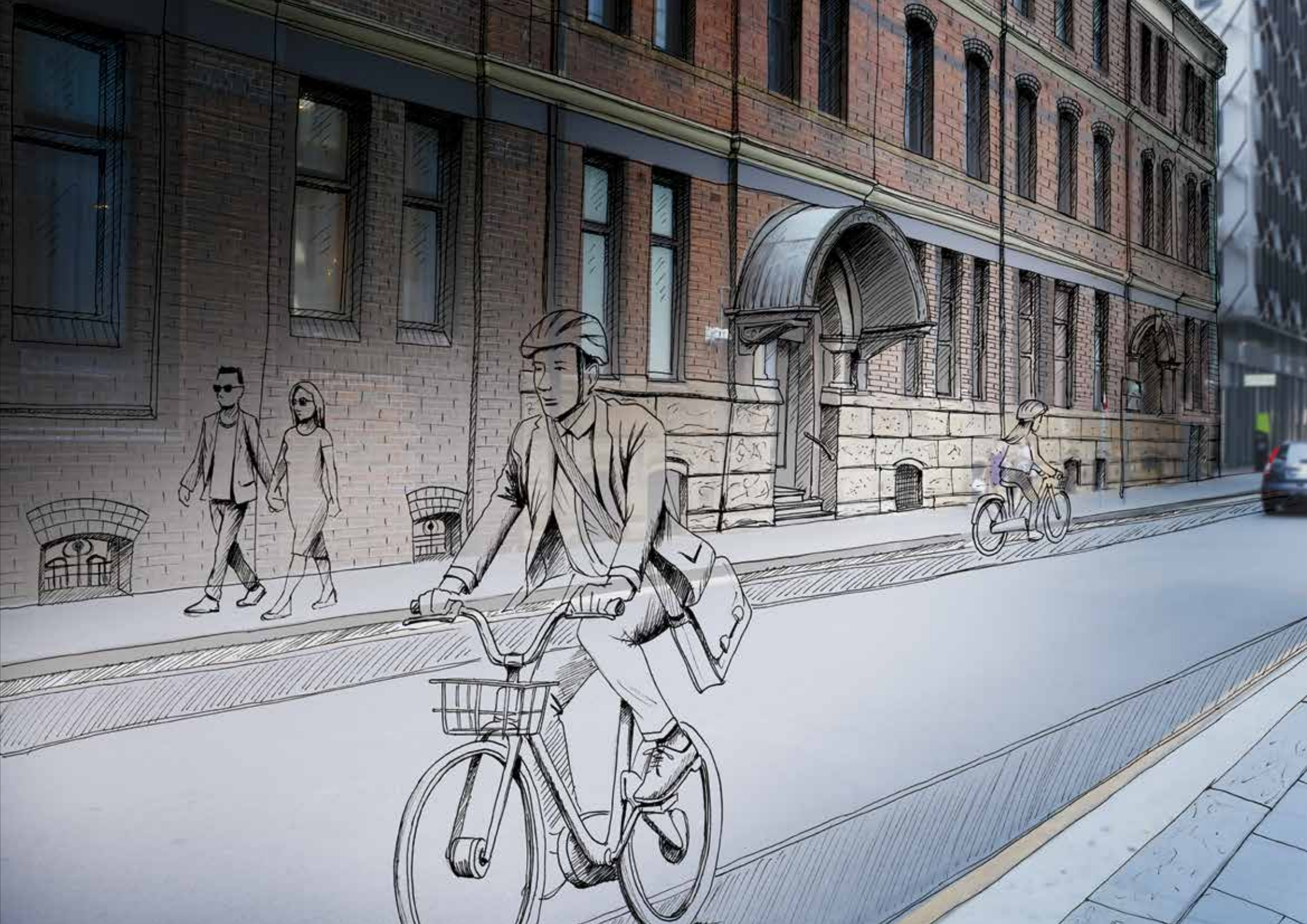
There is a need for connectivity both to and between cities to improve accessibility and make the additional centres functional hubs. This can be supported both by large-scale infrastructure and public transport projects, as well as through on-demand transport and the technology applied in smart cities.

Jobs are not the only consideration for people in deciding where to live. Individuals need amenities, cultural infrastructure and like-minded people to attract them to a place or community – merely shifting businesses is not sufficient. Each economic hub requires comparable cultural and sporting facilities and transport infrastructure to attract individuals to move there.

These challenges highlight the need to consider all practical realities, and possible unintended consequences, to make sure we get it right. And the vision requires substantial planning, policies and commitment to ensure smart investments cover transport infrastructure, other community based services and the application of technology that connects cities. In turn, these enable polycentric cities to work together collaboratively and efficiently at a local level and on a global scale.



Transport to the future



Any economic hub requires infrastructure to support activity and an innovative approach to transport will be the key to unlocking the 30-minute city.

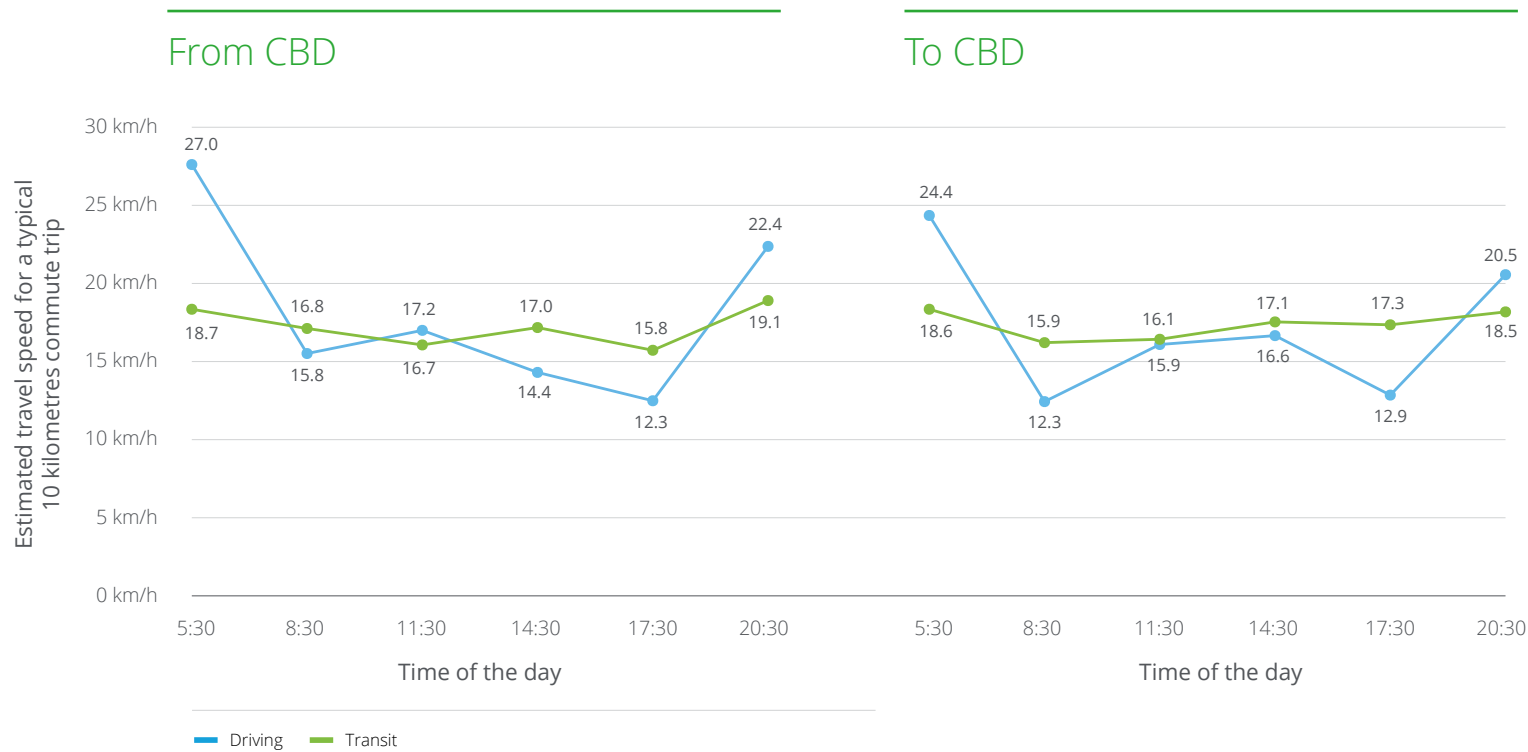
According to Deloitte's *Future of Mobility* research, the rise (and potential) of smart cities has brought about a rethink of transport systems around the world, potentially making these systems more integrated and data-driven.

