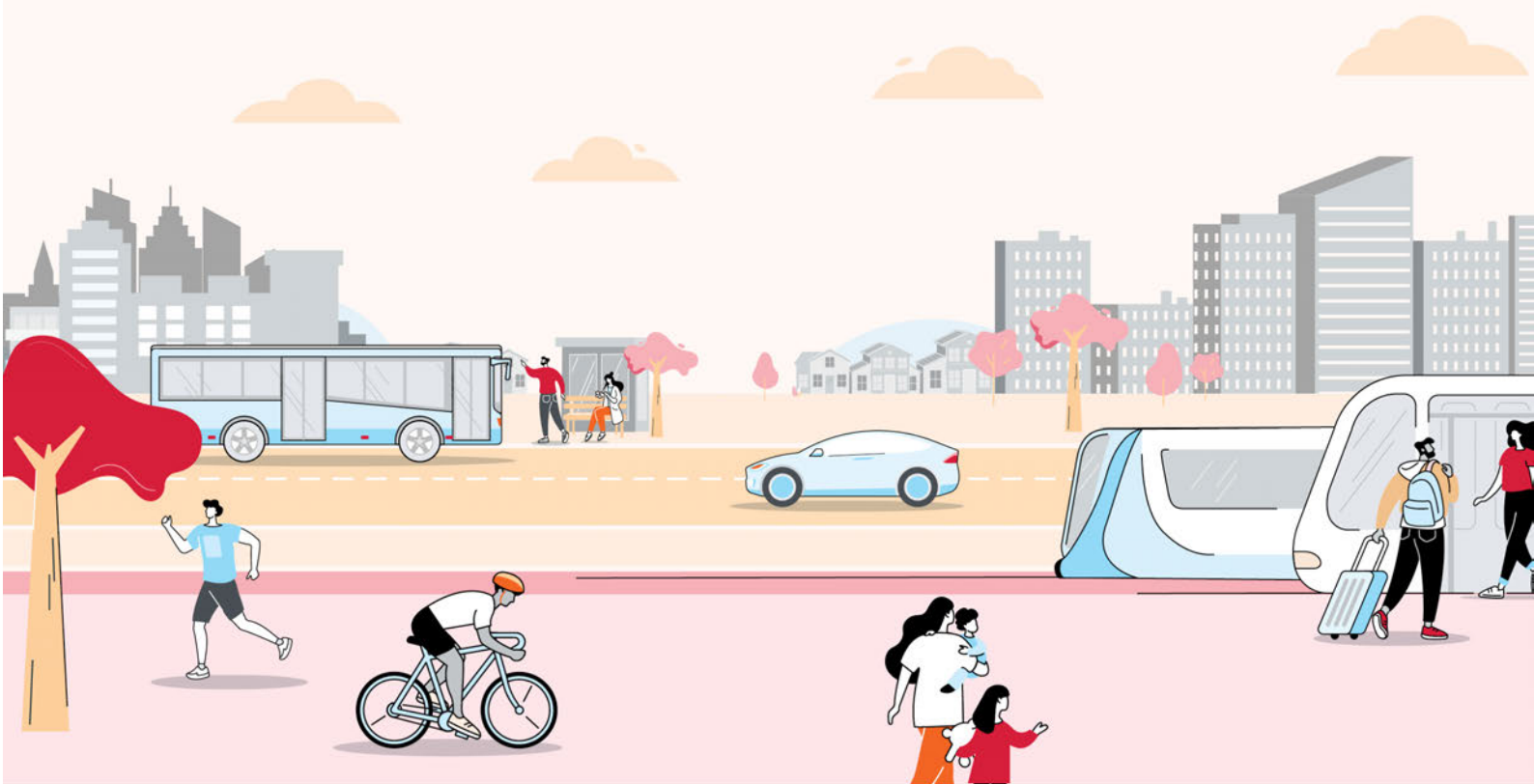


# Greater Liverpool to Bankstown Needs Study

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# 1. Executive Summary

## 1.1 Purpose and context

This Needs Study commenced in 2020 amidst a new strategic planning context including Future Transport 2056, Greater Sydney Region Plan – A Metropolis of Three Cities, and the commencement of Western Sydney Airport construction. This study reconsiders the specific needs of the community in South West Sydney (including Liverpool, Bankstown, and Fairfield), their urgency, potential options to meet these needs (such as the proposed Bankstown to Liverpool South West metro extension), and any need for corridor preservation to ensure the long-term viability of a future metro extension or alternative public transport links.

The study aims to identify the order of priority in which transport interventions should be undertaken to alleviate or resolve the problems experienced in the study area. It considers the input and vision agreed to with stakeholders, strategic planning directions, qualitative and quantitative analysis of the future state of the study area. It is not intended to confirm or dismiss the feasibility or viability of any particular intervention or scenario.



**Figure 1: Study Area**

The study is cognisant that challenges and potential solutions for the study area can arise from or be applied to different scales:

- Metropolitan-scale needs and solutions pertain to those that involve not only the study area but also its relationship or connectivity to the wider metropolitan area. For example, equitable access to employment, societal or cultural opportunities in other parts of the metropolitan area.
- Local needs and solutions pertain to those that are specific to the local characteristics of the community and place, such as quality of public domain, resilience to environmental stresses (especially in light of climate change), and support for active transport. Resolving these can then attract opportunities to the study area and thus work to improve the area's resilience and reduce the need to travel beyond it.

## 1.2 Challenges

Transport customers and the community of South West Sydney have a right to maximise the liveability, productivity and sustainability of their region. However, analysis of the study area has identified that this community bears a greater burden as a result of socioeconomic and transport disadvantage, and has range of local access and amenity issues. Nevertheless, there are opportunities for targeted transport investments to support a range of beneficial outcomes for the community. These opportunities include supporting the development of Liverpool as a Metropolitan Cluster (as designated in the Sydney Region Plan) and catalysing a range of urban renewal and infill development opportunities.

Five key problem areas or challenging themes have been identified.

### *Poor metropolitan connectivity to jobs, services and amenities*

Travel times and public transport service levels to centres of employment, to participate in employment, social and cultural activities, and to partake in opportunities for personal and professional betterment beyond the study area, such as Macquarie Park, Parramatta, and Sydney, are relatively poor compared to other places within metropolitan Sydney. For example, the travel time is almost one hour from Liverpool to Sydney. This is comparatively slow considering that Penrith or Campbelltown to Sydney has a similar travel time (an hour) as Liverpool to Sydney despite Penrith and Campbelltown being twice the distance away from Sydney.

### *Insufficient job diversity to cater for population*

Uncompetitive metropolitan connections limit the ability for residents of the study area to commute out of their immediate area but conversely also hinders the ability for the area to grow economically and create a diversity of jobs to both support its population and improve its socioeconomic status. This perpetuates the need for more skilled residents to submit to longer commutes, forgo more distant but productive, higher value and higher paying jobs, or move out of the study area all together. Only 23% of jobs in the study area are 'Knowledge Intensive' compared 32% for Greater Sydney.

### *Sprawling urban development with poor public domain and streetscape amenity*

Historically, the spatial structure and urban form of growth in South West Sydney has led to a range of unsustainable outcomes, such as a dispersed and auto-oriented urban form, longer transport journeys and car dependency, poor health and safety outcomes on the transport network. Many public spaces within the study area suffer from poor amenity and severance. Road corridors throughout the study are engineered for vehicles travelling at speed, leading to poor public transport service coverage, minimal shade features, suffer from air and noise pollution, may lack passive surveillance, have inadequate footpaths and bicycle paths, and lack a sense of local character and identity.

#### **THE EXISTING CAR-ORIENTED PHYSICAL ENVIRONMENT PRESENTS SPECIFIC CHALLENGES:**



**MAJOR AT-GRADE INFRASTRUCTURE CORRIDORS SEVERE LOCAL MOVEMENT AND PLACE**



**PEDESTRIAN AND CYCLE INFRASTRUCTURE IS LIMITED AND POOR QUALITY**



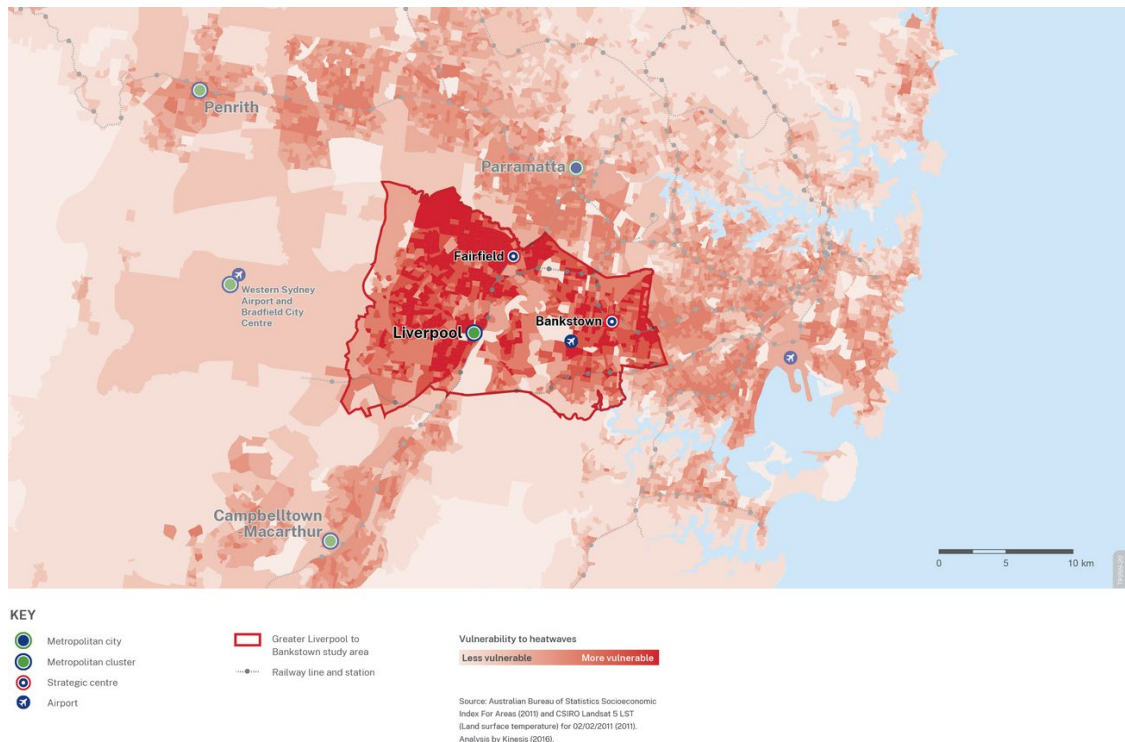
**LIMITED TREE CANOPY COVER ALONG THE STREETSCAPES**

**Figure 2: Gallery of key urban development and design issues**



### *Climate change and urban heat*

The community of South West Sydney is particularly vulnerable to the effects of a changing climate due to both geographical and socioeconomic reasons. The number of extreme hot days in South West Sydney is increasing more than Eastern Sydney in part due to distance from the coast, and access to climate-controlled indoor environments is poor due to their high cost or dispersion of community facilities. This can mean more expensive heating and cooling costs, and higher rates of heat-related health problems for an already disadvantaged community. The predominant dispersed urban form that necessitates high private car use further reduces the resilience of the study area to a changing climate due to the large proportion of impervious and heat absorbing surfaces dedicated to car parking and roads.



**Figure 3: Climatic and socioeconomic vulnerability to heatwaves**

### *Car dominance and neglect of sustainable transport*

The community within the study area demonstrate a high reliance on private vehicles for most journeys with two-thirds of trips from the study area undertaken by private car. High car use or car dependency has a range of economic, social and environmental outcomes that negatively affect community health, place amenity and transport network efficiency. Car dependent communities have higher mobility costs, both financial and travel time costs, which particularly affect residents with a physical disability and/or socioeconomically disadvantage. Higher rates of car use also negatively affect the environment through noise, air and water pollutants, and carbon emissions. The state of public and active transport in the study area is currently inadequate to effectively compete and deliver a more sustainable future.

## **1.3 Why act now?**

It is acknowledged the root causes and consequences of these problems are diverse and largely systemic. The systemic nature scale of the problems does not diminish the need to act but serves to emphasise the fact that responses will need to be multi-faceted and require long-term attention and investment. The need for better results is required – particularly for a population larger than that of Canberra's.

## 1.4 Vision statement

To address the identified community need, a vision statement was co-developed with the project working group (PWG) to inform the development of potential options. The PWG included stakeholders from the Transport Cluster, the Greater Sydney Commission, Department of Planning and Environment and Infrastructure NSW, Canterbury-Bankstown Council, Fairfield City Council, and Liverpool City Council. The vision statement seeks to capture an appreciation for the shared ambition for the long-term outcomes of the community and place within the study area. The vision statement is included in full in section 4.2.

## 1.5 Competing scenarios

This study evaluated the performance of a range of scenarios against a reference case. This study has adopted the position that the initiatives proposed by Future Transport Strategy 2056 that are proposed to be delivered by 2036 and serve a primary function or catchment is located largely outside of the study area, will be included in the 'reference case'. The key initiatives of note are:

- Norwest to Miranda rail line via Parramatta and Bankstown.
- Metro West line extension to UNSW/Randwick.
- Rapid bus lines largely outside the study area – this includes the route between Western Sydney Airport / Bradfield and Liverpool.

The Metro West line extension to Western Sydney Airport / Bradfield is part of the reference case only after 2036 and thus has not been included in the scenarios modelled for this study. The reference case also includes most Strategic Travel Model (STM) Common Planning Assumptions used in the modelling of TfNSW-led projects. It should be noted that the initiatives and timelines adopted from Future Transport Strategy 2056 are not final and remain subject to further investigation and refinement, as more detailed assessments take place.

The three core scenarios were developed so as to be able to consider a variety of transport modes and their geographic spread are. They were:

- South West Metro extension: A 10km railway line with stops at Liverpool, Newbridge Rd (near Governor Macquarie Drive), Marion St (near Birch Street), and Bankstown. The estimated travel time is 12 minutes between Liverpool and Bankstown. The service frequency assumed for the line is 20 trains per hour per direction during the peak and 6 trains per hour per direction in the off-peak.
- New Cumberland line: Consisting of a mix of components including new and upgraded railway line between Bradfield and Epping via Leppington, Liverpool, Fairfield, and Parramatta. Service frequency of the New Cumberland Line is assumed to increase to be 12 trains per hour during the peaks and 6 train per hour during the off-peak. The line is expected to offer travel time of 26 minutes from Bradfield to Liverpool and 32 minutes from Liverpool to Epping.
- Rapid Bus network: Includes eight Rapid routes, and fifteen new or modified Frequent and Local routes dispersed throughout the study area. The Rapid routes are proposed to have an average operating speed of 30 km/h and service frequencies of 8 or more per hour during the daytime hours Monday to Saturday and 4 or more per hour on Sundays. A suitable comparator to the Rapid routes are T-Way and B-line routes today. Frequent routes are assumed to have an 'all-day' service headway of 10 minutes, 7 days a week.

Modified Local routes are assumed to operate every 15 minutes during peak periods and every 30 minutes during the off-peak, 7 days a week.

## 1.6 Evaluation outcome

The evaluation was two-stepped:

- The three main or core scenarios were evaluated to identify the first priority.
- The first priority scenario was combined with each of the two remaining scenarios to identify the best performing combination and therefore the second priority.

The main evaluation method undertaken was a Multi-Criteria Analysis (MCA). The MCA incorporated total of 5 objectives, 9 criteria, and 12 key performance indicators (KPIs) assessing a mix of metropolitan and local scale issues and impacts.

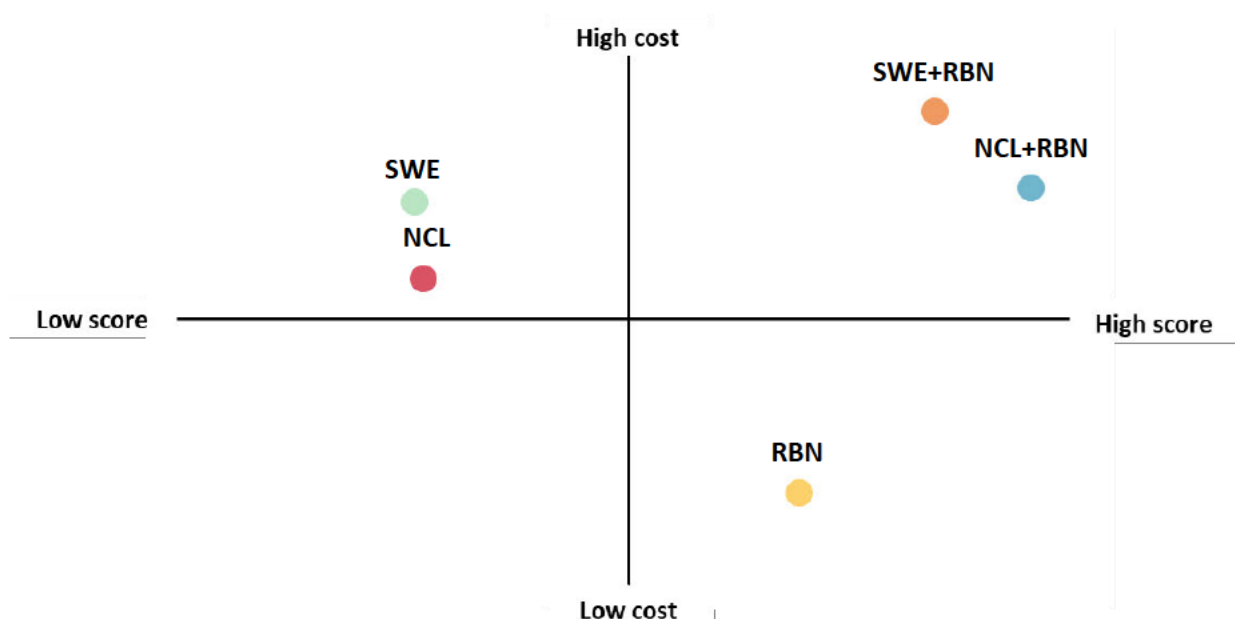
The evaluation identified that the first priority for further development and implementation was the Rapid Bus network, followed by the New Cumberland Line as second priority. This is corroborated in a comparison of each scenario's cost.

**Table 1 Multi-criteria analysis normalised results**

	Metro South West extension	New Cumberland line	Rapid Bus network	Rapid bus network + Metro South West	Rapid bus network + New Cumberland Line
Total score	14	15	34	43	50

Figure 30 compares the relative capital cost of each scenario in addition to their MCA score. Interestingly the New Cumberland Line plus the Rapid Bus option has a similar cost to the standalone South-West Extension scenario whilst performing far better in achieving the objectives.

It was observed that on a number of quantitative indicators that the results for the combinations were additive – that is, there is a synergistic effect that results in the combination scenario performing better than the sum of the two individual core scenarios.



**Figure 4: Comparison of scenario MCA score to cost**



## 1.7 Next steps

Amongst the combined scenarios, the Rapid Bus plus New Cumberland Line scenario performs best in achieving the overall objectives for the study area. The scenario:

- Has the highest impact on reducing average generalised public transport travel times in the study area,
- Brings more than 3,000 knowledge intensive jobs in the study area,
- Provides the most benefit to areas of socioeconomic disadvantage,
- Provides the greatest increase in the availability and frequency of public transport in the study area.
- Is likely to generate broader transport benefits in a less costly manner,
- Create significant travel time savings for the study area, improving access to jobs and opportunities across the Greater Sydney,
- Allows close to 1,000 ha of land use transformation leading to more complete neighbourhoods,
- Leads to significant increase in public transport use across Greater Sydney (~65,000 additional daily public transport trips),

Therefore, results of the evaluation suggest the following order of priority for detailed investigation and implementation should be:

1. Rapid Bus Network (RBN)
2. New Cumberland Line (NCL)
3. Metro South-West Extension (SWE)

While the extension of the Sydney Metro South West Line from Bankstown to Liverpool may have ranked third on the order of priority, the extension is not entirely without merit. The initiative shows long-term benefit for Greater Sydney, albeit it may not be as urgent or as easily implemented as alternative scenarios. However, early protection of corridors for future use is prudent from both a community and financial perspective.

Work undertaken as part of this study has also drawn attention to two historically neglected issues:

- The ability for enhanced bus service performance (e.g. frequency and speed) to change land use and employment patterns, particularly after considering the relatively low cost of bus interventions compared to other public and private motorised modes.
- The need to apply a more balanced approach to the design and engineering of bus priority infrastructure, such as the philosophy espoused by the Movement and Place framework, to improve environmental outcomes for the affected communities.

A more holistic and urban design-conscious perspective should be applied as it can result in even greater benefits for the Rapid Bus network as the places it serves become more attractive and thus generates more patronage demand for the bus service becoming a self-fulfilling prophecy for the local community and the wider network.

## 2. Introduction

### 2.1 What is the purpose of this Needs Study?

The NSW Government envisages a more productive, liveable, and sustainable Greater Sydney centred around three 30-minute cities, intended to increase people's access to jobs, services and other amenities within 30 minutes from home.

An extension of Sydney Metro City and South West from Bankstown to Liverpool was first examined in 2016. In March 2019, the NSW Government announced the commitment to plan for the metro extension. This would support the NSW Government's aspirations for population and employment growth improving 30-minute access to jobs and services, and extend efficient, reliable, high-frequency train access to the Harbour CBD for residents living in Liverpool and surrounding suburbs.

This Needs Study commenced in 2020 amidst a new strategic planning context including the release of Greater Sydney Region Plan – A Metropolis of Three Cities, and the commencement of Western Sydney Airport construction. This study reconsiders the specific needs of the community in South West Sydney, their urgency, potential options to meet these needs (such as the metro extension), and any need for corridor preservation to ensure the long-term viability of a future metro extension or alternative public transport links.

