

Connecting Sydney Olympic Park and GPOP with Greater Sydney

Final Technical Report

Sydney Olympic Park Business Association
May 2017



Independent insight.



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TABLE OF CONTENTS

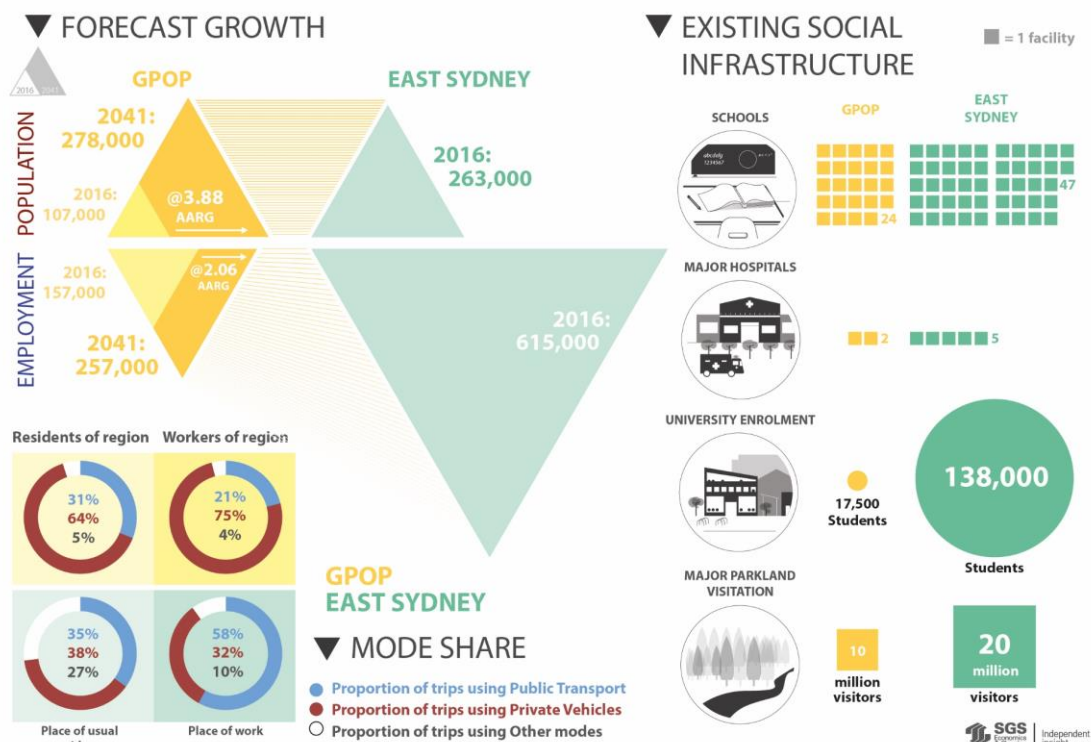
| | |
|--|-----------|
| EXECUTIVE SUMMARY | 1 |
| 1 INTRODUCTION | 5 |
| 2 STRATEGIC CONTEXT | 6 |
| 2.1 Introduction | 6 |
| 2.2 History of Sydney Olympic Park | 7 |
| 2.3 Greater Parramatta to Olympic Peninsula | 8 |
| 2.4 Summary of Context | 10 |
| 3 REGIONAL-SCALE ASSETS | 11 |
| 3.1 Introduction | 11 |
| 3.2 GOP and East Sydney | 11 |
| 3.3 Summary of regional scale assets | 24 |
| 4 TRANSPORT CONNECTIVITY | 25 |
| 4.1 Introduction | 25 |
| 4.2 Understanding levels of transport investment | 25 |
| 4.3 A networked GOP | 26 |
| 4.4 Current GOP network | 27 |
| 4.5 Planned investments | 28 |
| 4.6 Summary of Transport Connectivity | 30 |
| 5 KEY FINDINGS | 31 |

EXECUTIVE SUMMARY

This report provides the strategic rationale for improving transport connectivity to Sydney Olympic Park. It does this by considering Sydney Olympic Park in the context of ambitions for the Greater Parramatta and the Olympic Peninsula (GPOP) corridor outlined by the Greater Sydney Commission, and undertakes a comparative analysis between this area and the well-established area of East Sydney.

This analysis has highlighted a number of important distinctions between these two areas (refer to Figure 1).

FIGURE 1. KEY DISTINCTIONS BETWEEN GPOP AND EAST SYDNEY



Source: SGS Economics and Planning, 2017

- By 2041, the population of GPOP will grow to the same as East Sydney's population today. The number of jobs in GPOP by 2041 will remain well below the jobs in East Sydney today.
- A larger share of the resident population in East Sydney catch public transport or walk to work compared to residents in GPOP: 57% for East Sydney versus 35% for GPOP. Workers based in GPOP are much more reliant on cars to get to the precinct: 75% of workers based in GPOP use private transport compared to only 32% in East Sydney.
- Investment in public transport infrastructure is required to improve transport mode share, support the forecast population growth and importantly, promote employment growth in GPOP.
- If GPOP is to grow to the size that East Sydney is today, investment in a range of social infrastructure will be required to meet the levels provided in East Sydney today.

Sydney Olympic Park is transitioning from an Olympic Village and major event site to a focal point for a new residential communities and regional economic activities - a lifestyle super precinct.

Sydney Olympic Park is currently home to over 2,500 residents and expected to reach almost 20,000 residents by 2041. The 2016 review of *Sydney Olympic Park Master Plan 2030* shows that it has capacity to accommodate 23,500 residents and 34,000 workers. It is intended to offer inner-city style living, additional office, retail and residential development will complement its established sporting and recreation assets.

Sydney Olympic Park is the eastern anchor within GPOP, sitting between Parramatta and the Sydney CBD. It sits within a growing corridor that is expected to see a substantial increase in population and jobs.

Sydney Olympic Park is an essential eastern anchor within GPOP, geographically located at the centre of Greater Sydney. GPOP contains around 110,000 residents and 155,000 jobs, and as Western Sydney grows, GPOP will play an increasingly important economic and servicing role. The Greater Sydney Commission identifies GPOP as Greater Sydney's true centre – a place that will be a major urban hub in the future. Olympic Park has a real role as a focal point for the five precincts (Sydney Olympic Park, Wentworth Point, Rhodes, Homebush and Carter Street) within the Olympic Peninsula.

The vision for GPOP identifies four distinct quarters that each play a different economic, environmental, social and cultural role. The four quarters will be linked by the Parramatta River and the planned Parramatta Light Rail, and potentially by metro rail in the future. It is clear from the Commission's vision that transport accessibility is a major factor if GPOP is to become Greater Sydney's connected, unifying heart.

Transport connectivity will drive the successful development of GPOP, facilitating growth in economic activities and supporting the growing local community. GPOP's significant cluster of centres requires investment similar to that which has occurred, and is occurring, in East Sydney. This requires clear planning and integration of regional, district and local transport networks, in line with changing or expanding land uses, to support various accessibility needs of residents and businesses.

The significant cluster of centres within GPOP and the vision for its growth draws parallels with East Sydney now. A comparative analysis of GPOP and East Sydney highlights GPOP's geographic scale and its strategic regional role. Both these areas contain:

- a major CBD precinct
- a major sports and recreation precinct
- strategic industrial lands
- health and education precinct(s).

In both areas, population growth, employment centres and social infrastructure is concentrated along major transport corridors. The lack of transport infrastructure connecting GPOP's major activities and the strategic employment lands at its centre means GPOP does not contain a concentration of activity along a core spine, as in East Sydney. In East Sydney the various levels of integrated transport networks have enabled a more cohesive suite of regional, district and local connections.

The key distinctions between GPOP and East Sydney are detailed in Table 8.

TABLE 1. KEY DISTINCTIONS BETWEEN GOP AND EAST SYDNEY

| Area | GOP | East Sydney |
|---|-----------------|-----------------|
| Growth | | |
| Population 2016 | 107,270 | 263,485 |
| Population 2041 | 277,590 | 407,011 |
| 25 year population growth (Average annual Growth Rate) | 170,320 (3.88%) | 143,525 (1.75%) |
| Jobs 2016 | 156,625 | 614,665 |
| Jobs 2041 | 257,215 | 858,355 |
| 25 years jobs growth (Average annual Growth Rate) | 102,590 (2.06%) | 243,690 (1.34%) |
| Social Infrastructure | | |
| Schools | 24 | 47 |
| Major Hospitals | 2 | 5 |
| Universities | 3 | 4 |
| Visitors to Major Parklands (Sydney Olympic Park or Centennial Park) | 10 million | 20 million |
| Transport | | |
| Light Rail Network | 0km | 11km |
| Mode share: Public vs private transport (place of residence) | 31% vs 64% | 35% vs 38% |
| Mode share: Public vs private transport (place of work) | 21% vs 75% | 58% vs 32% |
| Average travel time to work | 46 minutes | 31 minutes |

In analysing and comparing the two areas, this report considers the different geographic scales of infrastructure and land uses, acknowledging that:

- different geographic scales of infrastructure and land uses affect an urban landscape in different ways, and
- effective integrated transport and land use planning requires a clear understanding of these different scales.

This report uses three geographic scales to classify infrastructure and to clarify the strategic importance of land uses:

- region: the Greater Sydney metropolitan area
- district: the subregional or corridor scale
- local: a suburb or neighbourhood.

By providing and integrating every level of transport, GOP can be a place that suits a diversity of lifestyles, a diversity of businesses, and a variety of trips and movements, both within GOP itself and to other destinations. This will promote a networked structure of precincts – and Sydney Olympic Park will be better connected within GOP and to other strategic centres and corridors across Greater Sydney.

If it is to replicate the success of East Sydney, GOP requires a networked and connected corridor with three levels of transport infrastructure to best function:

- **REGIONAL** transport infrastructure connects to the wider metropolitan transport network and provides the overarching structural framework for regional and local transport infrastructure.
- **DISTRICT** transport infrastructure projects integrate with higher-order structural infrastructure and connect clusters of centres within regional corridors.

- **LOCAL** transport infrastructure supports and responds to both regional and district transport infrastructure by providing fine grain urban connectivity. Local transport infrastructure responds to and enhances the quality and experience of the local environment.

This report identifies two significant gaps for GPOP:

- mass transit connections between its major centres (such as Parramatta and Sydney Olympic Park) to other regional centres such as the Sydney CBD and the future Western Sydney Airport.
- district-scale connections between the existing centres and precincts within GPOP which could limit GPOP to isolated, yet adjacent precincts.

GPOP requires both regional-scale transport infrastructure as well as more district and local infrastructure to support the vision as the connected, unifying heart of Greater Sydney.

1 INTRODUCTION

SGS Economics and Planning was commissioned by the Sydney Olympic Park Business Association to prepare a strategic rationale for improved transport connectivity to Sydney Olympic Park. This reflects the Park within the context of Greater Parramatta and the Olympic Peninsula (GPOP) and compares GPOP with the established East Sydney.

As a strong evidence base and strategic rationale, this report is structured as follows:

- Section 2. Strategic context: an overview of Olympic Park and the identification of GPOP.
- Section 3. Regional-scale assets: analysis of GPOP and its assets, infrastructure and growth in comparison to East Sydney.
- Section 4. Transport connectivity: the levels of transport investment required to create a networked corridor.

This technical report is accompanied by a summary document that outlines the strategic findings of this analysis.

2 STRATEGIC CONTEXT

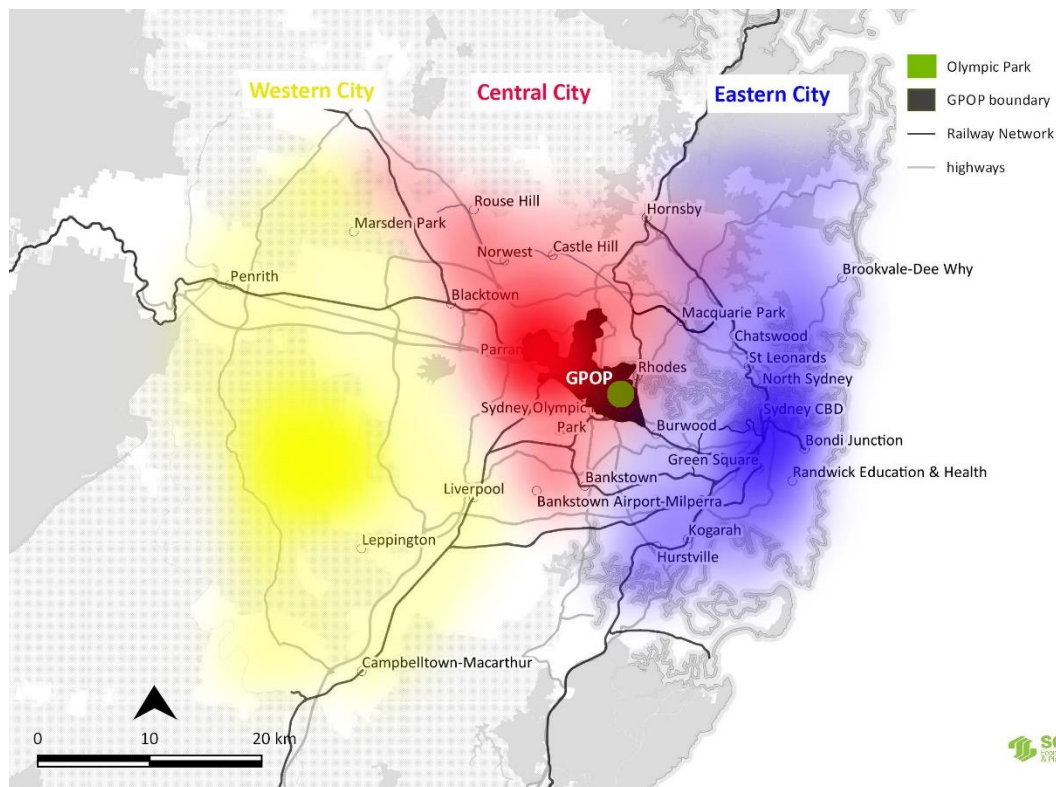
2.1 Introduction

Sydney Olympic Park is home to world-class sporting infrastructure, expansive public open space and more than five kilometres of Parramatta River frontage.

