

Newcastle Street Tree Masterplan



September 2011

Production

Street Tree Master Plan
was prepared by The City of Newcastle Liveable City Group

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Part A

The Street Tree Master plan (STMP) is a key action from the Newcastle Urban Forest Policy 2008 and details the rationale and methodology underpinning street tree planting in Newcastle.

Street trees are a major public infrastructure asset and so it is essential to establish a clear and comprehensive approach to making decisions about what should be planted and where.

The STMP streamlines the design and species selection process. Most street tree master planning involves a prescriptive approach where species are identified or nominated for each street within the public domain.

This STMP adopts a different approach that begins with analysis of design opportunities, site constraints and species characteristics as key considerations prior to determining a short list of suitable species. The mapping attached to this plan represents constraints and opportunities rather than species selection mapping.

Street tree establishment and maintenance practices and processes are separately detailed in the Urban Forest Technical Manual DCP 2005.

As of March 2011 council has collected data on 109,000 street and park trees (excluding bushland). Of the 90,000 street tree sites 68% have existing trees and 32% are vacant planting sites.

As the urban tree population is not self-renewing it needs to be planted, managed and renewed on a cyclical basis. Also a majority of trees on private land are likely to be lost and may not be replaced due to the need for urban consolidation and other development. Therefore the STMP is a critical element to sustaining the benefits of the public urban forest.

Council's Strategic Direction

The Newcastle Urban Forest Policy

In May 2008 Council adopted the Newcastle Urban Forest Policy (UFP) and Background Paper.

The STMP responds to two key strategies from Council's resolution:

1. *"To develop a co-ordinated approach to street tree planting, establishment and maintenance to deliver the potential benefits of the urban forest and to achieve the urban forest management objectives"*
2. *"To ensure the appropriate species are planted on public land to limit future maintenance costs and maximise the urban forest benefits."*

In order to respond to these council directions tree asset management planning is necessary.

The following seven key tree asset management objectives will apply within the STMP:

- Establish and maintain an appropriate diversity of tree age and species throughout the public urban forest as a key contribution to the overall health, biodiversity and sustainability of the urban forest.
- Use large, long-lived trees wherever possible in order to maximise tree biomass and to extend the period of accrued urban forest benefits
- Adopt procedures and technology including Water Sensitive Urban Design (WSUD) and root-vault planting to improve the success rate and the life span of the city's street tree investments
- Use tree planting to enhance the visual, historical and environmental aspects of the urban form
- Develop a list of site and climate compatible tree species for use in Newcastle
- Maximise the potential of each street to accommodate trees
- Plant trees to maximise the potential of the available space.

Newcastle 2030 Community Strategic Plan

The 2030 planning process has identified seven themes that Council is using to build future direction.

The STMP is connected most closely to:

Theme 2

Protected and Enhanced Environment

Objective: Our unique natural environment is maintained, enhanced and connected.

Outcome: Protection of Biodiversity .

Theme 3

Vibrant and Activated Public Places

Objective: Safe and activated places that are used by people day and night.

Strategy: Create streetscapes and public places that are clean and attractive, where people feel safe.

Theme 5

Liveable and Distinctive Built Environment

Objective: A built environment that maintains and enhances our sense of identity.

Strategy: Ensure good quality development with active publicly accessible frontages and active streetscapes.



Part B

The Urban Landscape Context

Tree lined streets are a living network of green, defining avenues, entrances, squares, parks and gardens and the design of these spaces gives structure and coherence to our experience of the public realm.

Street trees are ‘multipurpose’ infrastructure providing numerous benefits and are the most significant form of vegetation used in the public urban landscape – as such they are amongst Newcastle’s most important public assets.

Because trees in the public realm contribute to the social, cultural, economic and environmental well being of our community, they are important and highly valued by residents and visitors alike.

Trees, especially large trees, help define the character of places and civic venues and can be used in symbolic and historic roles. Trees also improve the city, making it a liveable place by encouraging people to meet, linger and socialise in shady, comfortable surrounds. They make our city beautiful, improve the air by removing carbon dioxide and returning oxygen, enhance property values and reduce energy needs by providing cooling shade. Streets shaded by trees provide greater comfort for pedestrians, contribute to increased community pride and increase footway/roadway longevity.

