An aerial photograph of a city grid, overlaid with a dark, semi-transparent layer. The grid lines are visible, and the overall tone is dark and monochromatic. The text is overlaid on the right side of the image.

3.0

Site Analysis

This section identifies existing conditions, patterns and qualities of GPEC by mapping at various scales observations, planning parameters and existing conditions. The analysis operates on a number of levels from physical environment to the activities taking place in them.

3.1. Landscape and Biodiversity

3.1.1 Landscape and Environmental Challenges

Flooding

The GPEC area is characterised by extensive flood prone land made up of a large number of drainage catchments. Flood risk presents challenges to future development and its higher densities and infrastructure provision that would need to be tackled by developing protective, resilience and adaptation strategies, including evacuation and the protection of property. Strategies such as flood management plans should be required for upzoning of currently lower density, rural or undeveloped lands if flooding issues are to be addressed properly within future development.

Soil Salinity and Health

Soil salinity, which is closely associated with stormwater and flood management, and can limit the development potential of a place and requires an integrated approach involving planting, soil remediation for any adapted built environment. Additional studies are required to determine the interconnectedness of soil health, water management and land use.

Steep Topography

Several locations in the south-eastern portion of the GPEC area feature steep slopes that could hinder, if not prohibit, certain open space uses such as sporting fields. Intrusive earthworks such as regrading steep slopes for certain land uses could further disturb vulnerable soil profiles and drainage patterns.

Dams and Waterbodies

Dams and waterbodies are key sites of water retention in the landscape and need to be retained where possible as stormwater flow detention and stormwater slowing mechanisms.

Protected Vegetation

Protected vegetation in the form of Threatened Ecological Communities need to be protected for biodiversity and tree canopy coverage reasons, particularly due to the vulnerability of the Cumberland Plain vegetation and the pace of urbanisation and development.

Urban Heat

Areas within GPEC are affected significantly by urban heat, particularly the more developed residential areas, and pose a challenge to both ecological and human health. These locations would benefit from strategic intervention to increase tree canopy and implement design strategies to minimise urban heat.

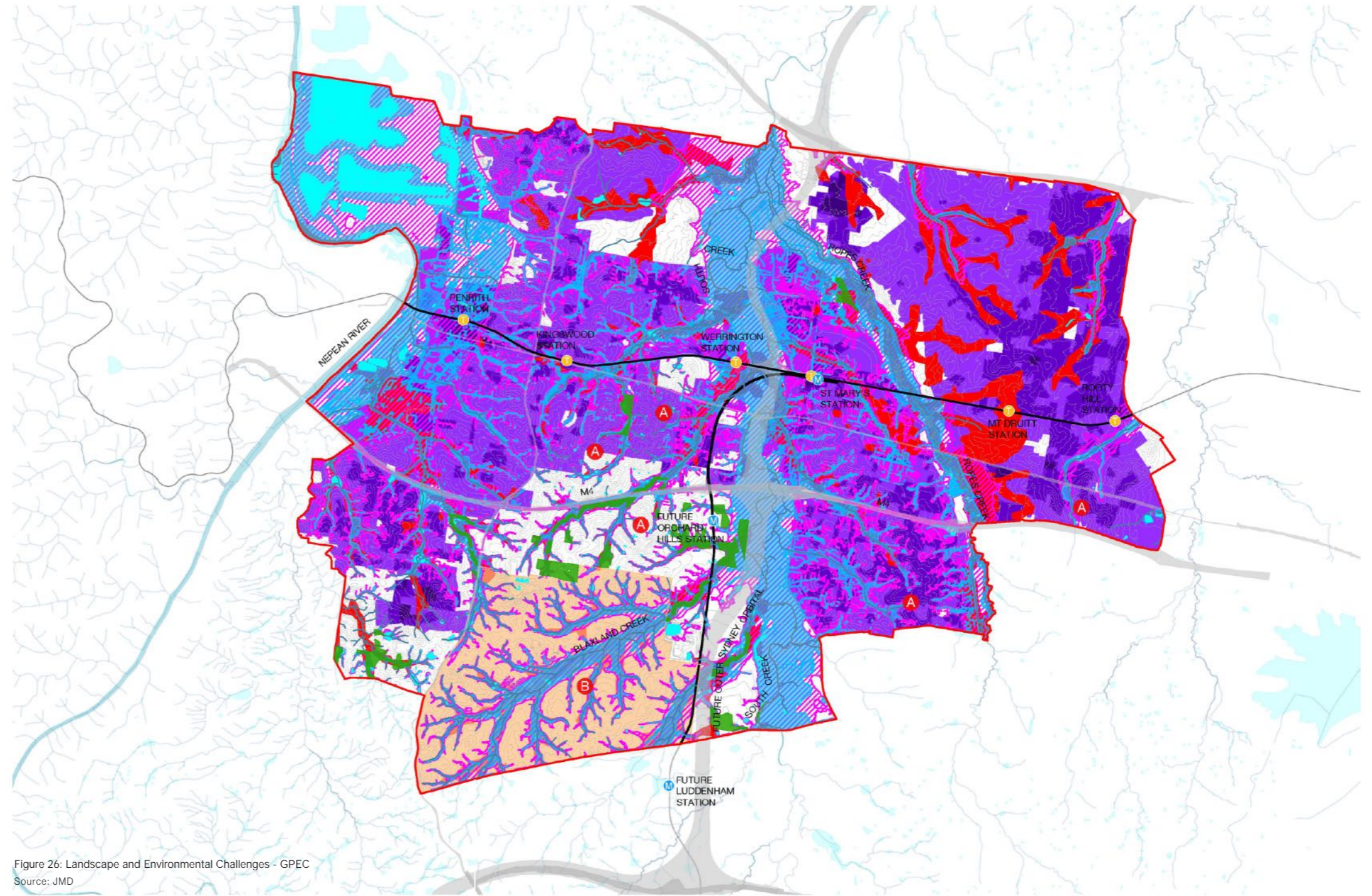


Figure 26: Landscape and Environmental Challenges - GPEC
Source: JMD

Legend

- EXTENT OF SITE
- MAJOR ROAD CONNECTORS
- EXISTING TRAIN LINE
- PROPOSED NEW METRO LINE
- CREEKS & WATERWAYS
- DAMS & WATER BODIES
- 1% AEP (1:100 FLOOD)****
- PMF (PROBABLE MAXIMUM FLOOD) EXTENT****
- KNOWN SALINITY*
- CONTOURS**
- CPCP - NON-CERTIFIED LAND (AVOIDED)***
- RELATIVELY STEEP SLOPES
- AUSTRALIAN DEFENCE SITE - INACCESSIBLE
- 6-8 DEGREES ABOVE NON-URBAN VEGETATED REFERENCE AROUND SYDNEY*****
- 8-10
- 10-12

SOURCE *NSW GOVERNMENT SEED PORTAL, MARCH 2021. SALINITY POTENTIAL WESTERN SYDNEY
 **NSW SPATIAL COLLABORATION PORTAL, MARCH 2021. PENRITH CONTOURS AHD 2m
 ***NSW DEPARTMENT OF PLANNING, CPCP AUGUST 2022
 ****PENRITH CITY COUNCIL AND BLACKTOWN CITY COUNCIL, MARCH 2021. BCC OWNERSHIP AND FLOOD DATA 20210430, 210521_FLOOD DATA
 *****NSW GOVERNMENT SEED PORTAL, NSW URBAN HEAT ISLAND TO MODIFIED MESH BLOCK 2016
 JMD DESIGN PRODUCED CONTENT BASED ON ABOVE MAPPED SITE ANALYSES 210816

SCALE 1:100000 @A3



3.1.2 Physical and Heritage Challenges

The following points identify challenges that revolve around Indigenous history and heritage, Country, non-Indigenous heritage, existing physical built and urban forms within the GPEC Area. These elements have been considered within the Structure Plan for GPEC.

- A** Wianamatta-South Creek, Ropes Creek and the Nepean River flood plain may contain significant Indigenous corridor archaeological deposits to be discovered. A sensitive approach needs to be taken to these areas to protect these areas holding significance for the Aboriginal communities of GPEC.
- B** The Metro, Outer Sydney Orbital infrastructure and electricity transmission lines along the Wianamatta South Creek corridor may constrain physical movement and visual connections across the Wianamatta South Creek corridor, as well as place constraints on future land uses in these areas. The Outer Sydney Orbital may also impact on existing activities and biodiversity in the recreational precinct in St Marys.
- C** The existing road corridors within GPEC create divided 'mega precincts' that are separated and disconnected from one another via these large infrastructure corridors. North-south and east-west movement is inhibited and will require significant investment to improve connectivity over time.
- D** Large heritage sites are located across the GPEC area and should be protected and retained. Of particular significance is the Blacktown Native Institute site which should be protected for its significance to the local community.
- E** The protection of view corridors, particularly to the Blue Mountains to the west, needs to be considered.
- F** High terrain in the form of ridge tops is primarily located within already developed urban land or within the Australian Defence Precinct. This creates less opportunity for view corridors to be harnessed within urban growth, however does provide some protection for these ridge-lines which hold significance for the Indigenous Communities in GPEC today.
- G** The Australian Defence site is self-contained and therefore is a huge barrier to east-west or north-south connectivity.