The aim of the study therefore is to identify the order of priority in which transport interventions should be undertaken to alleviate or resolve the problems experienced in the area. It will consider the input and vision agreed to with stakeholders, strategic planning directions, qualitative and quantitative analysis of the future state of the study area. It is not intended to confirm or dismiss the feasibility or viability of any particular intervention or scenario.

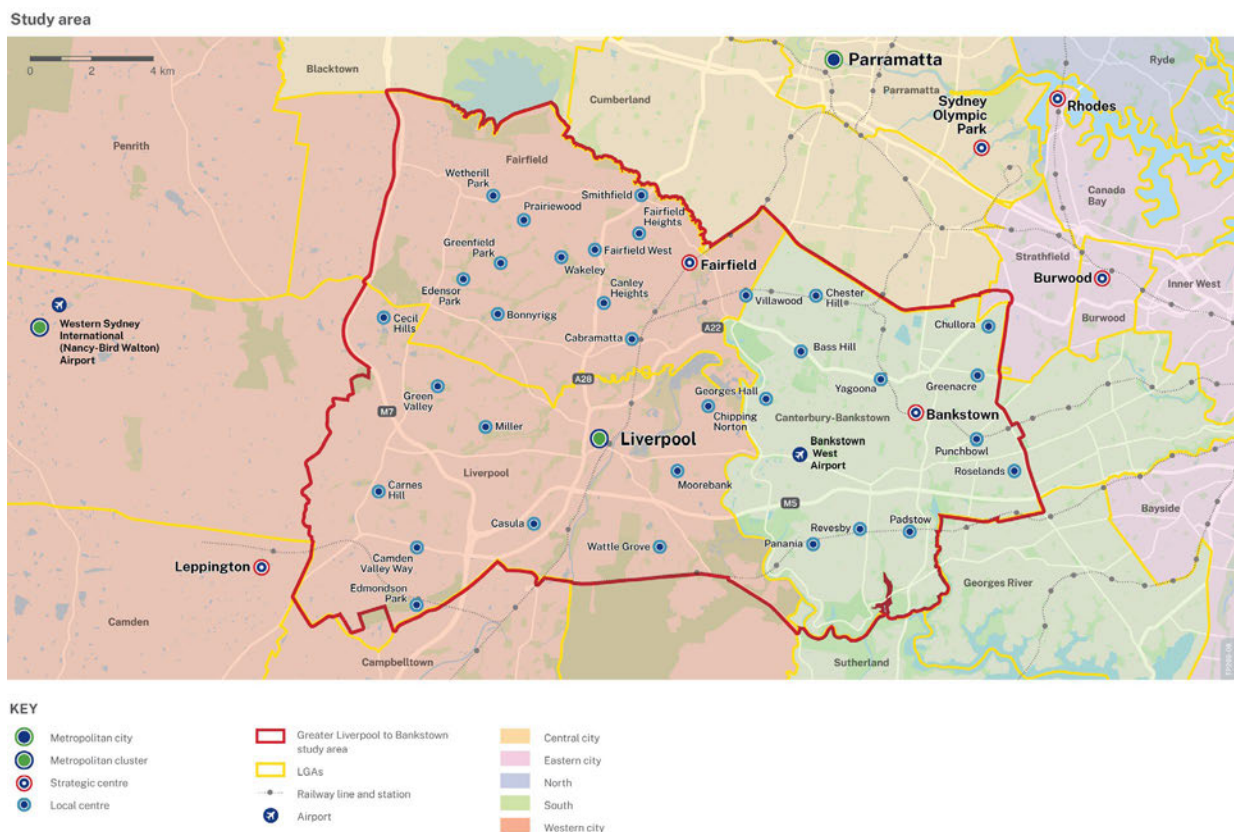


Figure 5: Study Area

2.2 Strategic land use and transport plans

2.2.1 Future Transport Strategy 2056

Future Transport Strategy 2056, which includes the Greater Sydney and Regional Services and Infrastructure Plans, lays out a 40-year plan for providing responsive and innovative services for moving people and goods across New South Wales. In Greater Sydney, its focus is to reshape the metropolitan area to deliver a three-city vision, and it recognises the critical role that transportation plays in supporting efficient land use, economic development, social mobility, and environmental sustainability. It also outlines a framework for service enhancements and future technologies to guide long-term transportation investment.

Future Transport 2056 also provides guidance on potential future transport networks for 2036 and 2056, as well as guidance on investment and service outcomes such as customer focus, successful places, a strong economy, safety and performance, accessible services, and sustainability. This strategic direction will influence the project's objectives, benefits, and reference network. The indicative future rail and rapid bus networks are illustrated in Figure 6 and Figure 7 respectively.

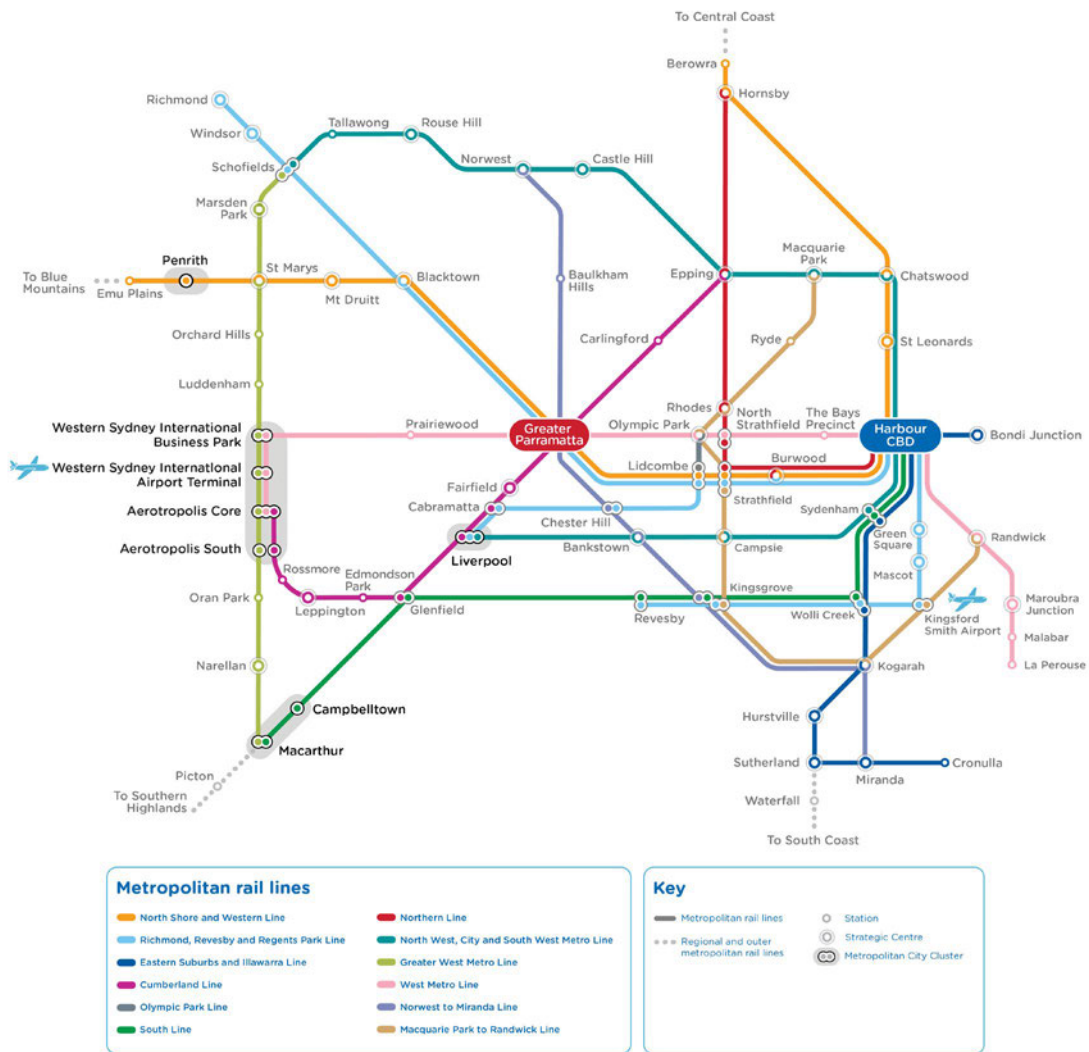
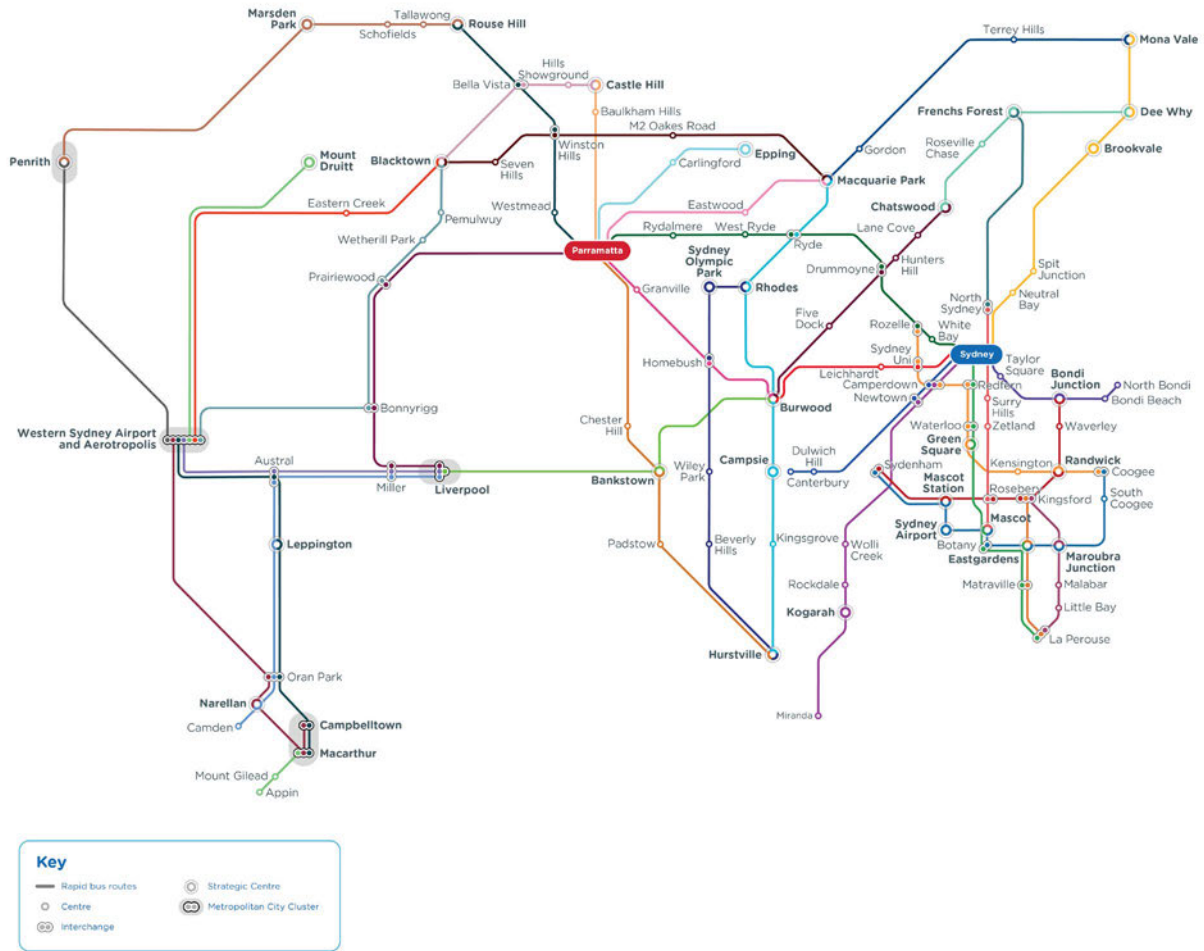


Figure 6: Indicative future rail network

## 2036 Rapid bus lines



**Figure 7: Indicative future rapid bus network**

### 2.2.2 The Greater Sydney Integrated Network Plan

The Greater Sydney Integrated Network Plan (GSINP) assists in the delivery of the Future Transport 2056 vision by developing a preferred network staging plan for Future Transport 2056 and initiating key next steps to define the transport network and outline a staged delivery plan through 2056.

The GSINP provides more detail to inform the development of city shaping and city serving corridors in all modes of transportation. The provision of option development within this report is heavily reliant on the GSINP's direction, although it should be noted initiatives and their timing are subject to further investigation and refinement, as more detailed assessments take place. It contains the following proposals, which have a significant impact on the Greater Liverpool to Bankstown study area:

- T5 Cumberland line would be extended from Parramatta to Epping and from Leppington to Bradfield (formerly known as 'Epping to Aerotropolis') by 2036. This would give Southwestern Sydney a direct link to the Global Economic Corridor centres of Chatswood and Macquarie Park in the lower North Shore.
- A new train line from Greater Parramatta to the Health and Education Precinct at Kogarah by 2036, connecting the Central City to the South region.



- The extension of the City and South West Metro from Bankstown towards Liverpool, connecting centres across the three cities in southern Greater Sydney. This is included in the longer term (up to 2056) vision of the rail network, but it not recommended in the short to medium term.
- The East West Rail Link or Metro West Extension is proposed to be delivered after 2036. It would provide a central and direct link across the three cities in Greater Sydney, penetrating Bradfield, Parramatta, and Sydney city centres.

The GSNP also identified reaffirmed the Rapid bus network to be implemented across Greater Sydney by 2036.

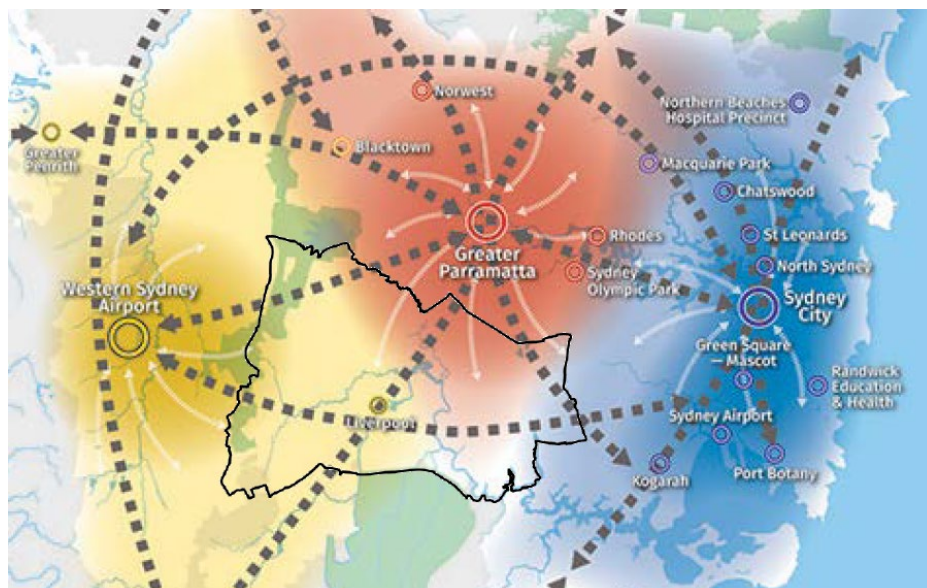
### 2.2.3 Greater Sydney Region Plan – A Metropolis of Three Cities

The Greater Sydney Region Plan sets strategic directions to support a three cities vision and the ambition of creating 30-minute cities. These directions include: infrastructure to support, and align with, growth; collaboration across government; putting people at the heart of planning; supporting a greater diversity of housing choices; designing great places for people; better integrating transport and land use to create a more connected and walkable city; creating the conditions for a stronger economy across centres, employment lands, health & education precincts; and creating a more sustainable city through healthy waterways, biodiversity protection, landscape protection, improved tree canopy coverage, enhanced open spaces, reduced carbon emissions, and resilience to climate change and extreme heat.

The Plan provides direction on land use and infrastructure development across the Greater Sydney metropolitan region. The Plan gives all three cities equal priority, elevating the role of Liverpool as part of the Western City cluster, alongside Western Sydney Airport and Aerotropolis (Bradfield) and of Greater Parramatta and Olympic Park as the Central City. The Western and Central Cities rise in importance as the nearest cities to the study area. This also de-emphasises the strategic need for a direct public transport link from most of the study area to the more distant Sydney City – however a demand may still exist that justifies this link on more tactical grounds.

The Greater Liverpool-Bankstown study will address the three cities vision, and develop investment scenarios that support the productivity, liveability, and sustainability goals of the plan.

**Figure 8: Location of the study area within the three cities**



(adapted from Greater Sydney Commission 2018)



## 2.3 Why South West Sydney is important?

### 2.3.1 Growing in population and jobs

The Western Parkland City (Western City) is the fastest growing region in NSW, with the population expected to grow at almost twice the rate of the Eastern Harbour City through to 2056. Based on population projections (version TZP19), from a population of approximately 1,870,000 people in 2021, the Western City is expected to grow by 470,000 by 2036, at an average annual change of 2.2 percent. Table 2 shows the population and employment projection and the growth rate from 2021 to 2036 for Greater Sydney and the Western City. There are also several emerging opportunities in Western Sydney that will intensify this growth, including the development of the Western Sydney (Nancy-Bird Walton) International Airport (WSA) and the Bradfield metropolitan cluster located near the future airport.

**Table 2: Population and employment growth 2021 to 2036**

	Statistic	2021	2036	Total Growth	Growth P.A.
Western City District	Population	1,186,589	1,655,789	39.5%	2.2%
	Employment	421,514	578,198	37.2%	2.1%
Greater Sydney	Population	5,252,665	6,661,775	26.80%	1.60%
	Employment	2,768,029	3,393,403	22.60%	1.40%

**(Internal DPIE analysis based on Transport for NSW 2019 Travel Zone Projections)**

Meanwhile, the study area population is expected to grow by about 158,000 residents, from 690,000 to 851,000 (23%) over the 15 years from 2021 to 2036, at an average annual growth rate of 1.5%. The study area also has 244,700 jobs in 2021 and this number is expected to grow by 59,000 to 2036.

Growing by over a quarter in 15 years illustrates how fast and significant this change will be for the study area and the city encompassing it. This growth will place increasing pressure on existing transport networks and highlights the need for better connections to leverage the proximity to centres of growth in Western Sydney. However, investment in airport and landside transport will create jobs, economic opportunities, and provide a chance to grow a new economy.

Figure 9 shows the projected population growth over the next 15 years around study area is located mainly west of Liverpool, at Edmondson Park, Bringelly, Austral, Leppington, and Cecil Park as well as farther suburbs outside of the study area including Oran Park, Gregory Hills and Gilead. This forecast assumes most population growth will be located mostly in green field areas south and west of the study area. Liverpool is the nearest Metropolitan Cluster that will serve much of this population, which is likely to increase the pressure on existing transport networks that link Liverpool to these growth areas.

Figure 10 illustrates employment growth is projected to cluster around the Western Sydney Airport. Suburbs that contain the highest amount of jobs growth within the next 15 years include Luddenham, Moorebank, Badgerys Creek, Kemps Creek and the upcoming centre of Bradfield. If this forecast of greenfield growth is realised, future jobs will mainly be located to the west of the study area, requiring investment in frequent public transport services from the study area towards these new jobs.