Towards Our Greater Sydney 2056, the Greater Sydney Commission's draft amendment to update *A Plan for Growing Sydney*, describes a future Greater Sydney as a metropolis of three cities¹.

Within the metropolis of three cities, the emerging Central City is focused on Parramatta. In this scenario, Sydney Olympic Park, as a vital quarter of Greater Parramatta and the Olympic Peninsula (GPOP), will be one of the strategic centres that will support Parramatta. Figure 2 illustrates the location of Sydney Olympic Park and GPOP in the context of the metropolis of three cities.

FIGURE 2. SYDNEY OLYMPIC PARK AND SYDNEY'S THREE CITIES



Source: SGS Economics and Planning, 2017, based on GSC (2016) *Towards Sydney 2056*

¹ Greater Sydney Commission 2016, *Towards our Greater Sydney 2056*

2.2 History of Sydney Olympic Park

Sydney Olympic Park has a complex and rich history of land uses and a number of fundamental transformations.

The fertile estuarine ecosystems provided the Wangal people with food, clothing and resources for thousands of years. During the early 19th and 20th Centuries, the area was used for industrial uses that created far-reaching environmental change. As early as 1812, colonial industries such as salt works occurred in adjacent Newington, and cottage manufacturing industries operated across the region.

During the 20th Century the site was home to an abattoir and State Brickworks which reached the end of their lifespan during the late 1980s, allowing for more recent redevelopments.

After being identified as the site of the Sydney 2000 Olympic and Paralympic Games, Sydney Olympic Park was subject to a 1995 vision and master plan. This included a core of sporting venues and entertainment facilities, accommodation for athletes and team officials in the Olympic Village, a major metropolitan park that integrated different ecosystems, and corridors with active recreational opportunities. Substantial waterfront and parkland development along the Parramatta River provided public access to the shoreline.

After the Olympics, a 2002 master plan for the precinct's continued function as an entertainment and leisure precinct included plans for festivals, sporting and entertainment events, and educational programs and amenities. It recognised the value of a mixed use town centre and approved various land uses, including commercial, leisure, education, retail, hotel and institutional activities.

In 2005, the Sydney Olympic Park Authority's Vision 2025 provided a longer-term plan for the overall urban structure and function, with the intention of developing a vibrant and diverse town centre.

This was refined in 2016 with Master Plan 2030, which proposed a more compact, dense development type, and more targeted concentration of land uses in specific precincts. Master Plan 2030 reinforces the sustainability principles set out for the Sydney 2000 Olympic Games.

The 2016 review of Sydney Olympic Park Master Plan 2030, has identified:

- 10,700 homes for 23,500 residents
- 34,000 job opportunities
- retail space increased to 100,000 square metres
- educational spaces for 5,000 students
- more local parks
- possibilities for new primary and secondary schools.

As of 2016, Sydney Olympic Park contained over 12,000 jobs, primarily within financial and insurance services and arts and recreation services. Since 2011, substantial growth in residential, commercial and education land uses has included a focus on banking as an industry of employment, due to the presence of the Commonwealth Bank of Australia (CBA). This focus may change when the CBA relocates to Redfern. Other industries include computer systems design, life insurance and sports and physical recreation venues operation.

The site retains its Olympic legacy role as a major sporting and events destination.

2.3 Greater Parramatta to Olympic Peninsula

The Greater Parramatta to Olympic Peninsula (GPOP) is geographically located at the centre of Greater Sydney. With significant population growth expected in Western Sydney, the GPOP corridor will play an increasingly important economic and servicing role.

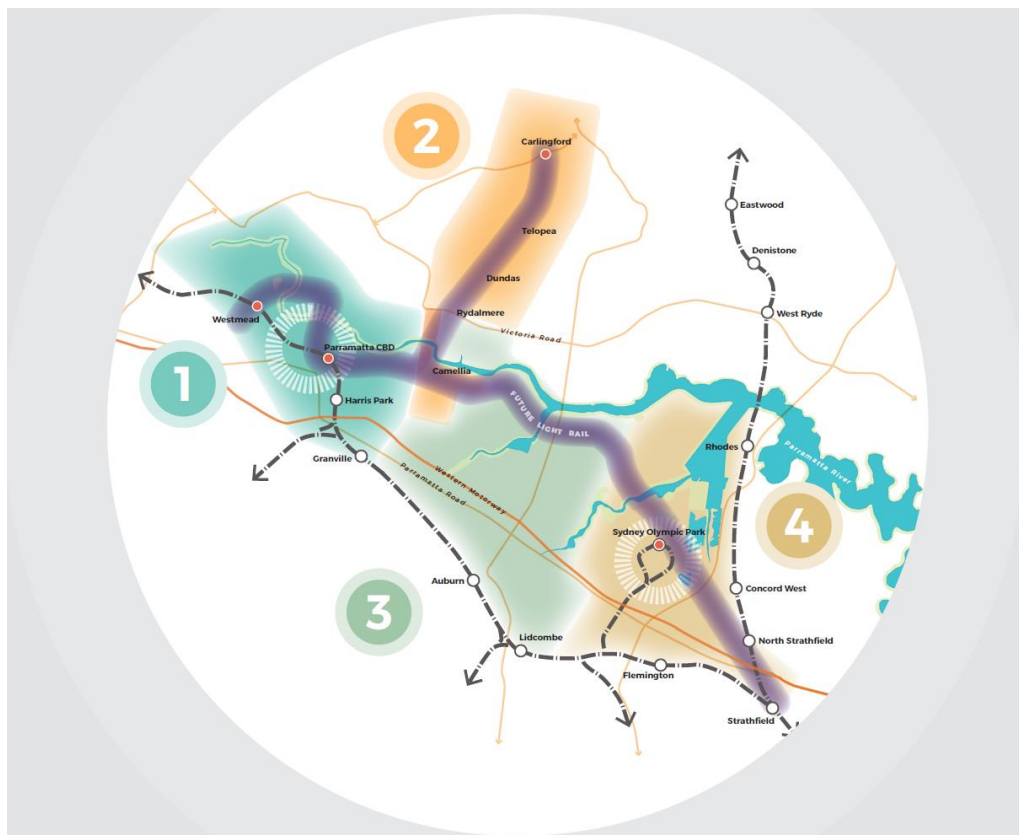
Accordingly to the Greater Sydney Commission, GPOP currently contains around 100,000 residents and 125,000 jobs². It has experienced strong population growth and is accessible to an increasing share of workers across Sydney by road and public transport infrastructure and by water. GPOP is accessible for employment and the movement of goods and services.

The Greater Sydney Commission has outlined the following vision for GPOP³:

- A central city close to Sydney's heart
- A link forging one Greater Sydney
- A jobs hub within reach of skilled workers
- An attractive place to invest
- A place of celebrated natural beauty

The Commission considers GPOP as quarters (refer to Figure 3) that each play a different economic, environmental, social and cultural role. Each quarter will be linked by the Parramatta River and the planned Parramatta Light Rail, with metro rail potentially playing a role.

FIGURE 3. GREATER SYDNEY COMMISSION GPOP FOUR QUARTERS – A STORY FOR SUCCESS



Source: Greater Sydney Commission, 2016

² Greater Sydney Commission 2016, *Greater Parramatta and the Olympic Peninsula: Vision*

³ *ibid*

The quarters are:

1. Parramatta CBD and Westmead: Health and education super precinct
2. Camellia to Carlingford: next generation living
3. Camellia, Rydalmere, Silverwater and Auburn: Essential urban services, advanced technology and knowledge sectors
4. Olympic Park: Lifestyle super precinct

Sydney Olympic Park is identified as a **'lifestyle super precinct'** that will offer inner-city style living and provide an eastern economic anchor to GOP.

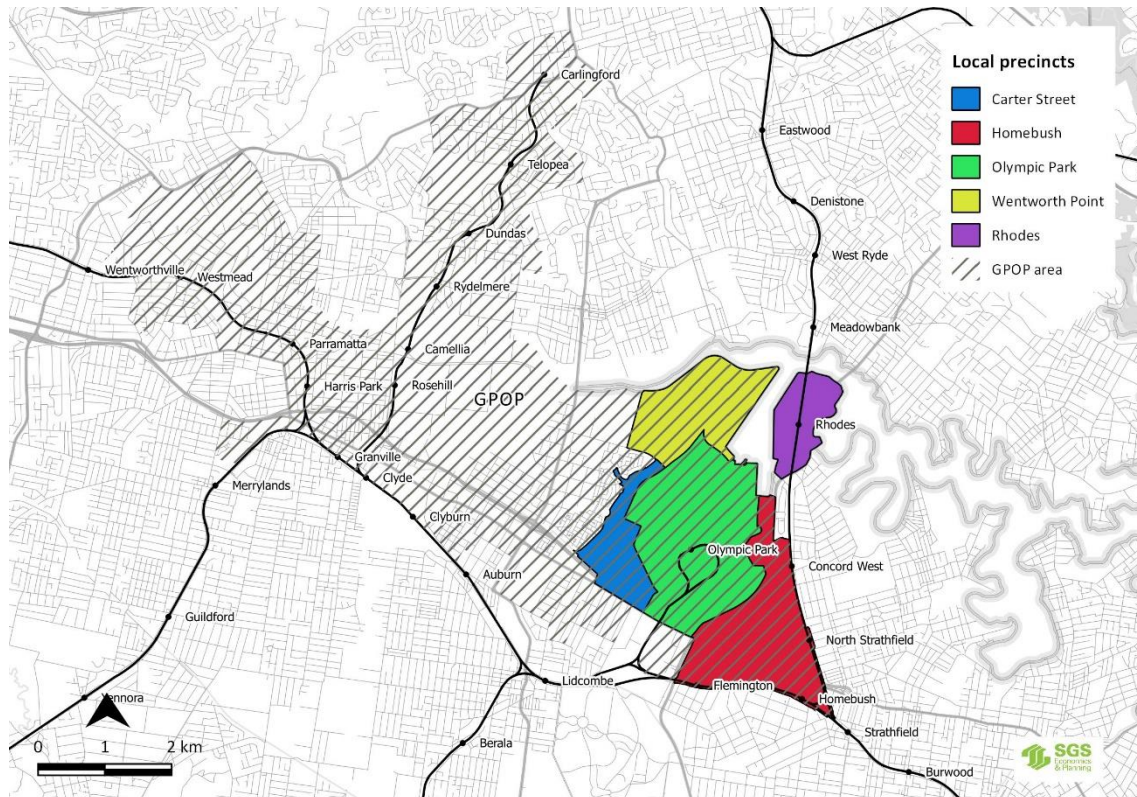
The vision set out for Sydney Olympic Park⁴ includes:

- green living and wellbeing in the heart of the park
- sustainable transport to realise lifestyle potential
- our central city's new celebration space.

Sydney Olympic Park offers significant scope to expand its role with additional office, retail and residential development that complements its established sporting and recreation assets.

There are five precincts in the Olympic Park lifestyle super precinct: Sydney Olympic Park, Wentworth Point, Rhodes, Homebush and Carter Street (refer to Figure 4). Sydney Olympic Park is planned to be the focal point and key centre for these precincts.

FIGURE 4. PRECINCTS WITHIN OLYMPIC PARK LIFESTYLE SUPER PRECINCT



Source: SGS Economics and Planning, 2017

⁴ ibid

The Greater Sydney Commission identified that as a site with transport access designed for the Olympic Games, it has limited road transport access points and special events-style rail access. A larger community of residents and workers requires greater transport diversity, especially if the Park is going to attract a diverse mix of users.

It is clear from the Commission's vision that **transport connectivity** is a major success factor for GPOP to become a major centre at the geographic heart of Greater Sydney.

2.4 Summary of Context

- Sydney Olympic Park is transitioning from an Olympic Village and major event site to a focal point for a new residential communities and regional economic activities - a lifestyle super precinct.
- Sydney Olympic Park is the eastern anchor within GPOP, sitting between Parramatta and the Sydney CBD. It sits within a growing corridor that is expected to see a substantial increase in population and jobs.
- for GPOP to become a major centre at the geographic heart of Greater Sydney, **transport connectivity** needs to move beyond major event style rail access to address the limited road transport access points.