Infrastructure that started in the private sector, such as point-to-point travel on demand, won't only be limited to ridesharing services like Uber, but is already spilling over into public transport. Indeed, the NSW Government is currently piloting on-demand public transport around Greater Sydney. These new services are booked through an app to pick up individuals and take them to a local transport hub, shopping centre, business park or hospital.

Many other changes are in store. The future evolution of transport and mobility for people and products is being shaped by a confluence of technological advances and changing demand preferences.



Figure 3.1: Converging forces transforming the future evolution of automotive transportation and mobility
(Source: The future of mobility, Deloitte University Press, 2015).



However, these megatrends should not distract us from the need to prioritise efficiencies to move towards a seamless future state of transportation.

Figure 3.2 shows the average travel speed to and from the CBD by driving, relative to public transport, at different times of day. It is clear that while driving is more efficient early in the morning and late in the evening, the average travel speed is much lower during the day, and during peak hour, public transport can be a more efficient way to travel.

This highlights the importance of investment in public transport connectivity and efficiency in realising the vision of a 30-minute Sydney.

Figure 3.2: Average travel speed to and from CBD by driving/transit in Sydney
(Source: Google Maps API data, Deloitte Access Economics analysis)



Transport to where you'd rather be

Tessa Knox-Grant

Director - Metropolitan Strategy, Transport NSW

Sydney is an incredibly liveable city. But it doesn't always rank highly on liveability indices and one of the reasons for that is transport.

The geographic concentration in the way the city has developed is imbalanced. We're bound by the ocean and while most of the economic activity in the east, the most recent population growth is in the west. This inequity requires us to think differently about ways in which to rebalance growth and investment to ensure this does not perpetuate.

The time it takes to commute to work, or to get anywhere, impacts on our quality of life. It's a measure of the time that we're not doing that 'something else' that we'd rather be doing or that is more fulfilling. A truly liveable city is one with a range of choices in how to get around and how to access things. Transport should not be a barrier to that.

The definition of liveability is a personal thing and it depends on individual context. We tend to think in terms of 'what is liveable for me', but people value access differently will and need different levels of access to different places - for example if they do shift work or have specific health needs. Liveability is about access to work, healthcare, transport - and essential services are fundamental - but in addition to that, it also needs to be about access to things that we want, not just things that we need.

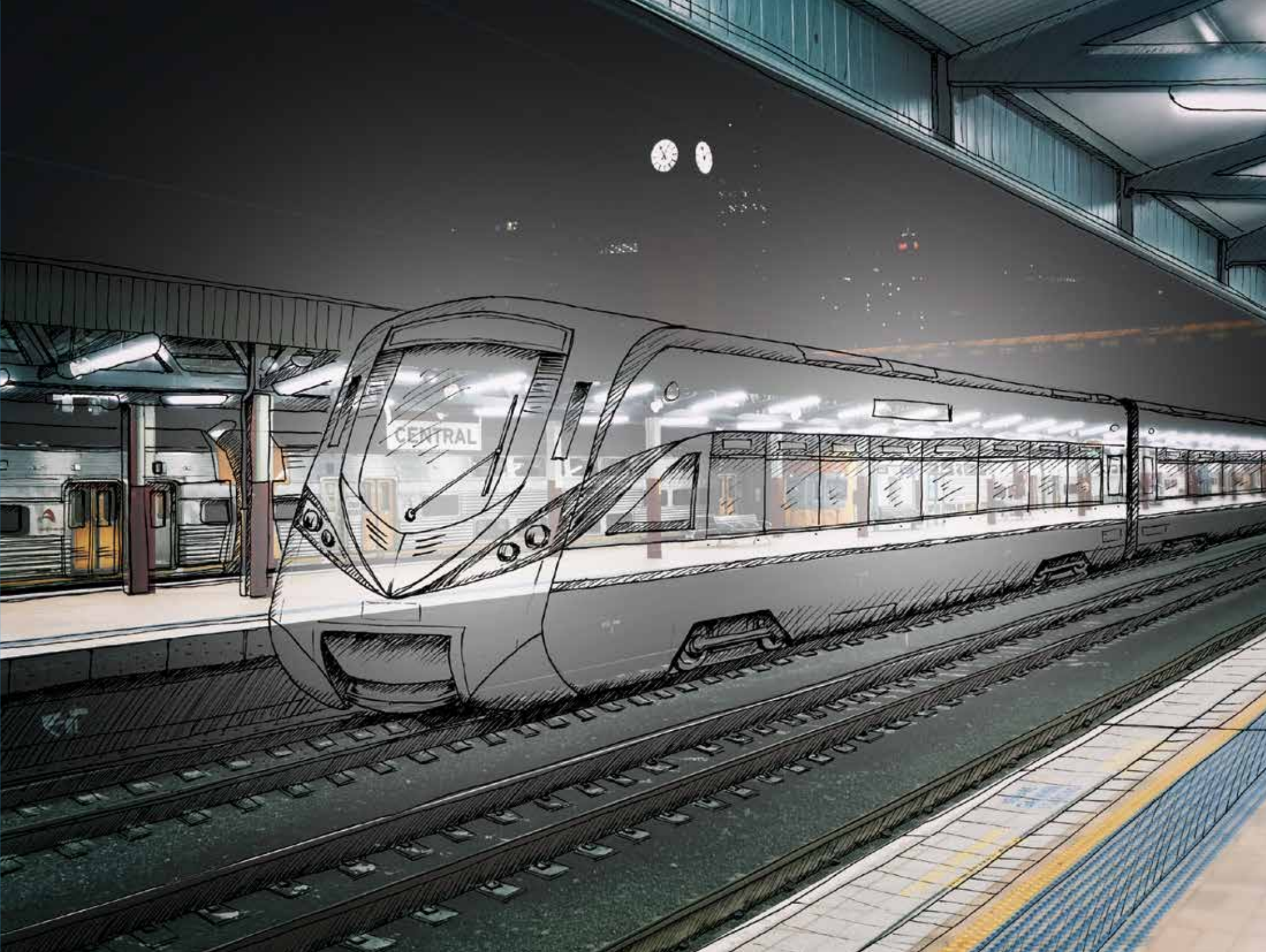
There are lessons to be learned, but each place has its own unique considerations. London for example, has a very well connected transport network - people don't need to go through the centre of London to access different places of interest. Well connected networks provide route choice, provide additional resilience to the network (e.g. if there is a route failure in one area) and disperse demand across the network.

London has also used regeneration opportunities to shape the concentration of employment nodes such as in Canary Wharf and East London. Investment in public transport has supported the development of these places.

A 30-minute city requires coordination and collaboration between different agencies and areas of government. A catalyst, such as the Olympics in London or the new Badgerys Creek airport in Sydney is often helpful and important, but vision is also required. Liveable cities don't develop overnight - we need to put the building blocks in place - so that as a city evolves, it does so with a clear vision in mind.

As such we need to take a long term view. *Future Transport 2056*⁷ is a state wide, long term plan that outlines the kind of things that we need to consider in a broad sense that are not spatially specific, such as growth, demographic changes and the impact of technology. These in turn, provide the frame for the plan for Greater Sydney. The next half century will bring about a lot of changes that we can't predict, but we need to try to take a longer term view to explore and understand the full impact of the decisions and investments we are making now.