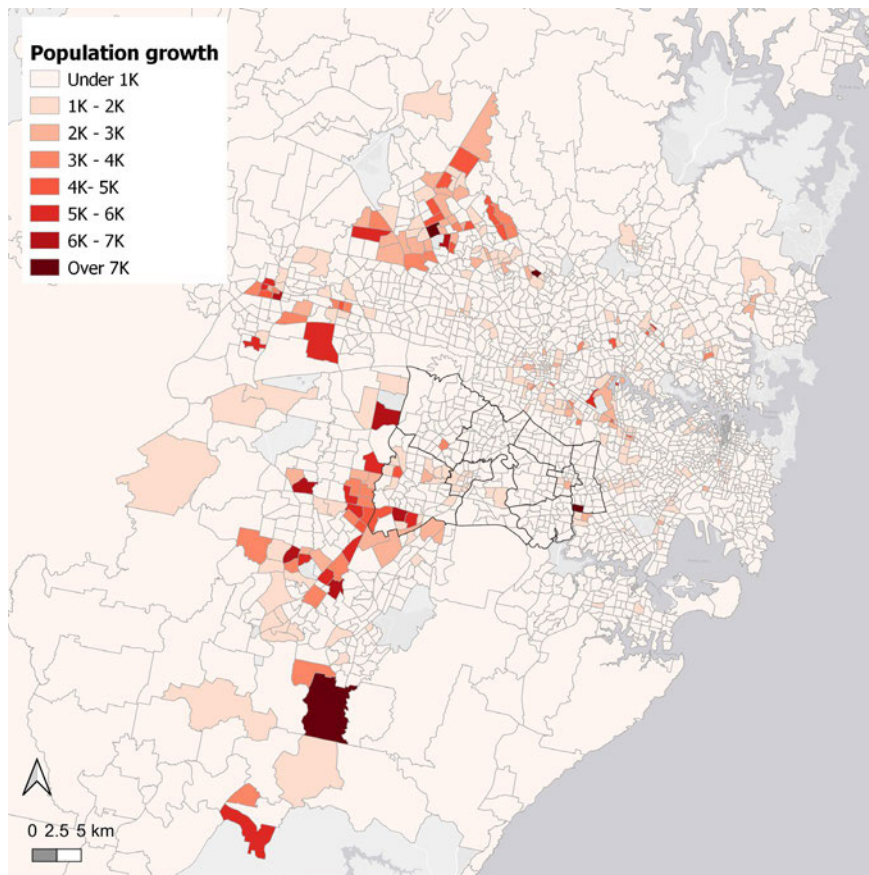


Figure 9: Population growth 2021-2036

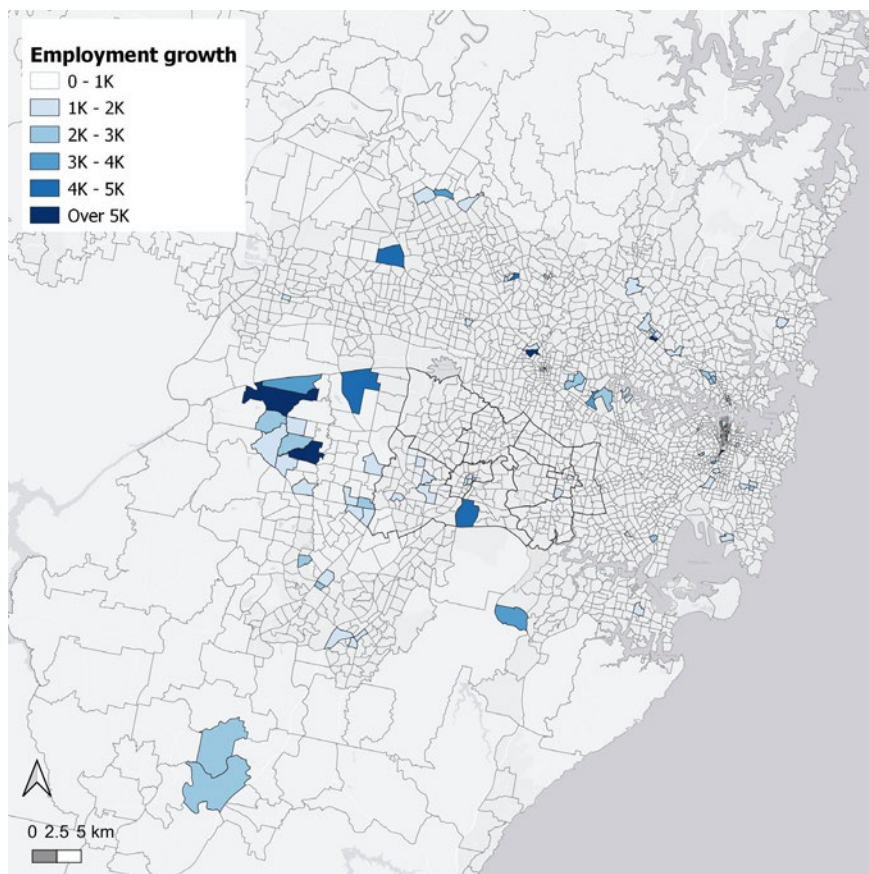


Figure 10: Employment growth 2021-2036

### 2.3.2 Growth and renewal opportunities

There are several key growth areas in Greater Sydney identified by Department of Planning, Industry and Environment (DPIE) which are illustrated in Figure 11. These focus on delivering homes in precincts and renewal corridors in the Western and Central Cities. The study area is a place of confluence where Western and Central Cities meet. In addition, Greater Sydney Commission leading cross-government planning for two collaboration areas in the study area - Liverpool Collaboration Area, and Bankstown CBD and Bankstown Airport Collaboration Area.

There are also several new development areas or opportunities being planned or reviewed by local councils to support the growing population and jobs. These include Moore Point, Moorebank East, Warwick Farm Precinct, Cabramatta Town Centre, Fairfield City Centre, Villawood Town Centre, Canley Vale Town Centre, Carramar Neighbourhood, Yennora Neighbourhood.

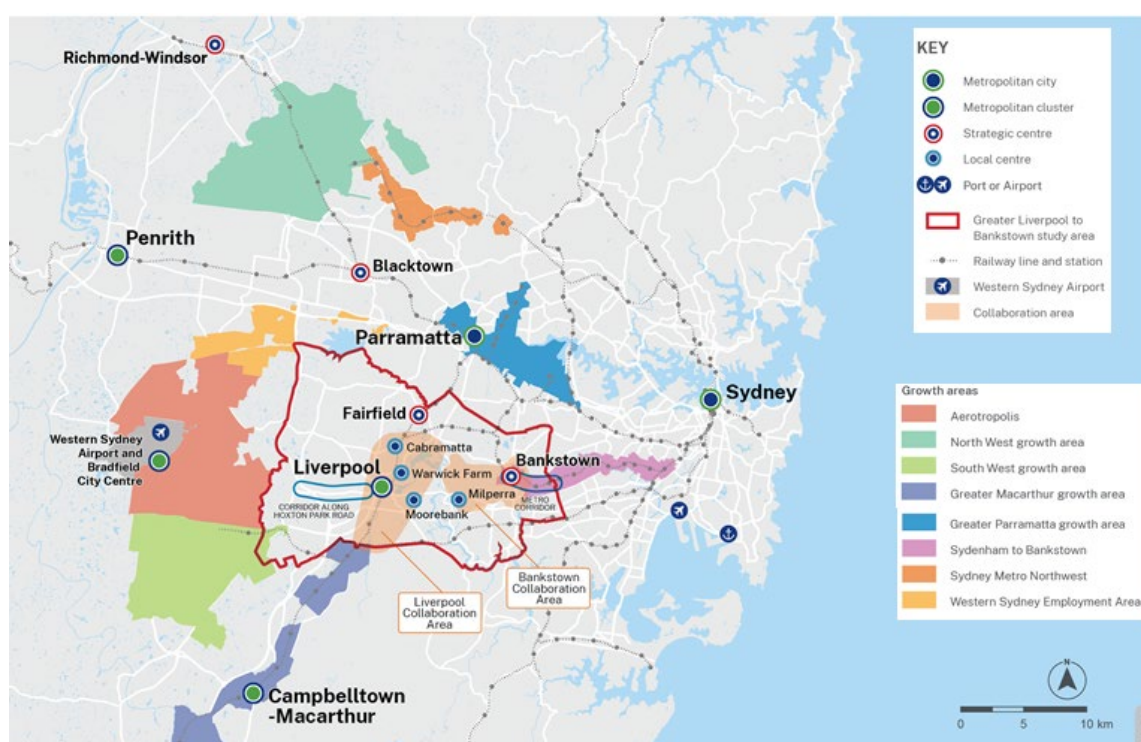


Figure 11: Growth and renewal opportunities identified by DPIE



### 2.3.3 Concentration of essential workers and large pockets of socio-economic disadvantage

The study area workforce is less skilled than the Greater Sydney average. Figure 12 illustrates the distribution of Sydney residents with a Bachelor's degree or higher. In the study area, it is apparent that working-age residents are unlikely to have such qualifications. Therefore, they are more likely to be 'essential' or 'blue-collar' workers that have below median incomes. This may also explain the concentration of socio-economic disadvantage illustrated by the SEIFA index as seen in Figure 13. Much of the study area is marked as disadvantaged area. It also correlates with the anecdotal narrative that once educated, residents leave the area to work or reside in other areas of Sydney that have better access to higher skilled jobs.

The spatial differences in disadvantage have immediate implications for the provision of transport infrastructure and services in the study area, as disadvantaged communities are more likely to be more dependent on public transport and expenditure on transport (fuel, fares, etc.) would make up a higher proportion of household income. A more nuanced view of transport for the study area is required that considers this range of characteristics.

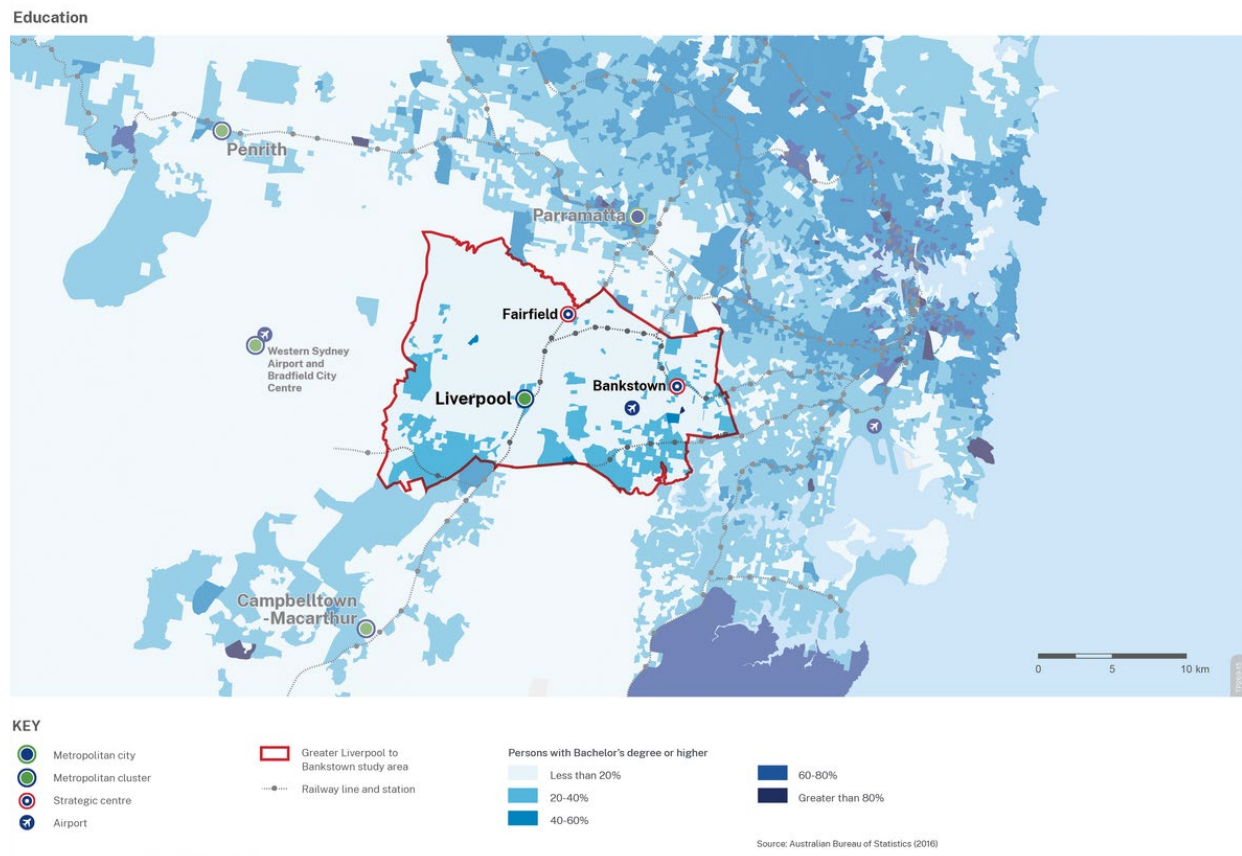


Figure 12: Bachelor's degree or higher attainment

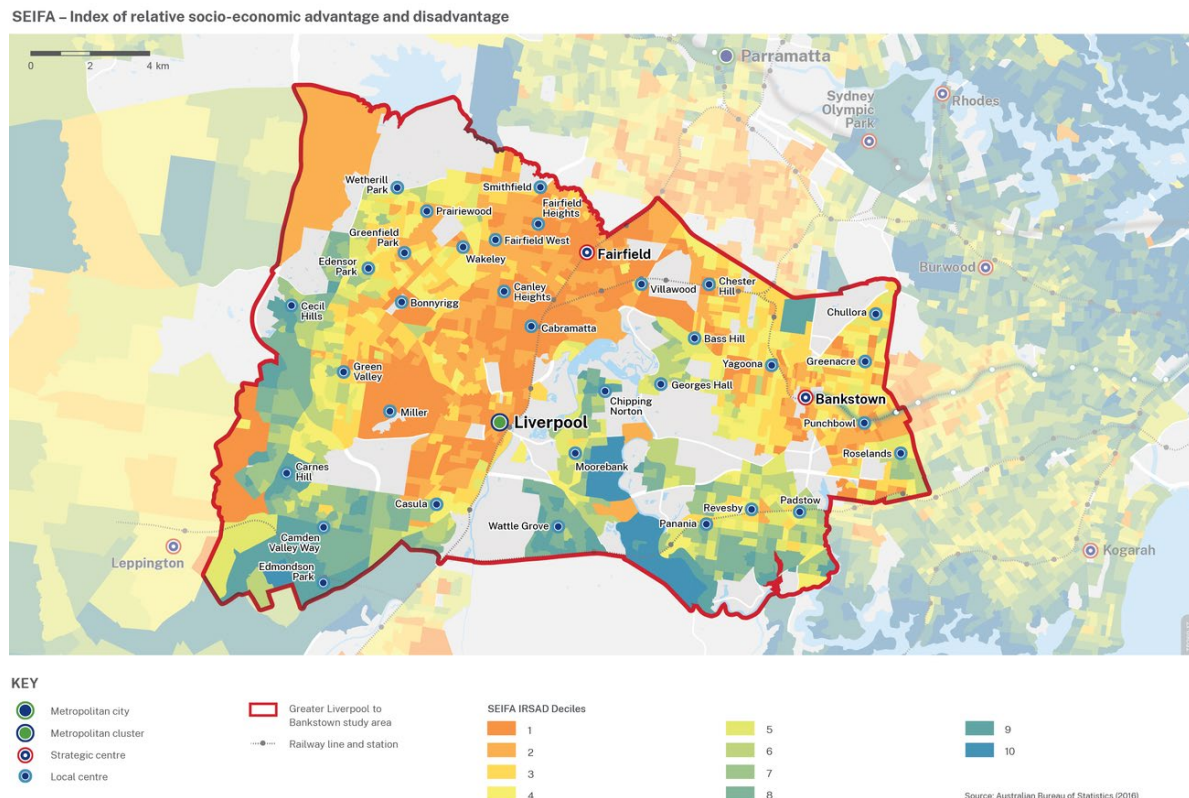


Figure 13: SEIFA Index of Relative Socioeconomic Advantage and Disadvantage

## 2.4 Collaboration with our stakeholders

A Project Working Group (PWG) was established to meet approximately monthly and workshop aspects of the study. The PWG included stakeholders from the Transport Cluster, the Greater Sydney Commission, Department of Planning and Environment and Infrastructure NSW, Canterbury-Bankstown Council, Fairfield City Council, and Liverpool City Council. Table 8 lists each PWG meeting held and key activities undertaken at each meeting.

A range of feedback from stakeholders was collected throughout the consultation process. Comments from local councils and TfNSW responses are outlined in Chapter 7 (Appendix A). Comments generally fell into three categories:

- Request for clarification and concern for current or committed policy settings to date. E.g. the future Sydney Trains service plan west of Bankstown after the opening of Sydney Metro City and South West Line in 2024.
- Local planning or geographical insights that were adopted in specification of the scenarios for evaluation.
- Local planning or geographical advice that could not be adopted (in part or full) due to reasons such as a difference in timings for a new development compared to the proposed transport initiative, conflicts with initiatives already committed, or the study is too strategic in scale to consider specific local issues. Most of the comments of this nature would need to be addressed as more detailed work commences on a relevant initiative or through other ongoing reviews and processes.



## 3. South West Sydney challenges

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### 3.1 Overview

Transport customers and the community of South West Sydney have a right to maximise the liveability, productivity and sustainability of their region. However, analysis of the study area has identified that this community bears a greater burden as a result of socioeconomic and transport disadvantage, and has range of local access and amenity issues, including:

- a growing need to accommodate a high rate of population growth,
- a large proportion of socio-economic disadvantage and people with a disability,
- a high rate of car dependency,
- poor public domain and streetscape amenity,
- built and natural barriers to walking and cycling, and vulnerabilities to climate change and urban heat.

Nevertheless, there are opportunities for targeted transport investments to support a range of beneficial outcomes for the community. These opportunities include supporting the development of Liverpool as a Metropolitan Cluster (as designated in the Sydney Region Plan) and catalysing a range of urban renewal and infill development opportunities.

Conventional transport issues such as road congestion and public transport crowding are not the key issues or root causes of need within the study area. The identified community needs are largely structural and systemic issues related to the typology and function of the transport network and the place outcomes this network has shaped. In this regard, the policy challenge is far broader than a mobility problem, rather being a challenge of understanding how the next increment of investment and operational changes might catalyse and support a structural shift in access, opportunity, amenity, and the development of a more sustainable urban environment that supports and reinforces those outcomes.

In developing a nuanced understanding of the needs of the study area and the problems that arise in satisfying those needs, it is important to consider that there are two distinct scales of problems and solutions:

- Metropolitan-scale pertains to not only the study area but also its relationship or connectivity to the wider metropolitan area. For example, equitable access to employment, societal or cultural opportunities in other parts of the metropolitan area.
- Local-scale pertain to those that are specific to the local characteristics of the community and place, such as quality of public domain, resilience to environmental stresses (especially in light of climate change), and support for active transport. Resolving these can then attract opportunities to the study area and thus work to improve the area's resilience and reduce the need to travel beyond it.

## **3.2 Problem statement**

### **3.2.1 Poor metropolitan connectivity to jobs, services and amenities**

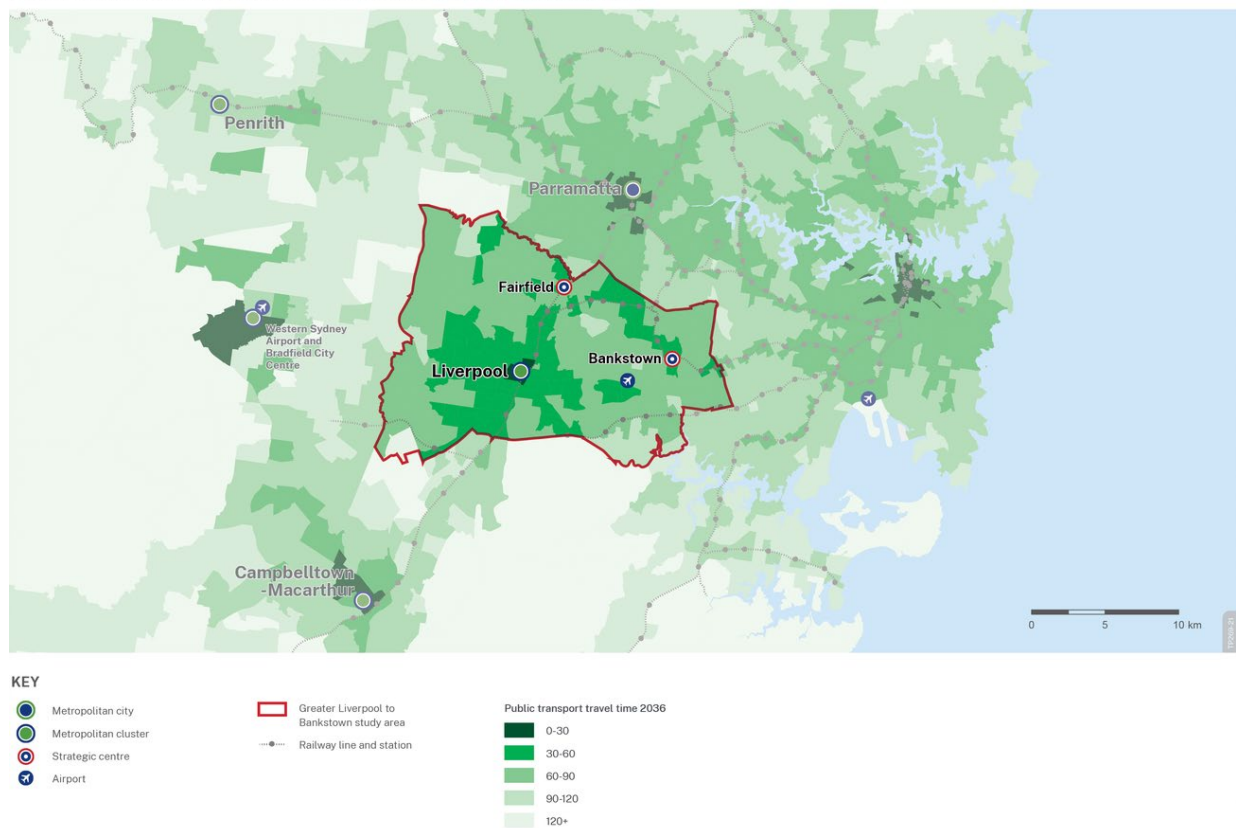
Travel times to centres beyond the study area that favour public transport use and offer higher-paying, high-skilled employment, such as Parramatta, Sydney CBD, North Sydney and Macquarie Park, are relatively poor compared to other places within metropolitan Sydney. Long travel times and infrequent transport services limit the opportunities for residents of South West Sydney to participate in employment, social and cultural activities, and to partake in opportunities for personal and professional betterment.

As seen in light and dark blue in Figure 14, much of the study area is more than 30 minutes by public transport from the nearest metropolitan city or cluster (e.g. Parramatta, Liverpool, Bradfield, Campbelltown) after the inclusion of access, waiting and interchange times.

The root cause of these comparatively long travel times are due in large part to the structure of the public transport network and service levels. For example, among the study area's strategic centres:

- From Fairfield or Liverpool to Parramatta (the nearest metropolitan centre), direct train services are fast (under 25 minutes) but infrequent, departing every half-hour all day and all week.
- From Bankstown to Parramatta, taking the train takes about half-an-hour but requires an interchange at Lidcombe. Alternatively, frequent but slow bus services can take almost twice as long.
- For travel to Sydney, Bankstown is relatively well served by a train service, which will improve in frequency upon the opening of the City and South West Metro.
- For Fairfield and Liverpool, the service to Sydney is reasonably frequent during the off-peak (departing every quarter-hour) but the travel time is almost one hour due to the circuitous route taken via Granville and frequent intermediate stops in the Central and Inner Western suburbs. This is comparatively slow considering for example that Penrith or Campbelltown to Sydney has a similar travel time as Liverpool to Sydney despite being former being twice the distance from Sydney as the crow flies.