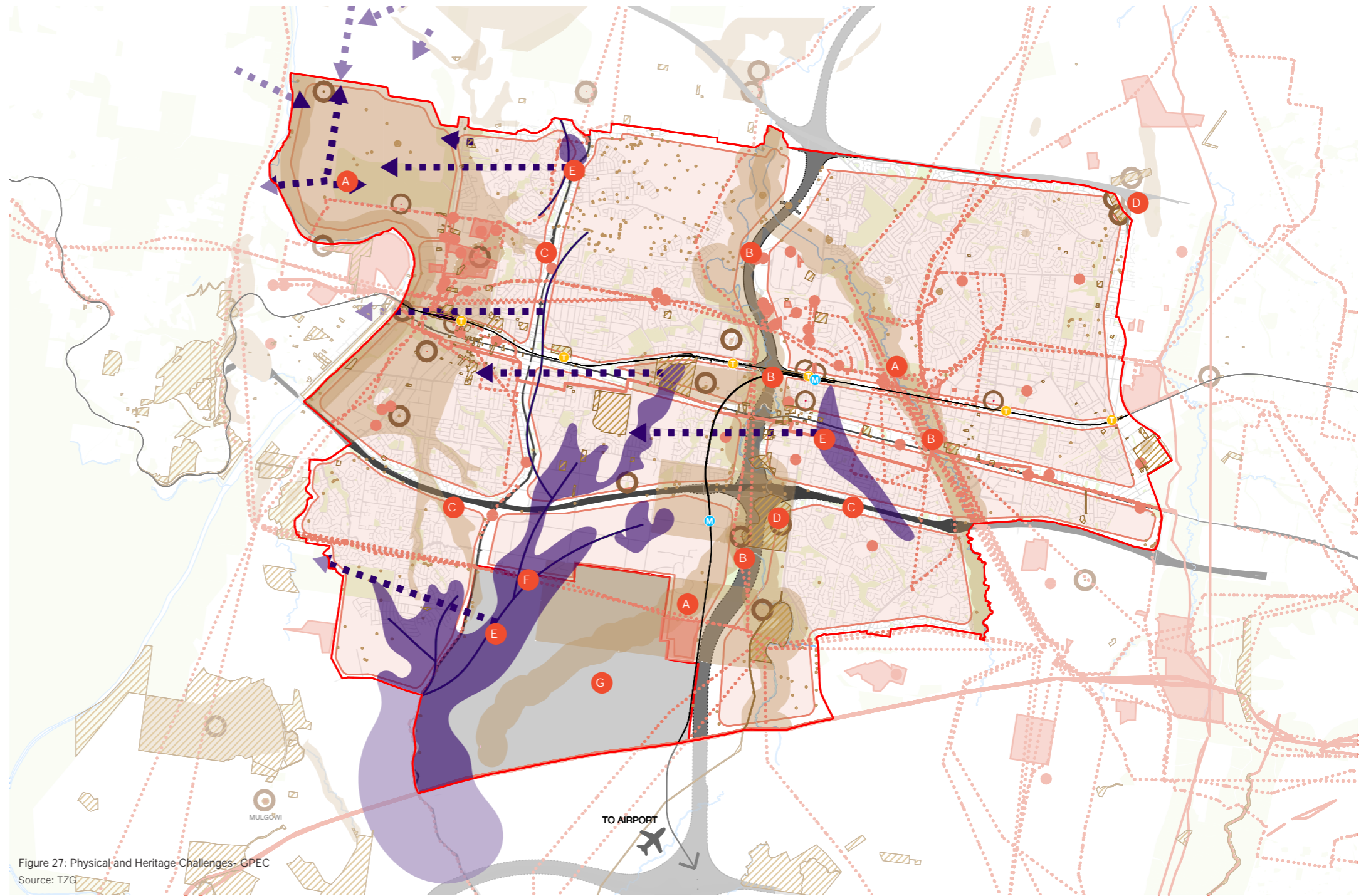


Figure 27: Physical and Heritage Challenges - GPEC
Source: TZG

Legend:

- | | | | |
|---|--------------------------------------|---|---|
| EXISTING FREEWAY / HIGHWAYS | HERITAGE ITEMS/ CONSERVATION AREAS | ELECTRICITY TRANSMISSION LINES | INDICATIVE HIGH TERRAIN |
| PROPOSED OSO | INDIGENOUS CULTURAL VALUES | WESTERN SYDNEY PRIMARY MAIN | INDICATIVE RIDGE LINE |
| LARGE PRECINCTS DISCONNECTED BY ROAD INFRASTRUCTURE | INDIGENOUS SIGNIFICANT SITES | EPA WASTE INFRASTRUCTURE OR EPA CONTAMINATED SITE | SIGNIFICANT VIEW CORRIDORS TO BE MAINTAINED |
| AUSTRALIAN DEFENCE FORCE SITE | AREAS OF ARCHAEOLOGICAL SIGNIFICANCE | EPA ENVIRO PROTECTION | |
| ROPES CREEK - SOUTH CREEK | | | |

SCALE 1:100000 @A3
500 0m 1000 2000 4000

3.1.3 Landscape Opportunities - Biodiversity

This section identifies opportunities around landscape biodiversity within GPEC. These opportunities have informed the preparation of the Structure Plan for GPEC.

Five major biodiversity protection areas have been identified based on existing regulatory protections. Biodiversity corridors could be used to link the various precincts of the GPEC area. These will comprise a combination of existing remnant vegetation corridors including Threatened Ecological Communities, flood planning areas zones (under the determined flood planning level), waterways and water-dependent ecosystems of High Ecological Values, C2-zoned areas, Priority Conservation Lands from the Cumberland Plain Recovery Plan (2011), lands with High Biodiversity Values that are particularly sensitive to impacts from development and clearing, and non-certified lands avoided for biodiversity purposes in the Draft Cumberland Plain Conservation Plan 'CPCP' (2020).

Collectively, these will be principally areas of habitat, ecological biodiversity and environmental conservation with the additional potential function of accommodating active transport linkages, that will impart their particular ecological character, function and connectivity throughout the GPEC area.

Riparian corridors currently generally allow for a north-south direction of flora and fauna movement, so east-west connections could be established at key riparian crossings and, more generally, along remnant vegetation corridors and their associated proposed open spaces.

Pending further exploration, there may also be the need for archaeological protection and investigation given the possible alignment of Aboriginal heritage with past flood extents.

Existing farm dams and waterbodies provide opportunities for preservation or incorporation into development as Water Sustainable Urban Design initiatives and/or detention basins in open space, enabling water to be held and its flow slowed in the landscape instead of contributing to flooding, salinity and nutrient overload issues in the riparian corridors.

A regional approach to waterway management would enable a focus on water quality and flow, and potentially present opportunities to integrate blue and green infrastructure.

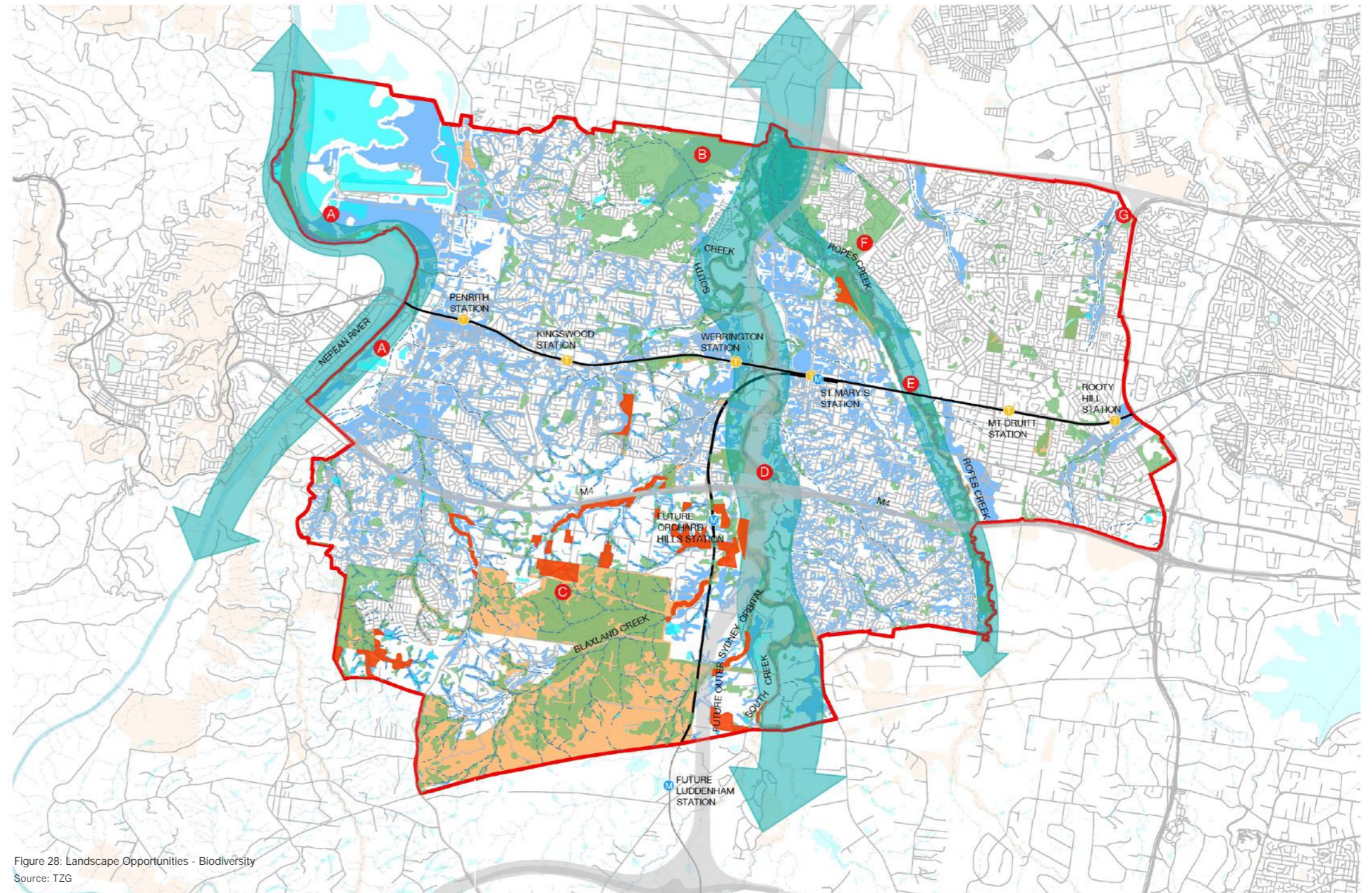


Figure 28: Landscape Opportunities - Biodiversity
Source: TZG

Legend

- EXTENT OF SITE
- MAJOR ROAD CONNECTORS
- EXISTING TRAIN LINE
- PROPOSED NEW METRO LINE
- CREEKS & WATERWAYS
- DAMS & WATER BODIES

- AREA BETWEEN 1:100 AND PMF (PROBABLE MAXIMUM FLOOD) LIMITS - OPPORTUNITIES FOR BIODIVERSITY & INDIGENOUS ARTEFACT CONSERVATION
- AREAS OF INTACT THREATENED ECOLOGICAL COMMUNITIES (STATE) CRITICALLY ENDANGERED, ENDANGERED, VULNERABLE
- CPCP - NON CERTIFIED LANDS (AVOIDED)
- C2 ZONING (CONSERVATION) LANDS, CPRP PRIORITY CONSERVATION LANDS OR LANDS WITH HIGH BIODIVERSITY VALUES

KEY BIODIVERSITY AREAS TO BE PROTECTED AND ENHANCED:

- A PENRITH LAKES, TENCH & NEPEAN RIVER RESERVES
- B WIANAMATTA REGIONAL PARK
- C AUSTRALIAN DEFENCE SITE
- D WIANAMATTA-SOUTH CREEK
- E ROPES CREEK (INCL. TREGEAR AND WHALAN RESERVES)
- F ROPES CROSSING
- G BLACKTOWN NATIVE INSTITUTION

SOURCE: JMD DESIGN PRODUCED CONTENT BASED ON ABOVE MAPPED SITE ANALYSES 210816

SCALE 1:100000 @A3
500 0m 1000 2000 4000

3.1.4 Key findings - Landscape and Biodiversity

Finding 1: Waterways are an essential defining element of GPEC. They must be protected from further degradation and their health must be improved.