⁷ <https://future.transport.nsw.gov.au/react-feedback/future-transport-strategy-2056/about-future-transport-2056/>



Connected communities

Sydney has already made a step in the right direction when it comes to new public transport infrastructure, with significant train lines, light rail and bus services supporting the region. However, to facilitate future population growth and three cities, even more investment is needed.

This means having more transport options to support the population to ensure all areas are well-connected to their sub-centres – to enable 30-minute connectivity. Current construction projects such as WestConnex and the Epping to Chatswood railway line are already going some way to address this. There are also a number of significant infrastructure developments planned or in progress within the western Sydney region in the next 10 years, including the Sydney Metro Northwest, Parramatta Light Rail and Western Sydney Infrastructure Plan, with capital investments totalling around \$14.7 billion.

It is not enough to ensure that individuals are well-connected within their sub-centres. There must be fast transportation connections between the three cities to promote and enable stronger cross-city social and economic activity. Already, investments are underway connecting the Eastern City to the Central and Western Cities. Planning for station locations has begun on Sydney Metro West – a high-speed metro between the Parramatta CBD and the Sydney CBD that could get workers across the region within 15 minutes. This is similar to the time it takes to walk from Town Hall to Barangaroo in the Sydney CBD. Advancements in communication technology will also reduce barriers for communication between businesses, promoting economic flows between the three cities.

Along with transportation, cultural, sporting and educational infrastructure needs to be adequate to support communities living in the region. An attractive place to ‘work, live and play’ will attract investments and other workers^{xii}.

A sense of community is also vital to the success of three 30-minute cities. Indeed, shifts in policies are signalling a stronger focus on culture and arts in the western Sydney region. Parramatta’s cultural precinct is growing, with the \$100 million renovation of the Riverside Theatre and the announcement of the relocation of the Powerhouse Museum from the western fringe of the CBD to Parramatta. The region is already making efforts to strengthen a sense of place and identity through sports and culture – notably the Greater Western Sydney Giants, Western Sydney Wanderers, Parramatta Lanes, Diwali: Festival of Lights and the Winter Light festival. Future investments in both cultural and communal infrastructure will be required to attract workers and improve the liveability of the region.

Pedalling a cycling city

A greater investment in public transport connectivity is not the only way to increase accessibility. Bicycle-friendly cities around the world experience a number of benefits.

Lower congestion

Congestion creates costs. With population growth and the sheer volume of Sydneysiders who drive, this cost is only going to increase. The Bureau of Infrastructure, Transport and Regional Economics (BITRE) has estimated that the cost of congestion in 2015 was \$6.1 billion and that this will increase to \$12.6 billion by 2030.

Health benefits

The World Health Organisation has identified that physical inactivity is one of the leading causes of poor health, and is the fourth leading risk factor for global mortality. It is well documented that cities with a large cycling population boast better average public health than cities that do not.

The cost of cycling is low relative to cars

Transport is one of the highest costs for Australian families as a proportion of household expenditure. A large proportion of this cost is maintaining a car. It is estimated that a bike costs 5% of the cost of maintaining a car, so cycling 10km to work could save \$1700 per year, and not including cost savings in parking that is usually free or negligible for cyclists.

Bike lanes provide value to taxpayers

The benefit-cost ratio (BCR) of walking and cycling projects has been reported to be a median of five to one. This means that a taxpayer gets five dollars for every dollar spent on active transport infrastructure.



The introduction of bicycle-sharing companies in Sydney is also heralding a move towards increasing cycling in the city. These companies offer bicycles for rent for short periods, which can be found and rented via a mobile app. While there have been some reported issues with these systems, including bicycles being left in inaccessible locations, local councils are starting to work with these companies to provide dedicated infrastructure such as bicycle racks to address community concerns.

Rapidly emergent technologies
will have significant impact on the
transport system of the future.

The virtuous virtualisation of Sydney

The Transport for NSW *Draft Future Transport Strategy*⁸ highlights some potential applications of technology in terms of reducing congestion and increasing accessibility. But as the use of machine learning and robotics increases across the globe, leaps in experimentation with similar technologies are expected in Australia. A number of these should also be considered to facilitate the three cities model:



Big Data

Technology improvements mean more accurate data can be collected and real-time analysis can help relieve transport pinch-points.



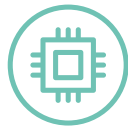
Driverless vehicles

Driverless vehicles have the potential to address accessibility issues. They will remove barriers to motor vehicle use and allow individuals with driving access issues to reach destinations more quickly.



On-demand transport

Customers can request bus transport through an app, with trials in NSW having commenced in 2017. This will better connect individuals in suburban areas to local transport hubs or landmarks.



5G and robotics

With faster speed and lower latency with 5G and the potential for wider applications, video conferencing will move beyond standard 'calls'. Telepresence robots (videoconferencing screens mounted on moving bases) controlled by the user, project the user's face on the screen while the robot moves around and interacts with people. Technologies such as this will improve flexible working by reducing the need for people to be at work in person, potentially reducing congestion and peak hour pinch points.



Ride sharing

Ridesharing and the growth of the sharing economy can assist in reducing total vehicle numbers and potentially in easing congestion.

A transport system powered by technology

Rapidly emergent technologies will have significant impact on the transport system of the future. While these developments may change the context for transportation, it's unlikely that citizen demand for an integrated, seamless transport experience will disappear. Whether it be by drone, ride-sharing, autonomous vehicles, pop-up buses or a combination of all of these – the need will only become more critical as new transport options emerge and our systems become inherently more complex.

⁸ <https://future.transport.nsw.gov.au/reactfeedback/future-transport-strategy-2056/>



What's in it for Sydney?



Economic benefits: the ins and outs

If we get it right, the economic and social benefits of a 30-minute Sydney are significant. The gains to Sydney from agglomeration, reduced travel time, and infrastructure investments could be more than \$10 billion per year.

First, there can be productivity and innovation benefits from clustering, with higher business earnings and individual incomes relative to work outside CBD areas. Our analysis finds that there is a positive correlation between income and the percentage of people working in the CBD.

Second, our analysis of Google data finds that the average one-way commute for all Sydneysiders is currently 37.5 minutes. But when we consider people who travel to the CBD for work each day, the average commute is much longer – taking 63 minutes each way.

Based on two trips a day for 250 working days of the year, Transport for NSW's recommended value of travel time and Deloitte Access Economics' forecasts of the number of workers in the CBD, we estimate that a shorter commute in this polycentric 30-minute city is worth \$3.5 billion to the Sydney economy each year.


However, productivity benefits from agglomeration and travel time saving are not the only potential economic benefits. To achieve a 30-minute city, public projects are in planning to develop each of the three cities and increase accessibility and liveability. While the benefits of each project are not necessarily additive, they provide an indication of the scale of the potential benefits to communities and local economies.

A centrepiece in the proposed Western City of the three cities plan, the Western Sydney Airport, is expected to alleviate constraints to meet excess demand in the Sydney basin, delivering productivity and competitiveness gains. The cumulative effect of the airport on the Western Sydney economy by 2050 is estimated to be between \$9.2 billion and \$15.6 billion in today's terms, and to add between 12,000 to 20,000 full time equivalent jobs to the region^{xiii}.

Industries and sub-regions with strong links to the air transport sector are looking to benefit the most. In particular, the local government areas of Bankstown and Parramatta will enjoy benefits from the airport, largely due to the relative concentration of manufacturing and business services in both regions, as well as financial services in Parramatta. Wage effects will be dispersed across Western Sydney as well – the top five LGAs will receive above \$200 million in additional aggregate wage income, including incremental increases in wages for existing jobs.