Generalised public transport travel time to nearest Metropolitan city or cluster 2036



**Figure 14: Generalised public transport travel time to the nearest metropolitan city or cluster**

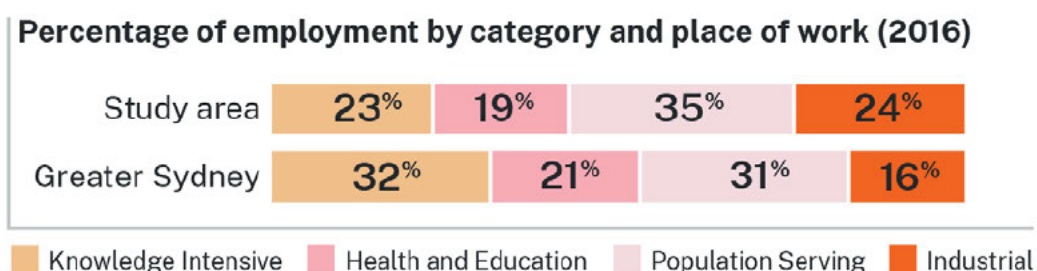
### 3.2.2 Insufficient job diversity to cater for population

Future Transport Strategy 2056 and the Sydney Region Plan envisions a metropolis of three cities, where communities have improved access to job opportunities, amenity and services, in part through the development of Liverpool as a Metropolitan Cluster. Uncompetitive metropolitan connections limit the ability for residents of the study area to commute out of their immediate area but conversely also hinders the ability for the area to grow economically and create a diversity of jobs to both support its population and improve its socioeconomic status.

Poor connectivity discourages new businesses from developing or growing in the study area due to a constrained catchment of potential customers and workers. The impact of this problem is exacerbated in more specialised, higher value-add, niche or knowledge-based industries that need a wider catchment to source suitably skilled workers or to maximise their potential customer base.

The inability to diversify jobs and industries within the study area can then affect the socioeconomic development and resilience of the area by perpetuating the need for more skilled residents to submit to longer commutes (to the detriment of their personal health and wellbeing), forgo more distant but productive, higher value and higher paying jobs, or move out of the study area all together. The disparity in job diversity between the study area and Greater Sydney generally can be seen particularly in the lower percentage of knowledge intensive jobs in Figure 15 and Table 16.

**Figure 15: Percentage of employment by category and place of work**



Source: Australian Bureau of Statistics (2016)

**Table 16: Differences on employment share in each category between Greater Sydney and study area**

Broad Industry Category	2016 Difference (percentage points)
Knowledge Intensive (KI)	-8.8%
Health and Education (HE)	-2.2%
Population Serving (PS)	3.8%
Industrial (IND)	4.3%

Source: Australian Bureau of Statistics (2016)

### 3.2.3 **Sprawling urban development with poor public domain and streetscape amenity**

Historically, the spatial structure and urban form of growth in South West Sydney has led to a range of unsustainable outcomes, such as a dispersed and auto-oriented urban form, longer transport journeys and car dependency, poor health and safety outcomes on the transport network. Many public spaces within the study area suffer from poor amenity and severance. Road corridors throughout the study area are engineered for vehicles travelling at speed, leading to poor public transport service coverage, minimal shade features, suffer from air and noise pollution, may lack passive surveillance, have inadequate footpaths and bicycle paths, and lack a sense of local character and identity.

The market for lower-density car-oriented development was historically very popular as increasing car ownership and suburban industrial areas characterised urban development in the mid to late 20<sup>th</sup> century. These preferences and market assumptions were widely captured in regulatory standards and frameworks that continue to govern urban development in the study area today. Land value economics can also explain this outcome, where the marginal cost of land consumption is cheaper than the marginal cost of higher density construction – therefore, where land values are low, the market will deliver lower density development. Unfortunately, low density land uses also provide insufficient taxation revenue to fund high quality public domain and streetscapes. Poor road environments and severance issues further diminish land values and encourages further dispersion of development. This historic trend will likely continue over the coming decades unless there is deliberate intervention to catalyse change.

The Western City has only 19 per cent of the housing stock in the form of apartments or townhouses (high and medium density) – this is significantly below the Greater Sydney average of 46 per cent. The low proportion is in large part due to the poor transport connections within the Western City (in comparison to other parts of Greater Sydney) preventing councils and developers from promoting a higher concentration of housing and the resultant diversity this can bring.

Despite land and property values indicating a community preference for more urban forms of living within mixed-use, compact, walkable and transit-oriented neighbourhoods, additional supply of these neighbourhoods today is largely constrained to high-rise in-fill within in-centre precincts. This form of growth can be equally challenging to affordability and liveability due to its much higher construction and maintenance costs (e.g. more substantial excavation for foundations, complex structural and load-bearing requirements, lifts, fire and evacuation considerations). Limiting in-fill development to high-rise development within existing centres can deepen the mismatch between housing needs and supply, limiting choice.

The sharp spatial change in housing type is visible in Figure 17 when one observes the dominance of units in centres of Fairfield, Cabramatta, Liverpool and Bankstown compared to the prevalence of detached housing in the rest of the study area. Concentrating density at these centres is overall a positive outcome for sustainability. But there is further opportunity to provide different forms of housing and mobility and support distribution of more considered, moderate densities of low-rise, high-quality attached housing ('the 'missing middle', such as villas, townhouses and terraces) that are of sufficient density to support better public domain and streetscape amenity.

Historically, transport investments have been catalyst for land use – that remains the case today. The opportunity that presents itself today is for less capital-intensive infrastructure such as train lines that need high population densities for financial viability. A more tapered and distributed approach to transport investment can deliver the housing and amenity sought by the community.



Distribution of dominant dwelling types

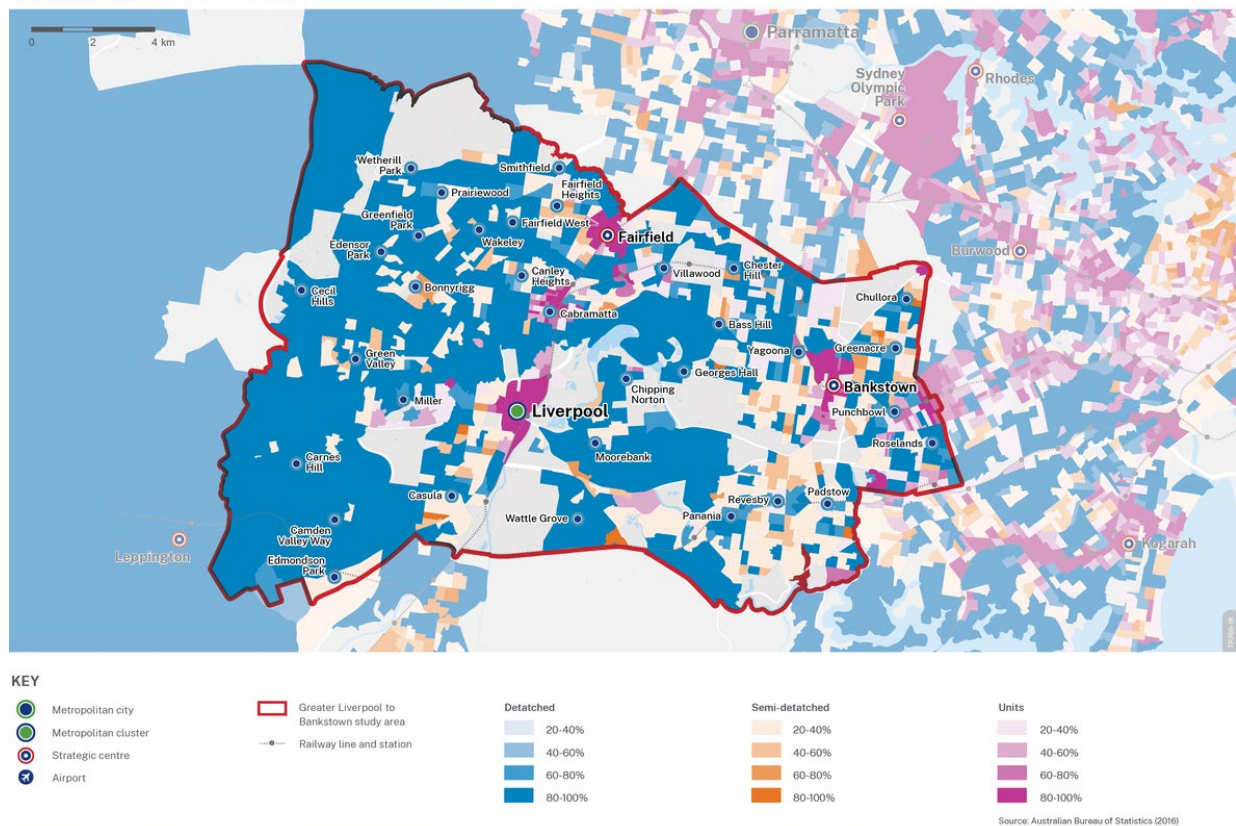


Figure 17: Distribution of dominant dwelling types

**LOW DENSITY, SINGLE USE, SEGREGATED LAND USES INFLUENCE A NUMBER OF ISSUES INCLUDING:**



**CREATES CAR DEPENDENCY**



**CREATES PLACES DEVOID OF VIBRANCY, ACTIVATION AND PASSIVE SURVEILLANCE**



**REDUCED PERMEABILITY OF PLACES**

**THE EXISTING CAR-ORIENTED PHYSICAL ENVIRONMENT PRESENTS SPECIFIC CHALLENGES:**



**MAJOR AT-GRADE INFRASTRUCTURE CORRIDORS SEVERE LOCAL MOVEMENT AND PLACE**



**PEDESTRIAN AND CYCLE INFRASTRUCTURE IS LIMITED AND POOR QUALITY**



**LIMITED TREE CANOPY COVER ALONG THE STREETSCAPES**

Figure 18: Gallery of key urban development and design issues

3.2.4 Climate change and urban heat

The community of South West Sydney is particularly vulnerable to the effects of a changing climate (Figure 19) due to both geographical and socioeconomic reasons. The number of extreme hot days in South West Sydney is increasing more than Eastern Sydney (Figure 20), due in part to the distance from the coast and access to climate-controlled indoor environments being poor due to their high cost, or dispersion of community facilities. Flood management and stormwater drainage systems can become inadequate for greater extremes in the intensity of heavy rainfall events. For vulnerable communities (either in terms of physical health or socioeconomically), this can mean more expensive heating and cooling costs, higher rates of heat-related health problems, higher risk of early death, and loss of livelihoods from flooding or storm damage, particularly for the uninsured.

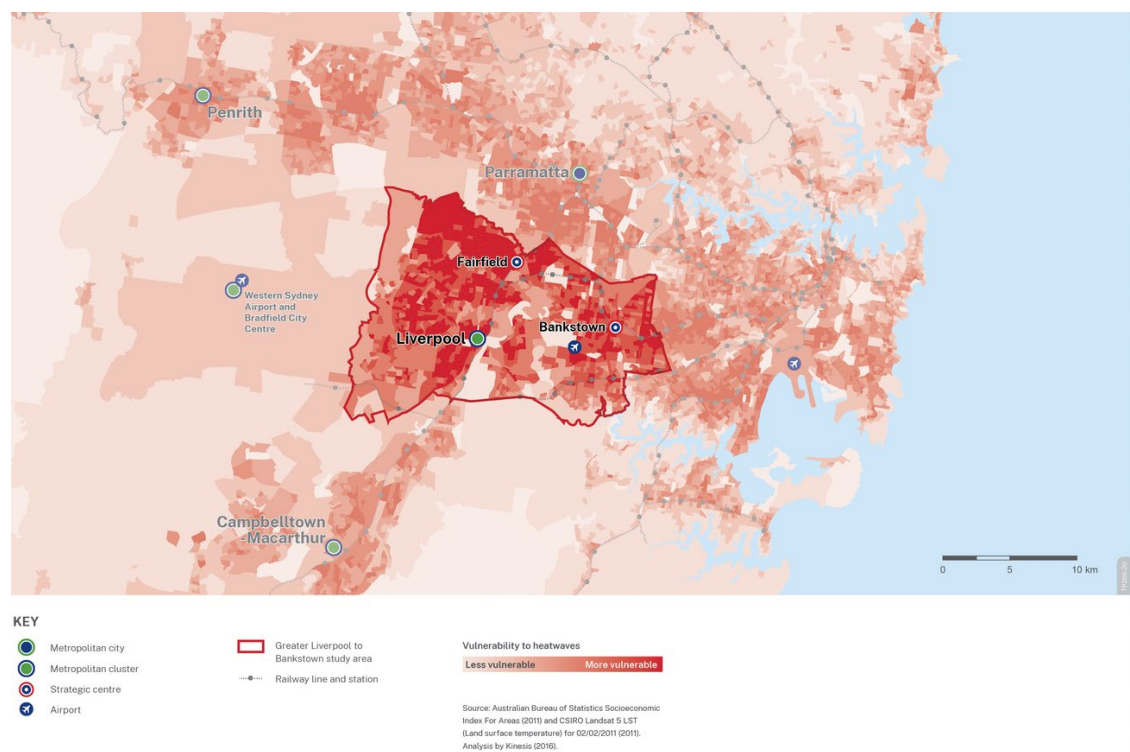


Figure 19: Vulnerability to heatwaves

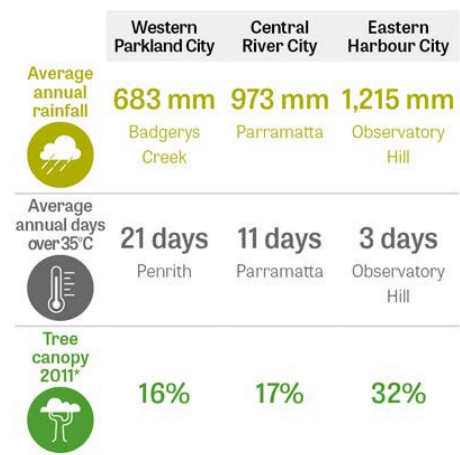


Figure 20: Comparison of climate between three cities (Greater Sydney Commission 2018)

Public and active transport investments can address the root cause of climate change such as global carbon emissions at a global scale. But local consequences also need to be addressed. The predominant dispersed urban form that necessitates high private car use can further reduce the resilience of the study area to a warming climate. For example, the large proportion of impervious surfaces dedicated to car parking and roads:

- Absorb heat during the day and release it during the night, exacerbating the urban heat island effect and increasing average ambient temperatures.
- Heighten the loads on man-made and natural stormwater drainage systems during extreme rainfall events, resulting in increased flooding risk.
- Reduce land that can be used for tree canopy coverage or vegetated ground cover to create shade and reduce ambient temperatures.

Encouraging shorter distance travel and a shift to more sustainable modes where the built form and land use is not conducive to it is extremely difficult in the study area where behavioural norms have already calcified. However, considered investment in infrastructure and services may not only make it more attractive to change behaviour, it can also act as a support for transforming the built form and land use from the status quo.

### **3.2.5 Car dominance and neglect of sustainable transport**

The community within the study area demonstrate a high reliance on private vehicles for most journeys with two-thirds of trips from the study area undertaken by private car (Figure 21). Much of the study area also has a proportionately high rate of private vehicle use compared with the rest of Greater Sydney, as can be seen for the Journey to Work (Figure 22). It is not uncommon for the private car mode share for Journey to Work to exceed even 90% in many parts of the study area – this is seldom the case in other parts of Greater Sydney areas to the north and east of the study area.

High car use or car dependency has a range of economic, social and environmental outcomes that negatively affect community health, place amenity and transport network efficiency – some of these have already been mentioned in this statement. At a local scale, car dependent communities have higher mobility costs, both financial and travel time costs, which particularly affect residents with a physical disability and/or socioeconomically disadvantage, while diverting income that could otherwise be spent in the local community to imported cars and fuel. Car dependency also reduces community interaction and the formation of social capital. Higher rates of car use also negatively affect the environment through noise, air and water pollutants, and carbon emissions.

The state of public and active transport infrastructure in the study area is currently inadequate to effectively compete with the private car or change the culture, particularly given the numerous advantages that have been bestowed upon car users over the years. Historically high car dependency has resulted in inattention and apathy in addressing poor or moderate public transport accessibility (measured by both spatial coverage and service levels), as seen in Figure 23. The poor coverage, service levels and quality only serve to condemn the study area to entrenched car dependency.

However, investment in public transport can act as a catalyst or carrot to more sustainable travel behaviour, particularly if it is coordinated with other changes such changes to planning regulation and traffic engineering. Evidence of this exists throughout Sydney in locales ranging from Rouse Hill to Zetland.



Mode share for all trips from the study area

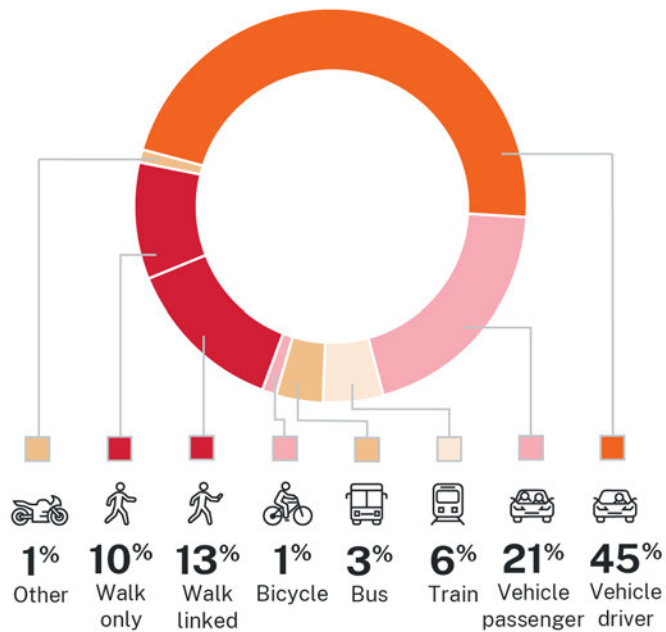


Figure 21: Mode share for all trips from study area  
(Household Travel Survey, TfNSW)

Car mode share for journey to work

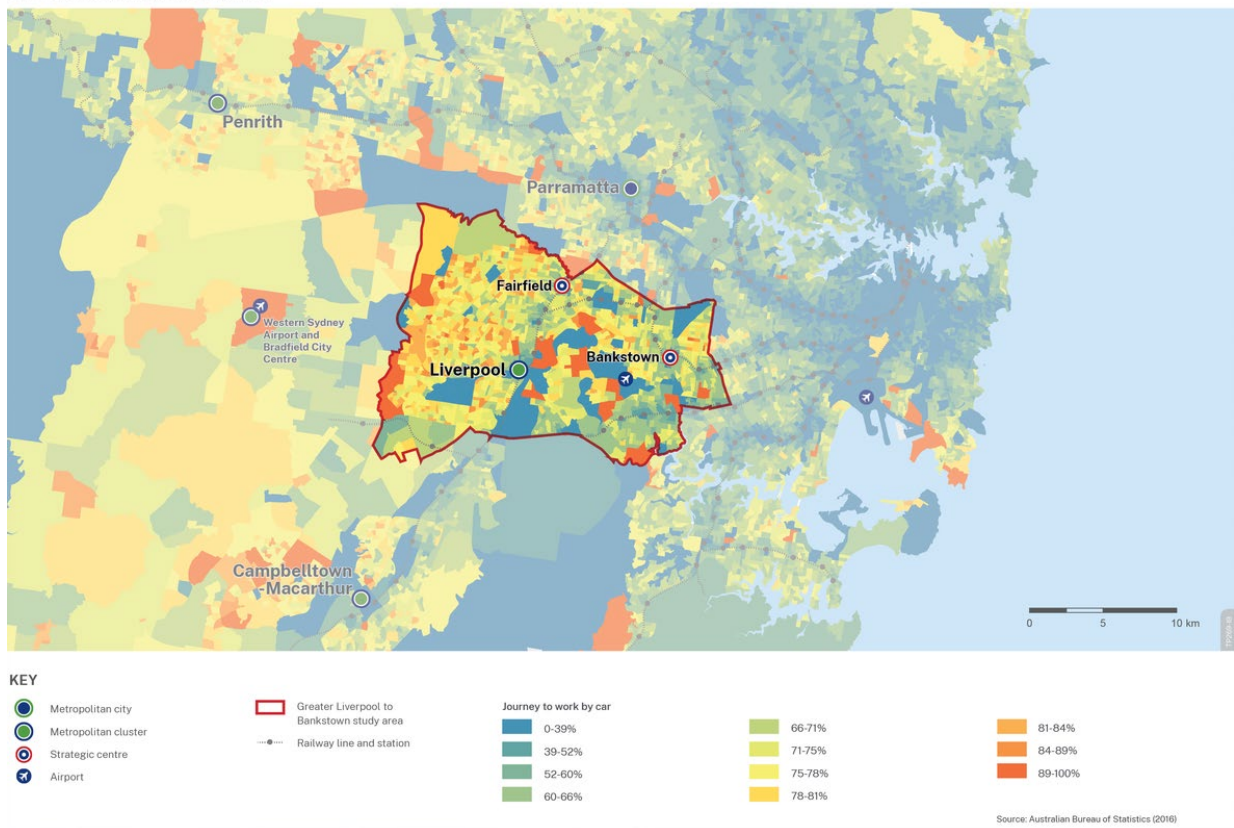


Figure 22: Car mode share for Journey to Work  
(ABS Census 2016)

Public Transport Accessibility Level (PTAL)