GPEC has four major riparian corridors – the Nepean River to the west, Eastern Creek to the east and Wianamatta-South and Ropes Creek running north-south. GPEC is characterised by flood plains and a serious of intricate, but degraded, waterways.

Waterways in GPEC hold a high degree of cultural significance for Traditional Owners and perform vital functions related to flooding and stormwater management. They provide opportunities for different types of spaces that fulfil different roles - connecting people, plants and animals into and along the blue grid and sometimes providing recreation and active transport linkages to centres.

Wianamatta-South Creek is identified in the Western Parkland City District Plan as central to the vision for the Western City. It should be protected, whilst retaining its natural formation and character. It will connect people to places and nature, provide amenity for communities that are developed next to the corridor, cool the city, and provide a place to recreate and be active.

Ownership of Wianamatta-South Creek and Ropes Creek is partly public and partly private, with a range of uses currently occurring within this space which are contributing to further degradation of the creek system. A significant challenge for the State Government in the GPEC area is bringing this land into public ownership over time, to allow these creek corridors to be managed holistically.

Finding 2: GPEC has world-class views to the Blue Mountains and scenic landscapes which should be protected.

The landscape of GPEC is characterised by floodplains, rolling hills and north-south ridgelines including between Cranebrook and Orchard Hills, St Marys to Erskine Park and Mount Druitt to Eastern Creek. Steeper more pronounced hills and ridgelines in Orchard Hills, Kingswood and south Glenmore Park afford iconic views across the landscape west to the Blue Mountains. These views bring a sense of orientation and legibility within the landscape. Recent housing developments in Glenmore Park, Jordan Springs and Ropes Creek have impacted views to and from ridges and interrupted the appreciation of Country through the landscape.

Growth in GPEC can orientate new development sensitively, capturing views and maintaining these view corridors to the mountains to provide a real sense of history and place. Locating district parks on hilltops will allow legibility and celebration of the GPEC landscape.

Finding 3: Increased tree canopy, protection of biodiversity, accessibility and quality of open spaces must improve across GPEC to support the existing and future community.

Open spaces in GPEC are a mixture of parks, civic uses and other undeveloped, operational or inaccessible open spaces. They currently service much of the existing urban areas, with most residential areas being within 400m of open space. The primary regional open space in GPEC is the Wianamatta Regional Park and along the Wianamatta-South Creek and Ropes Creek corridors. However, much of this space is inaccessible or poorly connected to centres. Local open spaces provide for important recreational and community functions, although some recreational spaces lack quality facilities and amenities.

Future planning should focus on increasing quality, accessibility, and multi-functionality of existing open space, and seek opportunities to expand the open space network. Existing high-points in Orchard Hills and Kingswood-Werrington are possible locations to increase district-level open space provision in GPEC, and connections from these spaces to waterways should be identified. Further local open space opportunities can be explored in local centres to increase amenity and civic spaces.

Cumberland Plain Woodland is a critically endangered ecological community, protected under both State and Federal legislation. It is one of the six main indigenous woodland communities of Sydney and comprises an open tree canopy of large eucalyptus trees (Red Gum, Grey Box, Stringy Bark, Ironbark and Spotted Gum) and primarily grasses and herbs as groundcover. Before European settlement, Cumberland Plain Woodland was extensive across Western Sydney. Today, only 9% of the original extent remains intact, with good examples in parts of GPEC. The Cumberland Plain Conservation Plan (CPCP) provides a best-practice strategy for preserving large areas of this endangered ecological community, whilst allowing development on its fringes. Aligning development with the CPCP will contribute to the Western Parkland City by protecting threatened plants and animals while supporting the delivery of housing, jobs and infrastructure.

The overall tree canopy coverage of GPEC is estimated to be around 24%, significantly lower than the target of 40% recommended by the Government Architect in their Greener Places design guide. GPEC's tree canopy coverage includes very densely treed areas (Wianamatta Regional Park and the Australian Defence Site), and urban areas where tree canopy could be significantly increased. This is consistent

Finding 4: GPEC must be resilient to flooding in the Hawkesbury - Nepean Valley.

The landscape of GPEC is characterised by floodplains, rolling hills and north-south ridgelines including those between Cranebrook and Orchard Hills, and St Marys to Erskine Park. The Hawkesbury-Nepean Valley (the valley) covers around 500 square kilometres from Bents Basin, near Wallacia, to the Brooklyn Bridge. Floods in the Hawkesbury-Nepean Valley pose a very significant risk to people's lives, livelihoods and homes because of the valley's unique landscape and the size of its population. The valley has the highest single unmitigated flood risk exposure in Australia.

140,000 people currently live or work on the floodplain. If a flood similar to the worst flood on record happened in the valley today - described as a "1 in 500 chance per year" event - it would pose the following, very significant risks:

- more than 90,000 residents would need to be evacuated
- over 15,500 homes would be impacted by floodwaters
- an estimated \$8 billion in damages

Future decisions on flooding policy, including building in the Hawkesbury-Nepean Valley, will be guided by the recent recommendations of the Independent Inquiry into Flooding, chaired by Professor May O'Kane and former Police Commissioner, Mick Fuller.

3.2. Built Form and Land Use

3.2.1 Built Form and Land Use Challenges

The following points identify challenges around built form and land use within GPEC and have informed the preparation of the Structure Plan.

- A** A significant amount of LAHC government-owned properties exists in fragmented locations in north St Marys, Mt Druitt, Whalan, Dharruk, Hebersham, Blackett and Oakhurst which may require consolidation to deliver development in line with the vision for GPEC. However challenges exist with consolidation due to the spatterdash pattern of the land holdings and the current use of the land by LAHC tenants.
- B** Land Fragmentation patterns can be seen at the macro level across GPEC. Smaller, cul-de-sac style suburbs have been incrementally planned over recent decades within GPEC, resulting in areas separated by major roads and zones of narrow and long open space (often flood prone). These subdivisions are often located away from larger town centres. Fragmented land ownership can also impact on precinct-wide strategies to create open space, ecological or transport corridor networks.
- C** Car dominated subdivision patterns exist within the residential suburbs that are located on the edges of the GPEC area. Car reliance is increased within the smaller suburbs that are distanced from larger, strategic centre such as St Marys, Penrith or Mt Druitt.
- D** As one of the remaining areas of rural land within GPEC, consideration should be given to how land in Orchard Hills will transition to new and appropriate uses that account for environmental and infrastructure challenges.
- E** Kingswood-Werrington could play a greater role in connecting St Marys and Penrith, however this would require improvements to transport links and connectivity. Careful investigation is needed to ensure growth in this area can capitalise on key health and education assets whilst ensuring the challenge of connectivity is overcome.

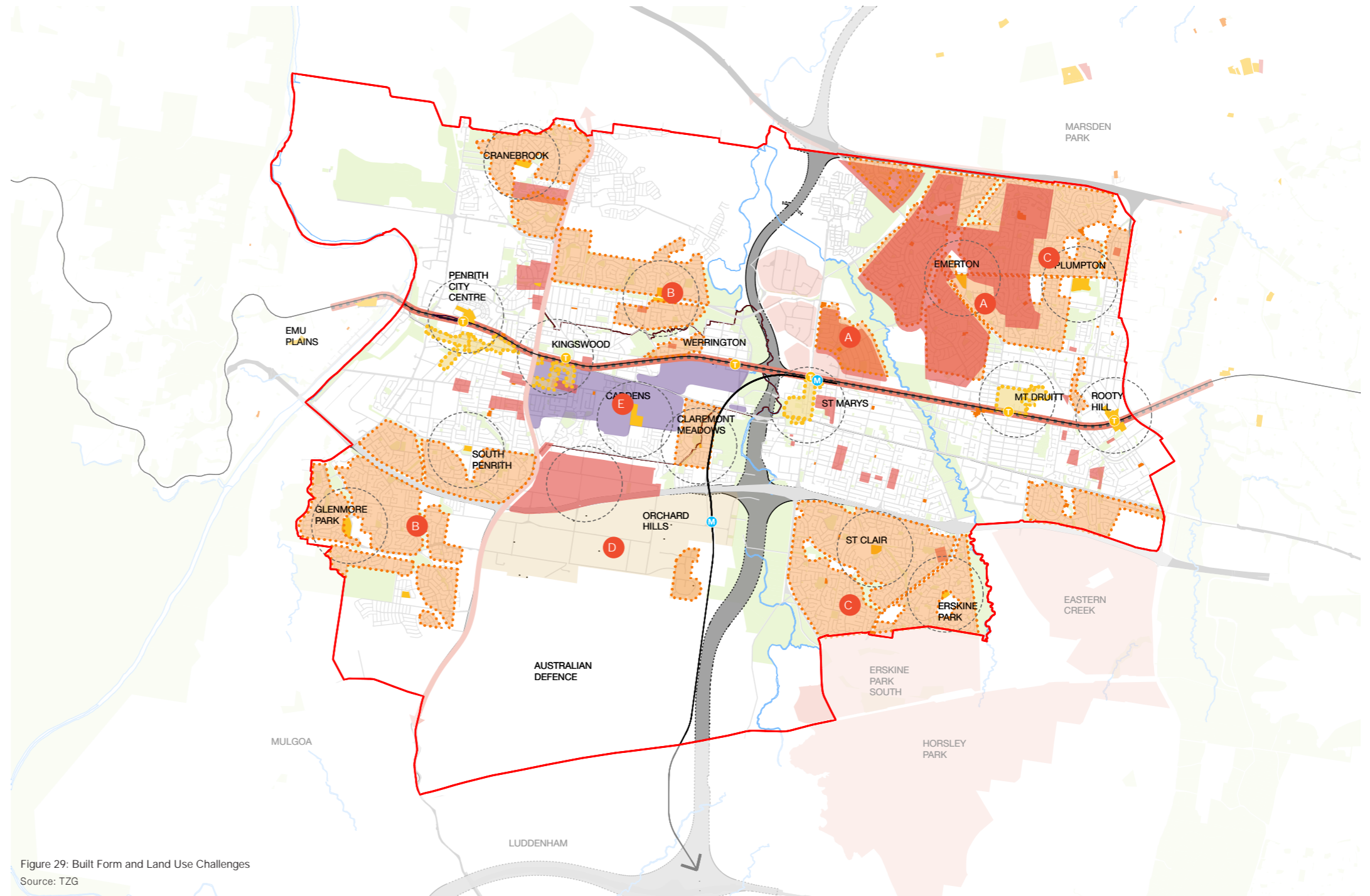
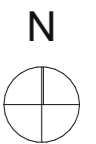