Deloitte has worked with business and government to create a blueprint for the economic transformation of Western Sydney (*Shaping Future Cities: Designing Western Sydney*) which is an integral component of the overall transformation of accessibility in NSW. Deloitte's economic growth scenario modelling for Westmead, suggests that if a jobs target of 50,000 can be achieved by 2036, the precinct will deliver an extra \$2.8 billion per annum of economic output to the state's economy^{xiv}.

Social benefits: from one to many



When work, educational and recreational opportunities are easily accessible, individuals benefit from a range of positive outcomes – greater work-life balance, more time with family and friends, and potentially a lower impact on the environment. For example:

- Australian workers who commute for more than 10 hours a week find that work interferes with activities outside work, community connections, and creates a time strain with family and friends often or almost always, as compared to a fifth of those who commute for two to five hours^{xv}
- More than 50% of Australian commuters said they would spend more time with family and friends if their commuting time was significantly reduced^{xvi}
- A study in the US found that every 10 minutes of commuting results in 10% fewer social connections^{xvii}.

Benefits aren't just limited to the individual either – there are flow on effects that shape the wider social and economic environment in a way that improves liveability.

Thirty-minute cities are denser and more compact. People who can't afford to, no longer have to concentrate in inner urban areas to avoid long and congested commuting distances. This means that wealth and human capital are more evenly dispersed across a 30-minute city. This can act to improve social cohesion, health, crime and education outcomes^{xviii}.

These cities are also likely to be associated with increased female labour force participation. Part of this is likely to be because, when compared to men, women with younger families often tend to look for work closer to home to stay accessible to their children^{xix}. When most jobs are centralised in the city, women who live further away have fewer employment options – making it harder for them to participate in the workforce.

There's clearly much to be gained through an increase in accessibility – with a deep tapestry of opportunity awaiting both individual and collective levels. But to achieve a 30-minute reality, we must maintain momentum and do so across government, in the private sector and in our communities.



Live: next stop action



Improving liveability in Sydney requires a collaborative effort – and it's time for action. Together we can ensure our city continues to flourish through diverse growth opportunities that create a new found quality of life. And the benefits range from increased productivity to enhanced work-life balance, where we all have more choice in, and autonomy over, our lives.



What can government do?

Government has an important role to play in ensuring the right incentives exist for individuals and businesses to distribute throughout the city, and in supporting an environment where urban and transport planners can adapt flexibly to changing needs. While many of the identified actions reflect current initiatives, it is important that governments maintain the momentum – which can be politically challenging (and is a key action in itself).

At the federal level:

Shaping future cities

Policy will have a high-level impact on growth trajectory and distribution of population and assets. Government can drive strategic, city-shaping infrastructure projects such as the Badgerys Creek airport and turbocharge the region by laying the groundwork for other job generation.

Looking beyond transport

Improving liveability through infrastructure is not all about rail and road. Educational centres such as universities and research institutes can boost the skills and employment profile of a region, making it more attractive to live and work in.

Policy development to drive change

Once the facilities are in place, there is a role for government to encourage people to live in an area. Housing and tax policy reform can disperse some of the rental demand from the inner cities, increasing demand for property in the suburbs. At the same time, policy vehicles like 'city deals' are a way for the federal government to contribute to the shaping of future cities through targeted projects.

At the state level:

Strategic policy making

The NSW government also has a number of policy levers to improve accessibility. Ensuring that businesses understand the opportunities of where to invest with a reasonable degree of long-term certainty will support future investments. The *Metropolitan Plan for Sydney 2036*, *Draft Future Transport Strategy 2056*, and the *NSW Long Term Transport Master Plan* already lay out strategic directions for growing and renewing population centres, and integrated strategic planning.

Promoting Western Sydney

There is currently a large disconnect between the resident labour force in Western Sydney and jobs within the region. Urban regeneration, supported by effective transport links, is needed to create balanced city centres that offer both employment and housing in the west, where the majority of Sydneysiders live.

As outlined in the Greater Sydney Commission's *Draft Greater Sydney Region Plan 2017* released in October 2017, the NSW Department of Planning and Environment could designate Priority Growth Areas along urban renewal corridors. UrbanGrowth NSW Development Corporation and Landcom, the agencies responsible for urban transformation, could implement urban renewal projects by planning for new land release areas, city shaping transport investment and optimising the use of government-owned land.

Transport and zoning

While transport investments such as the WestConnex and NorthConnex motorways are underway, and significant infrastructure projects such as the Sydney Metro are being delivered, many of the benefits of accessibility may not accrue directly to the Central and Western Cities. State government planners will need to think carefully about the effect this may have on where businesses decide to establish themselves, and individuals decide to live and work. Land and zoning policies can also be a barrier to new business entrants, or impede businesses from moving and expanding into an area.

Encouraging innovation

Deloitte's previous *Shaping Future Cities: Designing Western Sydney* work identified the potential for micro infrastructure projects to improve the liveability, walkability and safety of town centres and local communities, recommending the state government to allocate \$25 million over five years for 100 of these projects in Western Sydney.

Embracing tech in healthcare

Advances in technology and internet speeds are facilitating change in the way healthcare is delivered. While an area may have local doctors and hospitals, they may not be accessible to all patients, particularly those who are less mobile. State government initiatives to support the take-up of technologies can enable the growth of e-healthcare, particularly in outpatient care and increase the accessibility of this essential service.

Smart regulation

Smart design of regulatory settings will also encourage private sector innovation, as the NSW Government has done for Uber and autonomous vehicle test zones. In this vein, the *Draft Future Transport Strategy 2056* acknowledges the potential for public procurement of service offerings to develop the market of mobility as a service (MaaS) on-demand and technology-enabled services such as ridesharing and fleet services.

At the local government (council) level:

Investment in arts and culture

The cultural infrastructure of an area plays a big role in liveability and in attracting new residents and businesses. Promotion and investment in arts and culture (such as redeveloping the Riverside Theatre and moving the Museum of Applied Arts and Sciences to Parramatta) can make regions like Western Sydney desirable destinations, encouraging young people to live, work and play there. There is a role for state government investment in the arts and culture as well.

Supporting local business

Councils can support local businesses to qualify for federal and state government commercialisation and entrepreneur programs. At the same time, urban renewal projects and local development can thrive in the hands of suitably supportive council policy that prioritises new business entry and growth.



What can businesses do?

There are several things businesses can do to contribute to and embrace a 30-minute Sydney.

Planning precincts

Businesses can contribute to the public discussion on what is needed at a planning, industry, local and state government level to support business investment and operations. Greater clustering of businesses along transport networks and hotspots could benefit both employers and employees if done correctly – and so plans for new transport corridors should closely involve businesses to reflect the current and future geography of demand. Businesses would also do well to consider what other services are required to establish healthy, thriving business districts.

Expanding the footprint of the workplace to Western Sydney

Businesses can consider where their next workplace might be located, including whether a move to Western Sydney could tap into the required pool of appropriately skilled workers.

Embracing flexible work practices

Businesses should take advantage of the opportunities presented by faster internet speeds and remote working to consider the adoption of flexible working practices. If employees can work from home or other locations, the notion of 'access' within 30 minutes could be less relevant, depending on the nature of the work activities and the ease with which practices such as teleworking can be adopted. Even a simple move to more flexible working hours that alleviates the pinch points in public transport can provide benefits to the employee, the employer and other commuters.



What can you do?

For individuals, accessibility raises questions regarding the choices we make about where we live and work.

Many things determine the liveability that individuals have and want. Where people live, how long it takes them to get to work, and how much choice they have over where they work (e.g. the type of job that someone is trained for may only be based in the CBD), and the mode of transport they use. For most people, other determinants such as cost of housing and the level of cultural, social, educational and environmental amenities also play a large part in deciding where to locate.

Individuals will be the ones driving the change they want to see from businesses and government. This will come through demand for flexible working and clearly articulating the culture and facilities they would like to see in an area that would attract them to live there.