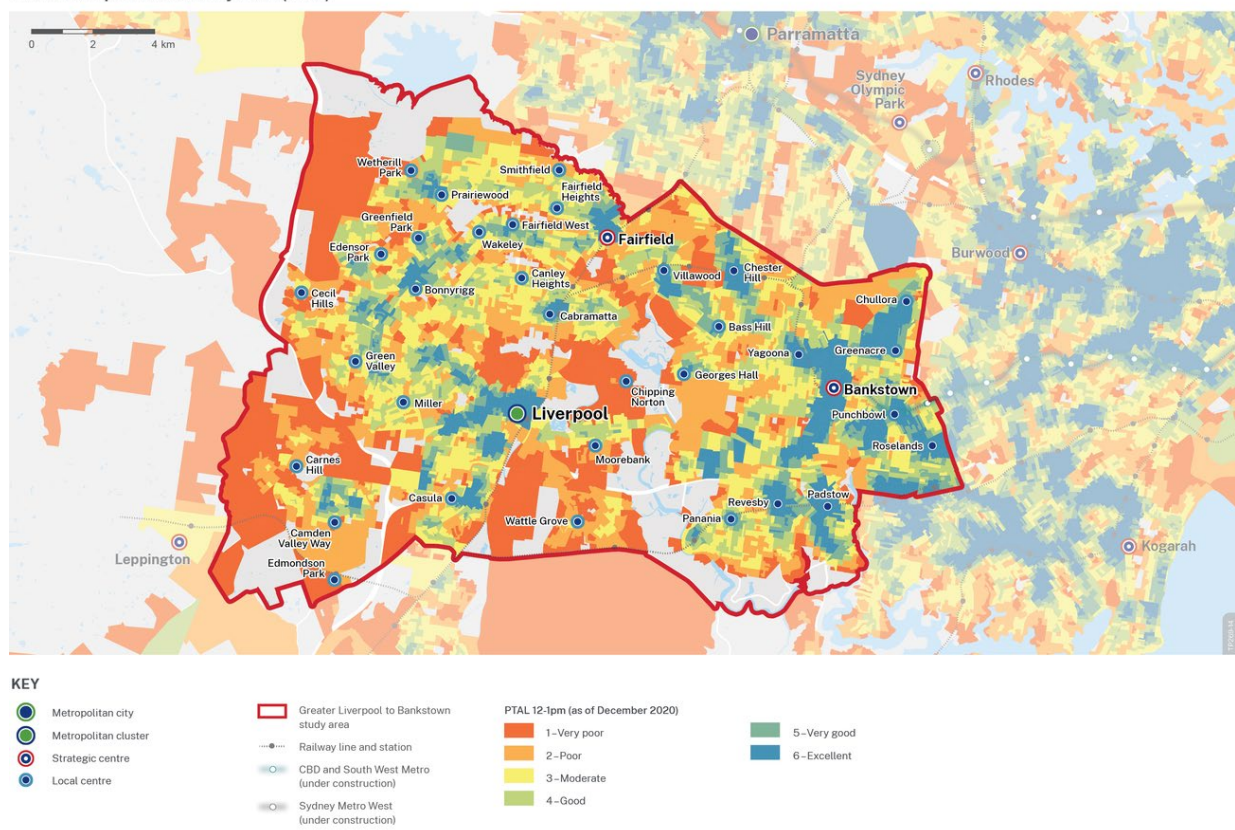


Figure 23: Public Transport Accessibility Index - Typical weekday inter-peak

### 3.3 Why act now to prepare for the long term?

A well-connected, sustainable transport network is critical to the productivity, liveability and sustainability of South West Sydney. Without investment, the region will be challenged by the needs of a growing population, constrained access to jobs and opportunity, poor public domain amenity, and fail to resist the impacts of a warming climate and changing environment. This will fail to address the community's socioeconomic disadvantage and instability, and the lost opportunity for improved living standards and economic development. Meanwhile a continued pattern of growth on the urban fringe beyond the study area will sprawl those communities beyond the 30-minute catchments of these centres (see light and dark blue in Figure 14), increase travel times and transport costs. Without change, the general lack of permissible growth in places with good public transport provision is set to continue.

The challenge of a changing climate and building resilient neighbourhoods cannot be deferred or delayed. Every investment must make meaningful contributions to lower carbon emissions if Australia is to reach its stated goal of net zero carbon emissions by 2050 and avoid potentially catastrophic impacts of climate change.

The incremental development of transport networks needs to be closely aligned with planning for population and employment growth. Deferral of transport investments that would support infill development will also strain local and state government budgets through higher greenfield infrastructure costs and restricted financial capacity to renew aging assets within the existing low-density urban area.

Poor connectivity and accessibility to South West Sydney's employment lands and urban centres like Liverpool, Fairfield and Bankstown, will result in forgone investment



and jobs to other centres and places, which may limit the productivity and economic potential of the region, or be lost to the NSW economy as a whole.

It is acknowledged the root causes and consequences of these problems are diverse and largely systemic. Because of these problems for example, private car use is the most convenient mode of travel. Journeys to work in low density industrial areas common to the study area are typically more convenient by car than walking or public transport. But travel to and from work only makes up 15% of journeys. Two-thirds of trips are by car regardless of the trip purpose. The causes of high rates of car use respond to the urban environment, financial incentives, and cultural norms. The road environment and parking facilities are typically designed for cars and are assumed to be essential, being reinforced by land use zoning, infrastructure funding mechanisms and regulatory minimums for car parking. A failure to holistically address car dependency will perpetuate the higher costs of car ownership, constrain access to opportunities beyond the local area, and perpetuate the negative impacts of car use on the environmental and community health and safety.

The systemic nature scale of the problems this area faces does not diminish the need to act. It serves to emphasise the fact that responses will need to be multi-faceted and require long-term attention and investment. The need to change and act now is required to see out the long gestation period and achieve results sooner. This can be observed for example by increasing bus service frequency during the off-peak and weekends. This can be implemented almost immediately with only the incremental cost of the driver, fuel, and maintenance and little in additional capital cost. However, it has both the immediate effect on improved accessibility for the community, and in the longer term sows the seeds that allow the community to question the need to drive or shoulder the costs of owning a car, if such a low-cost, high-quality service already exists.

“Insanity is doing the same thing over and over again and expecting different results.” But the need for better results is required – particularly for a population larger than that of Canberra’s<sup>1</sup>.

<sup>1</sup> The study area estimated population was 690,000 in 2021. Canberra’s Urban Centre/Locality population (excluding Queanbeyan) in the 2016 census was 400,000.

## **4. Vision for the South West**

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### **4.1 Developing a vision for the South West**

To address the identified community need, a vision statement was co-developed with the project working group to inform the development of potential options. The vision statement seeks to capture an appreciation for the shared ambition for the long-term outcomes of the community and place within the study area.

The collaborative vision setting process included a broad consideration of the study area context, state and local plans and a range of other project vision statements relevant to the study area. Consideration of the context included topography, hydrology, climate, history (including aboriginal, colonial and post-war migration), heritage, landmarks, networks and community demographics. The review of current plans included the Western City and Central City District Plans, Local Strategic Planning Statements, and input from Councils of current development plans and strategies.

As identified earlier in 2.4, 13 Project Working Group meetings and workshops were held discussing and building a consensus during the undertaking of the study. Two of these gathering in the latter half of 2020 focused on identifying and confirming the vision.

## 4.2 Vision statement

South West Sydney will soon become better connected both locally and across the metropolis of three cities, providing a step change in access to jobs, services and opportunity. Access to high-paying jobs will be significantly improved through faster access to the Sydney CBD, Parramatta and other centres along the global economic corridor.

As a Metropolitan Cluster, Liverpool will be the primary centre for attracting high value, globally competitive jobs and investment, and home to well-renowned health, education and cultural institutions. As strategic centres, Fairfield and Bankstown will be destinations of choice for jobs and services, realising the vision of a 30-minute city. Vibrant and bustling with life, these centres will be welcoming and safe for all, while being efficient and productive for commerce.

Beyond these centres, the area's employment lands, and freight hubs will thrive on a competitive and efficient network for freight and logistics. Bankstown Airport will become a highlight of the region, celebrating movement, technology and flight, while fostering a specialised cluster of aviation businesses and services.

Recognising the custodianship of this place by first nations people, the Darug and Tharawal people, the built environment will take greater care of its local ecology, climate and cultural heritage. The Georges River, its tributaries and lakes will become a central orienting feature of the area, with bridges, parklands and public spaces connecting neighbourhoods and residents to the natural environment. The area's historic landmarks and living cultural heritage will tell stories and lessons of the past and bring meaning and context to the present.

As the area grows the amenity of the centres will extend along transit corridors into surrounding neighbourhoods, filling previously underutilised gaps and foster a renewal of aging assets and infrastructure. Catalysed by transport investment and placemaking, these corridors will accommodate moderate densities of growth, providing greater housing choice, housing affordability and mobility options. New buildings will address tree lined streets and avenues that are inviting to walking and cycling, creating a sense of place, refuge and safety.

The transport experience itself will be modernised by new transport infrastructure and services. Transport customers will have convenient and comfortable access to their local centres and further afield to Sydney, Parramatta and the Aerotropolis. Equitable access will be assumed, with step-free movement, real-time service information, and convenient access to seating, water and shade.

The road environment will be more responsive to community needs and local context, separating fast moving traffic from people walking and cycling, and capturing water to feed a greener landscape and more abundant tree canopy. The movement of freight will become increasingly inconspicuous from daily life, while the movement of deliveries and essential services will add to the vitality and safety of the street.

### 4.3 South West Sydney transport scenarios

Table 2 is a matrix of each of the scenarios and their key components. The justification and makeup of these components form the majority of this report.

All assumptions and specifications for these scenarios are indicative and intended for use in this study only. They are subject to further design and development prior to confirmation and implementation.

**Table 2 Scenarios and components**

Components		Reference case	Metro South West Extension (SWE)	New Cumberland Line (NCL)	Rapid Bus Network (RBN)	SWE + RBN	NCL + RBN
A	<b>Common Planning Assumptions as per STM 3.8</b> , except where a component has been explicitly listed as included or omitted in this table.	O	O	O	O	O	O
B	Parramatta to Kogarah via Bankstown Metro	O	O	O	O	O	O
C	South East Suburbs Metro Extension (Sydney to Randwick)	O	O	O	O	O	O
D	<b>Rapid bus routes as per GSINP and GSBNS either:</b> <ul style="list-style-type: none"> <li>outside the study area, or</li> <li>inside the study area and committed by others</li> </ul>	O	O	O	O	O	O
E	<b>South West Metro Extension</b> from Bankstown to Liverpool		O			O	
F	New T5 Cumberland Line upgrade			O			O
G	<b>Rapid bus routes inside the study area as per GSINP and new routes proposed by this study</b>				O	O	O
H	<b>Frequent and local bus network enhancements</b> <i>in response</i> to Rapid bus routes inside study area (component G)				O	O	O
I	<b>Frequent and local bus network enhancements</b> <i>independent</i> of Rapid bus routes inside study area				O	O	O





The reference case also includes most Strategic Travel Model (STM) Common Planning Assumptions used in the modelling of TfNSW-led projects. These generally include formally publicly committed projects, although it should be noted such commitments are not contingent on a funding allocation and thus may also be subject to change.

#### **4.3.2 Metro South West extension**

In March 2019, the NSW Government committed to investigating an extension of Sydney Metro South West between Bankstown and Liverpool. This assessment follows investigations conducted by Transport for NSW in 2016 for a similar extension. However, there have been numerous changes in strategic planning in NSW (including the Metropolis of Three Cities, Future Transport Strategy 2056, and GSINP).

In these strategies, there is a greater emphasis on improving development opportunities and north-south connectivity to Greater Parramatta, and new connectivity between the emerging Western Parkland City 'metropolitan cluster' of centres, for which Liverpool and Bradfield are key centres.

This has strategic implications for the prioritisation of Metro South West extension as it does not directly feed Parramatta, or connect Western Parkland City centres. Nevertheless, a key benefit remains that the Metro extension would provide the study area with a more direct connection to Sydney CBD. It was for this reason that GSINP recommended the implementation of this line in the long term.

The Greater Sydney Commission has also developed place strategies for the Bankstown and Liverpool Collaboration Areas, which are important considerations for any proposed transport infrastructure along this corridor.

This study presents the opportunity to compare the solution of a South West Metro extension compared to other solutions identified since the Metro extension was first mooted, within the context of a current strategic metropolitan planning directions.

With consideration of feedback received from stakeholders, a concept alignment was identified for comparative purposes as part of this study. The concept investigated as part of this study is ~10km in length and include stops at Liverpool, Newbridge Rd (near Governor Macquarie Drive), Marion St (near Birch Street), and Bankstown. The estimated travel time is 12 minutes between Liverpool and Bankstown.

The service frequency assumed for the line is 20 trains per hour per direction during the peak and 6 trains per hour per direction in the off-peak. This aligns with the North West Metro line today and the future frequency planned for the City and South West metro line that adjoins this extension.

South West Metro extension scenario

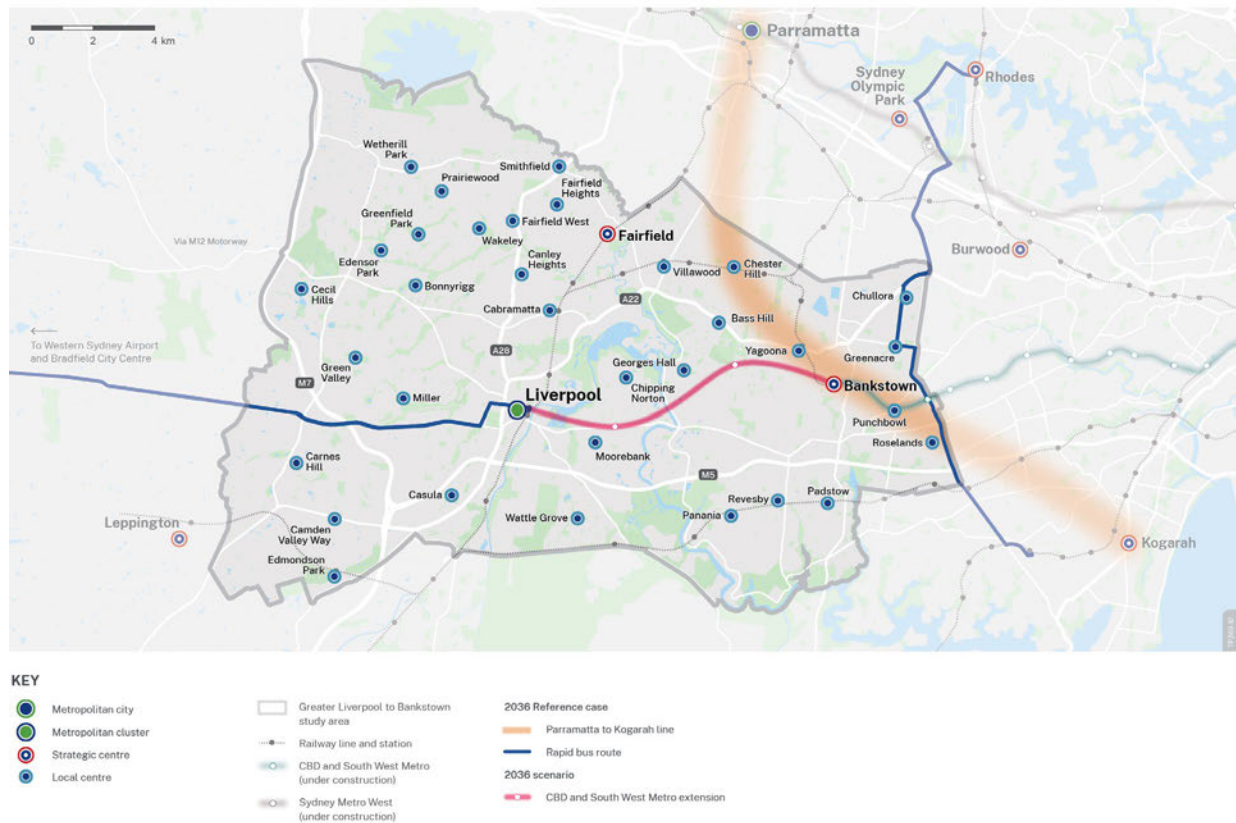


Figure 25: Metro South West Extension scenario map<sup>3</sup>

<sup>3</sup> Rapid bus routes included in the scenario but outside the study area are not shown.

### 4.3.3 New Cumberland line

The New T5 Cumberland Line (NCL) is a rail corridor between Bradfield and Epping via Glenfield, Liverpool and Parramatta identified in Future Transport Strategy 2056. The key components are:

- Bradfield to Leppington – South West Rail Link Extension
- Leppington to Merrylands – use of existing rail corridor
- Merrylands to Parramatta – new corridor
- Parramatta to Epping – new corridor

Under this concept, service frequency of the New Cumberland Line is assumed to increase to be 12 train per hour, or a service every 5 minutes, during the weekday AM and PM peaks. Outside of the peaks, the line would operate at a 10 minute headway.

New Cumberland Line scenario

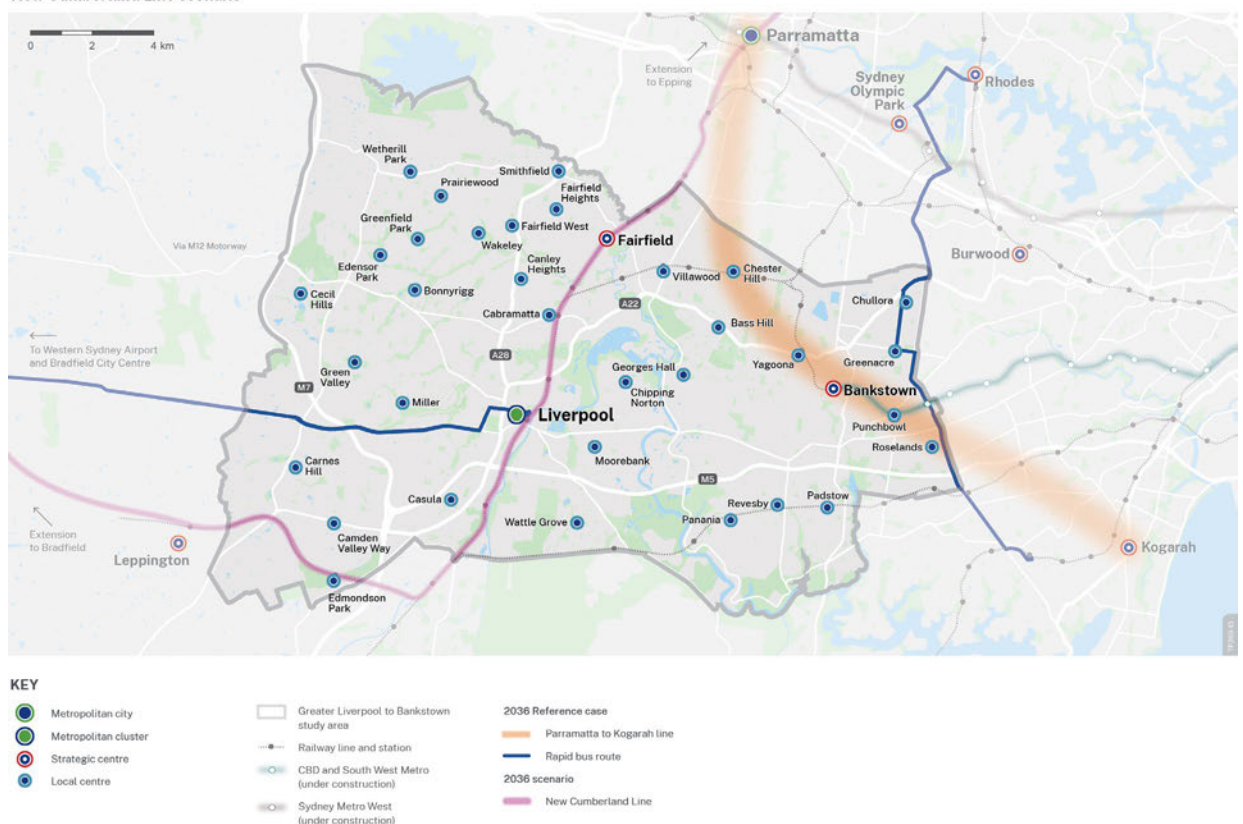


Figure 26: New Cumberland Line scenario map<sup>4</sup>

The New Cumberland Line would offer 30-minute in-vehicle travel time access from the North District and south-west Sydney to Greater Parramatta, Liverpool and Bradfield. The line is expected to offer a travel time of:

- 26 minutes Bradfield to Liverpool
- 10 minutes Liverpool to Fairfield
- 13 minutes Fairfield to Parramatta
- 9 minutes Parramatta to Epping

<sup>4</sup> Rapid bus routes included in the scenario but outside the study area are not shown.



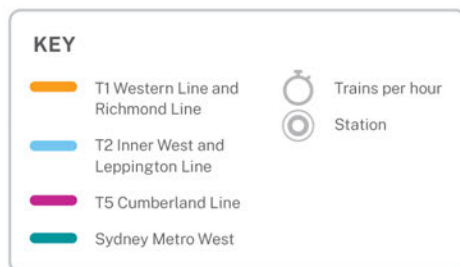
The NCL would separate the existing T5 Cumberland Line from the T1 Western Line between Seven Hills and Granville, allowing for better management of crowding on the T1 Western Line, improved network reliability and legibility.

The increase in service frequency brought by NCL will necessitate the removal of Leppington to Sydney via Granville services. The loss of these one-seat Sydney-bound services will be partially mitigated by the implementation of Liverpool to Sydney via Regents Park services in 2024 (coinciding with City and South West Metro opening), and the ability to conveniently interchange at Parramatta for Metro West and onward connection to Sydney.

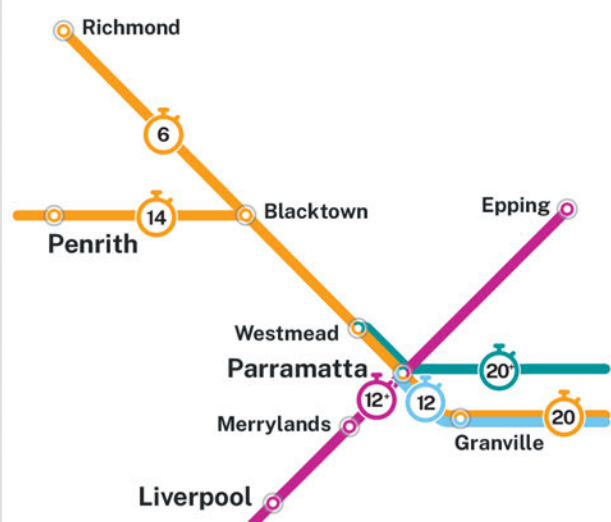
Another benefit of NCL is that it will provide the ability to start more T2 Inner West services from Parramatta (or points further west), with capacity to accommodate more Inner West passengers at busy stations such as Auburn, Lidcombe, Strathfield, Ashfield, and Newtown and the line having been freed from the task of picking up customers from upstream stations between Cabramatta and Merrylands and becoming full before reaching the Inner West.