Figure 29: Built Form and Land Use Challenges
Source: TZG

Legend:

- | | | |
|---|--|---|
| CENTRES | FRAGMENTED RESIDENTIAL OWNERSHIP | RAIL CORRIDOR |
| MIXED USE | EDUCATION PRECINCT DISCONNECTED FROM TOWN CENTRE | PROPOSED OSO |
| NEIGHBOURHOOD CENTRES | RESIDENTIAL SUBURBS - CUL DE SACS | 800m RADIUS |
| DISCONNECTED INDUSTRIAL EMPLOYMENT LANDS, PRIVATELY OWNED | RURAL ZONED LAND | |



SCALE 1:100000 @A3
500 0m 1000 2000 4000

3.2.2 Built Form and Land Use Opportunities

This section identifies opportunities around built form and land use within GPEC. These have been considered within the Structure Plan for GPEC.

- A** There are opportunities for a catalyst land use to contribute to a sense of place and identity within St Marys.
- B** Retail and Commercial investment in town or local centres, particularly St Marys and Penrith could create growing and strong regional centres that support GPEC's growth into the future.
- C** Improved connectivity between Kingswood/Werrington, Penrith and St Marys could lead to greater opportunities to renew areas in and around Western Sydney University.
- D** Transitioning some town centres to include higher density mixed use would take advantage of the future Metro Station infrastructure and public transport activation, and provide opportunity for increased residential living co-located with public transport.
- E** Dense urban cores around train stations will provide the opportunity for these centres to transition to vibrant mixed use areas.
- F** There are opportunities for the provision of higher order social infrastructure such as university campuses, to further contribute to a sense of place and identity.
- G** Land use opportunities for the Penrith Lakes site are currently being developed through a masterplanning process and will likely have regional benefits. These include potential future parklands, employment and tourism opportunities.

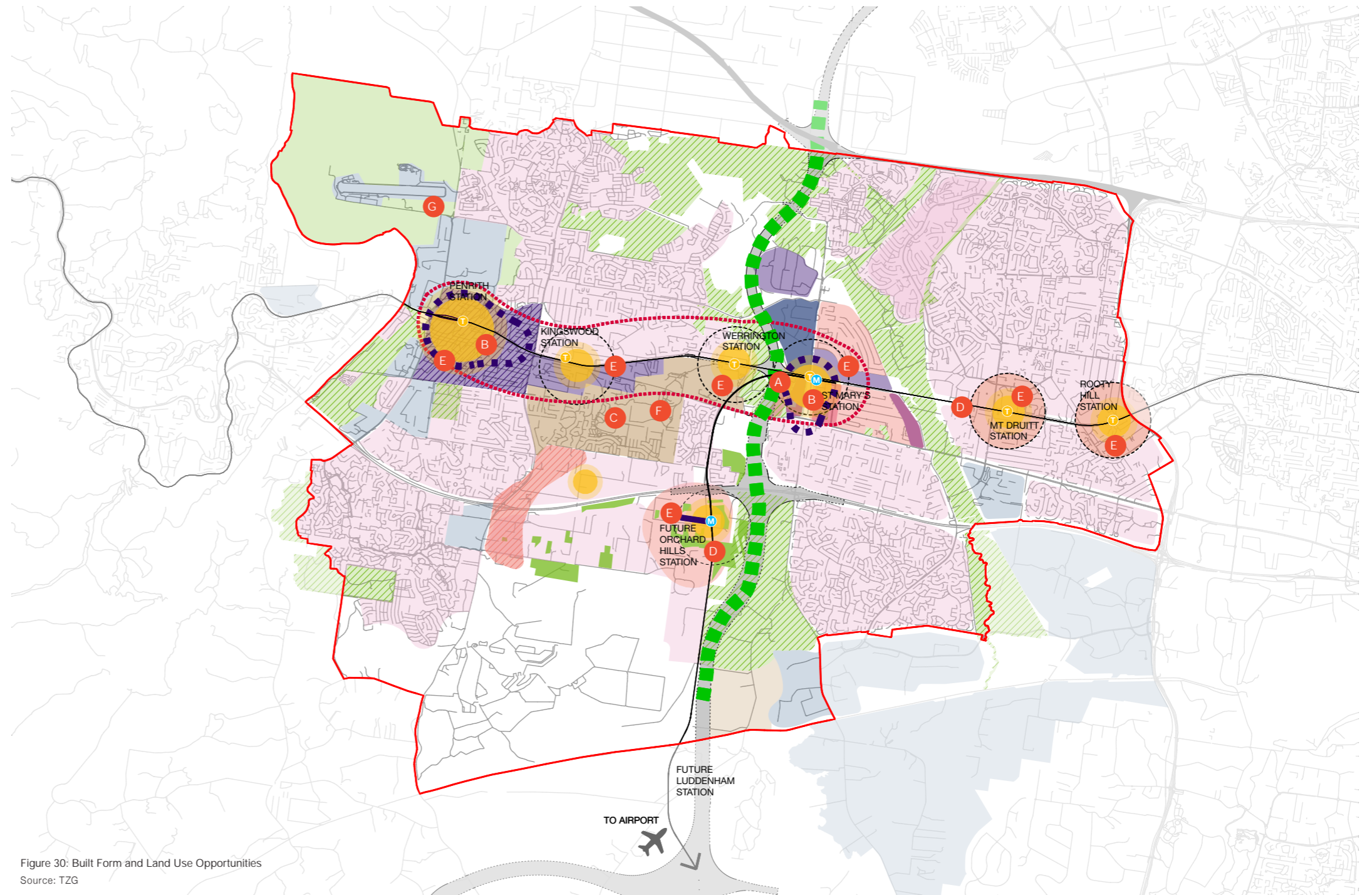


Figure 30: Built Form and Land Use Opportunities
Source: TZG

Legend:

- | | | |
|--|---|--|
| SUPPORT CENTRES | LOW DENSITY RESIDENTIAL | RAISED FREEWAY TO PRESERVE GREEN SPACE / EAST-WEST CONNECTIONS |
| PENRITH-ST MARYS ECONOMIC CORRIDOR | HIGH DENSITY URBAN RENEWAL AREAS | IMPROVED GREEN SPACE |
| STRENGTHENED CENTRE | RESIDENTIAL TRANSITION AREA | OPPORTUNITY FOR BIODIVERSITY AND ECOLOGICAL CONSERVATION, AND NATURAL LANDSCAPE AMENITIES. |
| MAIN STREET | INDUSTRIAL EMPLOYMENT LAND, PRIVATELY OWNED | PROPOSED OSO |
| POTENTIAL EMPLOYMENT GROWTH/ TRANSFORMATION OF INDUSTRIAL LAND | IMPROVE TRANSPORT LINKS TO LEVERAGE UNIVERSITY LAND | 800M RADIUS |
| STRENGTHENED PENRITH CBD | | |

N

SCALE 1:100000 @A3
500 0m 1000 2000 4000

3.2.3 Landscape Opportunities - Green Infrastructure

The various centres across the GPEC area are spatially distinct and located with sufficient distances between them to support the creation of a high-quality town park in each centre. High quality parks in each centre would provide opportunities for new recreational areas and opportunities for co-location with community, civic recreational and educational functions in addition to green open space.

To supplement the town centre parks, the existing ridgelines and high points in Orchard Hills and the Kingswood/Werrington area provide suitable areas for a series of hilltop larger-scale district parks which would be markers in the landscape and destinations in their own right. They would benefit from the outstanding views stretching to the Blue Mountains, are prominent locations providing ease of legibility and access, and enjoy cooling breezes.

Remnant vegetation corridors identified in the Biodiversity Protection site analysis maps provide an important framework for Green Grid connections which, in addition to providing biodiversity connectivity, can act as active transport connectors across GPEC.

Analysis of a 400-metre walking catchment from all existing open space provided in the Open Space Site analysis map revealed key locations where additional open space or crossing of infrastructure and major roads are needed to ensure adequate and equitable open space access provision as suggested by the Draft Greener Places Guide (NSW Government Architect) and Penrith Council's Recreation and Open Space Strategy.

Significant regional open space opportunities exist at Penrith Lakes, including the extension of the Great River Walk and development of other areas of regional level open space within the Penrith Lakes Scheme, such as the foreshores and lake headlands.