3 REGIONAL-SCALE ASSETS

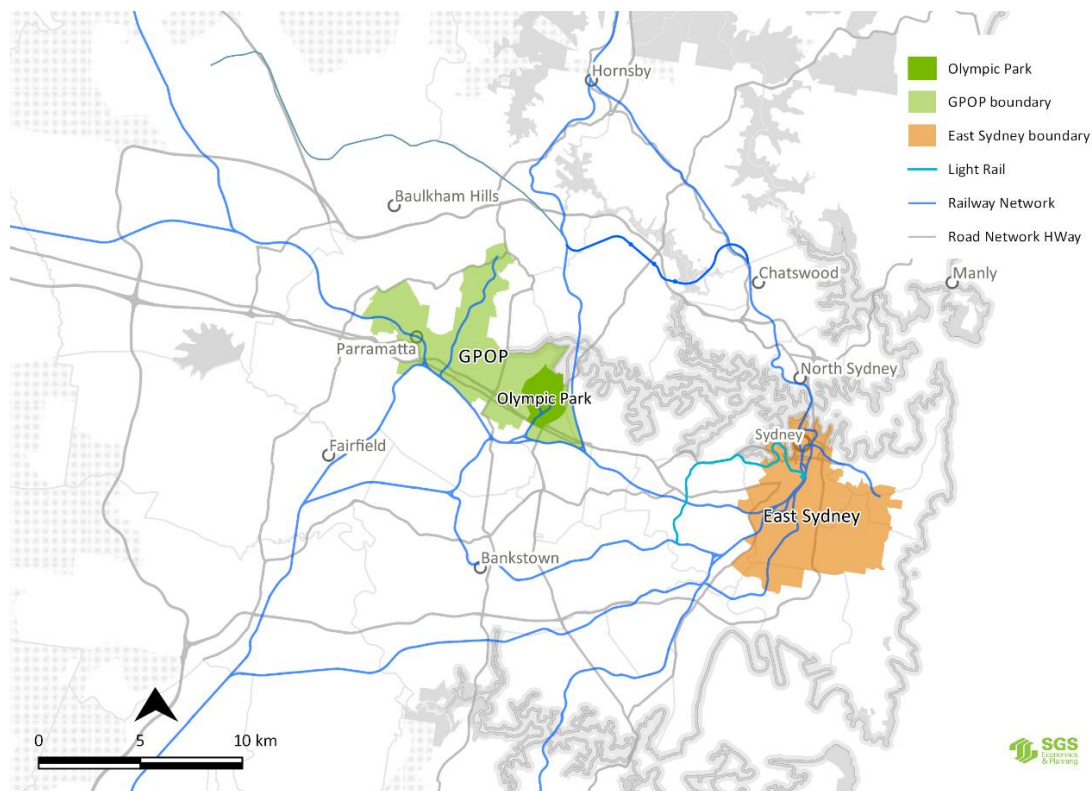
3.1 Introduction

This section compares GOP with East Sydney. It describes the planned population and employment growth, the existing and projected employment and visitor mix, and the extent of social and transport infrastructure in each area.

3.2 GOP and East Sydney

GPOP sits at the core of the emerging Central City and East Sydney is at the centre of the established Eastern City (see Figure 1). Comparing the assets in these two areas highlight the opportunities for GPOP to evolve (refer to Figure 5).

FIGURE 5. LOCATION OF GPOP AND EAST SYDNEY STUDY AREAS



Source: SGS Economics and Planning, 2017

A comparative analysis of GPOP and East Sydney emphasises GPOP's scale in terms of geographic area (around 4,000 hectares) and its scale of the assets and infrastructure. Figure 6 and Figure 5 illustrate that both these areas contain assets surrounded by supporting residential and community uses:

- a major CBD precinct
- a major sports and recreation precinct
- strategic industrial lands
- health and education precinct(s).

FIGURE 6. LAND USE PRECINCTS: GOP

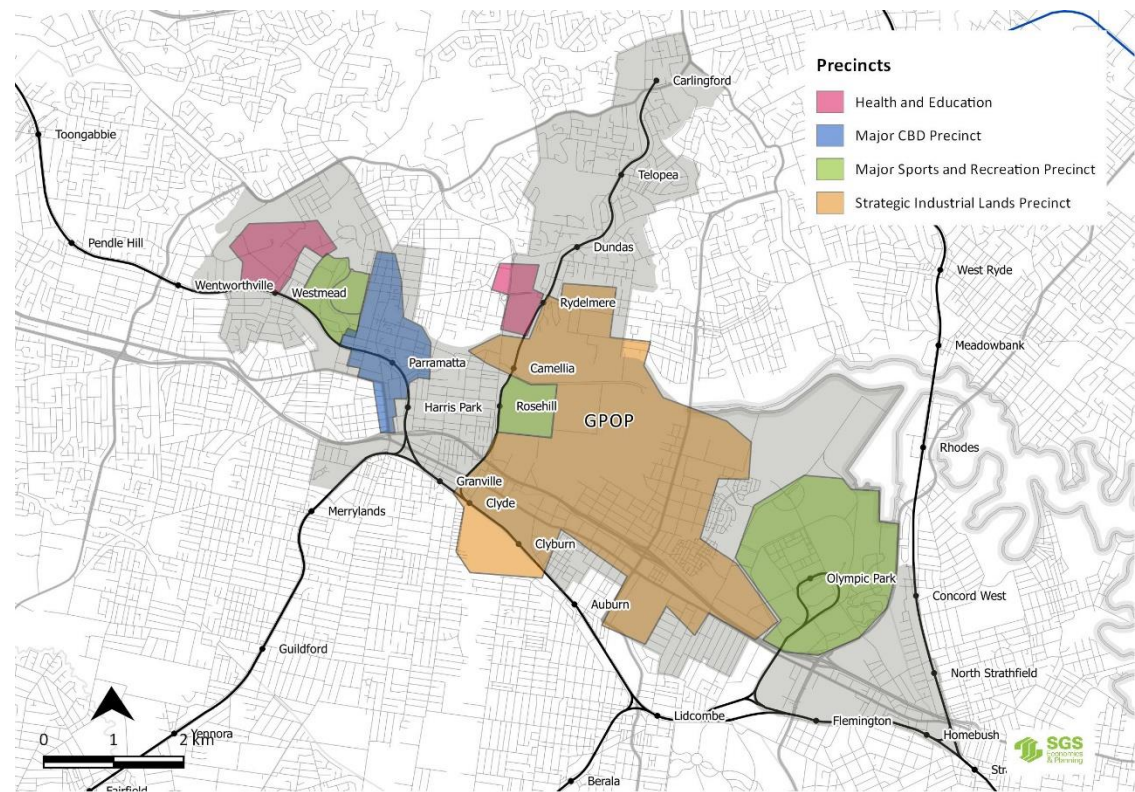
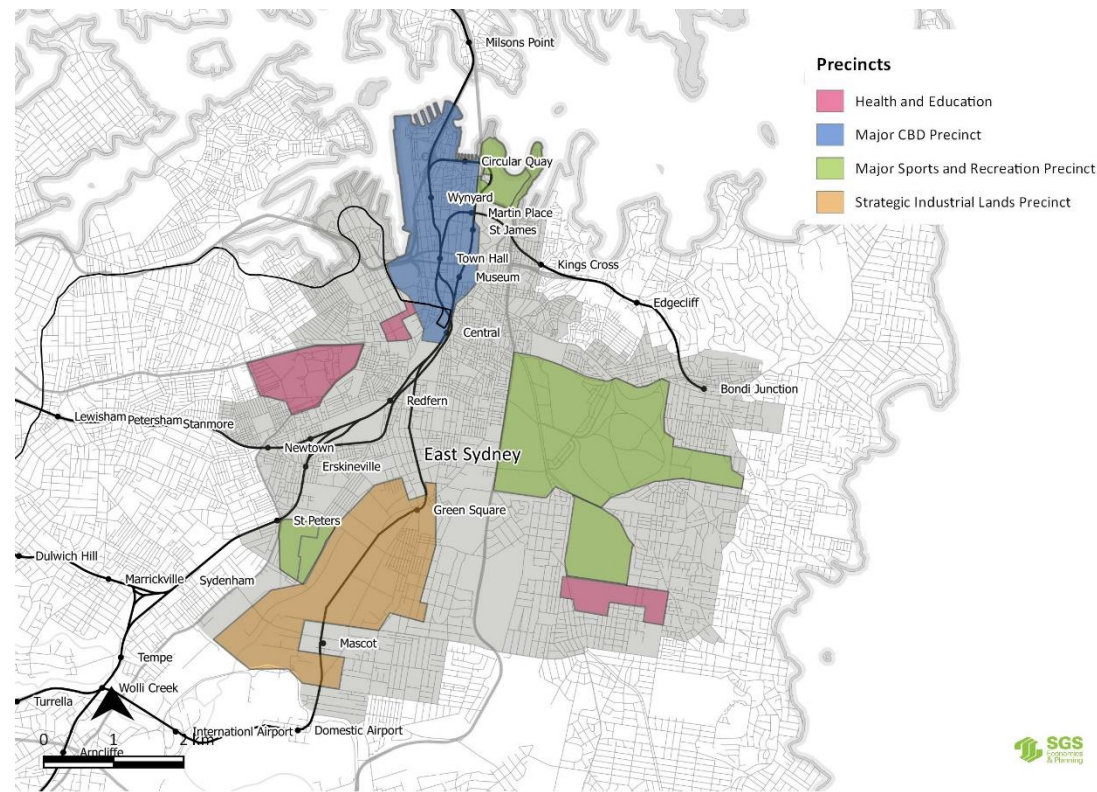


FIGURE 7. LAND USE PRECINCTS: EAST SYDNEY



Source: SGS Economics and Planning, 2017

Population growth

While the 2016 review of the *Sydney Olympic Park Master Plan 2030* has a vision for 23,500 residents by 2030, to allow a direct comparison between GOP and East Sydney, population projections from the NSW government have been used to show a growth comparison between these two areas.

NSW Government land use forecasts (TPA, LU16) suggest annual growth rate of almost nine per cent (refer to Table 2) at Sydney Olympic Park. At present there are over 2,500 residents, and the population is expected to increase to almost 20,000 residents by 2041 (an increase of over 17,000 new residents). These projections do not take account of the additional capacity identified within the master plan.

The existing population of GOP is almost 110,000 residents and forecasts suggest it will accommodate almost 170,000 new residents by 2041 (refer to Table 2). This is almost equivalent to that of East Sydney today which contains around 270,000 residents. The majority of this growth is project at Sydney Olympic Park, Parramatta and Carlingford (refer to Figure 8). Significant population growth is also expected in the precincts clustering around Sydney Olympic Park, in particular Homebush and Carter St.

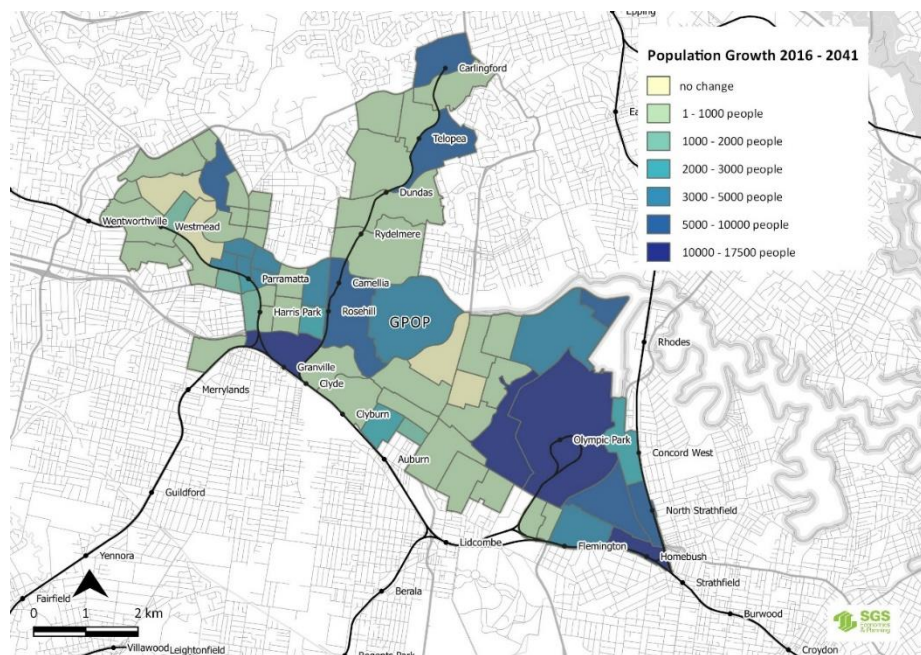
TABLE 2. POPULATION FORECASTS

| Area | 2016 | 2021 | 2026 | 2031 | 2036 | 2041 | Change 2016-41 | Annual Growth Rate 2016-41 |
|----------------------------|--------------|--------------|--------------|---------------|---------------|---------------|-------------------|----------------------------------|
| GPOP | 107,266 | 145,476 | 183,583 | 221,964 | 258,553 | 277,586 | 170,321 | 3.88% |
| Sydney Olympic Park | 2,588 | 5,760 | 9,330 | 13,593 | 18,355 | 19,845 | 17,257 | 8.49% |
| Wentworth Point | 8,022 | 15,741 | 19,023 | 20,028 | 20,455 | 20,990 | 12,968 | 3.92% |
| Rhodes | 14,109 | 15,230 | 17,631 | 20,095 | 21,821 | 22,851 | 8,742 | 1.95% |
| Homebush | 8,918 | 14,664 | 21,471 | 28,446 | 34,906 | 38,835 | 29,918 | 6.06% |
| Carter Street* | 0 | 2,000 | 5,340 | 9,394 | 13,931 | 15,508 | 15,508 | 10.78% |

Source: Transport and Performance Analytics Forecasts, 2016

*Annual Growth rate for Carter St is between 2021 and 2041)

FIGURE 8. PROJECTED POPULATION GROWTH 2016-2041 GPOP



Source: SGS Economics and Planning using Transport and Performance Analytics Forecasts, 2016

Employment growth

As above, the 2016 review of the *Sydney Olympic Park Master Plan 2030* has a vision for 34,000 jobs by 2030. Sydney Olympic Park contains around 12,000 employees and is projected to grow to around 22,000 employees by 2041 (refer to Table 3). The precinct is forecast to grow at a higher rate than GOP. These projections do not take account of the recent review of the *Sydney Olympic Park Master Plan 2030* which identified capacity up to 34,000 workers by 2030.