Other alternative configurations and network plans would be evaluated through the project development process before a final concept is endorsed.

#### Without the New Cumberland Line



#### With the New Cumberland Line



Up to 10 more trains per hour on the T2 Inner West Line between the Central City and Eastern City

More than 10 more trains per hour accessing Central City from Liverpool

- Untangles and simplifies the network
- Improves network resilience
- Connects Epping with Parramatta
- Improves services between Liverpool and Parramatta
- Connects Bradfield with Parramatta

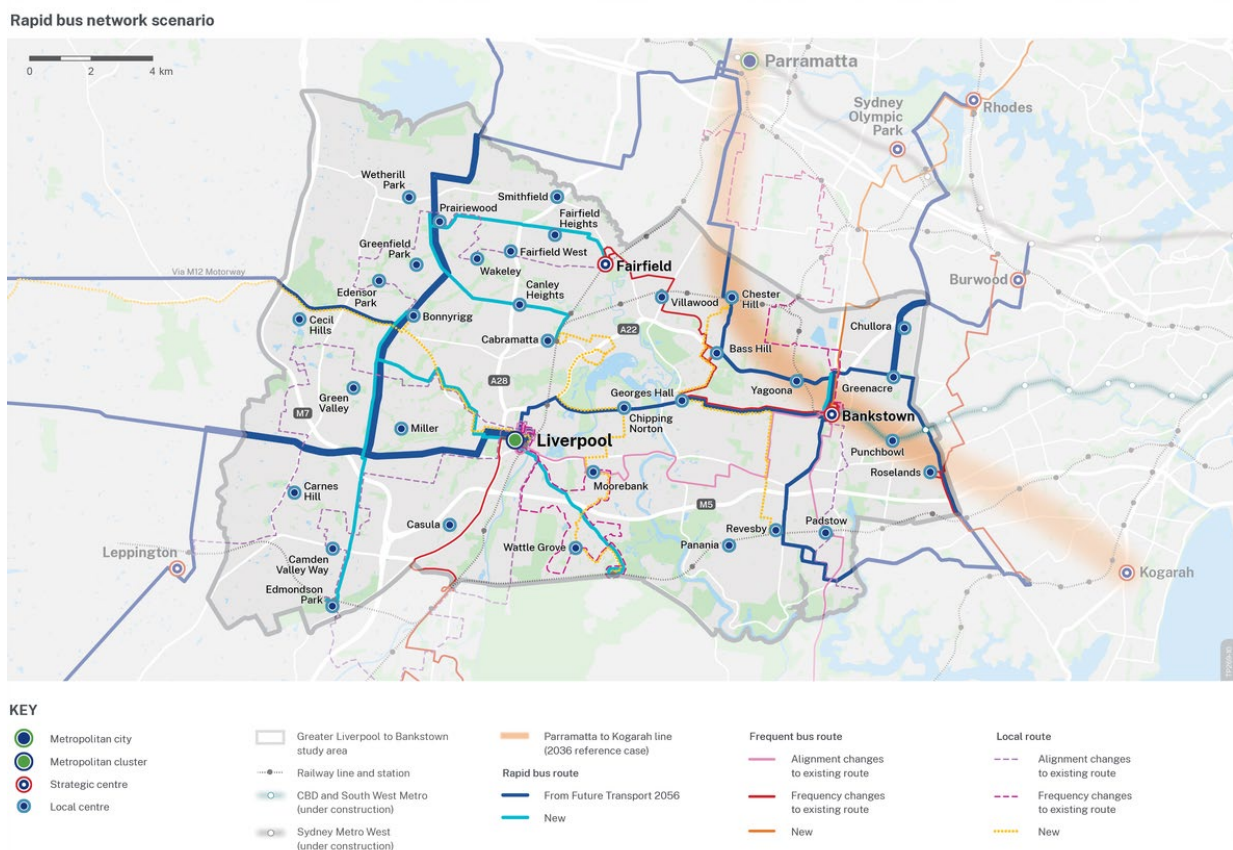
**Figure 27: Train network schematic without and with New Cumberland Line**

#### 4.3.4 Rapid bus network

Figure 28 is a summation map of all potential bus-related interventions within the study area. The map includes:

- two Rapid bus routes that penetrate the study area but have been considered part of the reference case and are not strictly part of the intermediate component (these also appear in the reference case map in Figure 24),
- eight Rapid routes within the study area connecting the study area to strategic centres outside the study area such as Blacktown, Bradfield, Burwood, Campbelltown, Hurstville, Leppington, and Parramatta,
- three Frequent and Local route enhancements in response and to complement these Rapid routes, and
- fourteen Frequent and Local route enhancements proposed independent of the Rapid routes.

The Rapid routes are proposed to have an average operating speed of 30 km/h and service frequencies of 8 or more per hour during the daytime hours Monday to Saturday and 4 or more per hour on Sundays. All Rapid bus stops will be spaced approx. 1km apart and receive upgrades to ensure the stops at a minimum have a concrete pad, seating, shelter, and real-time stop passenger information (SPI) displays. A suitable comparator are T-Way stations and B-line stops today.



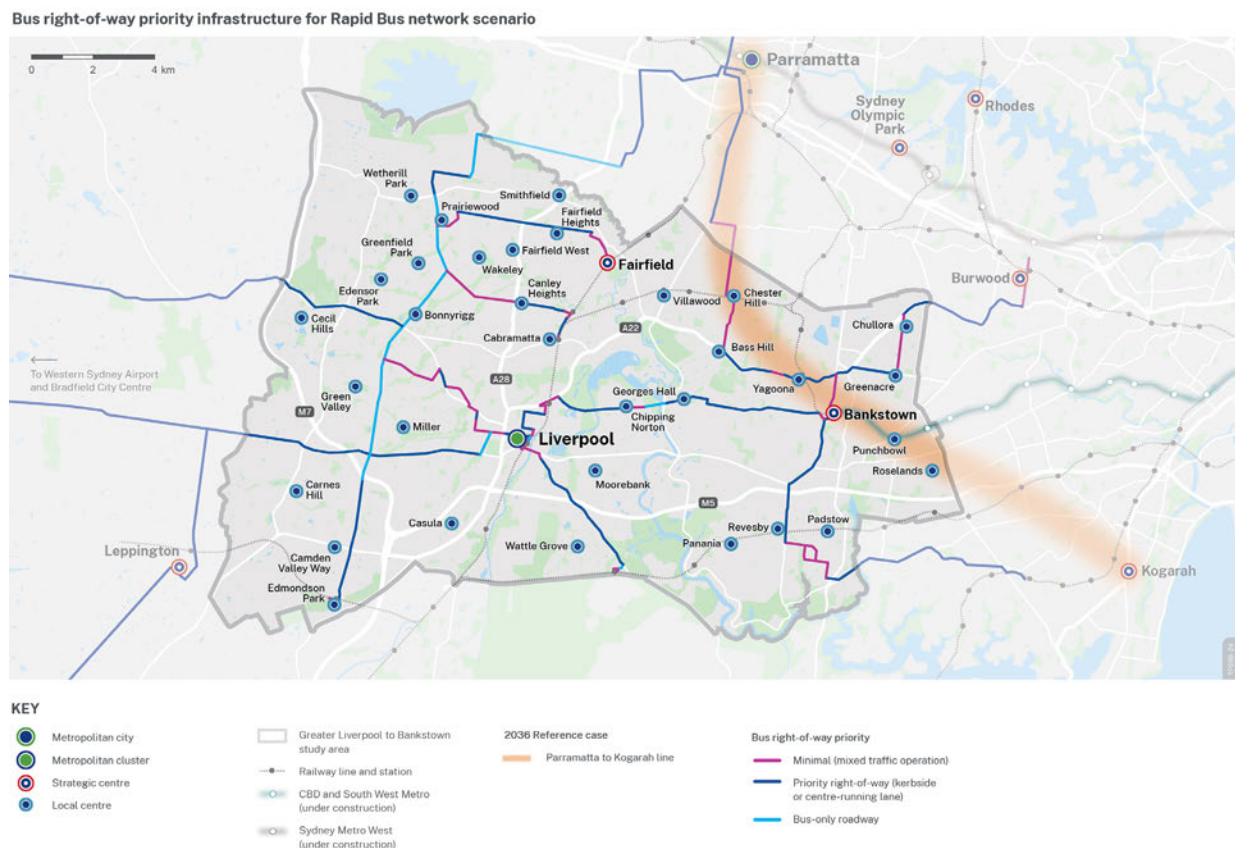
**Figure 28: Rapid, Frequent, and Local bus route service enhancements proposed in study area<sup>5</sup>**

<sup>5</sup> Rapid bus routes included in the scenario but outside the study area are not shown.

Frequent routes are assumed to have an ‘all-day’ service headway of 10 minutes – that is, a frequency of 6 buses per hour per direction applicable 7 days a week.

Local routes modified or enhanced in this study are assumed to operate every 15 minutes during weekday peak periods and every 30 minutes during the off-peak 7 days a week. These services are regular ‘all stops’ services with the differentiator between them being a slightly lower frequency and shorter operating span of hours over the day.

Figure 29 illustrates the bus right-of-way priority infrastructure assumed for this scenario. Where the infrastructure does not already exist or is not included in the Reference case, the capital cost of building the additional infrastructure is included in the evaluation of this scenario.



**Figure 29: Bus right-of-way priority infrastructure in Rapid bus scenario**

## 5. Outcomes

### 5.1 Evaluation method

The evaluation method undertaken was the application of a Multi-Criteria Analysis (MCA). This analysis used the Key Performance Indicators (KPIs) or Measures that were born from the process of:

- Translating the vision into project objectives that could be defined sufficiently so that they could be measurable,
- Establishing criteria for each objective,
- Identifying the geographic scale relevant or important to each criteria, considering the study's vision – either local (study area focussed) or GMA (Greater Metropolitan Area),
- Identifying KPIs for each criteria that could be scored or measured and ensuring the KPI matched the geographic scale(s) identified for that criteria.

The evaluation was two-stepped:

- The three main or core scenarios were evaluated to identify the first priority,
- The first priority scenario was combined with each of the two remaining scenarios to identify the best performing combination and therefore the second priority.

The reporting of results in this report will focus on the relative performance of three main or core scenarios. The combination scenarios add insight to the conclusion and recommendation by informing the order of priority.

### 5.2 Objectives and indicators for evaluation

The formulation of the objectives, criteria and indicators or measures is a culmination of:

- the review of strategic context of the study area and plans in effect,
- understanding of the importance and problems of the study area, and
- appreciation of the sense of urgency in responding to those problems.

The objectives, criteria and KPIs were developed and agreed upon by the Project Working Group including stakeholders from other state government agencies and local councils.

**Table 3 Evaluation objectives, criteria, and KPIs**

Objective	Definition	Scale	Criteria	KPI
1 Improve access to metropolitan jobs, services, and amenity	Improve access to jobs across the greater metropolitan area, specifically reducing public transport travel times to strategic centres, and providing improved access to	GMA	Increase access to jobs across the metropolitan area	Effective Job Density (based on public transport access)
		GMA	Reduce public transport travel time to all strategic centres outside the study area	Average generalised PT travel time from all zones in the study area to strategic centres outside the study area



Objective	Definition	Scale	Criteria	KPI
	cultural amenity and specialised services.	Local	Reduce public transport travel time to strategic centres in the study area	Average generalised PT travel time from all zones in the study area to strategic centres in the study area
2 Attract jobs and support the development of Liverpool and other strategic centres in the study area	Attract high-value jobs and investment and support the development of Liverpool and three strategic centres in the study area.	Local	Increase skilled jobs in the study area	Projected employment growth in knowledge intensive jobs within the study area
	Attract and retain skilled workers to the study area	Local	Increase jobs and investment in the study area	Projected population growth within the study area
3 Develop complete neighbourhoods	Provide the community of South West Sydney with a greater diversity of housing choice and higher urban amenity, and walkable access to jobs, services, public transport, and blue-green spaces.	Local	Improve housing choice, urban amenity, and walkability of neighbourhoods	Increase in areas of significant land use changes as a result of the transport investment (e.g. 800 metre catchments from all new/upgraded PT stops or stations)
				Increase in housing density within the influence area of PT investment
				Qualitative rating of the opportunities for creating walkable communities, higher amenity, and improved safety. Includes rating the potential for increased or improved access and quality of open space.
4 Improve public transport services and customer experience	Improve the frequency, convenience, accessibility, and legibility of public transport services. Enhance the customer experience at stations, stops and platforms, and improve in-vehicle comfort and the end-to-end journey experience.	GMA	Enhance PT customer experience through improved quality, accessibility and frequency of the services	Projected increase in PT patronage
		Local		Number of additional PT services per week
5 Building a socially and environmentally resilient future	Addressing social disadvantage	Local	Improve PT access for socially disadvantaged communities in the study area	The share of population in the two least advantaged SEIFA quintiles in the catchments of new/upgraded PT stops or stations
	And mitigating the risks of climate change	GMA	Reduce emission from private vehicle travel	Reduction in vehicle kilometres travelled (i.e. converted to PT and active transport trips)

### 5.3 Overall results

**Table 4 MCA normalised results**

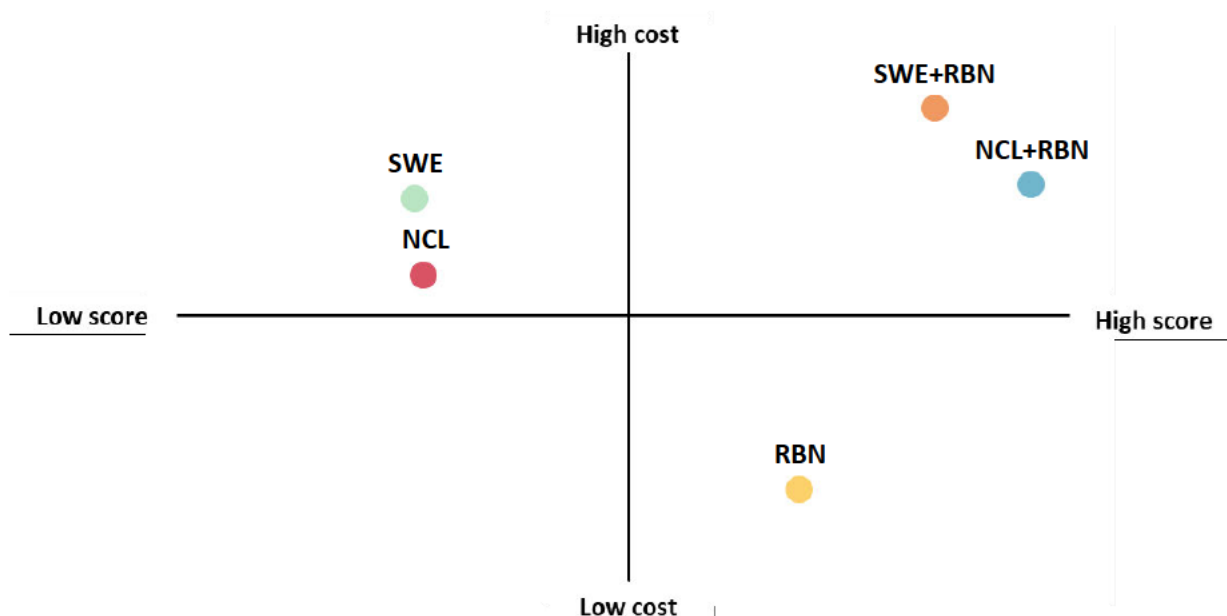
	Metro South West extension (SWE)	New Cumberland line (NCL)	Rapid Bus network (RBN)	Rapid bus network + Metro South West (RBN+SWE)	Rapid bus network + New Cumberland Line (RBN+NCL)
Total score	14	15	34	43	50

The multi-criteria analysis identified that the first priority for further development and implementation was the Rapid Bus network, followed by the New Cumberland Line as second priority. This is supported by a comparison of each scenario's cost.

Figure 30 compares the relative costs of transport investment options in addition to their MCA score. Of the core options, the Rapid Bus network (RBN) option is still the best performer, as it achieves the highest MCA score at the lowest cost.

Amongst the combination options, New Cumberland Line plus the Rapid Bus network option (NCL + RBN) achieves a higher MCA score at a relatively lower cost than the South-West Extension plus the Rapid Bus network option (SWE + RBN). Interestingly the New Cumberland Line plus the Rapid Bus option has a similar cost to the standalone South-West Extension option whilst performing far better in achieving the objectives.

It was observed that on a number of quantitative indicators that the results for the combinations were additive – that is, there is a synergistic effect that results in the combination scenario performing better than the sum of the two individual core scenarios. Chapter 0 (Appendix B) includes the full table of MCA scores.



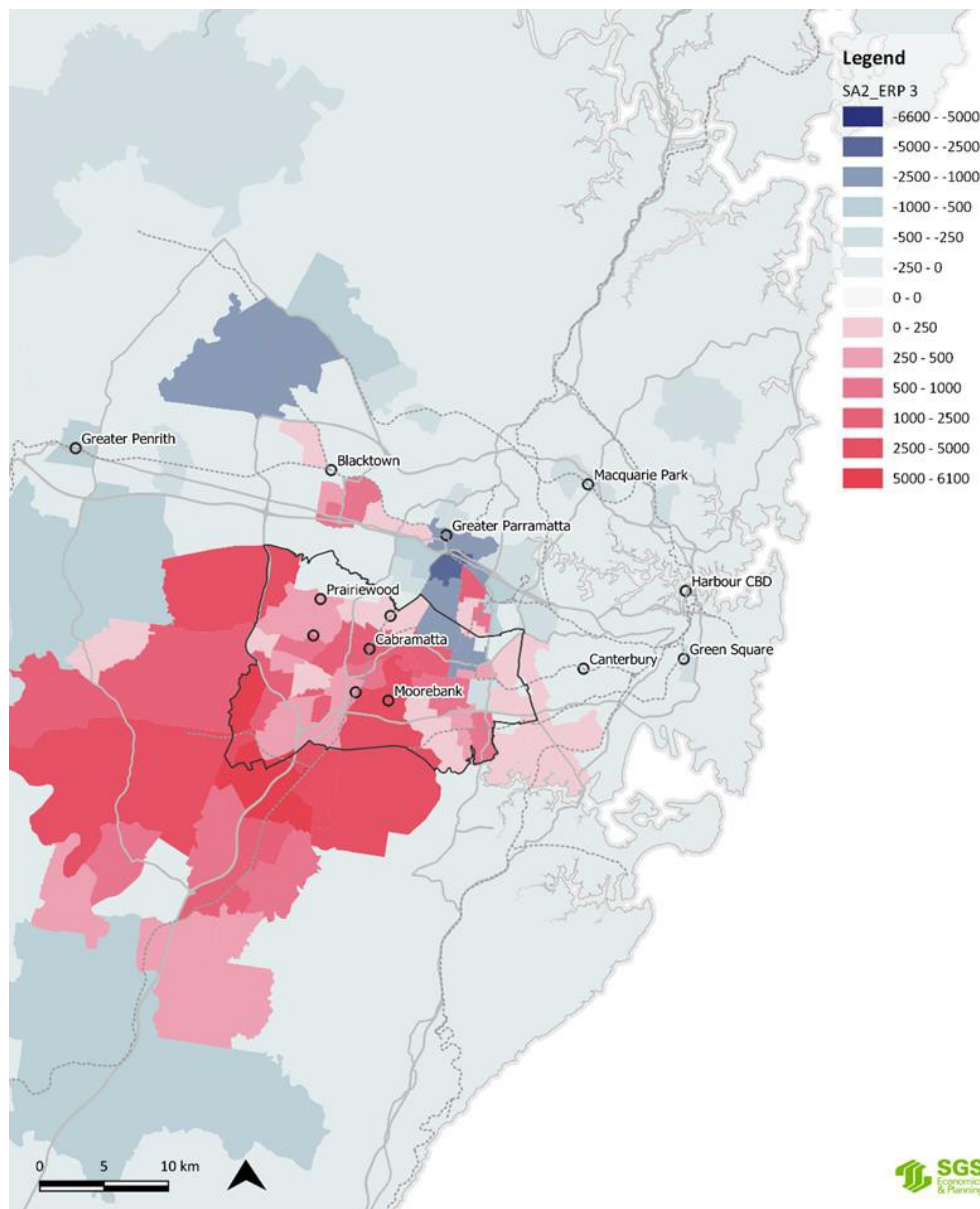
**Figure 30: Comparison of scenario MCA score and cost**

## 5.4 Land use and place outcomes and insights

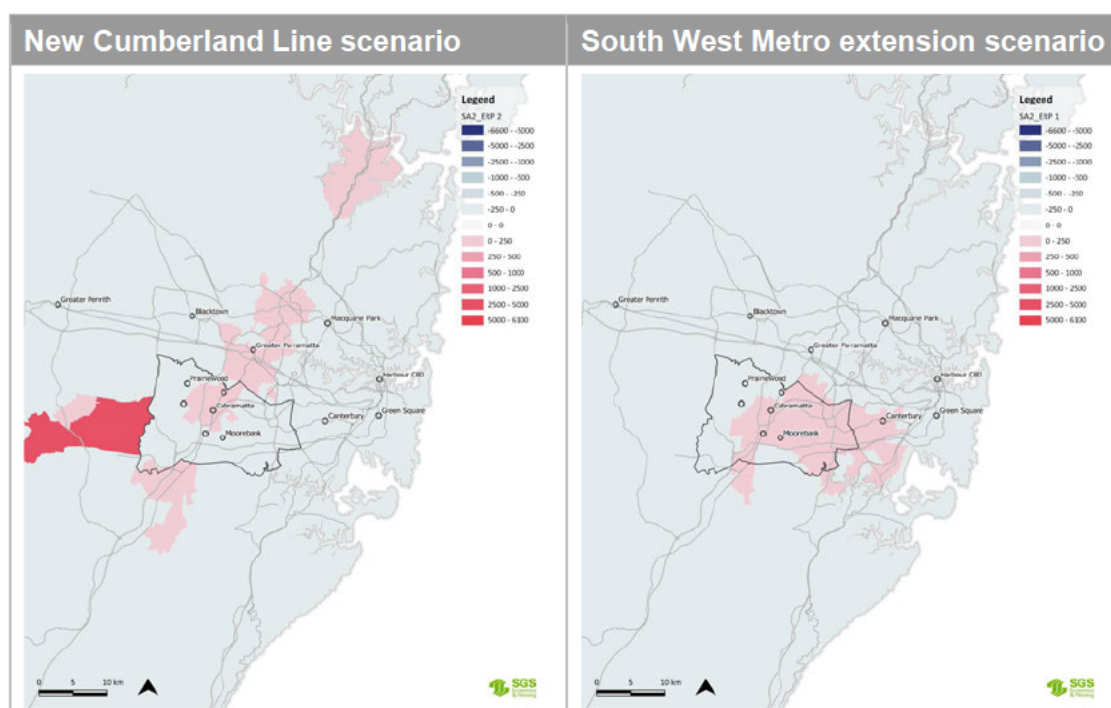
### 5.4.1 Population and jobs

At a metropolitan scale, the New Cumberland line scenario performs best among the core scenarios in improving overall accessibility to jobs (and by inference other social and economic opportunities) across Greater Sydney. This is because the new line is able leverage and amplify the attractiveness of high-density activity centres outside study area such as Parramatta and Macquarie Park, and the up-and-coming Western Sydney Airport and Bradfield.