Therefore it is important to ensure integrated planning and design of streets so the community’s investment provides beneficial returns over the long term.

‘Right Tree Right Place’

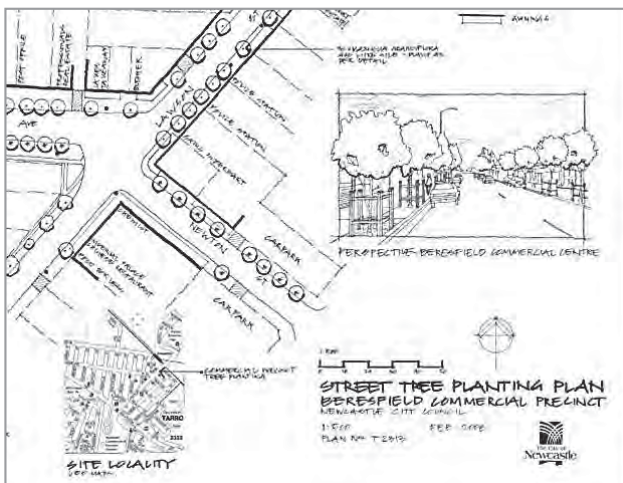
The adage of planting the ‘right tree in the right place’ is often stated although it has not often been applied in past planting practice. Relatively few of Newcastle’s streets were originally designed to accommodate street trees and subsequent planting periods have sought to fit popular and often quite large growing species into constrained spaces such as narrow footpaths or under power lines.

‘Right tree in the right place’ means selecting species that will reach maturity without compromising other assets and property in the immediate vicinity. Where the street footway or overhead power lines constrain the planting of a preferred species, then street redesign may be the most appropriate solution. For example planting might be moved into the street pavement and accommodated in underground vaults.

Design Considerations

The design of Newcastle's streetscapes occurs at several levels. The process moves from the broad scale to local scale through to detail, taking account of regional and sub-regional spatial strategies and catchment issues, land uses and the overall urban structure.

This part of the plan Part B, discusses the broad scale urban design approaches to street tree planting. Once the planning and design parameters are identified, the following Part C details the local scale and selection process to determine the most appropriate tree species for each street. Depending on the complexity of circumstances, other disciplines may need to be part of the design process.



Process

As a first step at this broad scale the proposed tree planting needs to:

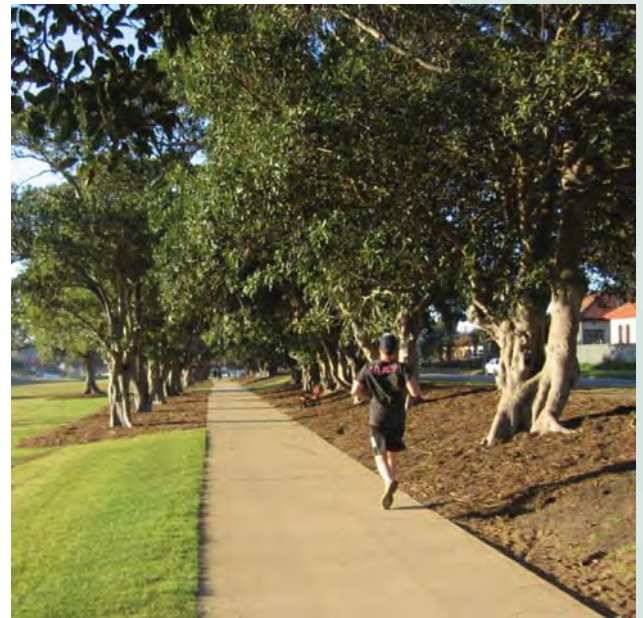
1. Respond to the natural systems and features underlying the city structure
2. Respond to the existing urban structure and form
3. Respond to the cultural and historical significance of the city
4. Contribute to the design of public domain in both new and urban renewal areas
5. Respond to the new issues and approaches of management relating to climate variability, risk mitigation and asset management.