Word up: It's time to start a conversation

Have a think about where you live. What determines whether an area is liveable or not to you? There are a range of factors you likely take into account, from access to work or school, to the extent of cultural activities and nightlife you can enjoy, how much parkland, open space, trees there are, and your suburb's proximity to the beach or harbour.

Or perhaps it has less to do with where you live and more to do with how you live? Some people prefer living in detached houses with a generous backyard in a quiet and leafy neighbourhood, while others will opt for compact quarters close to a buzzing night scene.

Now consider the following scenario: if access to the work and school opportunities you need was the same everywhere, what would your trade-off decisions look like?

Consider the time cost of your commute:

- Do you commute to the CBD or somewhere near your home?
- How long does it take?
- Would travelling to the Western Parkland City or Central River City instead of the CBD reduce your commute? How much time would you save each day, week, year?
- What about changing modes? Driving compared to public transport compared to cycling. Are there environmental or health/fitness benefits from switching? Would these be worth a longer commute?
- Is your commute all about getting from A to B in the shortest possible time? Or do you use the time to get ready for the day/unwind before getting home?
- Are you a morning person or a night owl? Would you prefer to get to work at a different time of day? Would you choose to commute at a different time?



Liveability and jobs in Western Sydney: Walk this way

Danny Rezek,
Managing Partner – Western Sydney, Deloitte

Liveability in Western Sydney has been an issue in the past primarily because there have been fewer work opportunities or choices. But that is changing. The development of Parramatta City Square and the surrounding area, the availability of high grade office accommodation and associated services – along with the development of the Riverside Theatre, relocation of the Powerhouse Museum and the planning for Western Sydney Airport – means that the western Sydney landscape is transforming and will look very different in the coming years.

Since we first opened our Parramatta office more than 35 years ago, Deloitte has played a role in strengthening the Western Sydney economy and community. By early 2031, around half of the total population of Greater Sydney will be based in Parramatta or further west. And we know the creation of jobs and work opportunities closer to where people live will be critical to achieving a liveable, and accessible, 30-minute city. In Deloitte's *Shaping Future Cities: Designing Western Sydney*, we articulated the economic and social benefits of creating 200,000 great new jobs in the region. According to the recently released *Designing Western Sydney Report Card*, since the launch of the collaborative blueprint in December 2015, more than 65,000 knowledge jobs have been created across the region in areas including healthcare, education and professional services. Much has been achieved to date, but more opportunities for job creation exist.

While the public sector needs to continue to create critical transport links to connect people to those jobs, the private sector in turn needs to leverage this investment. The Badgerys Creek airport is only eight years away and will be transformational in many respects. The Western City created by the aerotropolis will become one of the most connected parts of a polycentric Sydney and will catalyse the creation of a significant number of jobs. In turn, jobs that are closer to where people live, will create choice and unlock greater liveability.

A change in mindset is required too. As a society we are very dependent on cars. To realise an activated, liveable and prosperous region we need to think more about pedestrians – not just in urban design and planning, but in how we as individuals access amenities, shops, cafes and cultural attractions. A greater focus on walkability can only create a more resilient, sustainable and healthy city for us all.





Appendices

Appendix A: Methodology

Overview

We have developed a 30-Minute City Index to visualise the relative accessibility and liveability of the 279 statistical areas (ABS SA2 areas 2011) in Sydney.

Proximity to CBD can be considered a rough measure of accessibility, but this does not take into account 'local' accessibility. For instance, a local supermarket would increase accessibility of shopping for residents, even in areas further away from the CBD. Given that, the 30-Minute City Index needs to account for the accessibility provided by local facilities and employment hubs as well as the accessibility associated with the significantly higher number of employment opportunities in the current CBD.

Figure A.1 provides an overview of the components of our 30-Minute City Index, which comprises three elements: 1) Work accessibility, 2) Local accessibility and 3) Liveability. The data for the Index is sourced from Google Maps API data, the 2016 Domain Liveable City Index⁹, and the Australian Bureau of Statistics.

Specifically, work accessibility measures the available employment opportunities within a 30-minute driving/transit and accessibility measures the number of essential facilities (e.g. schools, hospitals, etc.) in local areas within a 30-minute walking distance.

Liveability is based on the Domain Liveable Cities Index, to which Deloitte Access Economics was a contributor, which takes into account local accessibility along with other social statistics metrics such as crime rate and culture diversity. However, we further enhance this to introduce a definition of local and work accessibility focusing on the density of facilities rather than proximity.

Further detail on the key components of the 30-Minute City Index and a formal mathematical definition of the model is provided in the full Appendix available at www.shapingfuturecities.com.au.