Locally or within the study area, the Rapid Bus network scenario (Figure 31) performs best as it improves access to internal strategic centres and employment areas, with an added benefit of better connecting the study area to the areas immediately south west of the study. By comparison, the rail-focused scenarios (Figure 32) are more likely to benefit areas outside the study area and make it easier for residents to leave for opportunities rather than stay.



**Figure 31: Redistribution of population in Rapid Bus network scenario**  
Red indicates a desirable outcome. (SGS 2021)



**Figure 32: Redistribution of population in rail scenarios**  
(SGS 2021)

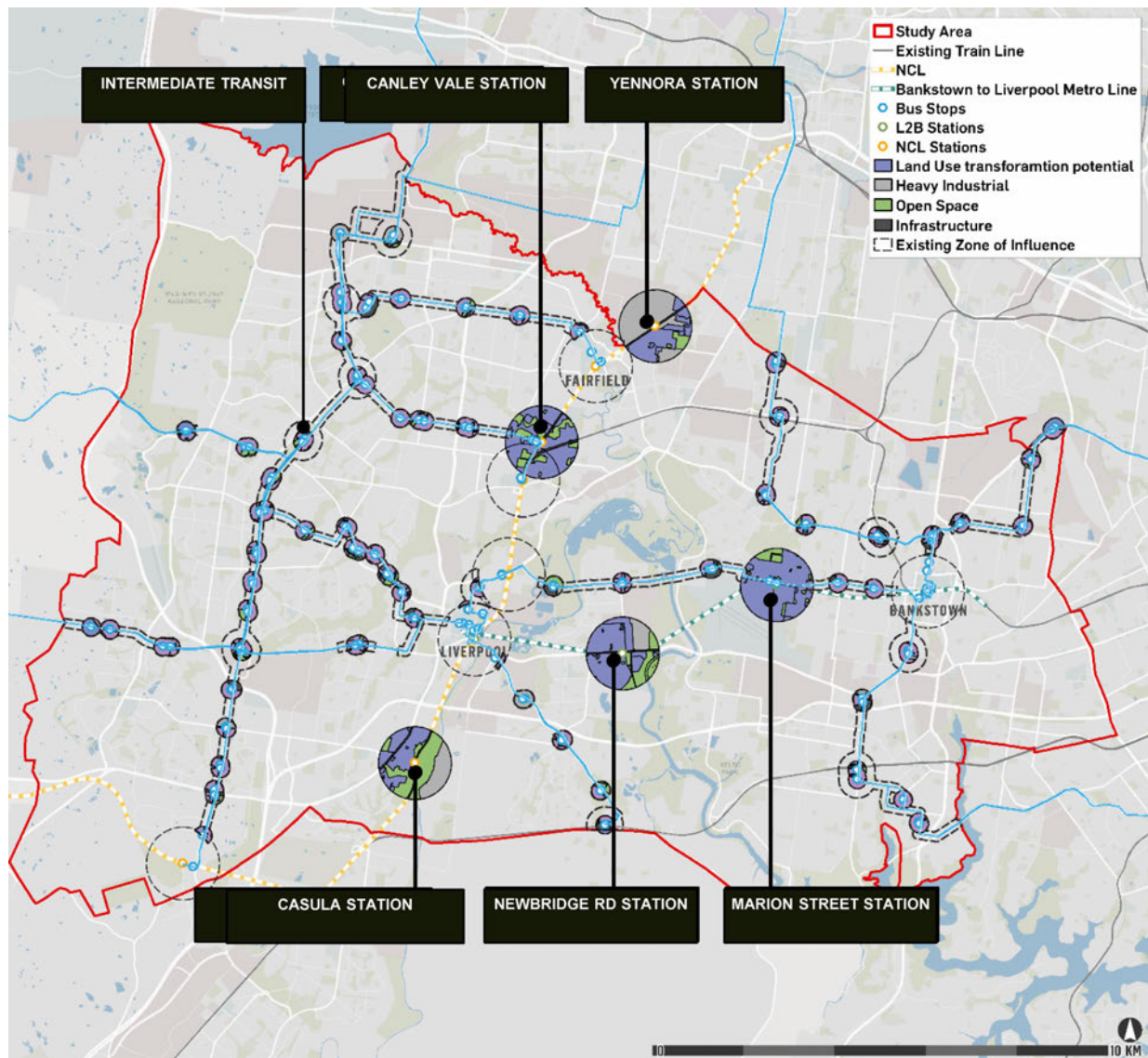
The Rapid Bus network's support for internal accessibility generates more population growth and jobs in the study area. The Rapid Bus scenario has the potential to generate 12,600 more jobs inside the study area than the reference case, representing about a 4% increase in jobs. By comparison, the other scenarios are expected to result in negligible change (less than 0.1%) when compared to the study area's 2036 forecast of 300,000 jobs.

#### 5.4.2 Density and renewal

Similar to the observed redistribution of population and jobs (5.4.1), among the core scenarios, the Rapid Bus network scenario offers the greatest likelihood in encouraging greater housing density, improving diversity, and catalysing improvements to public domain and amenity for the study area. This is due in large part to the Rapid Bus network scenario's spatial coverage in the study area across multiple routes and over two hundred Rapid Bus stops, which can be observed the prevalence of small areas of influence in Figure 33.

By comparison, while rail options may encourage significant degrees of change that radiate further from railway stations, there are fewer new or enhanced train stations in the study area under the scenario's studied. Furthermore, many of these stations catchments already have medium to high densities in existence or planned, limiting the ability for any new transport investment to further encourage urban renewal. In the New Cumberland Line scenario for example, the remaining stations open to renewal (Casula, Yennora and Canley Vale) all have either have some flooding risk or have large portions of their catchment zoned for open space or heavy industrial use (providing valuable local employment).

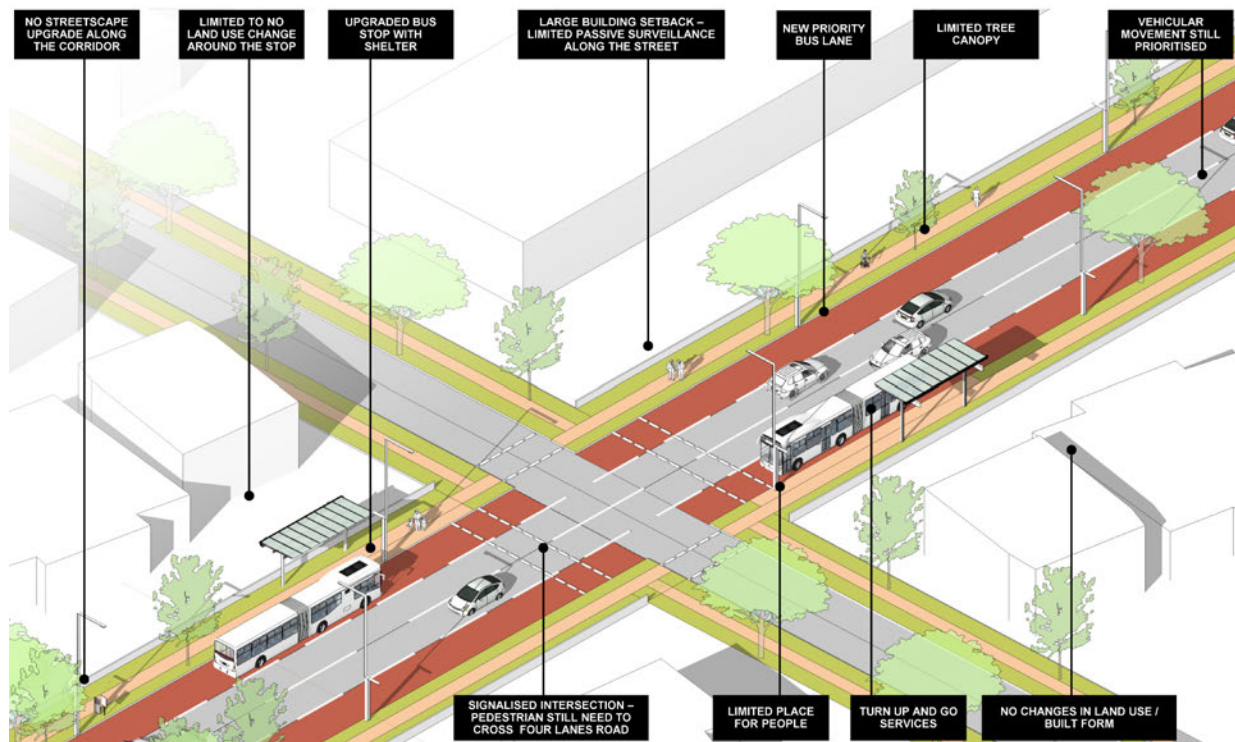




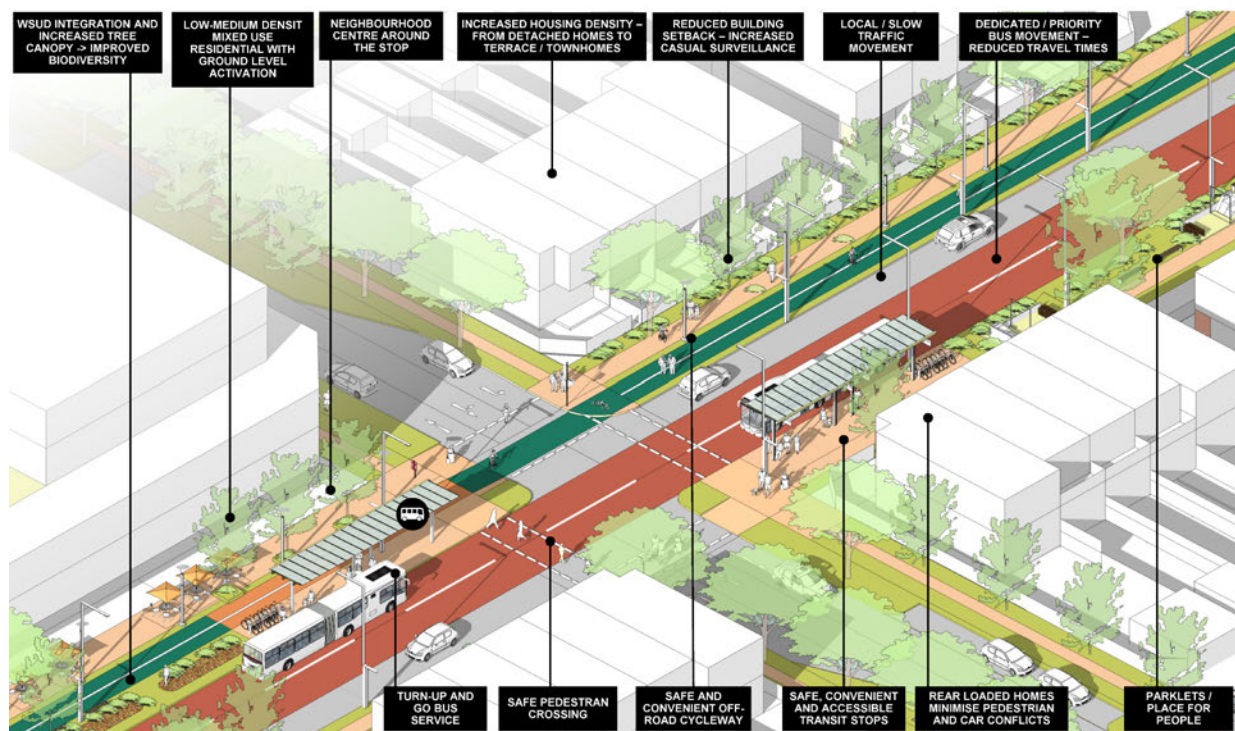
**Figure 33: Indicative areas of land use suitable for renewal in all scenarios**  
(Urbis 2021)

With respect to developing more ‘complete’ neighbourhoods with diverse housing stock, better liveability and amenity, the New Cumberland Line appeared to perform best because it was able to leverage locations that already possessed ideal qualities such as fewer severance-inducing main roads and more permeable local street networks. However, it was observed that the ability of the Rapid Bus network scenario to spur growth and renewal may be improved by deliberate design, to the point where the Rapid Bus scenario’s performance could exceed that observed in the New Cumberland scenario.

For this study, the specification of bus priority infrastructure conservatively focused on improving public transport speed and reliability, with relatively minor consideration for active transport and place outcomes. But it may be possible to design the public domain near bus stops and along the corridor to favour enhanced place and renewal outcomes. Figure 34 and Figure 35 compare the different public domain, streetscape, built form and density that can result in reprioritising different users within the same space while still delivering a Rapid Bus product. Alternative bus corridor designs that achieve this outcome can be tested through further project development.



**Figure 34: Proposal for Marion St in Rapid Bus scenario**  
(Urbis 2021)



**Figure 35: Alternative proposal for Marion St in Rapid Bus scenario**  
(Urbis 2021)



### 5.4.3 Socioeconomic

The most improved socioeconomic outcomes for the study area are observed in the core scenarios is with Rapid Bus, with a synergistic effect observed when combined with the New Cumberland line. The coverage and distribution of the network and service improvements in the Rapid bus option allows more disadvantaged areas (Figure 36) in locations such as Miller and Bonnyrigg to benefit. Approximately 30% of the study area population living the most disadvantaged<sup>6</sup> travel zones<sup>7</sup> would benefit from the Rapid bus scenario, compared to less than 5% for the remaining two core scenarios.

The Rapid Bus scenario also helps the study area to retain jobs and attract more knowledge intensive jobs that are likely to be higher paying. It has the potential to generate 3,700 more knowledge intensive jobs than the reference case, with the rail scenarios unable to move more than 100 knowledge intensive jobs each.

### 5.4.4 Environment

At the local scale, the Rapid Bus network offers the greatest ability among the core scenarios to trigger the redevelopment of energy-inefficient housing and the transformation of public domain and streetscape when considering measures such as potential for population growth (5.4.1), urban renewal (5.4.2) and socioeconomic outcomes (5.4.3). This would improve the area's housing stock and amenity for residents and workers and consequently improve resilience to climate change and mitigate the impact of the urban head island effect.

At a global scale, at least through the lens of vehicle kilometres travelled and greenhouse gas emissions, the New Cumberland line scenario is expected to have the greatest impact on the environment. There is a further synergistic effect when this is combined with the Rapid Bus scenario. This is due to the scenario's ability replace both local and longer car journeys across the Greater Metropolitan Region with public transport trips. However, it should be noted though that this benefit and the importance of this metric may diminish over time as society moves towards a carbon-neutral motor vehicle fleet.

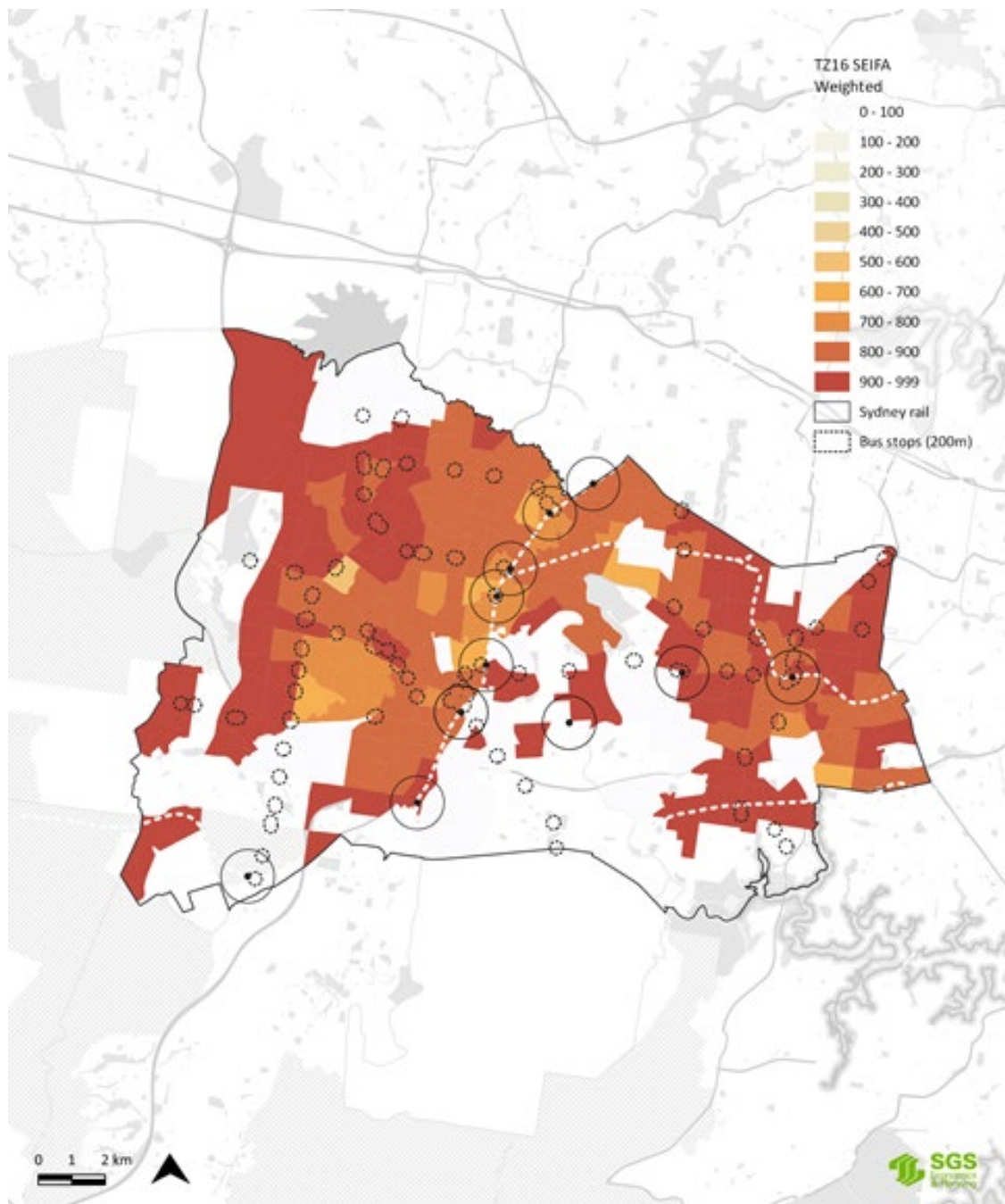
**Table 5: Change in private Vehicle-Kilometres-Travelled (VKT) relative to reference case**

	Change in VKT in AM Peak relative to reference case
Metro South West extension (SWE)	-114,066
New Cumberland Line Upgrade (NCL)	-136,805
Rapid Bus network (RBN)	-102,922
SWE + RBN	-181,929
NCL + RBN	-258,276

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<sup>6</sup> Defined as two least advantaged quintiles measured using on the Index of Relative Socio-economic Disadvantage (IRSD) as of the ABS Census 2016.

<sup>7</sup> The smallest geographic unit used for modelling in this study.