When addressing the above steps, the process needs to determine the design context and apply the following design principles:

1. Respond to the natural systems and features underlying the city structure and form such as the existing local vegetation and landforms by:
 - Providing habitat and contribute to sustaining urban ecology
 - Using street tree planting to reinforce green corridors and existing areas of indigenous vegetation and riparian areas where potential exists
 - Taking advantage of the borrowed scenery of gardens, parklands, reserves, ridgelines and backdrop planting
2. Respond to the existing urban structure and form by:
 - Emphasising the key entry points, intersections, city boulevards and avenues
 - Strengthening the visual and environmental quality of streetscapes patterns and use consistency and visual uniformity where appropriate
 - Increasing the legibility or ability to navigate the city form and layout
 - Appreciating the past, present and future influences of street trees

3. Respond to the cultural and historical significance of the city by:

- Acknowledging the ancient cultural legacies of the Awabakal and Woromi peoples and reflect a community's historical preference or aspirations through symbolic or ceremonial associations with trees
- Acknowledging the street trees' role as important landmarks and recognise the historical design styles associated with architecture and particular cultural associations of certain species e.g. Norfolk Island Pines, Canary Island Date Palms and Moreton Bay Figs.



4. Contribute to the design of public domain in both new and urban renewal areas by:

- Establishing new street plantings in patterns and locations that account for the important role trees play in creating the city's character and public realm and creating a sense of place
- Reinforcing or establishing a recognisable character of streetscapes with distinctive urban design approaches
- Maintaining or establishing new street tree plantings in patterns that reflect the hierarchy of city streets and complement pedestrian movement.



5. Respond to the new approaches of management from issues of climate variability to risk mitigation and management by:

- Investigating the use of alternative species for new conditions such as temperature and weather extremes
- Reducing the urban heat island effects of urban development
- Improving awareness of bio-security issues linked to family, genus and species choices.



High Profile and Special Areas

Some locations throughout Newcastle will warrant a multi-disciplinary approach to integrating urban design and street tree selection. The key areas are identified on the city-wide map below and are described as follows.

Heritage Conservation Areas

The layout of street trees and the selected species are often the result of previous land uses, or an association with a particular period of landscape design.

A heritage conservation area is where building forms and landscape features have combined to create a consistently distinctive local character. Newcastle's six heritage conservation areas are Cooks Hill, The Hill, Newcastle East, Beaumont Street, Hamilton South Garden Suburb and Newcastle CBD. Each heritage conservation area has a rich heritage and streetscapes that contribute to a sense of place. They are protected and maintained through Council's Development Control Plan (DCP) 2005. Street tree planting in these areas will respond to these requirements. For further historical background refer to Appendix 3: *The Origins of Tree Planting in Newcastle*.

Arterial roads, Avenues and Major Intersections

Road hierarchy and networks are important factors in selecting the type of street tree planting.

Selection and positions of trees should relate to the scale and use of the road and can indicate changes in road direction or condition e.g. 'T' junctions, curves, distant landmarks. A major arterial road will require large trees to balance multiple traffic lanes and provide shade where a narrow local road may only have room for small trees. Traditional approaches to avenue planting using regular rhythmical spacing and eventually creating interlocked canopies with leafy ceilings create a sense of place, are aesthetically pleasing and are amongst the most popular tree assemblages in cities around the world.

Generally where overhead power lines occur, the size and type of trees suitable will be limited to a smaller growing species with a suitable branching habit or tolerance to severe pruning. However for significant and important city corridors the urban design benefits and priority for larger trees will warrant relocation of power lines.

Various configurations of street tree design can apply for different road types as well. Refer to Appendix 5: *Guidelines for Street Tree Placement: Typical Street Cross Sections* for samples of different approaches to design.



Land Use Zones and Locations with Special Requirements

Industrial Zones

Compared with residential zones, industrial zones have different spatial requirements and scales of development and as a result the importance for integrated 'greening' for industrial and commercial precincts is often not adequately addressed. Often in locations with no street planting, retrofitting may be possible and with design potential for larger trees to be used.

Urban Core /Commercial Zones and City Centre Plan

Because of a range and scale of individual public domain projects such as the City Centre Plan 2008, the Newcastle City Centre Civic Improvement Plan 2008, the Hunter Street Revitalisation Master Plan, the Civic Cultural Precinct Plan 2004, various Place making projects and Laman Street Civic Precinct Planning, multi-disciplinary approaches to project design integrating street trees will be necessary.