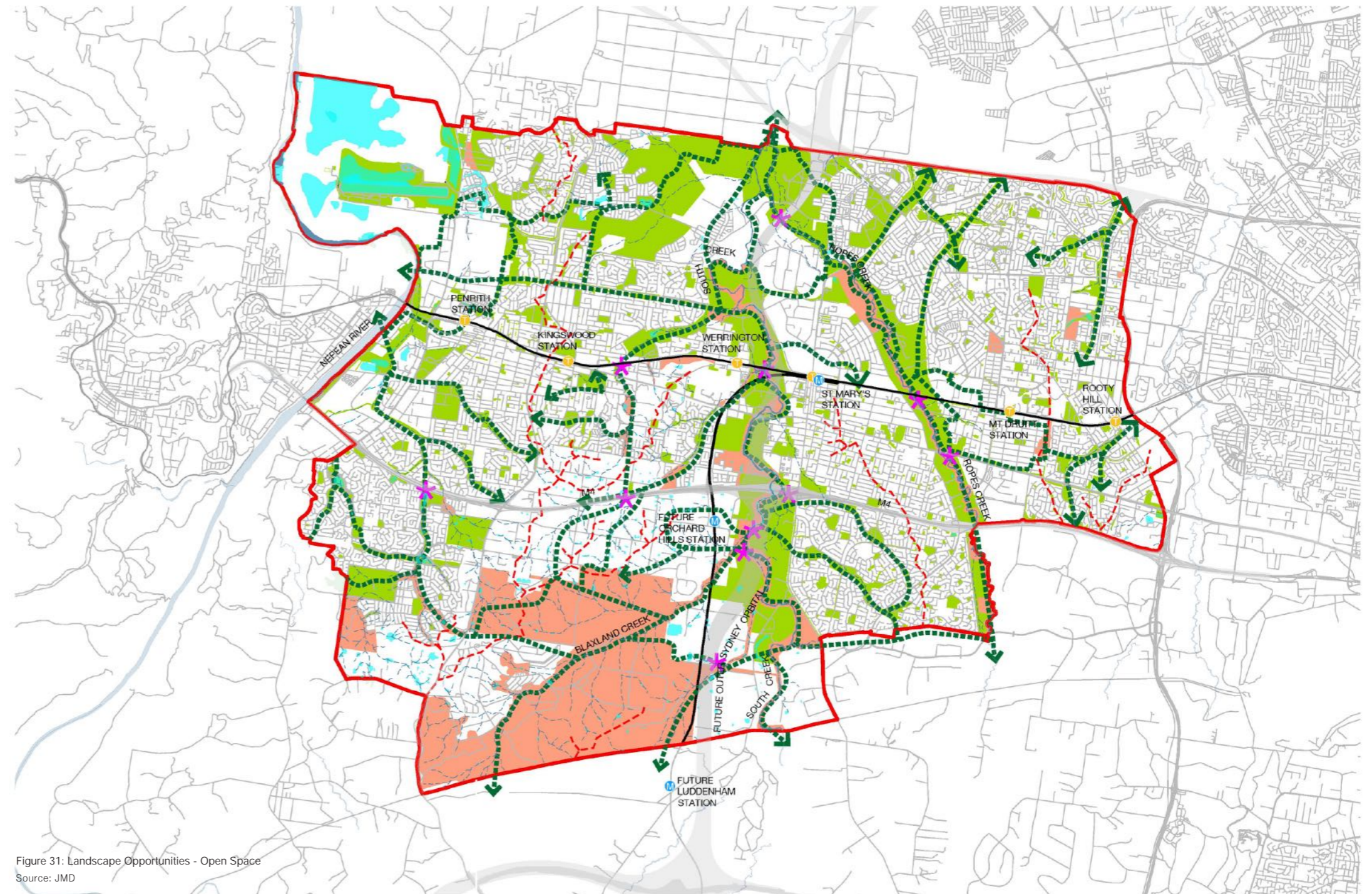
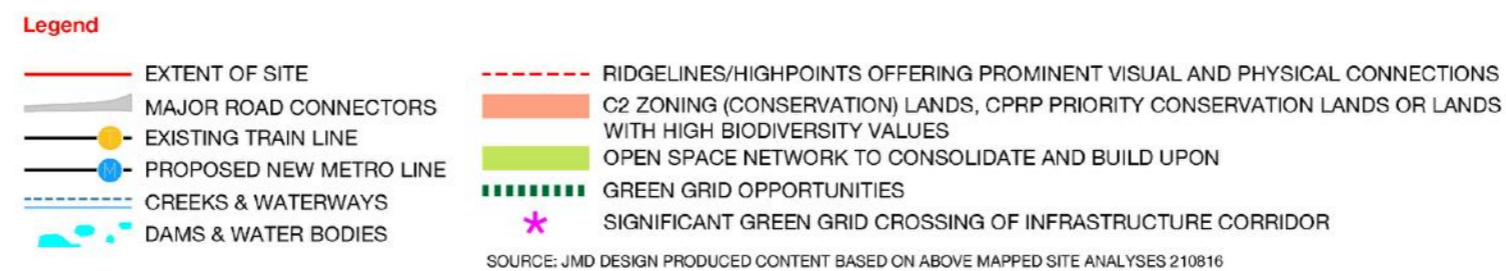


Figure 31: Landscape Opportunities - Open Space
Source: JMD



3.2.4 Key findings - Built Form and Land Use

Housing

Finding 5: There are opportunities to increase and renew the supply of social and culturally diverse housing across GPEC to meet community needs.

Significant concentrations of Social Housing are located in GPEC, mostly within the Luxford and St Marys precincts. Over 12% of households in the Blacktown LGA portion of GPEC are social housing tenants (Profile Id). This figure is much lower for the portion of GPEC in the Penrith LGA, at around 4.3% (Profile Id). Areas of social housing are generally less well connected to centres and public transport and enjoy lesser quality open space.

NSW Land and Housing Corporation (LAHC) has identified a need for re-development in some existing areas in GPEC to renew and increase the supply of social housing.

As well as increasing the supply of social housing, renewal of social housing also presents an opportunity to provide housing that caters for different cultural groups that may have larger families or require different types of housing to meet their kinship responsibilities. This is known as culturally responsive housing.

Renewing these areas will also require improvements in provision of social infrastructure, public transport connection to centres and design of open space. Key to any renewal of social housing will be close engagement with resident communities, especially Aboriginal households. Lived experiences of forced relocation mean that there are community concerns about further displacement. Planning for growth within GPEC must consider social equity so that social housing residents are able to remain in their community and do not become further disadvantaged by renewal of social housing stock. This must be balanced with the need to more equitably distribute social housing across Greater Sydney.

Finding 6: With increased housing costs, planning for GPEC must respond by implementing an affordable housing target for new and renewed development.

Housing provision in GPEC must ensure that there are affordable living opportunities for youth, families and key workers. The NSW Affordable Housing Ministerial Guidelines defines housing stress and eligibility for affordable housing based on median household income thresholds. Housing is considered affordable if it costs less than 30% of gross household income. Whilst house prices in GPEC are generally lower than the median house prices across Sydney, consideration of opportunities and options for expanding lower-cost private market housing must be considered. It is also expected the financial stress from housing costs are projected to increase further.

The District Plans establish a need to investigate a 5-10% affordable rental housing target across Greater Sydney. A formal affordable housing policy has not been adopted by Penrith or Blacktown City Councils. However there are some instances where, affordable housing outcomes are negotiated on a site by site basis. For example, the ADI site in Jordan Springs is delivering 3% affordable housing. The Blacktown Housing Strategy identifies that improving housing affordability is a priority, by increasing the supply of diverse forms of housing that better match the needs of residents and their ability to pay. Similarly, the Penrith Local Housing Strategy seeks to explore affordable housing delivery across the local government area, through a combination of mechanisms including affordable housing contributions and incentive mechanisms whilst ensuring affordable housing meets the same amenity standards as market housing.

GPEC presents the opportunity to implement affordable housing targets, through precinct scale renewals including at Orchard Hills and Glenmore Park. New smaller scale renewals must also contribute to the supply of affordable housing across the region to meet the community's needs and different tenure types.

Finding 7: The Aboriginal community's continued connection with landscape, waterways and significant cultural and community sites should be respected and embedded into future planning.

The Dharug people have an ongoing connection with GPEC Country that goes back thousands of years and continues to this day. Much of the cultural connection centres on waterways as places of movement and connection. Traditional Aboriginal movement corridors from east to west were formalised post-contact – with the Great Western Highway being a notable example. GPEC also contains the Blacktown Native Institute, a significant site in post-contact Australian history. The site contains remains of the Institute to which Aboriginal children were brought to be assimilated into white colonial culture. Now in the ownership and care of the Dharug people (the Darug Strategic Management Group) to realise their vision for healing, this site will be key to healing Country. More contemporary experiences of dispossession have been lived by the Aboriginal community members in GPEC, many of whom were forcibly relocated to Western Sydney from Redfern or have connections to relocated family members.

Ongoing engagement with the Aboriginal community will allow their stories to permeate the planning for GPEC and assist in identifying opportunities to embed Aboriginal culture in places and spaces.

Finding 8: Planning in GPEC must embrace the young and culturally diverse community.

GPEC's people are young and diverse, representing many cultures and backgrounds. The median age of GPEC residents is just under 34 years, compared to the Greater Sydney median of 36. 39% of Blacktown GPEC residents and 23% of Penrith GPEC residents were born overseas. Significantly, GPEC's Aboriginal community is one of the largest in Australia, with 4.2% identifying as Aboriginal or Torres Strait Islander at the 2016 Census. There are also large Filipino (4.7%) and Indian (2.3%) communities that call GPEC home.

Households across GPEC are larger than the Greater Sydney average of 2.8 persons per household, particularly within the portion of GPEC that is in the Blacktown LGA (3.25 persons per household). Compared to Greater Sydney, average median household income in GPEC is lower and unemployment higher.

Planning for GPEC presents an opportunity to improve employment opportunities for the GPEC community, as well as making it easier to access jobs and services. A more diverse range of housing will contribute to affordability, as well as meeting the cultural needs of different community groups.*

**Demographic information is taken from the results of the 2016 Census.*

Employment

Finding 9: GPEC is on the doorstep of major employment lands and has strong job opportunities within the area.