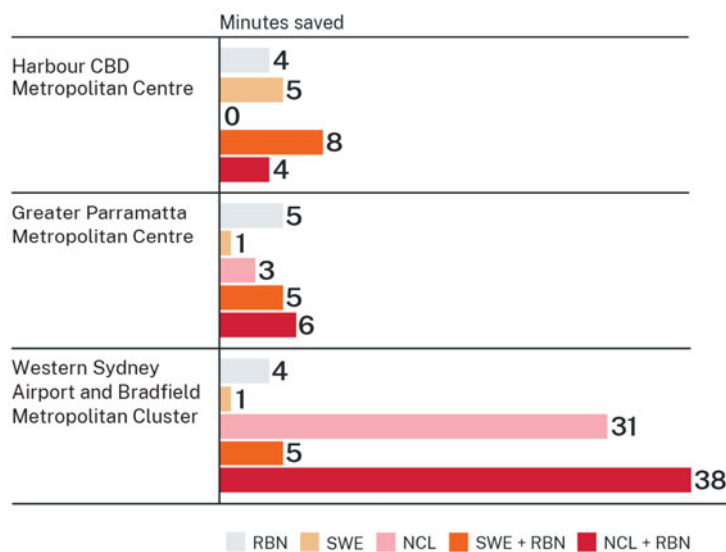
**Figure 36: Distribution of socioeconomic disadvantage, train stations and Rapid bus stops in study area**  
 (lighter brown = less advantage or more disadvantage)



## 5.5 Transport outcomes and insights

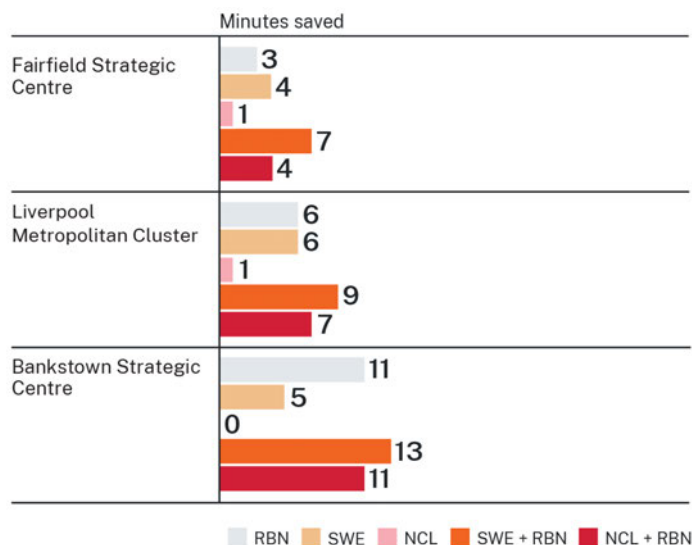
### 5.5.1 Travel time

All three scenarios generally only provide marginal travel time savings (less than 5 minutes) from the study area to Parramatta and Sydney (Figure 37) because there is already reasonably fast and frequent access to these cities. The biggest difference comes with the New Cumberland Line – this is expected to greatly advantage Bradfield, which would be directly connected to the study area by train. Interestingly, the travel time saving is additive or synergistic for the combined New Cumberland and Rapid Bus (NCL+RBN) scenario – that is, the time saving for the combined scenario is greater than the sum of the time saving from each of the two individual components or core scenarios.



**Figure 37: Average generalised time savings from the study area to the three cities of Greater Sydney**

Focusing only on local travel (from the study area to strategic centres inside the study area), the Rapid Bus network scenario (RBN) is generally the standalone scenario that achieves greatest time savings, although not necessarily for all centres.



**Figure 38: Average generalised time savings from the study area to the three internal strategic centres**

## 5.5.2 Public transport supply and demand

In terms of increasing public transport services for the study area, the Rapid Bus scenario has the strongest lead. This is because of the large number of new and upgraded routes.

The New Cumberland Line scenario is only expected to result in a minor increase in additional services as much of its benefit results from direct links into in new destinations and improved interchange opportunities rather than significant increases in service levels (as illustrated in Figure 27).

The South West Metro extension is in the middle of the field. While the Metro extension services have been counted as 'additional services' for the MCA, technically these are just extensions of services to Liverpool that would otherwise terminate at Bankstown, which is already inside the study area.

**Table 6: Additional services per week by scenario**

Scenario	Number of additional services per week compared to reference case
South West Metro extension	2,500
New Cumberland line	300
Rapid Bus network	22,200

Among the standalone scenarios, the Rapid Bus network scenario is forecast to carry the greatest number of passengers across the Greater Metropolitan Area. However, similar to what was observed in generalised travel time savings (5.5.1), public transport patronage is additive or synergistic for the combined New Cumberland and Rapid Bus (NCL+RBN) scenario – that is, the patronage for the combined scenario (65,900) is greater than the sum of the time saving from each of the two individual components ( $32,000 + 32,800 = 64,800$ ; 1,100 difference).

**Table 7: Forecast patronage increase by scenario**

Scenario	Forecast patronage growth from 2036 Reference case in AM Peak
South West Metro extension	22,300
New Cumberland line	32,000
Rapid Bus network	32,800
South West Metro extension + Rapid Bus	51,700
New Cumberland line + Rapid Bus	65,900

## 5.6 Covid-19 pandemic

As a result of the COVID-19 pandemic, demand for access to metropolitan centres significantly changed due to the COVID-19 pandemic.

Anecdotally, knowledge workers appear to be increasingly working from home for the long term and enhanced attractiveness of local centres may reduce the need for longer metropolitan journeys. Meanwhile, modelling in this study (without Covid-19 impacts) found that new Public Transport trips<sup>8</sup> in the two rail-focused core scenarios have a longer average trip length than Rapid Bus.

These insights lead to the preliminary conclusion that the Metro South West extension and New Cumberland Line scenarios may see relatively fewer benefits than the Rapid Bus scenario. The scale of the longer-term Covid impact is unclear and thus has been noted rather than directly incorporated in this study at the time of writing.

Independent of this study, TfNSW has undertaken modelling of the impact of Covid-19, using the best understanding of future trends as of July 2021. For trips originating in the Greater Liverpool to Bankstown Study Area, the forecast reduction in demand in 2036 relative to base case is 12% for car, 20% for bus and 21% for train.

To attract businesses and investment, it is still safe to assume that better access to customers, suppliers, workers and collaborators will remain a key prerequisite of economic development in the future as these are fundamental to how the economy and society operate – only the exact quantum is uncertain. Forecasts and assessments will need to be revised as new information comes to light and hypotheses become fact.

<sup>8</sup> Modelling excluding the impact of Covid-19 identified that the average length of for ‘new’ public transport trips (that is, where a public transport trip has been created in response to reduced generalised cost of travel) was 20.4 km in the Rapid Bus scenario, 27.3km in the Metro South West scenario, and 29.8km in the New Cumberland Line scenario.

## 6. Conclusion

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### 6.1 Recommended order of priority

When considering the core scenarios, the Rapid Bus scenario performs best in supporting the study objectives. Relative to the reference case, the Rapid Bus scenario:

- Has the highest impact on reducing average generalised public transport travel times in the study area,
- Brings more than 3,000 knowledge intensive jobs in the study area,
- Has the greatest area for potential land use and place making changes,
- Provides the most benefit to areas of socioeconomic disadvantage,
- Provides the greatest increase in the availability and frequency of public transport in the study area.
- Is likely to generate broader transport benefits in a less costly manner.

Amongst the combined scenarios, the Rapid Bus plus New Cumberland Line scenario performs best in achieving the overall objectives for the study area. In addition to the benefits of the Rapid Bus scenario, the addition of the New Cumberland Line should lead to:

- Significant travel time savings for the study area, improving access to jobs and opportunities across the Greater Sydney.
- New fast, frequent and high-capacity connectivity to WSA / Bradfield Metropolitan Cluster and to the Global Economic Corridor via Epping.
- Close to 1,000 ha of land use transformation leading to more complete neighbourhoods.
- A significant and synergistic increase in public transport use (~65,000 additional daily public transport trips).

In conclusion, the results of the evaluation suggests the following order of priority for investigation going forward.

1. Rapid Bus Network (RBN)
2. New Cumberland Line (NCL)
3. Metro South-West Extension (SWE)

### 6.2 Metro South West Extension corridor preservation

While the extension of the Sydney Metro South West Line from Bankstown to Liverpool may have ranked third on the order of priority, the extension is not entirely without merit.

The Rapid Bus option and South West Extension both accommodate a common movement function between Bankstown and Liverpool, however the latter performed better in fulfilling this need. But in reviewing the performance of each scenario over the whole study area, the Rapid Bus scenario performs better than the South West Extension as the former provides a broader coverage of benefits across the whole study area and at a more modest cost.

Nevertheless, the South West Extension scenario performed relatively competitively on a number of measures (see full list in chapter 0 Appendix). In particular, it:



- Reduced generalised travel time among the strategic centres within the study area,
- Reduced generalised travel time for much of the study area to the up-and-coming Bradfield Metropolitan Cluster to the west and Sydney to the east.
- Triggered significant land use change, surrounding the (albeit few) new stations proposed, and
- At a metropolitan-wide scale, significantly increased public transport patronage and reduction in private car use.

The recommendation for the South West Extension is that the task of corridor preservation should proceed. The initiative shows long-term benefit for Greater Sydney, albeit it may not be as urgent or as easily implemented as alternative visions. However, early protection of corridors for future use is prudent from both a community and financial perspective.

Considerations for the corridor preservation task include:

- Comprehensive options development and assessment to confirm the preferred alignment and station locations to be protected.
- Consultation with the local community and stakeholders during the development and assessment process,
- Protection in statutory environmental planning instruments, and
- Budget to undertake planning investigations and land acquisition where required.

### **6.3 Urban design and placemaking**

Work undertaken as part of this study has drawn attention to two historically neglected issues:

- The ability for enhanced bus service performance (e.g. frequency and speed) to change land use and employment patterns, particularly after considering the relatively low cost of bus interventions compared to other public and private motorised modes.
- The need to apply a more balanced approach to the design and engineering of bus priority infrastructure, such as the philosophy espoused by the Movement and Place framework, to improve environmental outcomes for the affected communities.

A more holistic and urban design-conscious perspective should be applied as it can result in even greater benefits for the Rapid Bus network, as the places it serves become more attractive and thus generates more patronage demand for the bus service.

## 7. Appendix A: Collaboration with stakeholders

### 7.1 List of project working group meetings and workshops.

**Table 8: Project Working Group meetings and workshops**

Date	Meeting/Workshop	Key Activities
28 August 2020	PWG meeting 1	<ul style="list-style-type: none"> <li>Presented Project Management Plan, PWG Agenda and summarised previous TfNSW work.</li> </ul>
24 September 2020	PWG meeting 2	<ul style="list-style-type: none"> <li>Discussed Collaboration area strategies</li> <li>Invitation for stakeholder to present findings and evidence from other plans relevant to the study area community</li> </ul>
22 October 2020	Workshop 1 – Context and guiding principles	<ul style="list-style-type: none"> <li>Present Place Context, Community Profile (demography, housing, travel behaviour) and Key insights</li> <li>Confirm planning intent and Key themes</li> </ul>
27 October 2020	Workshop 2 – Vision and Objectives	<ul style="list-style-type: none"> <li>Co-create a Vision statement and draft list of Project Objectives</li> </ul>
29 October 2020	Workshop 3 – Evaluation criteria	<ul style="list-style-type: none"> <li>Confirm Vision statement and Project Objectives</li> <li>Draft evaluation criteria</li> </ul>
8 December 2020	Workshop 4 – Understanding Movement and Place	<ul style="list-style-type: none"> <li>Present understanding of place, movement</li> <li>Key insights of 6 places evaluation</li> </ul>
10 December 2020	PWG meeting 3	<ul style="list-style-type: none"> <li>Presented draft vision, need for change, Objectives and evaluation criteria</li> </ul>
5 August 2021	PWG meeting 4	<ul style="list-style-type: none"> <li>Review of the study area and council's plans in the area, overview and recap of current and previous year's activities</li> </ul>
2 September 2021	PWG meeting 5 - Scenario development workshop #1	<ul style="list-style-type: none"> <li>Identified New Cumberland Line scenario</li> <li>Identified City and South West Metro extension preferred alignment and new stations</li> </ul>
3 September 2021	PWG meeting 6 - Scenario development workshop #2	<ul style="list-style-type: none"> <li>Identified Rapid, Frequent bus route options for intermediate transit/Rapid bus scenario</li> <li>Identified place making opportunities that could be catalysed by scenarios</li> </ul>
23 September 2021	PWG meeting 7 - Objectives and evaluation criteria	<ul style="list-style-type: none"> <li>Discussed revised objectives and evaluation criteria</li> <li>Finalised scenarios to be evaluated</li> </ul>
28 October 2021	PWG meeting 8	<ul style="list-style-type: none"> <li>Early insights and comparisons from evaluation and multi-criteria analysis</li> </ul>
16 November 2021	PWG meeting 9	<ul style="list-style-type: none"> <li>Results of multi-criteria analysis</li> </ul>

## 7.2 Comments from local councils and TfNSW responses

The summarised comments listed in this section have been collected throughout the development of this study at various meetings and written correspondence. The responses to these comments have been provided based on consideration and understanding of the issues at the time of writing.

**Table 9: Comments from Fairfield City Council and TfNSW responses**

Comment	TfNSW response
Why is East-West rail link not included in the Study?	Future Transport Strategy identified it as a post-2036 initiative, while this study is assessing scenarios up to 2036. It has been included in the reference case map for reference only.
Inconsistency between what the Western Sydney Rapid Bus (WSRB) Project proposed and what this project has proposed.	Discussion with WSRB project director undertaken. Preliminary results of project included in scenario.
Support Rapid route on Polding Street corridor between Prairiewood T-Way stop and Fairfield station. Request diversion via Prairie Vale Road/Restwell Road to serve Fairfield Hospital, Youth and Community Centre, and Leisure Centre.	Accepted rerouting suggestion and stop at Fairfield Hospital. Have not included stop outside Youth and Community centre due to proximity to other stops and dilution of 'Rapid' product. Can be reviewed during further development of route.
Historical opposition to increase density north of Polding St.	Noted.
Support Rapid route on Canley Vale Rd.	Noted.
Suggest a diversion of Bonnyrigg to Holsworthy Rapid route via Meadows Road and Elizabeth Dr to serve the Mount Pritchard Neighbourhood Centre.	Accepted.
Not sure how Bonnyrigg to Holsworthy Rapid route would work with route proposed by Western Sydney Rapid Bus project from WSA/Bradfield to Liverpool via Elizabeth Dr	Discussion with WSRB project director undertaken. Route from WSA via Elizabeth Drive included as a local route to serve catchment along Elizabeth Drive, rather than encourage TOD.
Large number of lots on Elizabeth Drive, Mount Pritchard that could benefit from renewal.	Noted. The proposed rapid route has been rerouted to take advantage of this opportunity.
East-west PT corridors linking T-Way and railway are lacking. The final product for the intermediate option cannot just be another bus route. To ensure that it is well utilised, it should be branded and have upgraded bus stops and electronic signage at each of those bus stops to provide the user a better experience and instil confidence in the network, to encourage mode shift.	The Rapid bus network scenario assumes the Rapid routes will have B-Line and T-Way like service levels, branding, and passenger infrastructure. This has been included in strategic cost estimates for this scenario.
Urban renewal and consolidation opportunities at Carramar, Fairfield, Canley Vale, Cabramatta, Bonnyrigg.	Rapid bus scenario provides improvement to all suburbs listed. New Cumberland Line improves access for Fairfield, Canley Vale, Cabramatta.

**Table 10: Comments from Canterbury-Bankstown Council and TfNSW responses**

Comment	TfNSW response
Provide clarity over the timeframes for short/ long/ intermediate solutions so we can better understand the impact on movement. For example, if the Metro extension is a long term solution, what timeframe is the rapid bus route suggestion utilising a bridge over Georges River.	All scenarios have been assessed on the basis of any can be delivered by 2036. The result of the assessment determines which of the measures or scenarios should be developed first.
Given the 2036 timeframe of this study, function of the current Bankstown to Liverpool line needs to be included within the discussion, particularly as the 2024 scenario (the publicly committed train service plan for Cabramatta-Bankstown-Lidcombe) does not support the strategic intent of better connecting Bankstown and Liverpool with this project.	The 2024 scenario assumed the South West Metro extension would be advanced. As this study now recommends prioritisation of the Rapid bus and New Cumberland Line scenarios, these will have to consider how to better connect Bankstown and Liverpool in the short term. New Cumberland Line will impact rail operations between Cabramatta and Sefton. This is an opportunity to explore restoring direct train service between Bankstown and Liverpool in lieu of South West Metro extension.
North-south link through Bankstown airport desired, and linking the two railway lines.	New Chester Hill-Revesby via Bass Hill and Georges Hall local bus route included in Rapid bus scenario.
Urban renewal or consolidation opportunities at Bankstown CBD, Chester Hill, south-west Bankstown Airport, old (current) Bankstown Hospital, Riverwood.	Bankstown, Bankstown Airport and Chester Hill receive a high level of public transport access, with the Rapid bus scenario enhancing this. Riverwood and old Bankstown Hospital site will need to be considered in conjunction with master planning of the sites.
Further information requested on the Kogarah to Parramatta via Bankstown and Chester Hill link, considering Cumberland Line is also in scope. This will inform how people west of Bankstown might access services and connect to the broader network and give more certainty on the future of Birrong and Yagoona.	This link is considered out of scope for this study due to its more tangential impact on the study area and need to consider its proposed extension to Norwest and Miranda. By comparison, New Cumberland Line serves two of three strategic centres in the study area – Fairfield and Liverpool.
Need to see the data and forecast changes in movement as the growth of Bankstown and Liverpool is realised. At the moment, we're seeing options based on no evidence.	Demand is relatively low directly between Bankstown and Liverpool city centres. Demand forecasts even with the metro extension scenario showed only modest take up of the line compared to other scenarios.
Data available on projected journey times etc. which may influence choice of mode desired.	See charts comparing generalised time to Bankstown and from the study area across different scenarios.
Significant low density growth expected in Milperra around the current WSU site and Riverlands golf site.	Noted.
Opportunity for an active transport loop around Georges River/ Chipping Norton Lakes supported.	Noted. Could be investigated as part of a business case to improve place and support access/egress to public transport investment.



**Table 11: Comments from Liverpool City Council and TfNSW responses**

Comment	TfNSW response
Council's current urban renewal opportunity is along the existing Liverpool-Parramatta Transitway and the planned Liverpool-the WSIA rapid transit corridor along the section of Hoxton Park Road/Fifteenth Avenue.	The reference case maintains Rapid routes on both these corridors.
The current growth and renewal suburbs include Moorebank East (redevelopment of the former Flower Power site and Marina, south of Newbridge Road), Miller, Cartwright, Middleton Grange, Moore Point precinct, Warwick Farm precinct and the South-West Growth Centre. Council has received and endorsed planning proposals for Moore Point (approximately 6,000 dwellings in short-term and 12,000 dwellings in long-term) and Middleton Grange town centres.	<p>In the South West extension scenario, a station will serve Moorebank East. A Moore Point station is to be considered when the South West extension corridor identification is undertaken.</p> <p>In the Rapid Bus scenario:</p> <ul style="list-style-type: none"> <li>Moorebank East would be served by a Frequent route (realigned M90) and new local route (Cabramatta-Holsworthy)</li> <li>Moore Point would be served by a Frequent route (realigned M90), new Rapid route (Bonnyrigg-Holsworthy) and upgraded local routes (901, 902).</li> <li>Middleton Grange would have an extended local route running through the suburb (827).</li> </ul> <p>Miller and Cartwright have not been investigated extensively as part of this study, but a review is warranted.</p>
The proposed change to the bus route in Middleton Grange will require the construction of the M7 Motorway underpass. The design is to be approved by TfNSW and the M7 Motorway operator. The minimum height clearance requirement for bus needs to be resolved prior to the approval. Interim route is to be via Flynn Avenue and Qantas Blvd and Cowpasture Road.	Strategic cost estimate of building the underpass has been included in the assessment of the scenario. Design requirements and suggested interim route alignment noted.
Supports the proposed rapid bus route along Bernera Road between the existing T-way and Edmondson Park, which has been identified as part of Edmondson Park TMAP. However, Bernera Road is currently carrying significant heavy vehicle movements to serve Preston Industrial Precinct. It does not have any bus priority treatments. A number of pinch points along the route need to be addressed. A detailed investigation is recommended.	Agreed. Local detailed issues can be reviewed during further development of route.
Council supports the proposed new rapid bus route through Chipping Norton between Warwick Farm and Georges Hall. In addition, Council has developed a draft Georges River Parklands and Chipping Norton Lakes Spatial Framework which identifies future active transport links to connect to the planned greenspaces and foreshore recreation areas. There are potential urban renewal opportunities along sections of the proposed new rapid bus routes. Council can work with TfNSW to further develop TODs along the proposed new rapid bus corridors.	Noted. Active transport improvements and TOD opportunities can be investigated as part of a business case to improve place and support access/egress to public transport investment.

## 8. Appendix B: Multi-criteria analysis results

**Table 12: Multi-criteria analysis objectives, indicators and scores by scenario**

Objectives	Scale of Impact	Key Performance Indicator	SWE	NCL	IMT	SWE+IMT	NCL+IMT
Improve access to metropolitan jobs, services and amenity	GMA	1. Effective Job Density (PT Travel)	2	5	-3	-1	3
	GMA	2. Average generalised PT travel time from all zones in the study area to strategic centres outside the study area	1	2	3	4	5
	Local	3. Average generalised PT travel time from all zones in the study area to strategic centres in the study area	3	0	4	5	4
Attract jobs and support the development of Liverpool and other strategic centres in the study area	Local	4. Projected employment growth in knowledge intensive jobs within the study area	0	0	5	5	5
		5. Projected population growth within the study area	0	0	5	5	5
Develop complete neighbourhoods	Local	6. Increase in areas of potential land use changes as a result of the transport investment	2	1	2	2	1
		7. Increase in housing density within the influence area of PT investment	0	0	5	5	5
		8. Qualitative rating of the opportunities for creating walkable communities, higher amenity, and improved safety. This includes rating the potential for increased or improved access and quality of open space	1	2	1	1	2
Improve public transport services and customer experience	GMA	9. Projected increase in PT patronage	2	2	2	4	5
		10. Number of additional PT services per week	1	0	4	5	5
Building a socially and environmentally resilient future	Local	11. The share of population in the two least advantaged SEIFA quintiles in the catchments of new/upgraded PT stops or stations	0	0	4	4	5
		12. Reduction in vehicle kilometres travelled (i.e. converted to PT and active transport trips)	2	3	2	4	5
Total score – summation of KPI scores			14	15	34	43	50