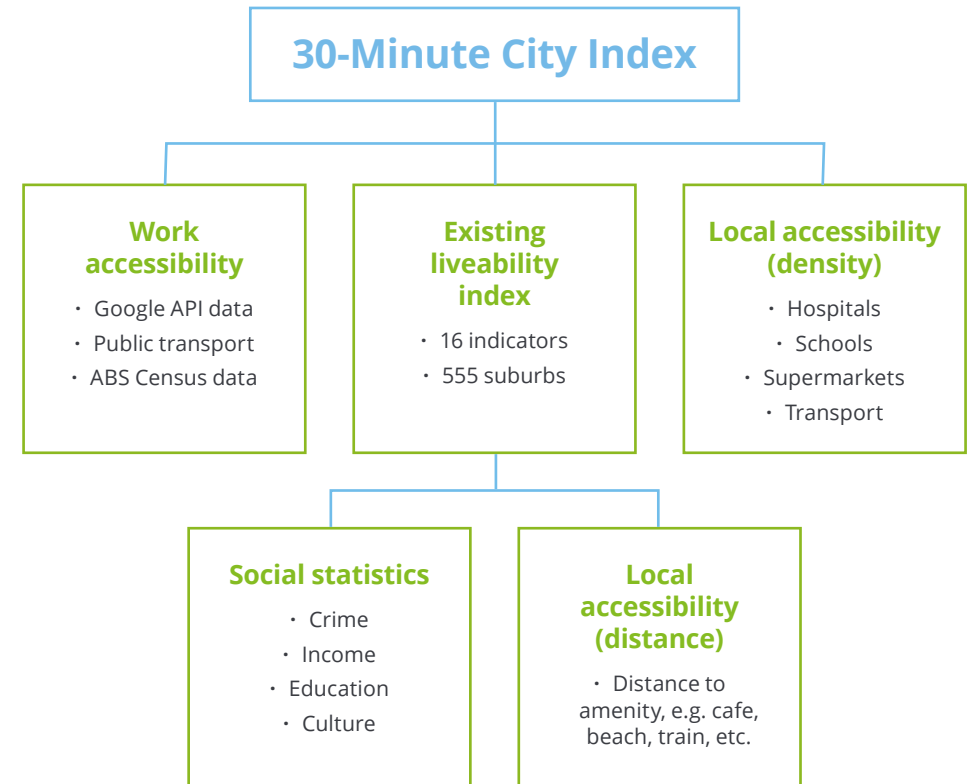


Figure A.1: Components of the 30-Minute City Index

⁹ Authored by Tract Consultants and Deloitte Access Economics

Definition of accessibility

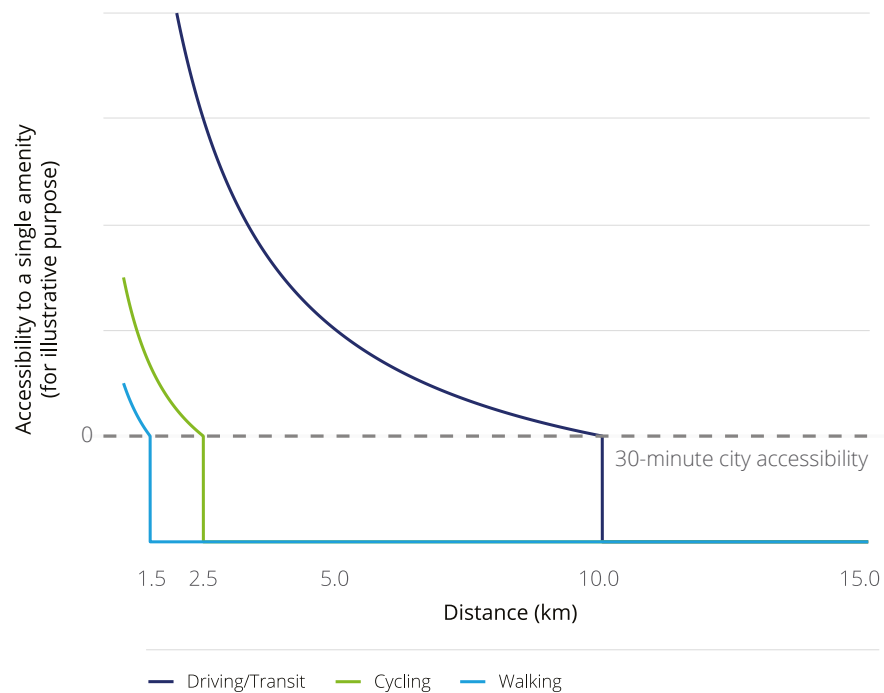


Figure A.2: Relationship between accessibility and distance by different transport mode

We have used the ABS Statistical Area 2 as the geographic unit to construct the 30-Minute City Index. The reasons are two-fold: 1) it is the most granular level at which the 2016 Census records commute origins and destinations; 2) the populations in SA2 areas are comparable in size.

The definition of accessibility for a given SA2 area comprises two related criteria, namely:

- The accessibility to places of interest (e.g. number of supermarkets) in the surrounding areas
- The accessibility of places of interest in the given SA2 area to people living in surrounding areas.

The first criterion is a standard measure of accessibility that captures the number of amenities in a given area.

The second is designed to highlight the 30-minute city concept by placing higher scores on areas with amenities that also support surrounding areas – echoing the contribution of CBD to total accessibility in a city like Sydney. In other words, the second criterion measures the reduction in total accessibility to Sydneysiders should the amenities in the given area disappear.

The definition of ‘surrounding’ areas reflects a ‘cut-off distance’ threshold, beyond which accessibility declines to zero. Accordingly, accessibility for places within the defined surrounding areas should decrease monotonically with distance and approach zero gradually as the travel time approaches 30 minutes. To illustrate, Figure A.2 shows an indicative relationship between accessibility and distance for driving/transit, cycling and walking respectively. The dotted horizontal line denotes zero accessibility at the 30-minute threshold. The blue and green lines show the decline of accessibility as distance increases. The driving/transit line, sits above the cycling and walking lines, as the travel speed is much faster, reflecting that the same place is more accessible if one could drive rather than walk.

The rate at which accessibility declines is governed by the inverse of travel time as a function of distance and travel mode. The rate at which accessibility declines reduces as distance increases, reflecting a higher marginal cost of travel at short distances (e.g. five minutes extra travel time on a five minute journey has a relatively larger cost than the same extra travel time on a 30-minute journey).

It is worth mentioning that Figure A.2 only depicts the relationship between accessibility and distance for a given SA2 with respect to a single amenity (e.g. a train station). In the full analysis, we account for all amenities accessible in a given SA2 based on its geographic location.

Figure A.3 shows the cut-off distances defined for different places of interest. The 10 km cut-off distance for driving/transit is based on the estimated weighted average travel speed of 19.53 km/hour at peak hours in Sydney (see details in Appendix B). The 2.5 km cut-off distance for walking is based on an average walking speed of 5 km/hour. It should be noted that the resulted SA2 rankings are not sensitive to small changes in the cut off distance, given the index declines towards zero quickly as travel time increases.

Accessibility Index	Travel mode	Cut-off distance (corresponds to 30 min travel time)
Work	Driving and transit	10 km
Hospitals	Driving	10 km
Supermarkets / groceries	Walking	2.5 km
Schools	Walking	2.5 km
Public transport	Walking	2.5 km

Figure A.3: Cut-off distance for various places of interest for calculating the 30-min accessibility index

* These travel modes and corresponding distances are used in the Index to reflect how far people generally travel to these locations and still consider them accessible, rather than the actual mode of travel used. It is acknowledged that people may prefer to drive to the supermarket, schools or to access public transport, but would consider them less accessible if greater than 2.5km away.

The final accessibility Index is an equally weighted ranking based on the five sub-indices in Table A.1.

Definition of work accessibility

Time of travel

Traffic conditions at different times of the day have an effect on work accessibility. During peak commuting times, the number of jobs accessible within 30 minutes from any location is significantly lower than the number of jobs that are accessible during off-peak times. To reflect work accessibility at peak time, the index is calculated based on the number of jobs that can be reached within 30 minutes at particular times during peak travel periods (8:30 am to CBD and 5:30 pm from CBD).

Figure A.3 below shows the travel times from different SA2s to the CBD at 12am (off-peak), 8.30 am (peak) and 5.30 pm (peak) respectively. Compared to off-peak times, there are fewer SA2s where residents can travel to the CBD in given time budgets e.g. 30, 60 or 90 minutes during peak hours. This means that the travel speed during peak hour is much slower, which reduces the number of jobs that can be considered accessible.