The design results will have long-term significance in daily life and in the presentation of the city to visitors. The STMP will be a valuable tool in tree selection.

Cycle ways, footpaths and public transport routes

These modes of transport are of increasing importance and popularity. Each of these transport /movement corridors has unique design constraints within the street network. Effective design integration with street trees is essential to ensure the greatest benefits for those seeking alternative, low impact modes of travel. Currently the Civic Improvement Plan for Newcastle City Centre 2009 (p 12) identifies the type of design initiatives proposed for these modes.

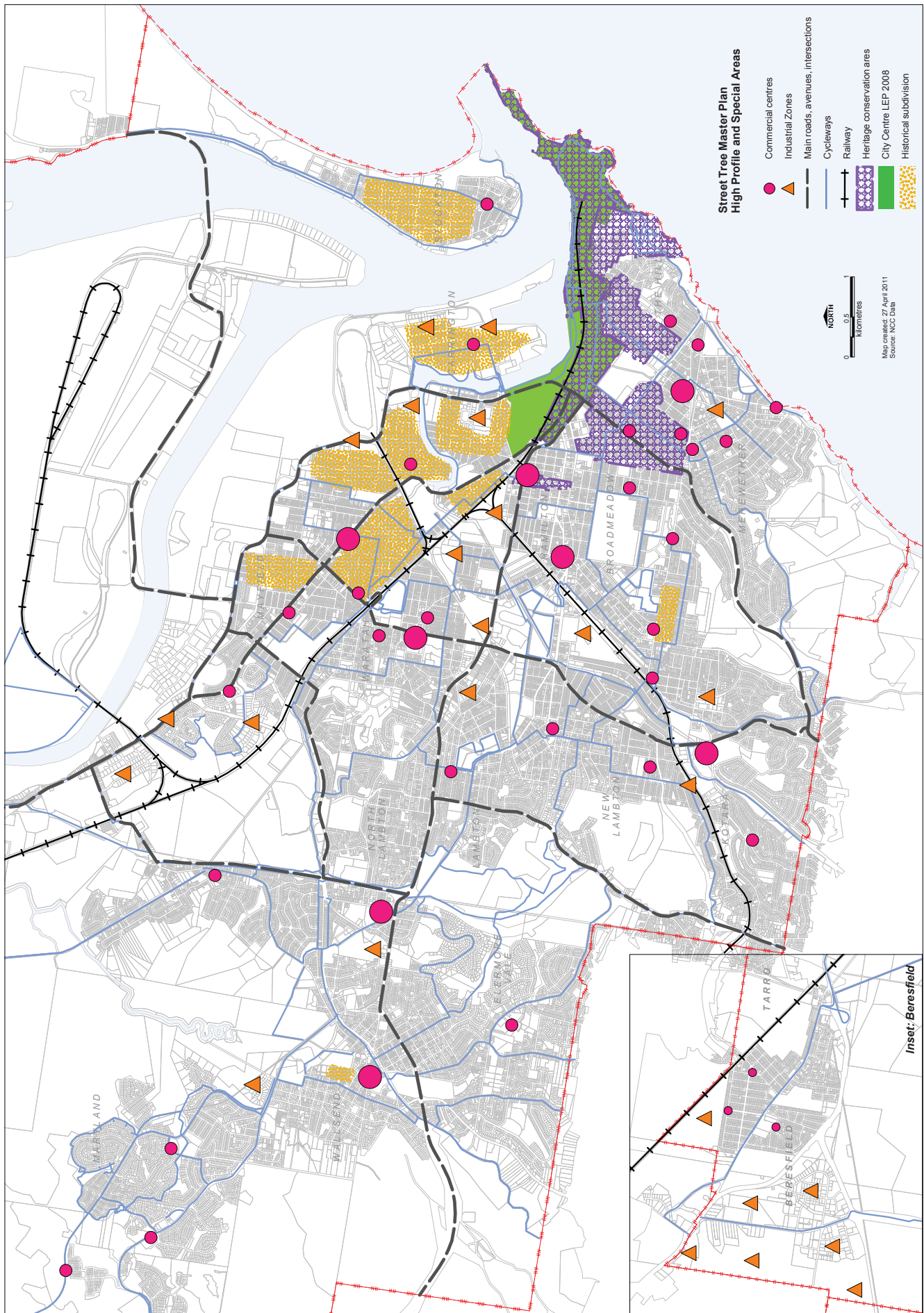
Historical sub-division design

These areas, often found as enclaves in older suburbs or original villages, such as Mayfield, Hamilton, Carrington and Tighes Hill, have a style and structure that often precludes street tree planting. Historically they are characterised by narrow road-ways often only one lane wide, no green verge, no footpath, no off street parking, inconsistent or no building set backs, and overhead power lines sometimes on both sides of the street.

With a lack of obvious 'tree' space in these locations more innovative ways of achieving tree planting are needed to improve and enhance the streetscape. For instance there may be space within the building lot for trees and a borrowed landscape or perhaps there are unique modifications that can be made to the street design such as planting within the street pavement or only using one side of the street for parking.



High Profile and Special Areas



Part C

The Approach to Species Selection

As outlined in Part B, the STMP begins with a whole-of-city analysis that includes consideration of natural, built and cultural design factors. It is now necessary to determine trees appropriate for each street at the local scale and a clear, objective process has been developed. The trees selected for Newcastle's streets are likely to occupy their planting sites for 20 to 80 years. Selecting the most appropriate tree for any site is a challenging task that requires balancing multiple and often conflicting considerations. Information on tree performance, urban design principles and technical issues are key considerations in every instance.

City Wide Suburb Plan

The city wide suburb plan is a GIS map that identifies which suburbs are to be planted within any give year. An analysis of vacancy rates and age profile of existing trees within the Tree Asset Management System (TAMS) will drive the development of the plan.

Space available mapping