TABLE 3. EMPLOYMENT FORECASTS ADD OLYMPIC PARK PRECINCTS

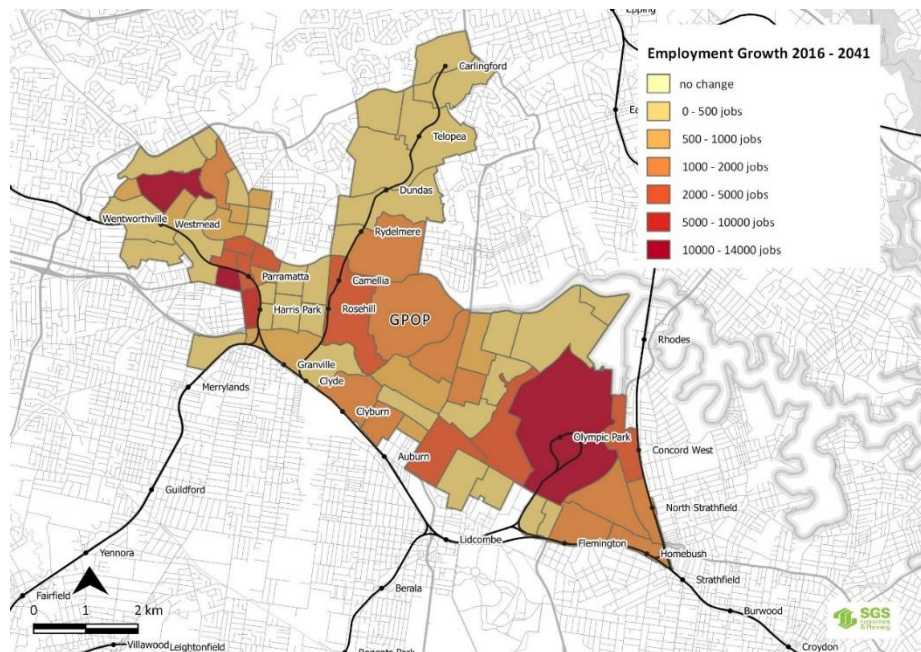
| Area | 2016 | 2021 | 2026 | 2031 | 2036 | 2041 | Change 2016-41 | Annual Growth Rate 2016-41 |
|----------------------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------|----------------------------------|
| GPOP | 154,624 | 170,085 | 195,250 | 215,929 | 235,814 | 257,213 | 102,589 | 2.06% |
| Sydney Olympic Park | 11,753 | 11,497 | 16,950 | 19,018 | 20,658 | 22,711 | 10,958 | 2.67% |
| Wentworth Point | 1,014 | 1,077 | 1,135 | 1,232 | 1,298 | 1,366 | 351 | 1.20% |
| Rhodes | 13,083 | 14,561 | 15,807 | 17,146 | 18,653 | 20,256 | 7,173 | 1.76% |
| Homebush | 12,253 | 13,450 | 15,122 | 16,940 | 18,509 | 20,237 | 7,984 | 2.03% |
| Carter Street* | 2,417 | 2,585 | 3,173 | 3,969 | 4,123 | 5,022 | 2,605 | 2.97% |

Source: BTS Forecasts, 2016

*Annual Growth rate for Carter St is between 2021 and 2041)

Employment growth across GPOP is expected to be concentrated primarily in Sydney Olympic Park, and Parramatta (refer to Figure 9).

FIGURE 9. PROJECTED EMPLOYMENT GROWTH 2016-2041 GPOP



Source: SGS Economics and Planning using Transport and Performance Analytics Forecasts, 2016

Employment mix

In GOP, 17 per cent of jobs are in either financial and insurance services or professional, scientific and technical services (refer to Table 4), compared to 35 per cent of jobs in East Sydney. GOP contains a concentration of employment in public administration and safety and health care and social assistance (26 per cent), compared to 13 per cent of employment in East Sydney.

At Sydney Olympic Park, 35 per cent of jobs are in within financial and insurance services, 17 per cent in arts and recreation services and 9 per cent in professional, scientific and technical services. These proportions are higher than the surrounding GOP, highlighting Sydney Olympic Park's role as a specialised centre.

TABLE 4. EMPLOYMENT MIX 2016

| Area | Sydney Olympic Park | GPOP | East Sydney |
|---|---------------------|---------------|---------------|
| Electricity, Gas, Water and Waste Services | 5.1% | 2.7% | 0.7% |
| Construction | 7.0% | 7.2% | 3.8% |
| Wholesale Trade | 4.6% | 6.7% | 2.3% |
| Retail Trade | 0.8% | 7.6% | 5.6% |
| Accommodation and Food Services | 5.0% | 3.9% | 6.9% |
| Transport, Postal and Warehousing | 1.7% | 5.0% | 6.0% |
| Information Media and Telecommunications | 1.1% | 1.5% | 5.4% |
| Financial and Insurance Services | 35.2% | 11.2% | 16.6% |
| Rental, Hiring and Real Estate Services | 0.6% | 1.5% | 2.1% |
| Professional, Scientific and Technical Services | 9.1% | 6.3% | 18.9% |
| Administrative and Support Services | 1.6% | 2.8% | 4.7% |
| Public Administration and Safety | 3.0% | 11.8% | 6.1% |
| Education and Training | 2.1% | 3.3% | 5.9% |
| Health Care and Social Assistance | 0.7% | 14.1% | 7.0% |
| Arts and Recreation Services | 16.8% | 2.1% | 2.9% |
| Other Services | 1.6% | 3.8% | 2.8% |
| Unclassified | 4.1% | 8.4% | 2.3% |
| Total | 100.0% | 100.0% | 100.0% |

Source: BTS Forecasts, 2016

Table 5 lists the employment industries that are expected to experience the greatest growth between 2016 and 2041 in GOP. Jobs in both health care/social assistance and public administration and safety will grow rapidly in GOP.

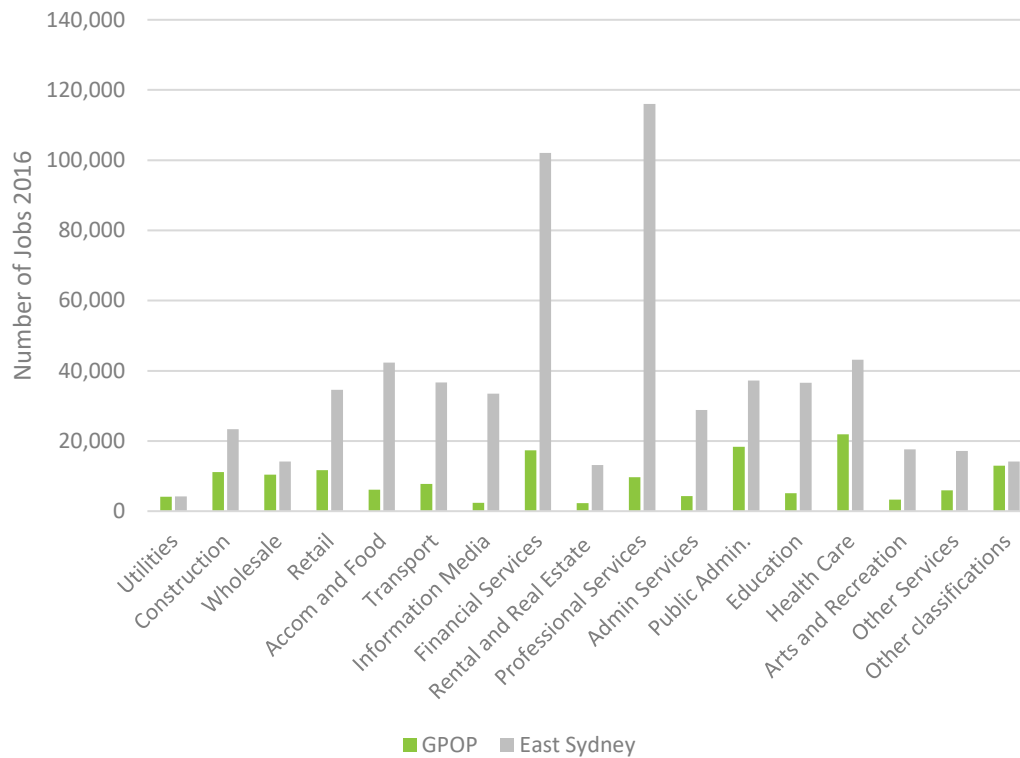
TABLE 5. KEY SECTORS WITH JOB GROWTH 2016-2041

| GPOP | No of Jobs |
|---|------------|
| Health Care and Social Assistance | 18,890 |
| Public Administration and Safety | 14,320 |
| Retail Trade | 14,000 |
| Professional, Scientific and Technical Services | 10,235 |
| Financial and Insurance Services | 6,450 |

Source: BTS Forecasts, 2016

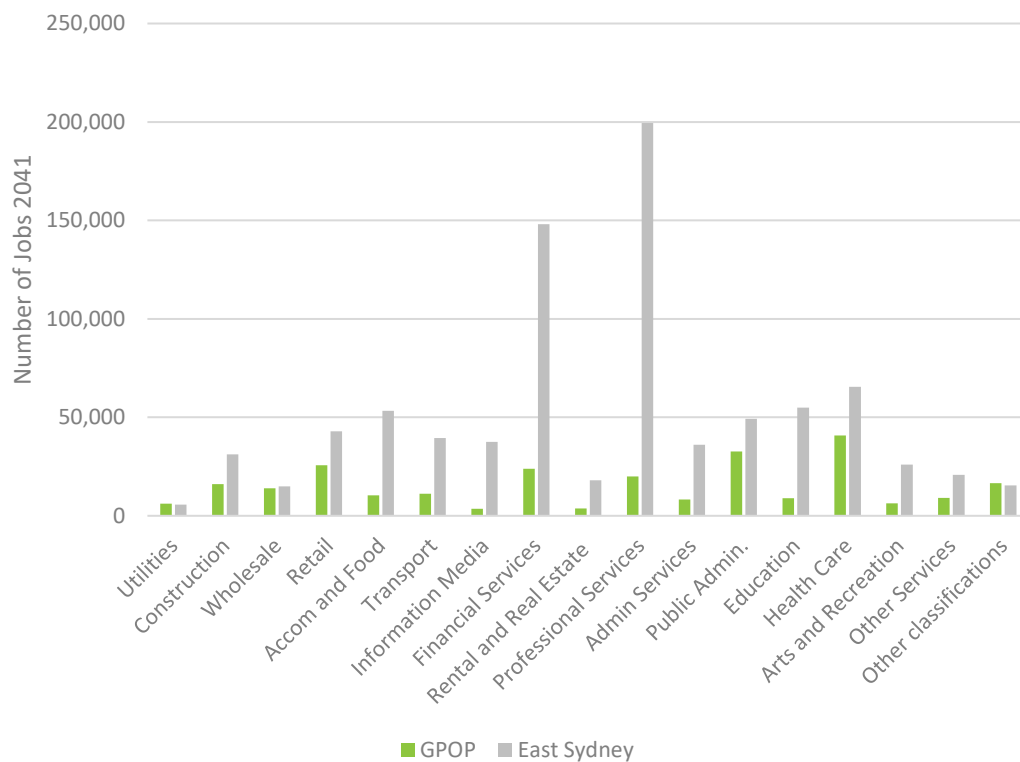
Figure 10 compares the mix of jobs across the main industries of employment in GOP and East Sydney, while Figure 11 compares the projected mix of jobs in 2041.

FIGURE 10. CURRENT EMPLOYMENT MIX: MAIN INDUSTRIES 2016



Source: BTS Forecasts, 2016

FIGURE 11. PROJECTED EMPLOYMENT MIX: MAIN INDUSTRIES 2041



Source: BTS Forecasts, 2016

Visitors

In addition to residents and workers, many visitors come to GPOP and East Sydney to major destinations and services every day. Sydney Olympic Park alone receives 10 million visitors each year, attracted to its range of sporting and leisure facilities⁵. The Centennial Parklands in East Sydney (Centennial Park, Moore Park and Queens Park) receive 20 million visitors each year⁶ to facilities such as the Moore Park Golf Course, the Entertainment Quarter and Fox Studios and the Centennial Parklands Equestrian Centre. This excludes the major stadiums (SCG and Allianz Stadium) that attract around 1.85 million visitors a year⁷.

Social infrastructure

East Sydney enjoys a considerably greater supply of social infrastructure than GPOP, as described in Table 6. This analysis provides a snapshot to allow a high-level comparison, without considering demand or capacity.