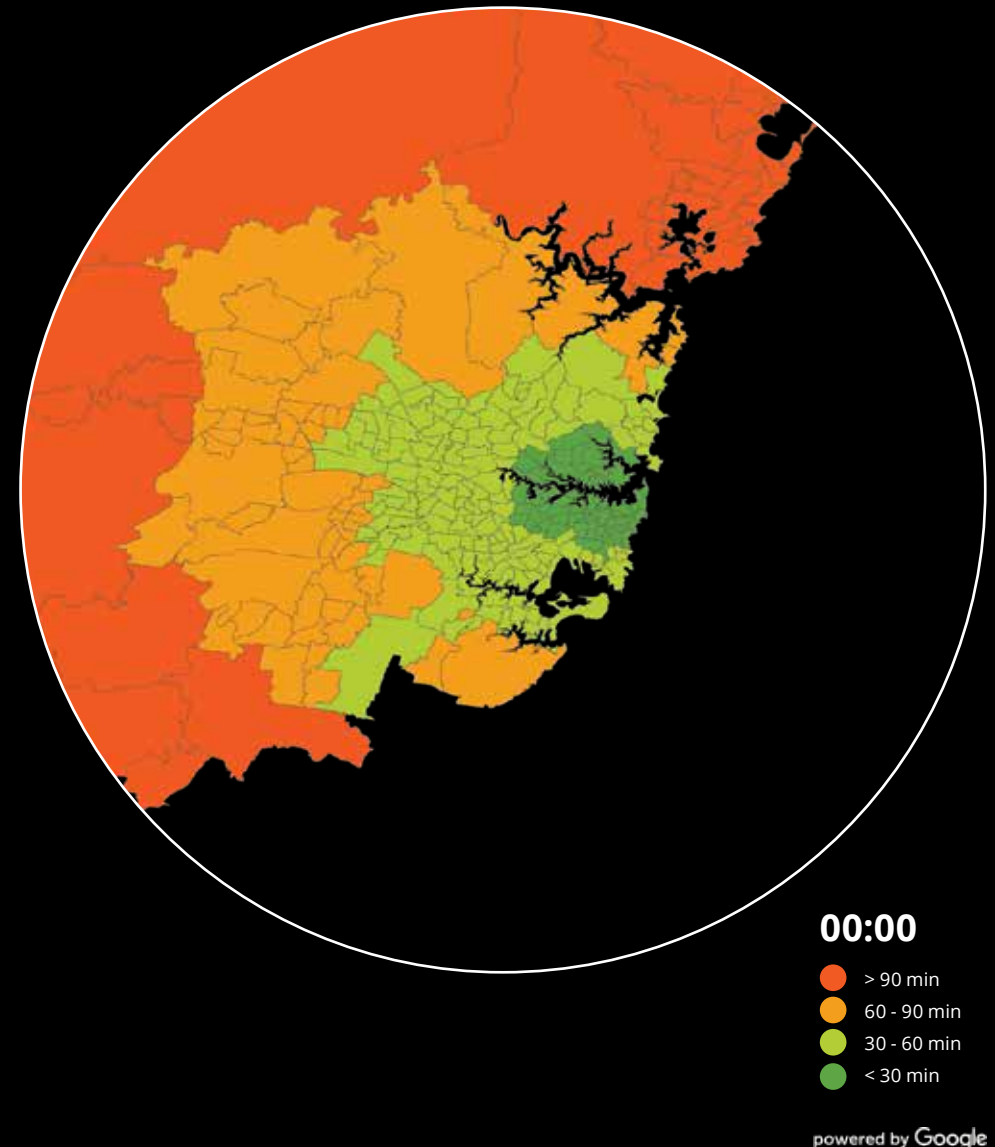
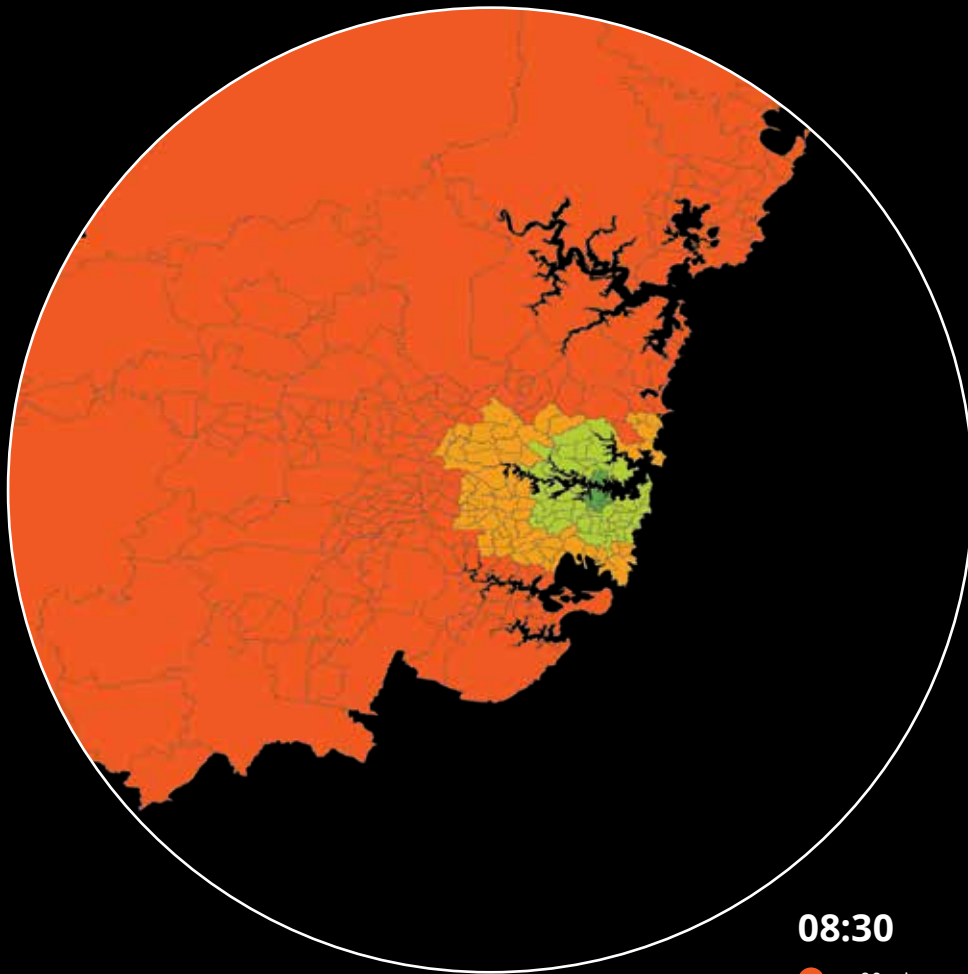
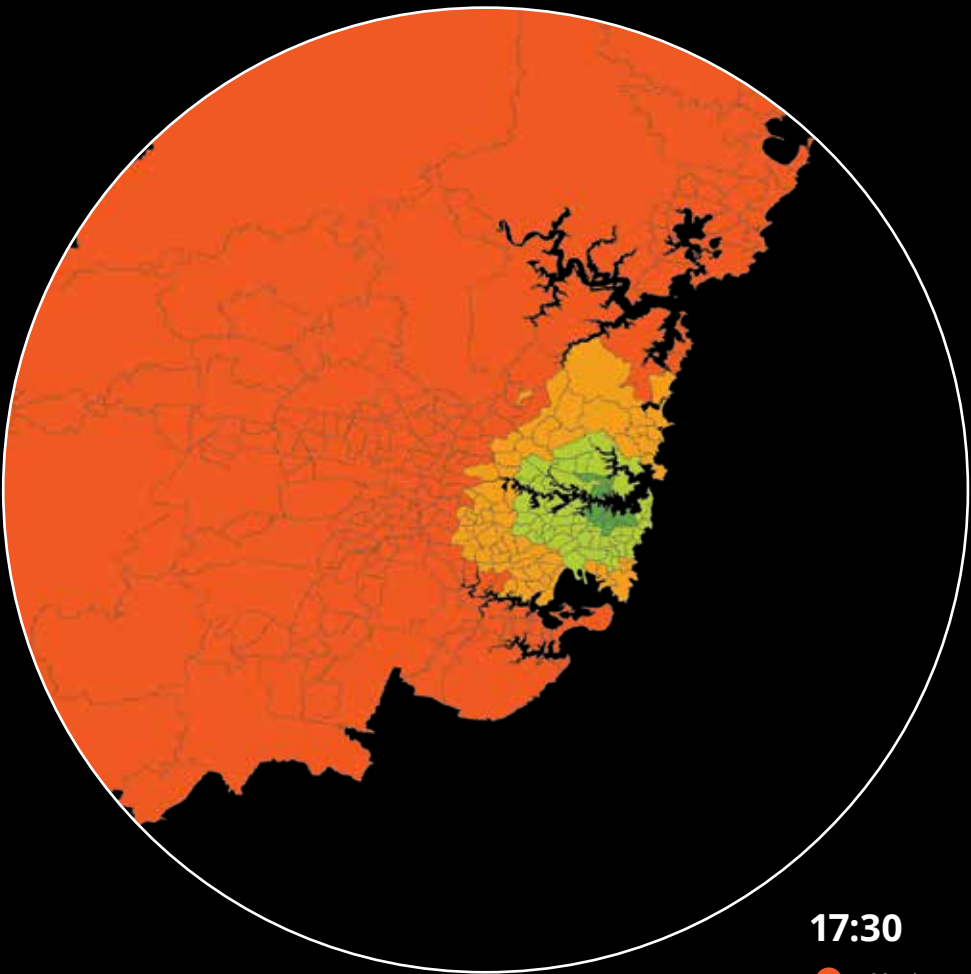


Figure A.4: Travel time to CBD at different time of day
(Source: Google Maps API data, Deloitte Access Economics analysis).



08:30

- > 90 min
- 60 - 90 min
- 30 - 60 min
- < 30 min



17:30

- > 90 min
- 60 - 90 min
- 30 - 60 min
- < 30 min

Driving vs public transport

Sydneysiders use various modes of transport for commuting. It is conceivable that driving is more sensitive to traffic conditions at peak hours, while public transport that does not use the road network such as the trains, ferries and light rails are less affected.

Assuming a travel time budget of 30 minutes, the number of jobs that are accessible from any location depends on the mode of transport used. Figure A.5 shows that travel time across the same distance to the CBD is roughly equivalent whether driving or taking public transport throughout the day, with driving only being faster than public transport at 5.30am or 8.30pm. The work accessibility index therefore uses the average speed of public transport and driving at peak hours to calculate the number of jobs that are accessible within 30 minutes.