GIS Mapping for the STMP is colour coded to represent nine combinations of powerlines and footway widths. (Table 1.) The use of footway width and powerlines is necessary to reflect the primary constraints on the available space. Other site constraints such as building setback are not used in determining the code as these vary greatly within any street segment. This and other site factors are considered later in the species selection process. Refer to Appendix 4 Space Available Mapping – Sample Street Maps.

deciding what to plant

The Selection Process

The Species Matrix

The street tree matrix provides a range of suitable species adapted to a range of street and road conditions. The matrix does not have specific application to Park environments although many of the matrix species may also be suitable for park and open space planting.

The matrix is a computer based application that allows for filtering a range of site specific characteristics in order to arrive at a short list of suitable species for any given location. This will eliminate inappropriate planting, minimise negative interactions and outcomes and will reduce the cost burden of species proven unsatisfactory. The approach also minimises councils risk exposure. (Refer to Appendix 3 The Species Matrix)

The matrix includes a number of species for trial planting in Newcastle. A trial planting involves the use of species not previously planted in large numbers in Newcastle but which have succeeded in other local government areas. The need to trial new species arises because some existing species have proven unsatisfactory (e.g. disease, stability, pests, weediness, size) and new species are required to maintain a diverse and robust tree population.

Diversity

An analysis of the existing public tree population has revealed an imbalance at the plant family and species levels. An over-representation of one family or tree species increases the risk of significant loss as a consequence of pest and disease outbreaks - for example the loss of 1200 New Zealand Christmas Bush to borers, the threat to Plane Trees from Lace bug and infection of Canary Island Date Palms with Fusarium Wilt. In addition the recent introduction and spread of the exotic disease Myrtle Rust now threatens the Myrtle (Myrtaceae) plant family which comprises 52% of Newcastle's public tree population. As a result it is vital to trial new species in order to gain a better balance of plant families and improve biosecurity outcomes.

This STMP details an objective step-by-step process to replace past subjective decision making concerning street tree selection. This process and associated mapping also meets councils Best Practice commitments which require Council to address risk in the planning for street planting. (Statewide Best Practice Manual - Trees and Tree Root Management v2 2003) For further detail refer to Appendix 8 - Statewide Obligations.