Whilst GPEC is anticipated to provide a significant workforce for nearby growing employment areas including the Aerotropolis, Western Sydney Employment Area, Sydney Science Park and Marsden Park, there are a range of employment opportunities within GPEC. GPEC currently has around 86,000 jobs and is anticipated to have over 110,000 jobs by 2036 and over 132,000 jobs by 2056. Employment areas across GPEC include:

- Industrial areas in St Marys and around Penrith which provide essential urban services.
- Local retail centres, mixed use and core commercial areas in Penrith, St Marys and Mount Druitt, which support a range of employment types including white collar jobs and retail.
- Existing business developments around Kingswood and Werrington.
- Tourism opportunities at Penrith Lakes, greater Penrith area and Rooty Hill.
- Health and education employment, with major health and education precincts at Kingswood, Werrington and Mount Druitt.
- Employment corridors along major transport routes of the Great Western Highway, the Northern Road and Mulgoa Road.

The continued role of these areas within GPEC must be retained and where appropriate, expanded. Investment in infrastructure, the public domain and supporting uses is essential to ensuring employment uses are safeguarded to support their long-term viability. There is opportunity for jobs growth in appropriate locations in GPEC to support Penrith City Council's employment self-containment target rate of 1:1, meaning that across the Penrith local government area, there will be opportunity to support 1 job for every working Penrith resident. Nearby employment areas currently accommodate large floorplate uses like logistics and warehousing. New employment areas will provide a wider diversity of jobs, education and services such as the knowledge intensive industries expected within the Aerotropolis. Future planning must also consider the ability to access jobs by public transport. Whilst accessing jobs by public transport is often convenient from key hubs such as Penrith, only around 9% of residents working outside of GPEC travel by train, and most of these trips are to Parramatta and Sydney CBDs as there is limited local public transport connectivity to other employment hubs. Upgraded and new road connections, as well as the arrival of metro rail, will enhance public transport connectivity within GPEC as well as to major nearby employment locations.

Finding 10: Penrith will continue as the main commercial and civic centre in GPEC, anchoring an east-west economic corridor, connecting through the growing health and education precinct at The Quarter, and St Marys through to Mount Druitt.

The continued role of the Penrith City Centre in delivering GPEC's primary commercial, civic, service and employment functions is essential to GPEC's overall success. Supported by medium and high-density housing, employment activity is driven by predominantly population-serving uses. Penrith City Centre will also continue to be the primary destination within GPEC for cultural activities and events. The establishment of the Metro is likely to improve connectivity to wider metropolitan Sydney and to the Aerotropolis, however, Penrith may not see the same amount of residential growth influenced by the new metro line as somewhere like St Marys town centre, which will be directly connected.

Key to the continuing success of the Penrith City Centre will be the complimentary role that other lower order centres will play, including The Quarter health and education precinct at Kingswood Werrington, St Marys as it evolves to fulfil its strategic centre role and the new centre in Orchard Hills in providing for the daily needs of surrounding residents.

The East-West corridor connecting Penrith City Centre to the strategic centres of St Marys and Mount Druitt is an important strategic economic corridor. Extending from Penrith Lakes in the west, through the centres of Kingswood and Werrington, the health and education precinct at The Quarter, St Marys, and finishing at Mount Druitt in the east, it provides the opportunity to connect key green and blue assets and establish a corridor of complimentary centres to deliver a range of jobs, education, business and services. Delivering integrated transport connections between centres will further support this vision.

Finding 11: GPEC will have a strong residential and employment relationship with the Western Sydney Aerotropolis.

GPEC's southern boundary abuts the Western Sydney Aerotropolis. The Western Sydney Aerotropolis Plan sets the vision for the Western Sydney Aerotropolis as Australia's next global gateway, built around the world-class Western Sydney International (Nancy-Bird Walton) Airport. The Aerotropolis is essential to the NSW Government vision for a 30-minute city, where people live within 30 minutes by public transport to their nearest strategic or metropolitan centre. The Aerotropolis provides for a job dense environment and GPEC provides the opportunity to deliver residential growth and supporting local employment uses that are connected to the Aerotropolis and that deliver the 30-minute city.

Finding 12: Penrith Centre, St Marys, and Mount Druitt will continue to be main centres within GPEC, with a new mixed use local centre evolving at Orchard Hills.

The District Plan establishes a clear hierarchy of centres. The future role and function of GPEC's centres will reflect the hierarchy established in the District Plan, Penrith Council's Interim Centres and Corridors Strategy and Blacktown Council's LSPS. GPEC's centres and their roles into the future are shown in Figure 32 below.

Job capacity numbers in 2056 refer to capacity within Travel Zone areas within an approximate 15-minute walk of the main transport node and have been informed by the Department of Planning and Environment's 2019 Population Projections. Potential job capacity numbers will be reviewed following the release of Travel Zone Projections aligned to the 2022 DPE Population Projections.

Centre	Centre Type	Vision	Features	Potential Job Capacity (2056)
Penrith Centre	Metropolitan Cluster	Maintained as key regional, commercial, retail, civic and service centre of GPEC.	<ul style="list-style-type: none"> - Western anchor of East-West Economic Corridor. - Public transport connectivity - rail. - Civic and cultural heart of GPEC. - Significant retail, entertainment and night-time economy. - Diverse Housing. - Jobs growth in service sector. 	25,000
St Marys	Strategic Centre	St Marys core becomes a subregional centre to the south of the train line, whilst retaining urban services north of the station to service the future centre.	<ul style="list-style-type: none"> - Transport Interchange - connected to all parts of Greater Sydney via rail and metro. - Build on existing main street to create vibrant centre with high quality public domain. - Transitioning employment uses. - Diverse housing. - Connected to open space. - St Marys North retained as an industrial precinct for cluster of construction, infrastructure manufacturing and reuse of materials uses with opportunities to increase uses in transport and logistics over time. - Strong competitive advantage for white collar jobs if there is a catalysing land use added to the centre. 	7,600
Mount Druitt	Strategic Centre	Maintained as regional retail and service centre with health and education precincts.	<ul style="list-style-type: none"> - Retail and services. - Public transport connectivity - rail - Diverse Housing. - Commercial growth. - Renewed public domain. - Regional social services hub - Major bus interchange 	8,500
Rooty Hill Town Centre	Local Centre	Maintained as local retail and service centre, with focus on tourism and recreation.	<ul style="list-style-type: none"> - Urban renewal - Connections to Western Sydney Parklands - Recreation and entertainment precinct - Public transport connectivity - rail - Diverse housing 	2,700
Kingswood / Werrington	Specialised Precinct	Consolidated tertiary and education campuses with a transit corridor for intraregional connections between St Marys, Kingswood, Nepean Hospital and the Penrith CBD.	<ul style="list-style-type: none"> - Health, education and innovation precinct at The Quarter. - Higher education (UWS and Tafe). - Public transport connectivity - rail. - Improved connections to other areas within GPEC. - Connected to open space. 	15,000
Orchard Hills	New Local Centre	Local services centre for Orchard Hills and St Marys populations, with high amenity location and built form.	<ul style="list-style-type: none"> - Population serving retail servicing daily needs of residents. - Public transport connectivity - Metro. - Green connections to open space. - Landscape-led design of town centre. - High quality public space. 	3,000
Approx 40 local centres such as St Clair, Lemongrove, Emerton	Local Centre	Local services centres to support the local communities.	<ul style="list-style-type: none"> - Population-serving retail servicing daily needs of residents. - Retain function and character. 	Variable

Figure 32: Table outlining the roles of centres within GPEC
Source: DPE

3.3. Access, Connectivity and Transport

3.3.1 Access, Connectivity and Transport Challenges

The following points identify challenges around access, connectivity and transport within GPEC. These challenges have been considered within the Structure Plan for GPEC.

- A** The lack of existing easily accessible public transport to centre destinations within suburban areas, particularly across infrastructure or highway corridors of the Great Western Highway or the M4, is a challenge for the amenity of existing residents. Increased coverage and increased frequency of bus public transport routes on the fringes of the GPEC area would greatly improve the ability for some residents to reach critical day to day amenities currently only located within the strategic centres of St Marys, Penrith and Mt Druiitt.
- B** In some areas, pedestrian and cycling trips are easily facilitated due to the grid street structure, however these routes may not be often used due to less pleasant urban street conditions and a lack of clear or dedicated cycle path infrastructure. Improved cycling infrastructure and street conditions across GPEC would increase the possibility that residents would use active modes of transport for daily trips to local areas.
- C** Areas of poor existing connectivity are highlighted where poor public transport and active transport have been identified within site analysis diagrams. Areas of poor connectivity generally occur where there is a lack of north-south or east-west routes across the rail corridor, highways or major roads. These areas are significantly large - sometimes kilometres in width - and illustrate that vehicle movements have been prioritised, creating disconnection between suburbs and precincts.
- D** Car dominated subdivision patterns exist within the cul-de-sac residential suburbs that are located on the edges of the GPEC area. Car reliance is also increased within the smaller suburbs that are distanced from larger, strategic centres such as St Marys, Penrith or Mt Druiitt.
- E** A lack of road infrastructure in greenfield areas presents challenges to staging and implementation of urban development.