Delays to driving time caused by congestion in peak hours of traffic is further illustrated in Figure A.6. The x-axis shows the time of the day, and the y-axis shows the ratio of travel time as a percentage of travel time at midnight (i.e. representative of a measure of delay). The green lines provides the average, which represents all SA2 areas within 50 kilometres from CBD. It can be seen that average delays to driving time caused by traffic for public transit are relatively flat, meaning these are less affected by traffic.

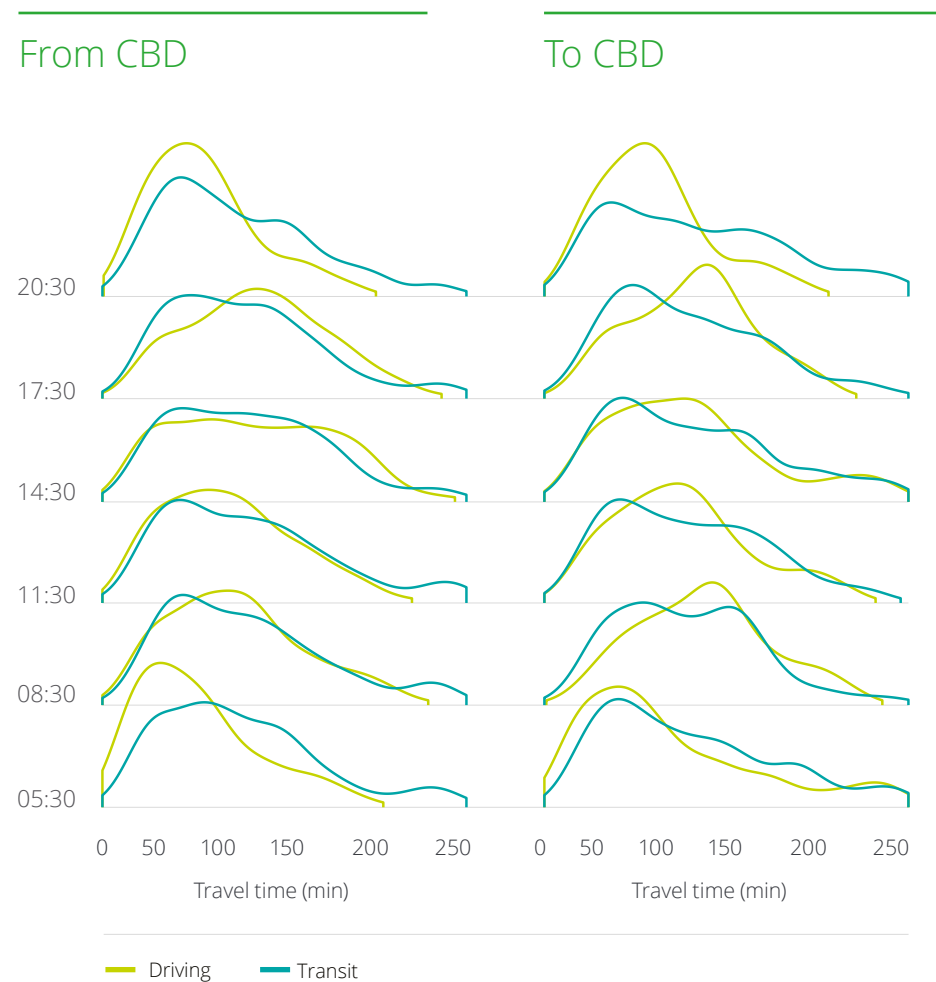


Figure A.5: Travel time density plots by transport modes
(Source: Google Maps API data, Deloitte Access Economics analysis)



Figure A.6: Travel time as a percentage of midnight travel time for driving and transit from or to CBD
(Source: Google Maps API data, Deloitte Access Economics analysis).

Comparison of the work accessibility index with raw count of jobs

Our work accessibility inputs are calculated based on the accessible number of employment opportunities, which is a better measure than a simple count of the total number of jobs (employed persons) in a given SA2 area.

To illustrate this, Figure A.7 shows the top 20 SA2 areas by employment for 2016-17. It can be seen that employment hubs further away from the CBD, such as Penrith and Campbelltown are highlighted on the map. However, areas such as Redfern and Waterloo are not included in the top 20 despite their close proximity to the CBD.

In contrast, Figure A.8 shows the top 20 areas with the highest work accessibility scores. The areas around the CBD are highlighted here as a whole, reflecting the indispensable accessibility to jobs offered by the current availability in the CBD.

Count map



Figure A.7: Top 20 areas by number of employed persons

Gravity map



Figure A.8: Top 20 areas by work accessibility index

Appendix B: 30-Minute City rankings for top 50 areas

SA2	30-Min City Index rankings	Local accessibility Index rankings	Work accessibility Index rankings	Liveability Index rankings
Sydney - Haymarket - The Rocks	1	1	1	56
North Sydney - Lavender Bay	2	8	3	2
Potts Point - Woolloomooloo	2	6	6	17
Darlinghurst	4	3	5	59
Surry Hills	5	4	4	70
Newtown - Camperdown - Darlington	6	2	8	92
Neutral Bay - Kirribilli	7	18	24	5
Bondi Junction - Waverly	8	12	19	47
Pyrmont - Ultimo	9	9	2	77
Glebe - Forest Lodge	10	10	14	65
Chatswood (East) - Artarmon	11	14	17	48
Crows Nest - Waverton	12	20	22	13
Leichhardt - Annandale	13	11	18	69
Petersham - Stanmore	14	7	32	95
Ashfield	15	5	34	118
Kogarah	16	16	54	NA*
Redfern - Chippendale	17	15	10	121
Cremorne - Cammeray	18	30	42	3
Woollahra	19	38	36	11
Randwick - South	20	28	33	40
Marrickville	20	21	20	103
Erskineville - Alexandria	22	23	9	113
Paddington - Moore Park	23	45	16	18
Dulwich Hill - Lewisham	24	19	50	114
Double Bay - Bellevue Hill	25	43	30	26

SA2	30-Min City Index rankings	Local accessibility Index rankings	Work accessibility Index rankings	Liveability Index rankings
Balmain	26	48	25	12
Lilyfield - Rozelle	26	33	28	58
Burwood - Croydon	28	24	26	130
Randwick - North	29	40	41	40
Haberfield - Summer Hill	30	25	45	101
Auburn - Central	31	13	85	146
Canterbury (South) - Campsie	32	17	59	149
Bondi - Tamarama - Bronte	33	44	62	24
Northmead	34	31	37	117
Rockdale - Banksia	35	22	83	124
St Leonards - Naremburn	36	73	11	6
Canterbury (North) - Ashbury	37	25	74	125
Lakemba	38	32	108	NA*
Concord West - North Strathfield	39	46	27	98
Liverpool	40	47	79	NA*
Strathfield	40	27	60	165
Waterloo - Beaconsfield	42	54	12	110
Centennial Park	43	70	49	23
Sydenham - Tempe - St Peters	44	55	35	102
Lane Cove - Greenwich	44	89	31	16
Homebush	46	49	44	128
Willoughby - Castle Cove - Northbridge	47	72	56	29
Parramatta - Rosehill	48	57	7	132
Bexley	49	36	115	109
Kogarah Bay - Carlton - Allawah	49	34	146	85

* Region not included in Domain Liveable Cities Index



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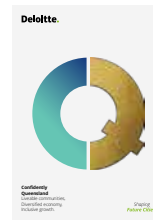


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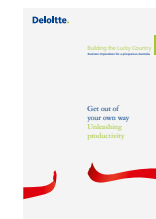
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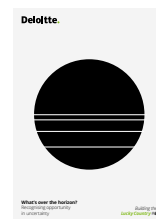
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