The process is shown in the diagram following. It illustrates how species will be selected for the three key streams of street tree planting that can occur in Newcastle as:

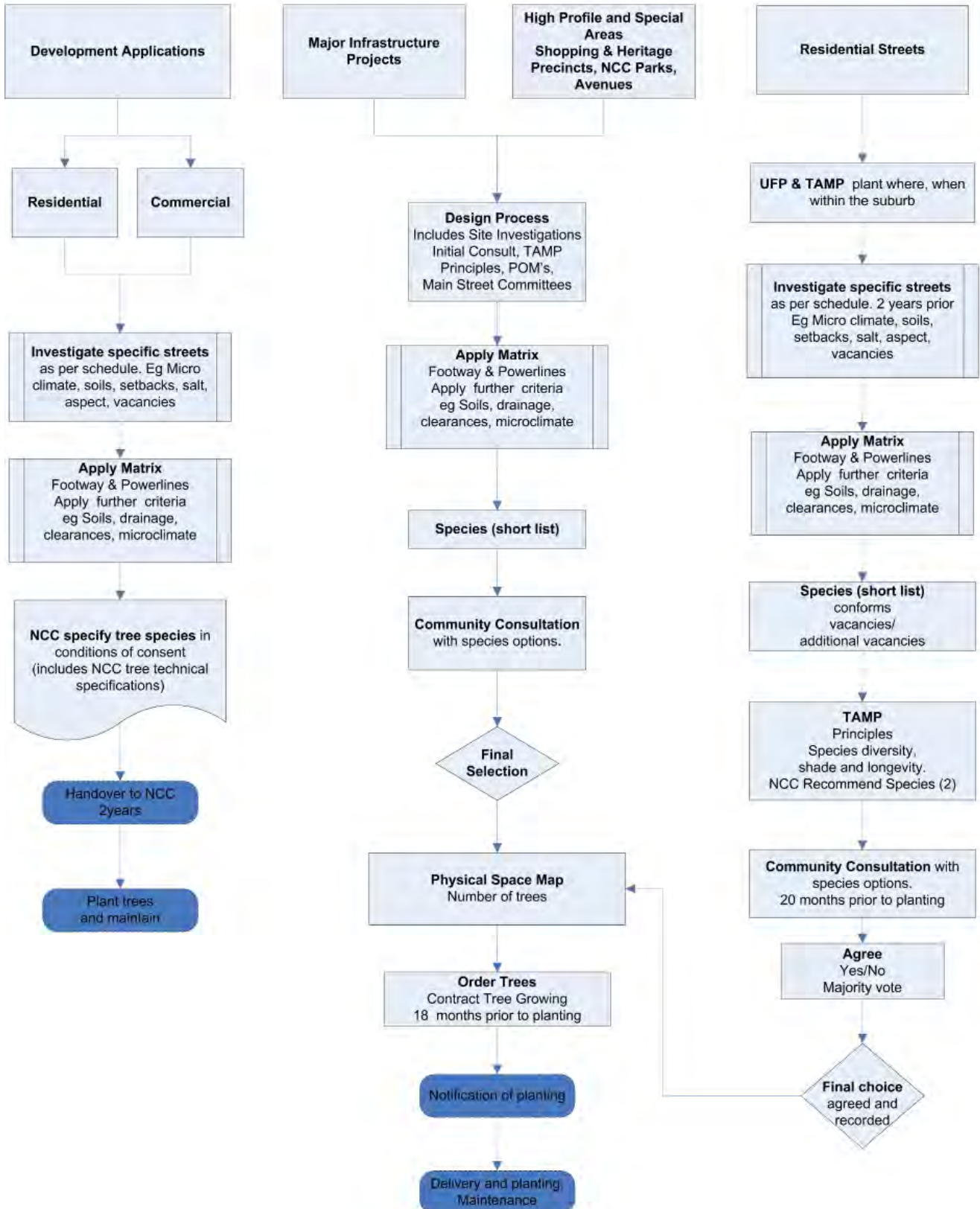
1. A suburban residential street program
2. A major project or major infrastructure plan
3. As conditions of consent for a Development Application

Each of these is detailed on the following pages.