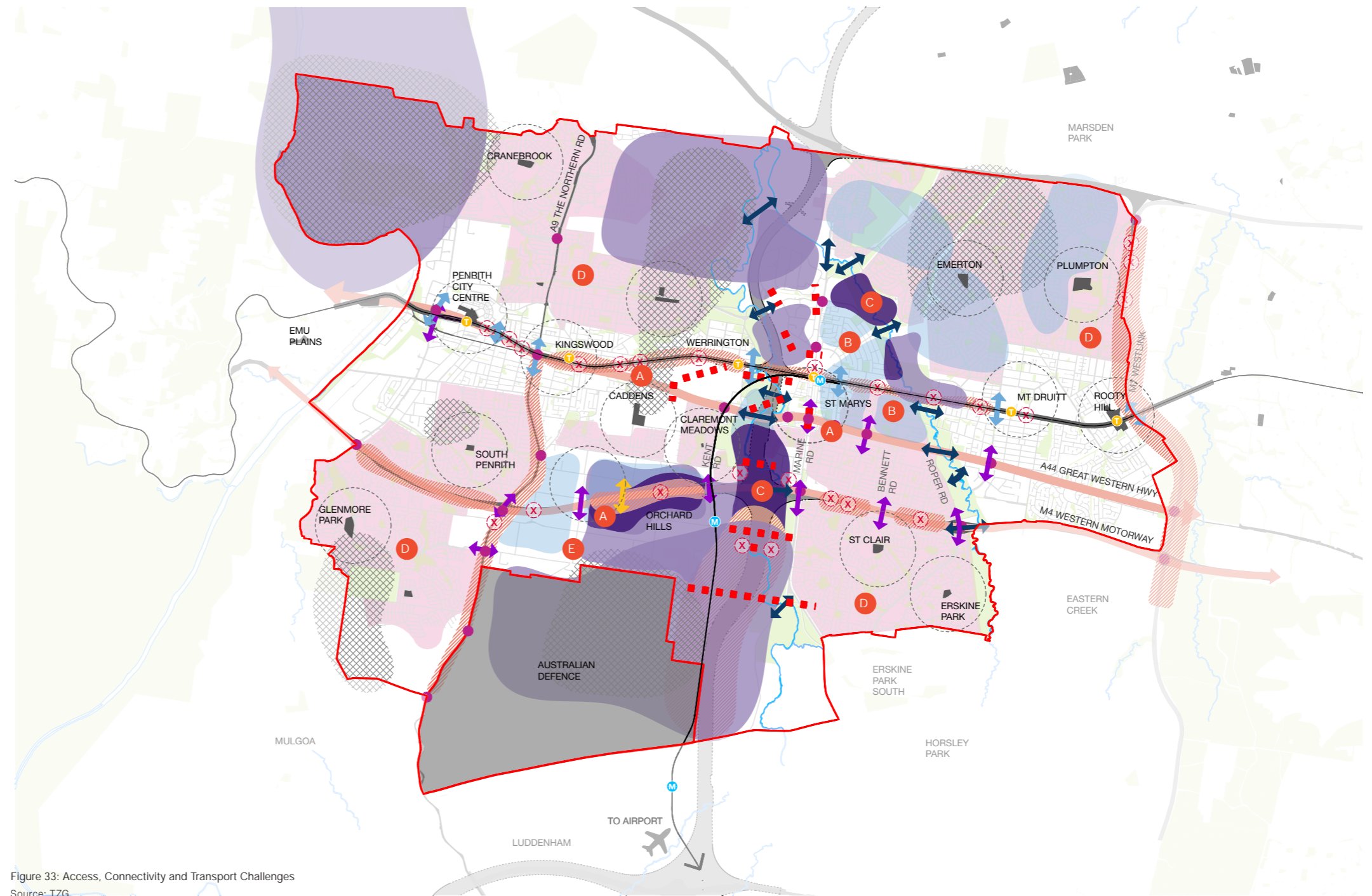


Figure 33: Access, Connectivity and Transport Challenges
Source: TZG

Legend:

- INFREQUENT EXISTING CONNECTIONS ACROSS HIGHWAY
- MAINTAIN FUTURE CONNECTIONS ACROSS HIGHWAYS
- INFREQUENT EXISTING CONNECTIONS ACROSS WATERWAYS
- INFREQUENT EXISTING RAIL CROSSING
- ROPES CREEK - SOUTH CREEK
- BARRIER TO CONNECTIVITY
- POOR CONNECTIVITY ACROSS INFRASTRUCTURE
- LIMITED CONNECTION TO MAJOR INTERSECTIONS
- EXISTING TRAIN STATION
- RAIL CORRIDOR
- POOR ACTIVE CONNECTIONS
- POOR PUBLIC TRANSPORT CONNECTIONS
- POOR ACTIVE AND PUBLIC TRANSPORT CONNECTIONS
- POOR ACTIVE & PUBLIC TRANSPORT CONNECTIONS
- ENCLOSED INACCESSIBLE SITE
- RESIDENTIAL AREAS RELIANT ON CAR ACCESS / OUTSIDE CENTRE
- CENTRE
- 800m RADIUS
- HIGHWAY - LACK OF PEDESTRIAN CROSSING LOCATIONS
- BUSY INTERSECTION

SCALE 1:100000 @A3
500 0m 1000 2000 4000

3.3.2 Connectivity Opportunities

This section identifies opportunities around connectivity within GPEC for further consideration. The opportunities identified in this section are not committed projects.

- A** Active transport connections could be implemented to improve local usage rates, with connections to town centres and also improve recreation.
- B** Existing barriers created by the separated suburban precincts could be overcome to encourage users to take up active modes for local trips.
- C** Links to green space and open space will increase connection between suburbs previously cut off by the Riparian creek corridors, or by larger areas of flood prone land.
- D** Improved amenity could be achieved by balancing public transport and car parking needs at transport interchanges.
- E** There are many opportunities for improved crossings at rail corridors and highways for active transport, pedestrian and vehicles.
- F** Local connections to the Western Sydney University campus can be strengthened, especially east-west.
- G** Public transport services could connect areas that are currently well serviced by public transport – such as the rail corridors, public transport interchanges, and well serviced suburbs – with areas that lack public transport connections, by implementing frequent bus services and more routes in these poorly serviced locations.
- H** An opportunity to leverage the development of the Metro line within St Marys and Orchard Hills could create better connectivity to other strategic town centres, and onwards to Parramatta, the Sydney CBD and Greater Sydney.
- I** Increased access to transport is likely to reduce motor traffic on the highways, thus also reducing overall car usage, increasing resilience and sustainable movement across the GPEC.
- J** Busy intersections can be improved by enhancing the quality of the public domain and improved cyclist connectivity.
- K** Improved usage of all modes – not just cars – along the Great Western Highway will create better public transport connectivity.
- L** Improved public transport links east-west over the Nepean River will enable access to major open space.
- M** An opportunity exists to improve freight links exists with road infrastructure upgrades planned to existing and future highway corridors.
- N** Connecting St Clair to both Orchard Hills and St Marys Metro stations means enhanced accessibility for this community to the Aerotropolis, Blue Mountains and Greater Sydney.
- O** There are also significant opportunities to improve public transport connections between Mt Druiitt and St Marys through Luxford, to enhance local community accessibility and amenity.
- P** The future St Marys metro extension through to Tallawong is a major opportunity for future activation of the Mt Druiitt / Luxford precinct and provides critical connections to Greater Sydney for this community.

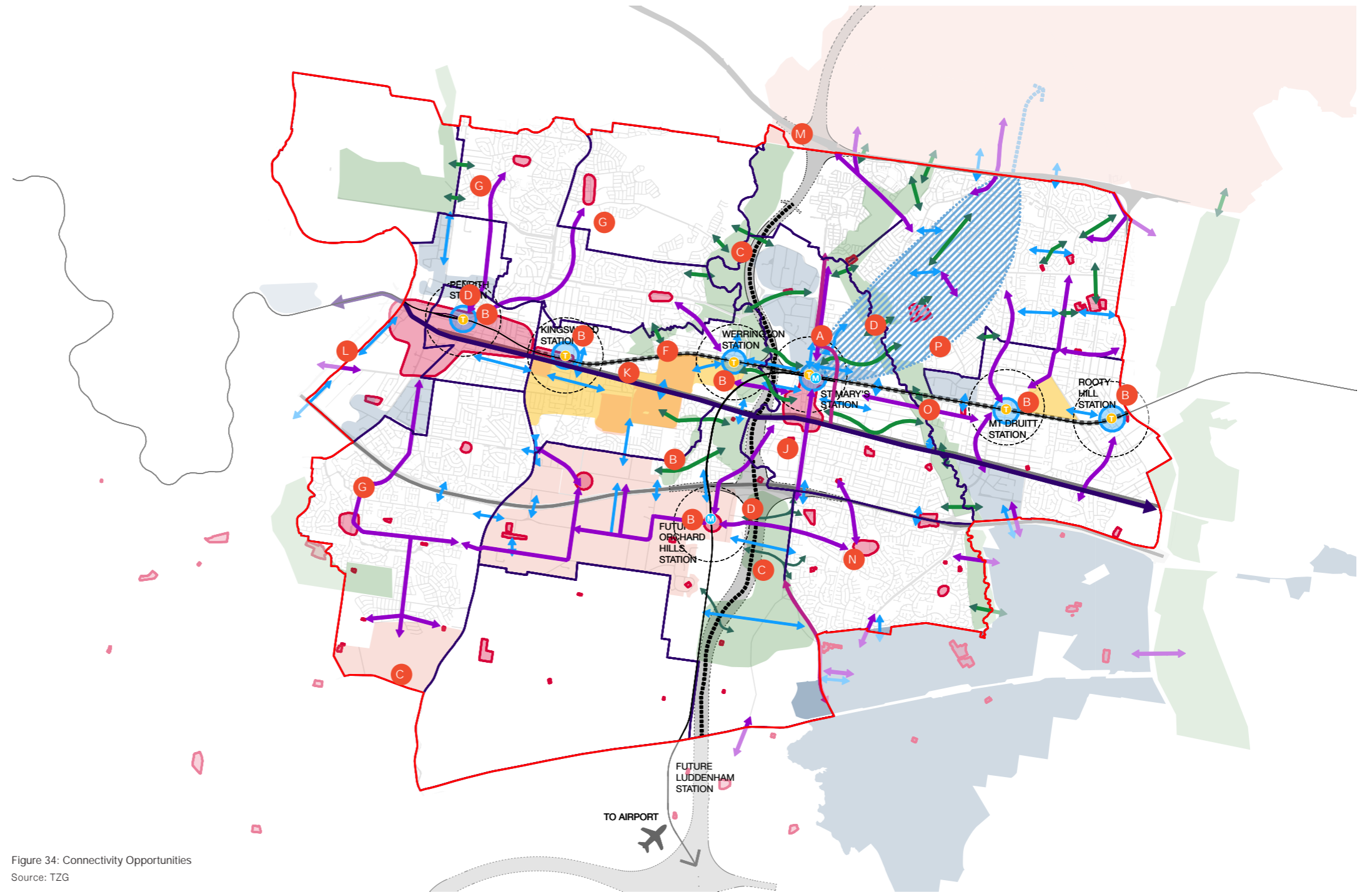


Figure 34: Connectivity Opportunities
Source: TZG

Legend:

- | | | |
|---|---|--|
| KEY EMPLOYMENT LAND | IMPROVED FREIGHT CORRIDOR CONNECTION | ELEVATED HIGHWAY SUPPORTING EAST-WEST CONNECTIVITY |
| RESIDENTIAL GROWTH | IMPROVED PUBLIC TRANSPORT CONNECTIONS | EXISTING RAIL |
| OPEN SPACE | IMPROVED ACTIVE TRANSPORT CONNECTIONS | EXISTING HIGHWAY |
| HEALTH AND EDUCATION PRECINCT | IMPROVED MULTI MODAL TRANSPORT | OUTER SYDNEY ORBITAL (OSO) |
| WSU / TAFE LAND | IMPROVED ACCESSIBILITY TO OPEN SPACE | METRO INVESTIGATION AREA |
| CENTRE | | |
| TRANSPORT INTERCHANGE | | |



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500 0m 1000 2000 4000

3.3.3 Key findings - Access, Connectivity and Transport

Finding 13: Major transport routes create connectivity barriers for residents to jobs and community services, resulting in car dominance.