TABLE 6. SOCIAL INFRASTRUCTURE ASSET COMPARISON

| Area | GPOP | East Sydney |
|---------------------------|-----------|-------------|
| Public Primary Schools | 9 | 19 |
| Public Secondary Schools | 5 | 8 |
| Private Primary Schools | 5 | 10 |
| Private Secondary Schools | 5 | 10 |
| TAFEs | 0 | 3 |
| Universities | 2 | 5 |
| Major Hospitals | 3 | 4 |
| Minor Hospitals | 1 | 6 |
| Other Health Clusters | 2 | 3 |
| Playing Fields | 31 | 41 |
| Stadia | 5 | 2 |
| Racecourses | 1 | 2 |
| Total | 69 | 113 |

Source: SGS Economics and Planning, 2017

The spatial distribution of social infrastructure assets is illustrated in Figure 12 and Figure 13.

Education and health facilities cluster around Westmead in GPOP, while these are more widely distributed in East Sydney, with several significant health and education clusters.

Sydney Olympic Park contains a limited amount of social infrastructure. With the exception of one public primary school, Sydney Olympic Park and adjacent areas generally focus on public open space and recreation infrastructure.

⁵ Greater Sydney Commission 2016, *Greater Parramatta and the Olympic Peninsula: Vision*

⁶ Centennial Parklands 2016, *Centennial Parklands Annual Report 2015 -16*

⁷ Sydney Cricket & Sports Ground Trust 2016, *2015/16 Annual Report*

FIGURE 12. SOCIAL HEALTH AND EDUCATION INFRASTRUCTURE: GOP

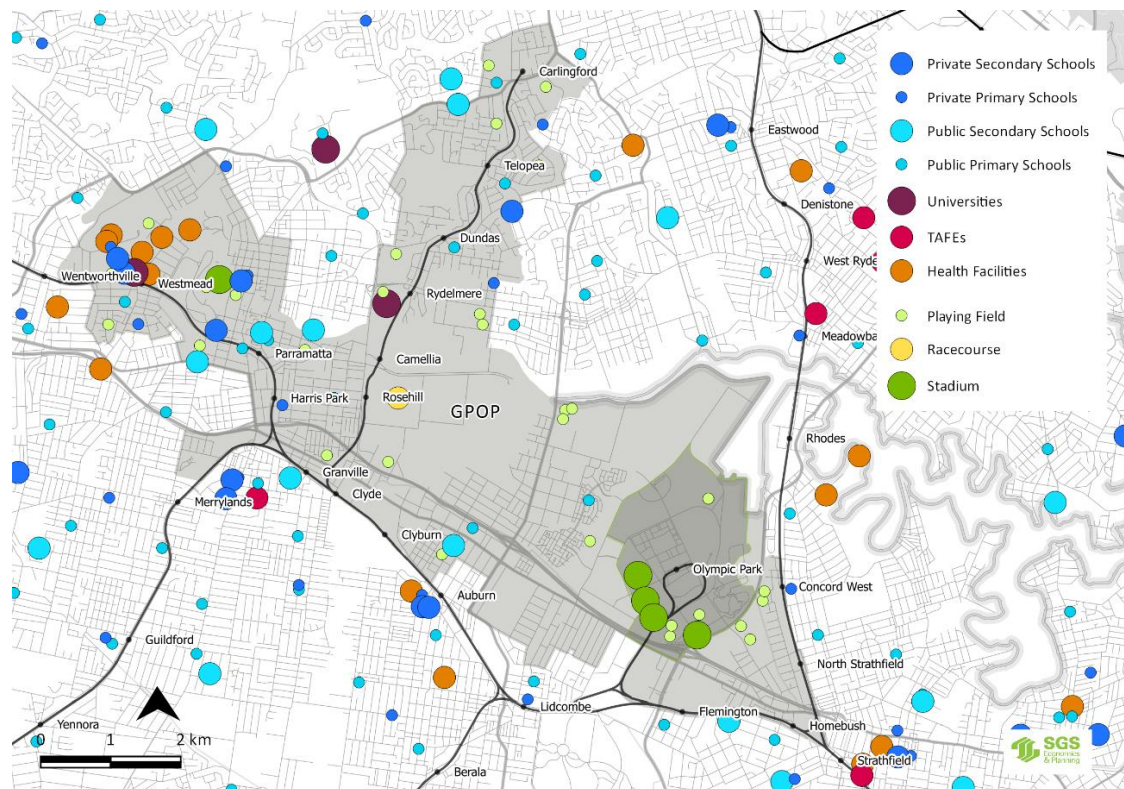
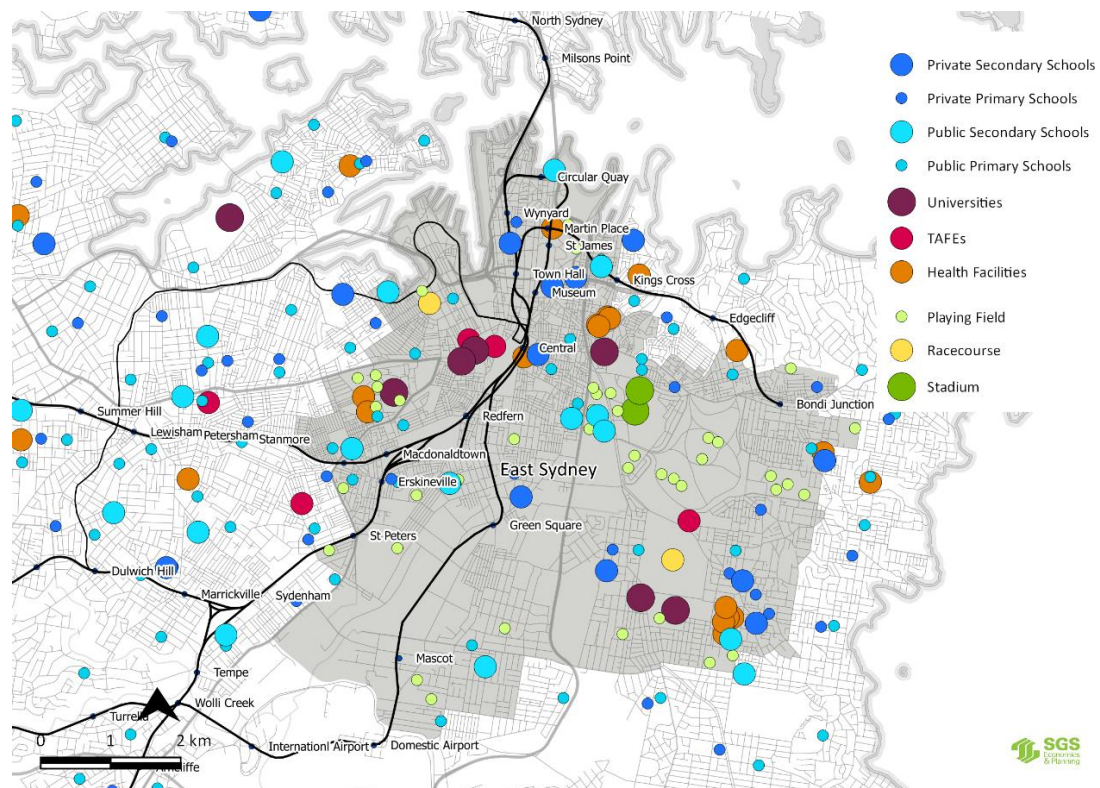


FIGURE 13. SOCIAL HEALTH AND EDUCATION INFRASTRUCTURE: EAST SYDNEY

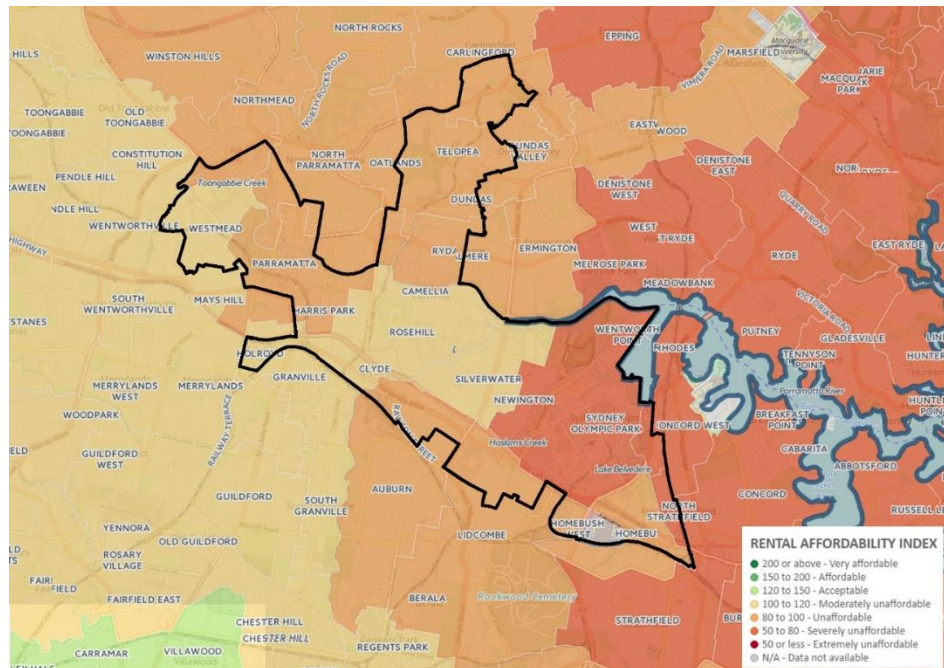


Source: SGS Economics and Planning, 2017

Social and affordable housing

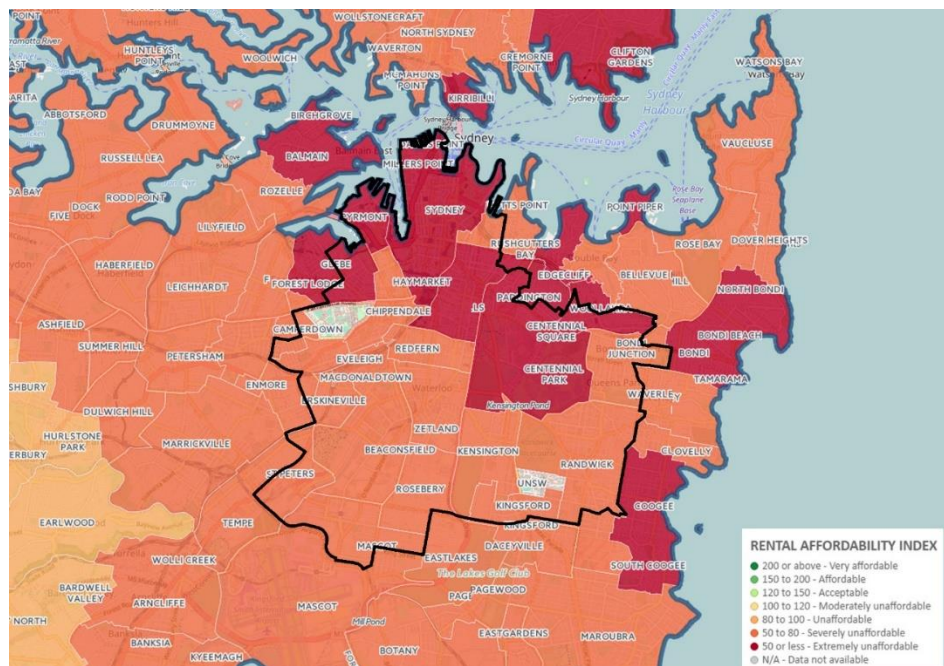
The Rental Affordability Index (RAI) developed by SGS provides insight into the affordability of housing across Australian cities and regions. Figure 14 and Figure 15 illustrate the rental affordability across GPOP and East Sydney. Both regions are considered to be unaffordable. However, GPOP is considered to be more affordable than East Sydney which is considered to be extremely unaffordable. Sydney Olympic Park and the suburbs immediately adjacent are the only areas that are considered severely unaffordable while the remainder of GPOP is unaffordable or moderately unaffordable. In contrast, all suburbs in East Sydney are either severely or extremely unaffordable.

FIGURE 14. RENTAL AFFORDABILITY INDEX: GPOP



Source: SGS Economics and Planning, 2016

FIGURE 15. RENTAL AFFORDABILITY INDEX: EAST SYDNEY



Source: SGS Economics and Planning, 2016

Transport infrastructure

Table 7 illustrates the many similarities in the quantum of transport infrastructure in each of these areas. The indicator that varies the most is the length of cycleways: there is more than double the length of cycleways in East Sydney compared to GPOP.

TABLE 7. EXISTING AND PLANNED TRANSPORT INFRASTRUCTURE ASSET COMPARISON

| GPOP | Length/No. | East Sydney | Length/No. |
|--|------------|--|------------|
| Existing Rail | 43 | Existing Rail | 44.7 |
| Existing number of rail stations | 17 | Existing number of rail stations | 15 |
| Existing number of bus stops | 195 | Existing number of bus stops | 196 |
| Existing Cycle-way length | 252.3 | Existing Cycle-way length | 489.9 |
| Existing Light Rail | Nil | Existing Light Rail | 9.4 |
| <i>Proposed transport infrastructure</i> | | <i>Proposed transport infrastructure</i> | |
| Parramatta Light Rail Stage 1 (proposed) | 12 | CBD and South East Rail | 11.5 |
| Parramatta Light Rail Stage 2 (proposed) | 8 | (under construction) | |
| West Metro | 9 | Sydney Metro New rail * | 3.6 |
| (proposed with approx. length) | | (under construction) | |
| West Metro New Stations | 2 | Sydney Metro New Stations * | 3 |
| | | (under construction) | |
| | | Syd Metro Station expansion * | 2 |

Source: SGS Economics and Planning, 2017

*Sydney Metro Rail Project extends far beyond the East Sydney area, and figures in this table only represent the length of rail/number of stations within the East Sydney study area

East Sydney's transport network is undergoing significant investment and change. New projects include the Sydney CBD and South East Light rail (11.5km of light rail currently under construction), and Sydney Metro City & Southwest. Proposed transport infrastructure projects within GPOP include the Parramatta Light Rail and West Metro.

Despite similarities in the quantities of transport infrastructure, distribution is substantially different, as shown in Figure 16 and Figure 17. Rail stations are generally located on the perimeter of GPOP, while East Sydney contains several train stations within the CBD area through the core of East Sydney.

The Existing T1 Western line that services GPOP is more than a century old. Transport NSW states that during the morning peak it is currently operating at 135 per cent seated capacity. Despite scheduled upgrade works and increased services, the line is expected to be severely overcrowded within the next 15 years.⁸

While there are similar numbers of bus stops in each corridor, the number of routes that utilise each stop differ. A significantly higher number of routes pass through bus stops in the Sydney CBD than in Parramatta, for example.

Sydney Olympic Park is directly serviced by one train station, a loop on the Western Line that runs at 20-minute frequency. It is also served by four bus routes, though only one bus route connects with other centres within GPOP- the 525.

- The 401 runs from Olympic Park to Lidcombe (20-minute frequency)
- The 525 runs from Parramatta to Burwood via Olympic Park. (20 to 40-minute frequency)
- The 526 runs from Burwood to Olympic Park (20-minute frequency)
- The 533 runs from Olympic Park to Chatswood via Ryde (20-minute frequency).

⁸ <https://www.transport.nsw.gov.au/projects/sydney-metro-west>

FIGURE 16. EXISTING AND PROPOSED TRANSPORT INFRASTRUCTURE: GOP

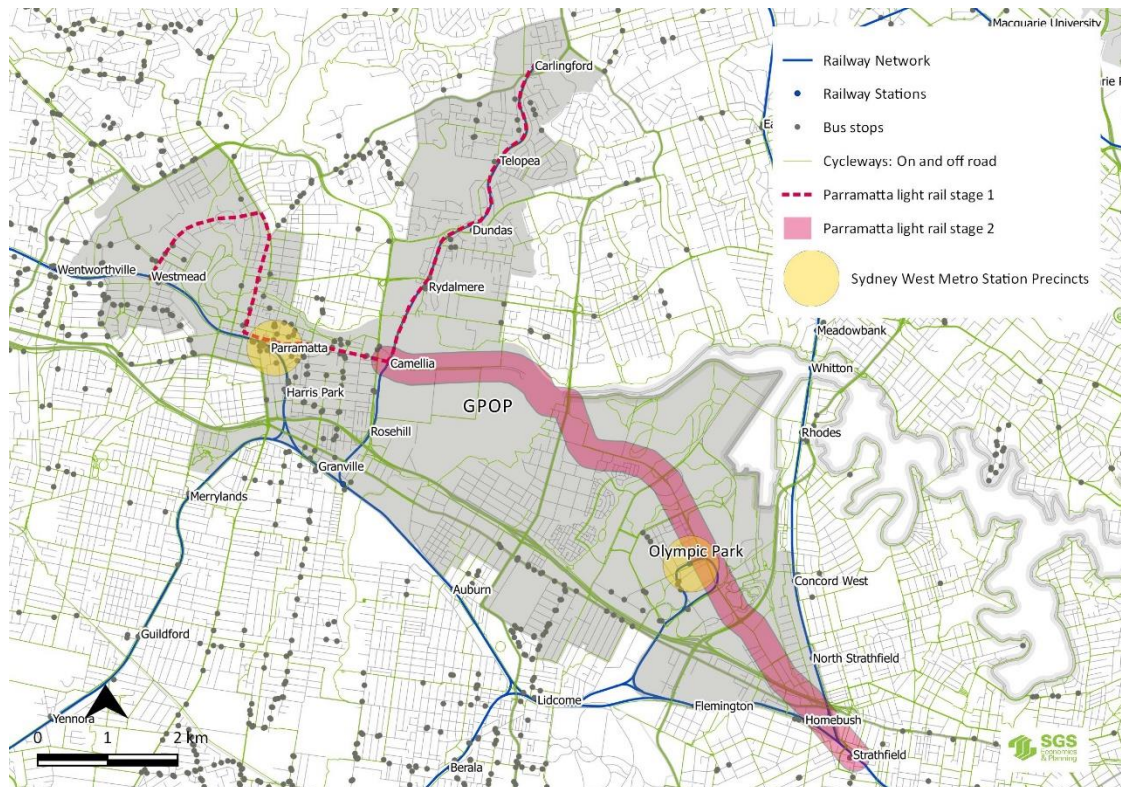
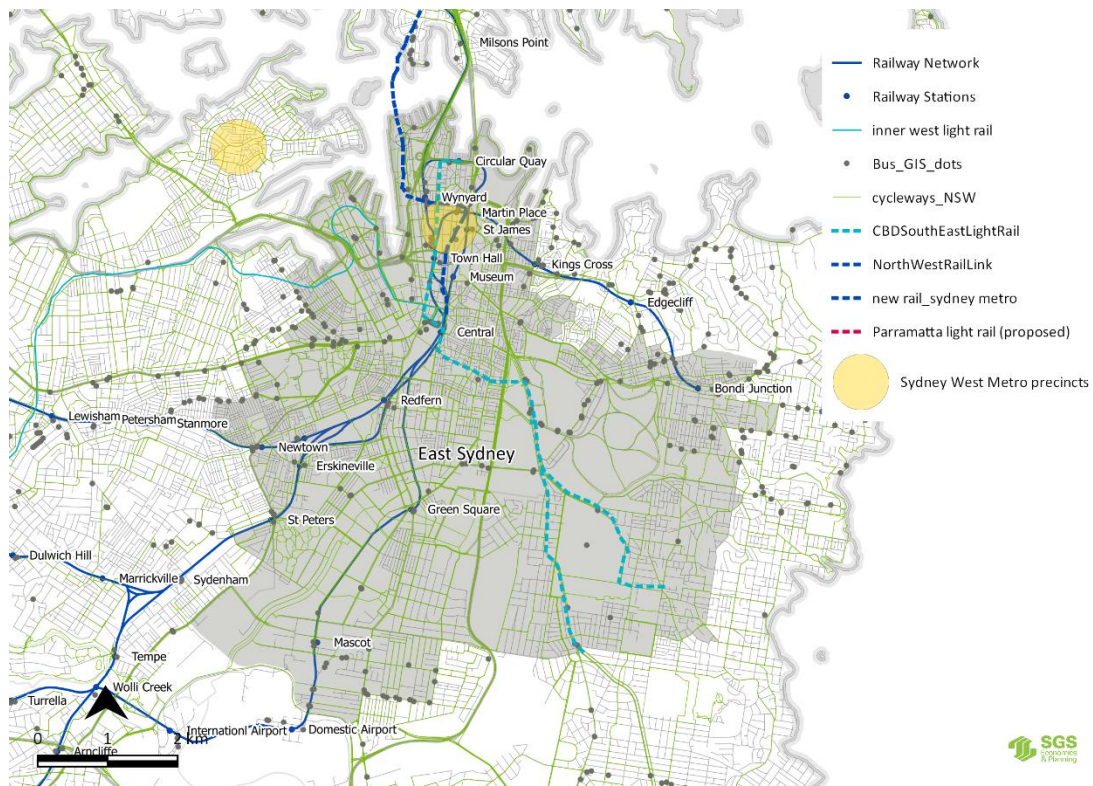


FIGURE 17. EXISTING AND PROPOSED TRANSPORT INFRASTRUCTURE: EAST SYDNEY



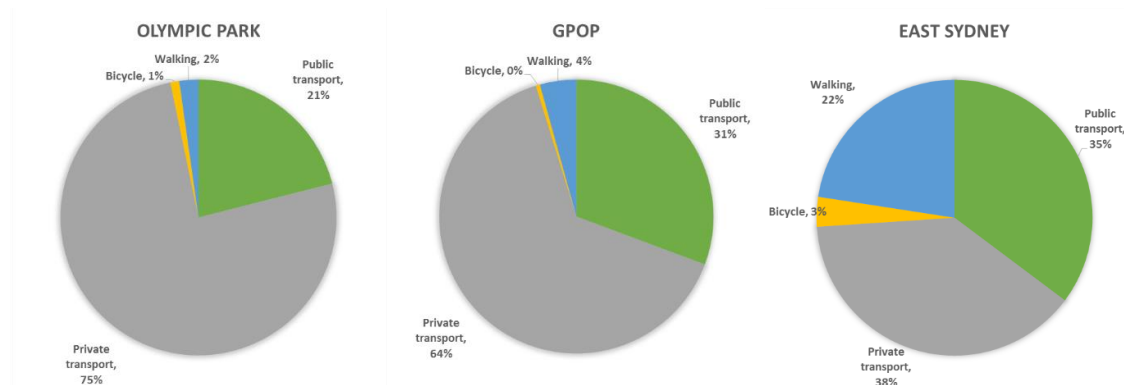
Source: SGS Economics and Planning, 2017

Other transport outcomes

Mode Share

A far larger share of the resident population in East Sydney catch public transport or walk to work compared to residents in GOP and Olympic Park. Currently, 57 per cent of residents who live in East Sydney catch public transport or walk to work compared to 35 per cent in GOP and only 23 percent in Olympic Park (refer to Figure 18). Conversely, a much greater proportion of residents who live in Olympic Park and GOP travel to work using private transport, 75 per cent in Olympic Park compared to 38 per cent for East Sydney.

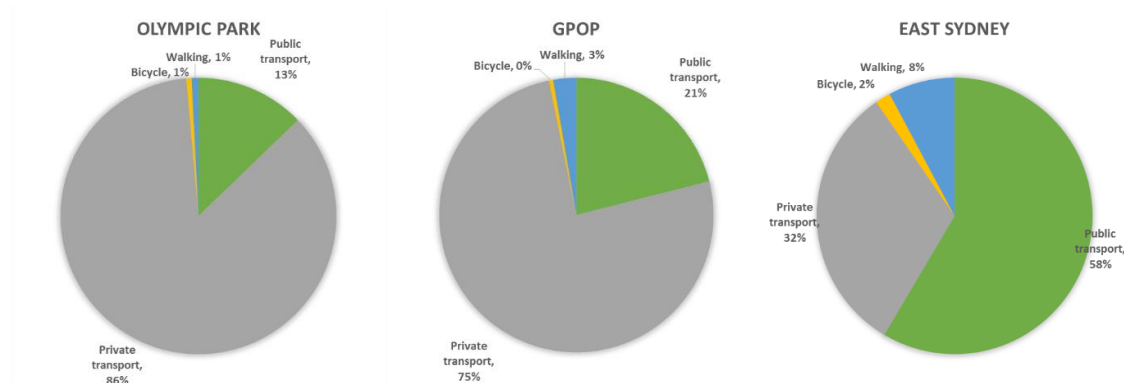
FIGURE 18. JOURNEY TO WORK MODE SHARE: PLACE OF RESIDENCE



Source: Bureau of Transport Statistics, 2011 using ABS Census Data

There is a significant difference between the journey to work mode share patterns for workers based in Olympic Park and GOP compared to East Sydney. Almost 60 per cent of workers who work in East Sydney travel to work via public transport (refer to Figure 19). This compares to 13 per cent for Olympic Park and 21 per cent for GOP. Similarly almost 90 per cent of workers based in Olympic Park travel to work via private transport compared to only 32 per cent in East Sydney.