GPEC contains significant road and rail infrastructure including the M4 motorway, Great Western Highway and Western rail line. While these links provide access to other parts of Greater Sydney, they create barriers to local movement within GPEC. North-south connectivity barriers include The Northern, Mulgoa and Mamre Roads. Future connections such as the Sydney Metro - Western Sydney Airport and the proposed Outer Sydney Orbital also have the potential to create connectivity barriers at the same time as enabling greater access to areas outside of GPEC. Improved connections across connectivity barriers are needed, as well as more east-west links to make travel within GPEC easier and more efficient. Increasing connectivity across these barriers, with walking, cycling and public transport will improve access for local trips for existing and future communities. The provision of additional transport options will also reduce local traffic reliance on larger movement corridors such as the M4 and Great Western Highway. Some of the connections that are recommended to be explored in the next stages of planning are:

- Between Luxford and Marsden Park,
- East-west between Glenmore Park to Orchard Hills and through to St Clair and Erskine Park
- Secondary transport opportunities between St Marys and Penrith
- Walkability and public transport between Dunheved, Mt Druitt and St Marys
- Active transport opportunities along the north-south spine of Wianamatta-South Creek
- Ensuring the proposed Outer Sydney Orbital is not a barrier to east-west connections

Travel patterns in GPEC are heavily reliant on cars, with private vehicle usage accounting for 84% of travel by GPEC residents and workers. Due to limited public transport options, the majority of GPEC residents who leave the area for work travel by private vehicle.

Accessing jobs by public transport is often convenient from key hubs such as Penrith, however only around 9% of residents working outside of GPEC travel by train, and most of these trips are to Parramatta and Sydney CBDs as there is limited local public transport connectivity to other employment hubs.

Finding 14: Sydney Metro - Western Sydney Airport will support the revitalisation of St Marys and the establishment of Orchard Hills town centre whilst fast tracking connections for existing communities to the new Airport.

The NSW Government is delivering major transport infrastructure to support the vision of the 30-minute city, with the Sydney Metro - Western Sydney Airport Stage 1 currently under construction connecting St Marys to the Western Sydney Aerotropolis. As well as improving access to jobs, it provides opportunities to create a new mixed-use centre at Orchard Hills and renew St Marys centre. While the metro station at Orchard Hills provides opportunities for a high amenity and walkable new community with great connections to employment opportunities throughout the Western Parkland City, the new metro at St Marys can be a catalyst for the revitalisation and renewal of St Marys as a strategic centre. The St Marys metro will provide an accessible interchange with the existing T1 western line, promoting employment growth and connecting existing and future residents to improved bus services, new walking and cycling links as well as future and improved connections across Greater Western Sydney. Key to realising the full benefit of the Metro for GPEC will be creating east-west links that connect GPEC residents into the metro network, particularly from Kingswood and Werrington to St Marys, and from Glenmore Park and St Clair to Orchard Hills.

A metro link between St Marys and Tallawong would ultimately complete the metro line from the Western Sydney Aerotropolis through the Central River City and onwards into Sydney's CBD. The future potential metro link provides opportunity to initiate renewal of socio-economically disadvantaged communities in the Luxford Precinct by enhancing connectivity to jobs and education in different parts of Greater Sydney.

Finding 15: The proposed Outer Sydney Orbital will provide an essential transport route but its design must respond to Caring for Country principles, and protect east-west connections, open space and waterway health.

Identified in Future Transport 2056 as a City Shaping Corridor, a recommended corridor for the Outer Sydney Orbital (OSO) was exhibited by Transport for NSW in 2018. The OSO will provide a future motorway and freight rail connection to connect the North West and South West Growth Areas of Sydney to the Aerotropolis and Western Sydney Airport, with potential to connect the Illawarra to the Central Coast beyond 2056. It will support growing communities, businesses and the creation of new jobs in Western Sydney and allow freight to move efficiently and safely by rail.

The proposed OSO corridor within GPEC is located in a sensitive riparian corridor where the future rail and road connection has the potential to adversely impact on the landscape and cultural values of the waterways (which have special meaning to local Aboriginal people), and the quality and accessibility of planned adjacent open space and conservation areas, and connectivity for pedestrian and cyclists. Early designs of the connection in this location should consider whether it is raised or at-grade, and how the corridor can become a successful community greenspace, facilitate active transport and achieve great biodiversity outcomes.



Tregear

Whalan

Mount Drutt

Roddy Hill

Doonside

Oxley Park

Bungarrabee

Colyton

Minchinbury

St Clair

Erskine Park

Eastern Creek

4.0

Key Growth Drivers and Areas for Change

4.1 Key Growth Drivers and Areas for Change

Key Drivers

GPEC has been identified by the state government for investigation due to the significant investment by all levels of government into infrastructure in Western Sydney.

Growth is needed in appropriate areas within GPEC to support the functioning of the new Western Sydney Airport and Aerotropolis, which will be home to thousands more jobs over the coming decades.

The commencement of operation of the Sydney Metro Western Sydney Airport in 2026 provides an invaluable opportunity to renew and create places that are well connected to the jobs and opportunities that will come with the new Airport, as well as across greater Sydney.

Strategic planning for GPEC is also an opportunity to build upon key delivery strategies that benefit the natural environment, in particular the Cumberland Plain Conservation Plan. It also sets the scene for future work to ensure that Wianamatta-South Creek is able to function as a critical green and blue corridor that fulfils recreational as well as environmental functions.

Based on these key drivers, a range of areas in GPEC have been identified for change. Some of these areas will change in the short term, and some over a longer timeframe. A summary of these areas and their desired roles and functions is provided below in the GPEC Growth Framework. It should be noted that GPEC precinct boundaries used in this document align with those created for the Western Sydney Place-Based Infrastructure Compact (PIC).

Areas for Change

The GPEC Structure Plan identifies areas for change. The identification of these areas has been informed by the key drivers as well as landscape, biodiversity, built form and connectivity opportunities identified through the Site Analysis process.

The primary categorisation used for the Areas for Change is:

- *Priority Growth Areas*
- *Renewal Areas - short term*
- *Renewal Areas - long term*
- *Urban Release Areas*
- *Limited Change Areas*

Priority Growth Areas, Urban Release Areas and Short Term Renewal Areas align with short-medium term strategic aims of all levels of government, while long term renewal areas recognise that there will be capacity for change beyond a ten-year timeframe, or when further commitments are made to mass transit connections between Luxford and Tallawong.

Priority Growth Areas

The following areas are identified as Priority Growth Areas:

- St Marys Centre Priority Urban Renewal
- Orchard Hills South Priority Urban Release

Renewal Areas – Short Term

Renewal areas identified in the GPEC Growth Framework are areas where infrastructure and service investment can stimulate, enable and support growth in jobs and homes in the short term. While under the same category, the primary role and function of these precincts vary across these precincts.

The following precincts are identified as Renewal Areas for the short term:

- Penrith Centre
- Penrith West
- Kingswood and Werrington
- Mount Druitt and Rooty Hill (North)

Penrith Centre and Penrith West precincts will look to reinforce their role as employment centres, growing the commercial core and enabling more mixed use development, including some housing subject to its flooding constraints. Kingswood and Werrington will primarily focus on leveraging the key health and education institutions to foster investment in health services, education, research, and related technology which have great potential for jobs growth. Opportunities for housing growth within this area will contribute to diversity and provide accommodation opportunities for key workers and students.

Mount Druitt and Rooty Hill (North), will support vibrant centres that offer a range of activities focussed around retail, services, health, education and cultural facilities and a mixture of housing, including social, affordable rental and private housing.

Renewal Areas – Long Term

These areas are identified where there may be longer term opportunities to investigate renewal, given their proximity to existing transport infrastructure, or opportunities which may be unlocked through potential commitments to an extension of the Sydney Metro Western Sydney Airport line.

The following precincts are identified as Renewal Areas for the long term:

- Luxford
- North St Marys (residential)

The Luxford precinct consists of older low to medium density housing with a large concentration of social housing, open spaces, educational uses and two local retail centres at Emerton and Plumpton. Planning will investigate opportunities for urban renewal aligned with the future investment in the Sydney Metro extension from St Marys to Tallawong.

The Mount Druitt, Rooty Hill (South) and South Penrith areas within GPEC present longer term opportunities to support greater housing diversity over the long term. Future housing in these initial places should be planned to meet the needs of its unique community and provide access to local services. They may also present opportunities to support 'missing middle' typologies.

Urban Release Areas

Land identified as 'Urban Release Areas' are appropriate locations to create new communities and provide significant capacity into the medium and longer term. These areas are intended to support and manage land release development that aligns with infrastructure to optimise existing infrastructure and to maximise investment in new infrastructure.

The following precincts are identified as Urban Release Areas:

- Orchard Hills North
- Glenmore Park South

Limited Change Areas

Areas not highlighted in Figure 2 are already established and unlikely to change. Notwithstanding this, there may be opportunities to deliver on the strategic directions for GPEC, such as increasing the green canopy and providing access to regional open space and transport.

The following precincts are identified as residential areas that will experience limited change:

- St Clair
- Cranebrook
- Jordan Springs
- Ropes Crossing
- Glenmore Park