FIGURE 19. JOURNEY TO WORK MODE SHARE: PLACE OF WORK



Source: Bureau of Transport Statistics, 2011 using ABS Census Data

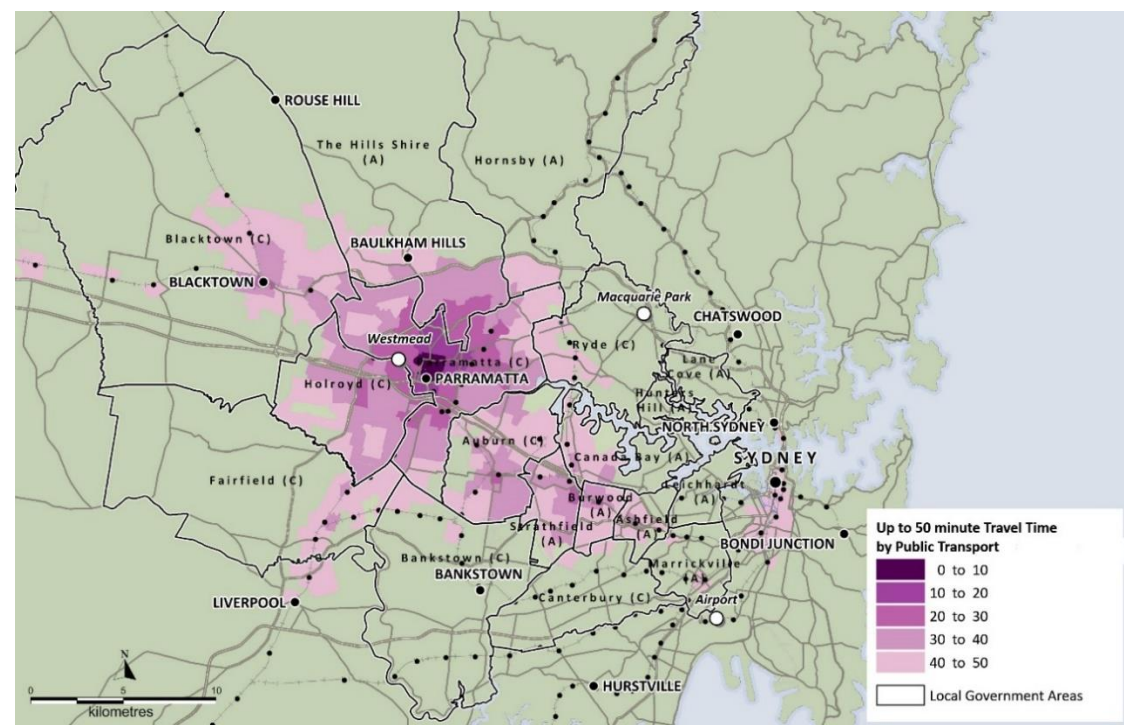
Travel Time

A way to assess the difference between transport networks is to analyse the area that is accessible within specific travel times. Figure 20 and Figure 21 illustrate the access to the broader metropolitan area using public transport from GOP, and from East Sydney. For residents in GOP, a far smaller area is accessible within 50 minutes than for East Sydney. Accessibility from GOP is skewed towards the Western Line Corridor and the Southern Line Corridor to Liverpool. In contrast, accessibility from East Sydney is distributed in all directions.

The average travel time to work for GOP and East Sydney have been compared. The top 10 destinations for work from GOP and East Sydney were identified and the average travel time to work was estimated.

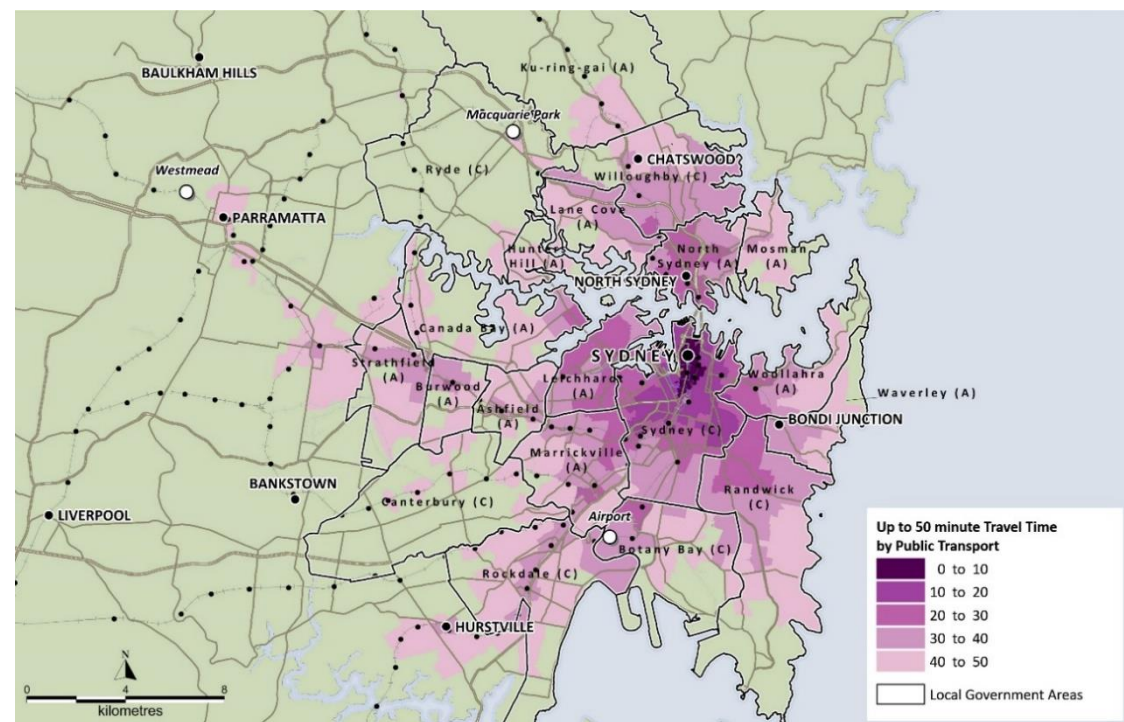
It demonstrates that average travel time to work (using public transport) is 50 per cent longer in GOP than in East Sydney at 46 minutes for GOP and 31 minutes for East Sydney⁹.

FIGURE 20. CITY ACCESSIBILITY BY PUBLIC TRANSPORT: GOP



Source: SGS Economics and Planning

FIGURE 21. CITY ACCESSIBILITY BY PUBLIC TRANSPORT: EAST SYDNEY



Source: SGS Economics and Planning

⁹ Based on BTS 2011 and Google Maps, 2016

3.3 Summary of regional scale assets

Sydney Olympic Park's population will increase from 2,500 residents in 2016 to almost 20,000 by 2041. GPOP's population of 110,000 is expected to more than double by 2041.

The existing population of East Sydney of 270,000 will grow by almost 145,000 extra residents by 2041. By 2041, GPOP and East Sydney will experience relatively similar levels of growth. The growth in these areas must be supported by integrated transport and land use planning.

The significant cluster of centres within GPOP and the vision for its growth draws parallels with East Sydney now. Comparing GPOP to East Sydney highlights the geographic scale of the GPOP and its geographic scale and its strategic regional role. Both these areas contain:

- a major CBD precinct
- a major sports and recreation precinct
- strategic employment lands
- health and education precinct(s)

In both areas, population growth, employment centres and social infrastructure is concentrated along major transport corridors. GPOP does not contain a concentration of activity within its core spine, likely due to the lack of transport infrastructure connecting major activities and the significant strategic employment lands at its centre.

The key distinctions between GPOP and East Sydney are detailed in Table 8.

TABLE 8. KEY DISTINCTIONS BETWEEN GPOP AND EAST SYDNEY

| Area | GPOP | East Sydney |
|--|-----------------|-----------------|
| Growth | | |
| Population 2016 | 107,270 | 263,485 |
| Population 2041 | 277,590 | 407,011 |
| 25 year population growth (Average annual Growth Rate) | 170,320 (3.88%) | 143,525 (1.75%) |
| Jobs 2016 | 156,625 | 614,665 |
| Jobs 2041 | 257,215 | 858,355 |
| 25 years jobs growth (Average annual Growth Rate) | 102,590 (2.06%) | 243,690 (1.34%) |
| Social Infrastructure | | |
| Schools | 24 | 47 |
| Major Hospitals | 2 | 5 |
| Universities | 3 | 4 |
| Visitors to Major Parklands (Sydney Olympic Park or Centennial Park) | 10 million | 20 million |
| Transport | | |
| Light Rail Network | 0km | 11km |
| Mode share: Public vs private transport (place of residence) | 31% vs 64% | 35% vs 38% |
| Mode share: Public vs private transport (place of work) | 21% vs 75% | 58% vs 32% |
| Average travel time to work | 46 minutes | 31 minutes |

Transport connectivity will drive the successful development of GPOP, facilitating growth in economic activities and supporting the growing local community. GPOP's significant cluster of centres requires investment similar to that which has occurred, and is occurring, in East Sydney.

4 TRANSPORT CONNECTIVITY

4.1 Introduction

Integrated transport and land use planning is a central tenet of an efficient, sustainable city. This report considers how this integration can be planned for at regional, district or local scales and illustrates the need for an integrated transport solution across GPOP.

4.2 Understanding levels of transport investment

Effective integrated transport and land use planning requires a clear understanding of the different geographic scales of infrastructure and land uses. There are generally three geographic scales to classify transport infrastructure and the strategic importance of land uses¹⁰:

- region: the Greater Sydney metropolitan area
- district: the subregional or corridor scale
- local: a suburb or neighbourhood.

Well planned regional-scale transport infrastructure is thought of as city-shaping infrastructure – the kind of investments that can influence the overall urban structure of a metropolitan area and provide a basic foundation to a city’s transport network. In Sydney, this is defined by the motorway network and heavy rail corridors that connect larger centres.

District transport infrastructure typically responds to district demand and, in doing so, integrates with regional transport infrastructure. This infrastructure improves accessibility for district, provides connections to a wider area, and, importantly, helps to revitalise and enhance local environments, as has been seen by the Inner West and planned City and South East Light Rail.

Local transport infrastructure responds directly to local conditions and supports day to day connections within a suburbs or neighbourhood. It provides access to regional and district networks, and often precedes the delivery of district or regional infrastructure to provide an early response to changing land use patterns. Examples include the City of Sydney’s expanded cycleway network.

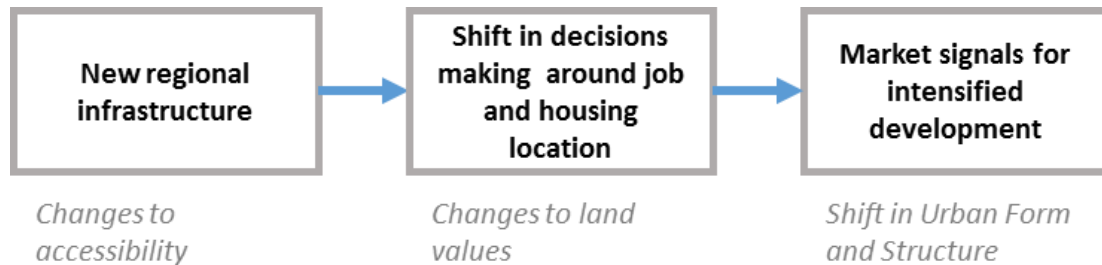
Regional transport infrastructure

New regional transport infrastructure can shift a city’s development patterns and prospects for growth. These investments should be scoped around a city’s preferred future urban structure, rather than simply respond to demand. In this way, regional infrastructure is a powerful means for planning a city’s structure, and is best supported by land use regulation.

¹⁰ Integrated Transport and Land Use Planning (2016) Transport and Infrastructure Council, Australian Transport Assessment and Planning Guidelines. http://atap.gov.au/framework/integrated-transport-land-use-planning/files/f02_integrated_transport_and_land_use_planning.pdf

Investment in regional infrastructure must consider whether the initiative will demonstrably and significantly raise accessibility; substantially redistribute jobs; substantially redirect the property market or increase the desirability of a particular area; or provide opportunities to shift land uses through land use planning responses¹¹ (refer to Figure 22).

FIGURE 22. IMPACT OF STRATEGIC TRANSPORT INFRASTRUCTURE



Source: Transport and Infrastructure Council, 2016

Sydney Metro North West, Metro City & Southwest, and Metro West

Sydney Metro projects are examples of strategic infrastructure. Sydney Metro North West will upgrade the rail network to support a higher frequency and faster train services and extend the rail network between Epping and Rouse Hill and create new Sydney CBD stations. Sydney Metro City & Southwest will transform heavy rail from Sydenham to Bankstown to metro services to substantially increase access to CBD jobs. The transition will be a catalyst to renew the areas around the new metro stations. Longer term, Sydney Metro West will provide underground services linking the Parramatta and Sydney CBDs.

District transport infrastructure

Planning for district infrastructure typically entails a more traditional approach that integrates transport with land use planning by identifying corridors of demand, defining the performance required from the transport network and moving towards a connected and integrated system.¹²

Inner West and South East Light Rail

The Inner West Light Rail improved transport connectivity within the Inner West and to local centres as well as the broader metropolitan rail transport network. The CBD and South East Light Rail will improve district transport connections for people living in East Sydney. A priority in the development of the City and South East Light Rail has been integration with surrounding land uses, including public domain improvements.

Local transport infrastructure

Local transport infrastructure provides services into a suburb or neighbourhood. Local infrastructure similarly requires a more traditional approach to integrated transport and land use planning.

4.3 A networked GPOP

A fully networked GPOP requires all three levels of transport infrastructure to best function:

- **REGIONAL** rail infrastructure can connect GPOP to the wider metropolitan transport network and provide the overarching structural framework for district and local transport infrastructure.
- **DISTRICT** infrastructure projects integrate will integrate higher-order structural infrastructure and connect GPOP's cluster of centres.

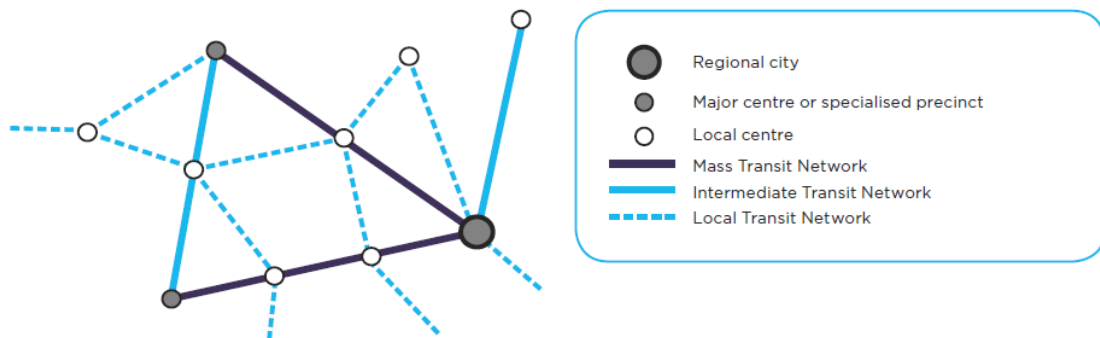
¹¹ ibid

¹² ibid

- **LOCAL** transport infrastructure will support and respond to regional and district transport infrastructure by providing fine grain urban connectivity. It will responds to and enhances GOP's local lifestyle assets, communities and businesses.

This concept is illustrated in Figure 23.

FIGURE 23. NETWORK DIAGRAM OF THREE TRANSIT TYPES



Source: Transport for NSW, 2012

4.4 Current GOP network

From a regional infrastructure perspective, GOP has access to Greater Sydney through the heavy rail network.

However, the rail network largely skirts the outside of the corridor, and provides only limited intermediate connectivity between key centres within GOP (with the exception of the Carlingford Line), and to the Greater Sydney rail network. The rail to Olympic Park operate as major event services.

GOP is underserved in terms of district transport infrastructure:

- Mass transit connections are limited between GOP's major centres (such as Parramatta and Sydney Olympic Park) and to other regional centres such as the Sydney CBD and Western Sydney Airport.
- A lack of district scale connections between the existing centres and precincts within GOP limits its potential as an economic corridor; without investment in this level of infrastructure, GOP will operate as a number of isolated precincts that are geographically adjacent.

Without the district-level infrastructure to connect the cluster of centres within GOP, the potential for Sydney Olympic Park to meet the full ambitions of its Master Plan will be limited.

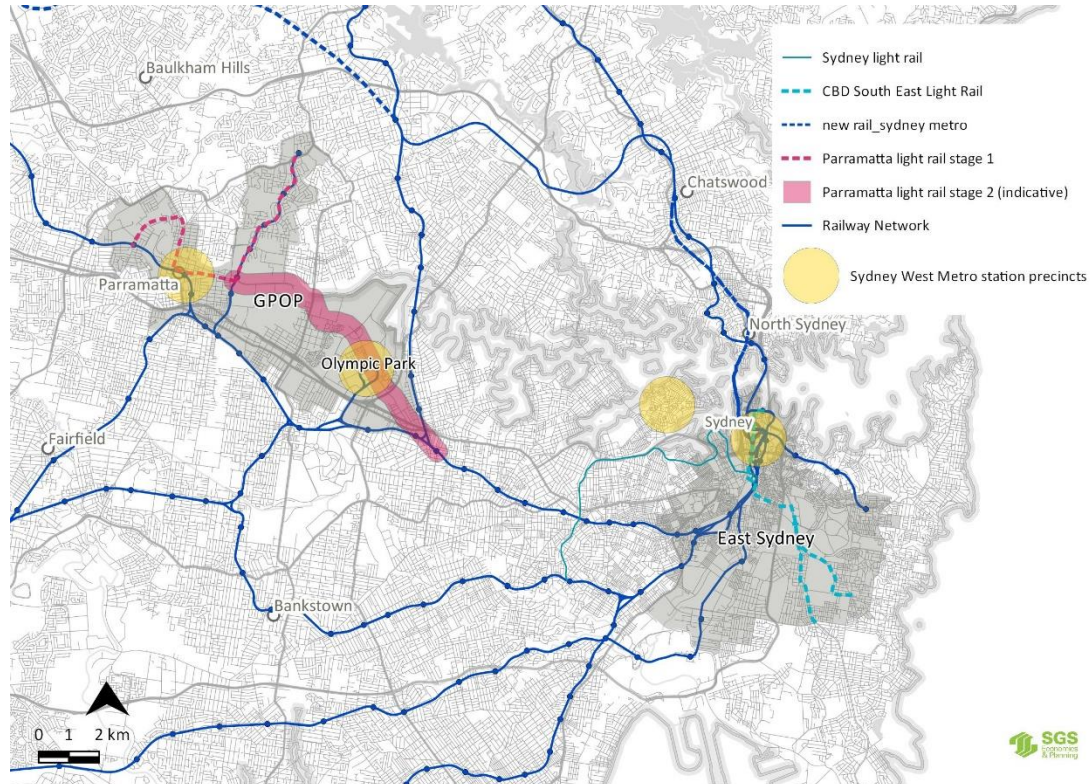
From a local infrastructure perspective, parts of GOP, particularly Parramatta, Westmead and precincts clustered around the Carlingford Line, have good access to local bus networks and cycleways.

These deficits are best illustrated when compared with past, current and future investments in East Sydney. The area is already serviced by multiple rail lines, established bus services, including express and Metrobus services, substantial cycleway and pedestrian infrastructure. The investment in the CBD and South East Light Rail along with Metrobus services, illustrates a missing link within the area's transport network, and will service the Randwick Health and Education super precinct and to allow the area to fully reach it's potential.

4.5 Planned investments

The key transport infrastructure projects that will increase accessibility to Sydney Olympic Park are Parramatta Light Rail (Stage 2) and Sydney Metro West. Investment in cycleway infrastructure will also continue. Figure 24 shows the location of proposed Sydney Metro West stations and the Parramatta Light Rail (Stage 2).

FIGURE 24. PROPOSED TRANSPORT INFRASTRUCTURE



Source: SGS Economics and Planning, 2017

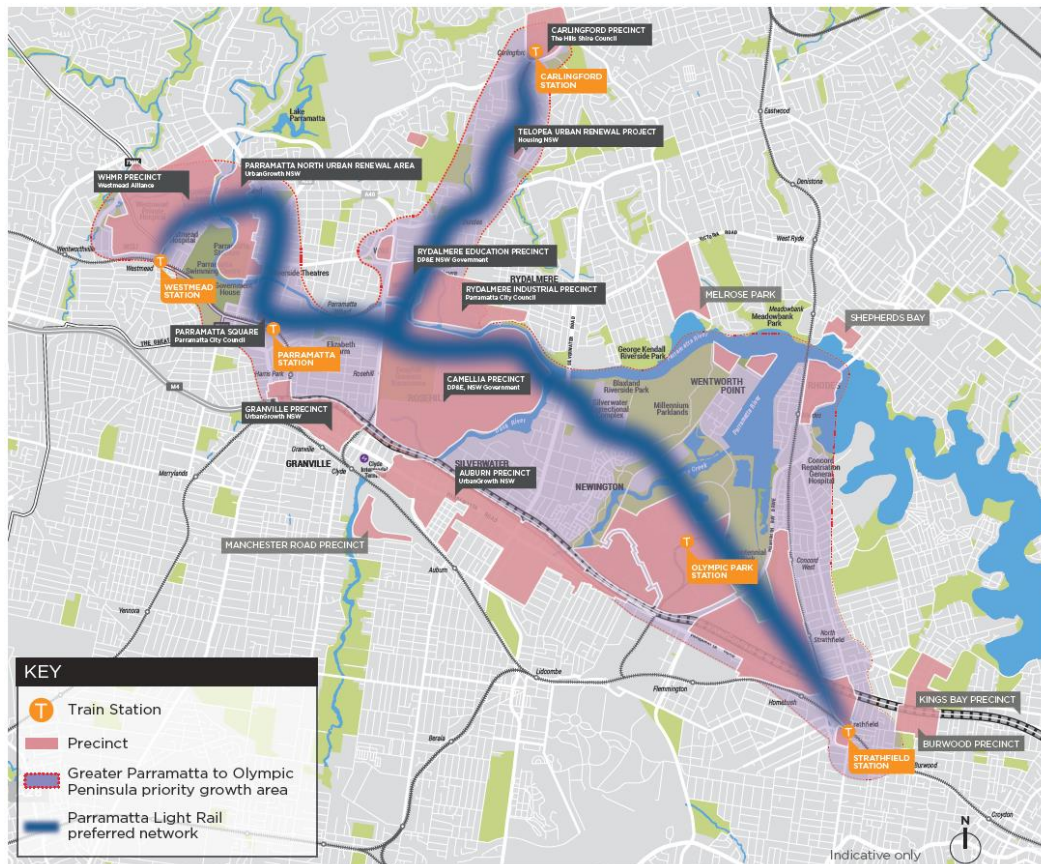
Parramatta Light Rail

The proposed Parramatta Light Rail is a revitalisation project that is expected to improve access to jobs, destinations and communities in GOP. Stage 1 includes a 12 km link between Westmead, Parramatta and Carlingford via Camelia, with 12 stops. Stage 2 is proposed to link Camelia to Sydney Olympic Park, with the specific details of the route and stops yet to be finalised.

In a media release from the NSW Premier on 17 February 2017 where the preferred route for Stage 1 was revealed, the project was described as not only connecting, but also as revitalising communities and helping to grow new ones. It is anticipated that the project will attract investment that can strengthen and revitalise existing centres. Stage 1 connects the major health precinct at Westmead to Western Sydney University and the Parramatta CBD as well as Rosehill Racecourse and the new Western Sydney Stadium.

More detailed planning for Stage 2 is reportedly being developed in conjunction with Sydney Metro West, and is anticipated to be finalised by the end of 2017. The outcomes of this detailed planned will impact the ability of Sydney Olympic Park to reach its ambition for 23,500 residents and 34,000 jobs as GOP's eastern anchor.

FIGURE 25. STAGE 1: PARRAMATTA LIGHT RAIL



Source: Parramatta Light Rail, Department of Transport NSW, 2017.

Sydney Metro West

Sydney Metro West is a proposed underground metro line that will link Parramatta and Sydney CBDs. It could deliver faster and more frequent services with increased capacity, helping to meet the demand experienced on the Western Line.

Station locations have not yet been determined, but four key precincts are identified: Parramatta, Sydney Olympic Park, The Bays Precinct and Sydney CBD. The project is consistent with vision for a Central City focused on Parramatta, and is anticipated to foster investment that will revitalise existing, and establish new, communities. As an example of regional transport infrastructure, it would have broad impacts on accessibility for people and businesses from the Sydney CBD to beyond the Parramatta CBD.

Subiaco Creek Link: Cycleway

The missing links within the Parramatta Valley Cycleway constrain effective connectivity within the transport network. The NSW Government's Priority Cycleways Program is funding the missing links in cycleway networks across NSW, and this includes the 20km Subiaco Creek link that connects Parramatta Park to Sydney Olympic Park via Parramatta CBD and the Western Sydney University campus in Rydalmere. This will improve connections between GOP's local centres of activity, including Sydney Olympic Park.

These projects represent three different scales of transport investment in GOP. Effective strategic planning will need to integrate these investments with planned land uses to promote a more networked corridor as well as networked Central City.

4.6 Summary of Transport Connectivity

There are clear gaps in the transport network. There is a need for transport solution that includes regional transport infrastructure, along with district and local infrastructure.

Transport connectivity will drive the successful development of GPOP, facilitating growth in economic activities and supporting the growing local community. GPOP's significant cluster of centres requires investment similar to that which has occurred, and is occurring, in East Sydney.

This requires clear planning and integration of regional, district and local transport networks, in line with changing or expanding land uses, to support various accessibility needs of residents and businesses.

If it is to replicate the success of East Sydney, GPOP requires a networked and connected corridor with three levels of transport infrastructure to best function:

- Regional transport infrastructure connects to the wider metropolitan transport network and provides the overarching structural framework for regional and local transport infrastructure.
- District transport infrastructure projects integrate with higher-order structural infrastructure and connect clusters of centres within regional corridors.
- Local transport infrastructure supports and responds to both regional and district transport infrastructure by providing fine grain urban connectivity. Local transport infrastructure responds to and enhances the quality and experience of the local environment.

This analysis identifies two significant gaps for GPOP:

- mass transit connections between its major centres (such as Parramatta and Sydney Olympic Park) to other regional centres such as the Sydney CBD and the future Western Sydney Airport
- district-scale connections between the existing centres and precincts within GPOP which could limit GPOP to isolated, yet adjacent precincts.

GPOP requires both regional-scale transport infrastructure as well as more district and local infrastructure to support the vision as the connected, unifying heart of Greater Sydney.

5 KEY FINDINGS

The comparative analysis of GOP and East Sydney has identified four strategic themes. These themes provide the overall rationale for improving transport connectivity to Sydney Olympic Park”

- Sydney Olympic Park is transitioning from an Olympic Village and major event site to a focal point for a new residential communities and regional economic activities - a lifestyle super precinct.
- Sydney Olympic Park is the eastern anchor within GOP, sitting between Parramatta and the Sydney CBD. It sits within a growing corridor that is expected to see a substantial increase in population and jobs.
- Transport connectivity will drive the successful development of GOP, facilitating growth in economic activities and supporting the growing local community.
- GOP’s significant cluster of centres, including Sydney Olympic Park, requires investment similar to that which has occurred, and is occurring, in East Sydney. This requires clear planning and integration of regional, district and local transport networks, in line with changing or expanding land uses, to support various accessibility needs of residents and businesses.
- By providing and integrating every level of transport, GOP can be a place that suits a diversity of lifestyles, a diversity of businesses, and a variety of trips and movements, both within GOP itself and to other destinations. This will promote a networked structure of precincts – and Sydney Olympic Park will be better connected within GOP and to other strategic centres and corridors across Greater Sydney.

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