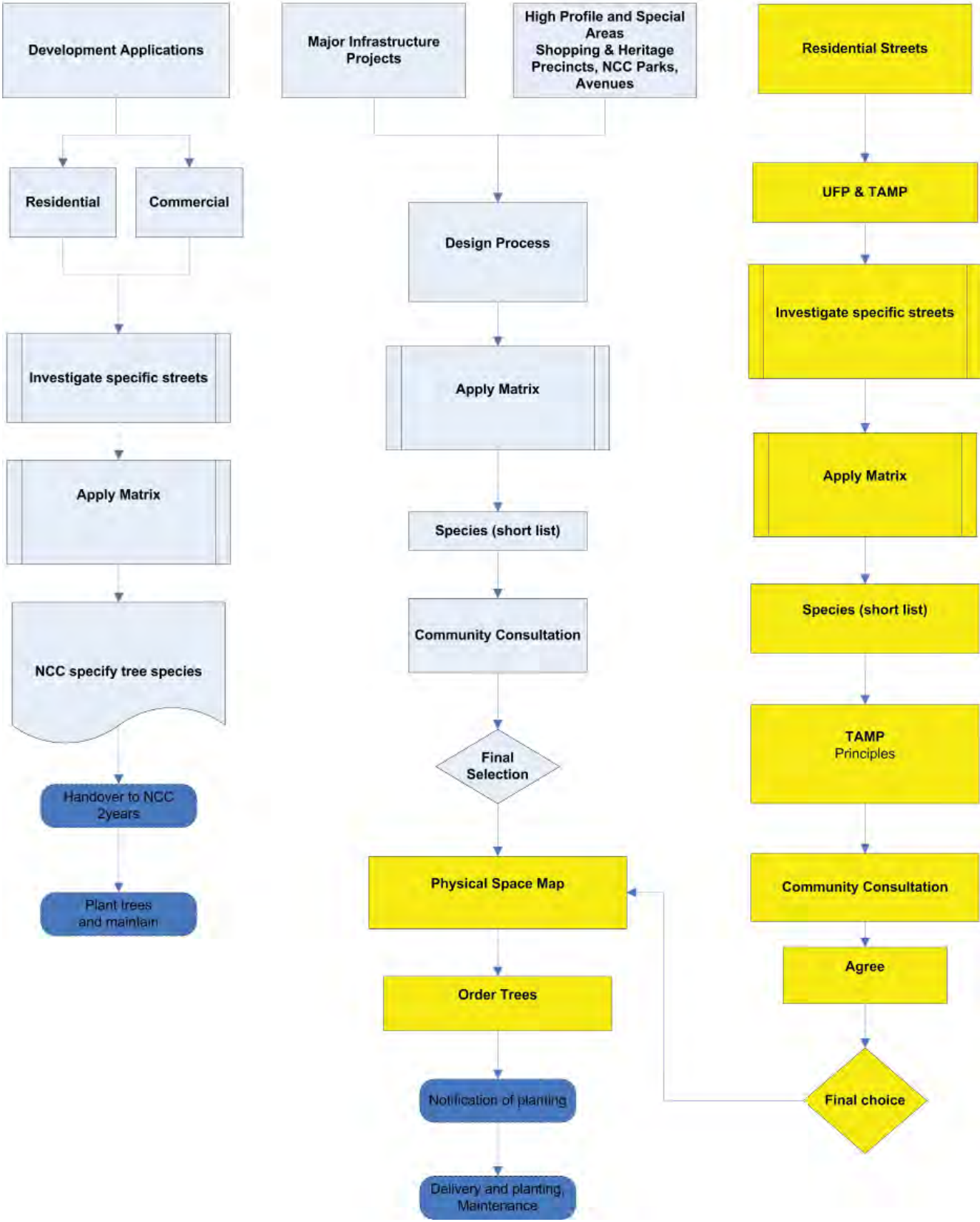
Table 1
Street Tree Master Plan - space available

FOOTWAY WIDTH	POWER LINES (Y/N)
Less than 2.5m	NA
2.5 to 3.0m	Y
2.5 to 3.0m	N
3.1 – 3.5	Y
3.1 – 3.5	N
3.6 – 4.5	Y
3.6 – 4.5	N
Greater than 4.5	Y
Greater than 4.5	N
Median 4.5 or greater	N

Tree Species Selection Process



Tree Species Selection Process

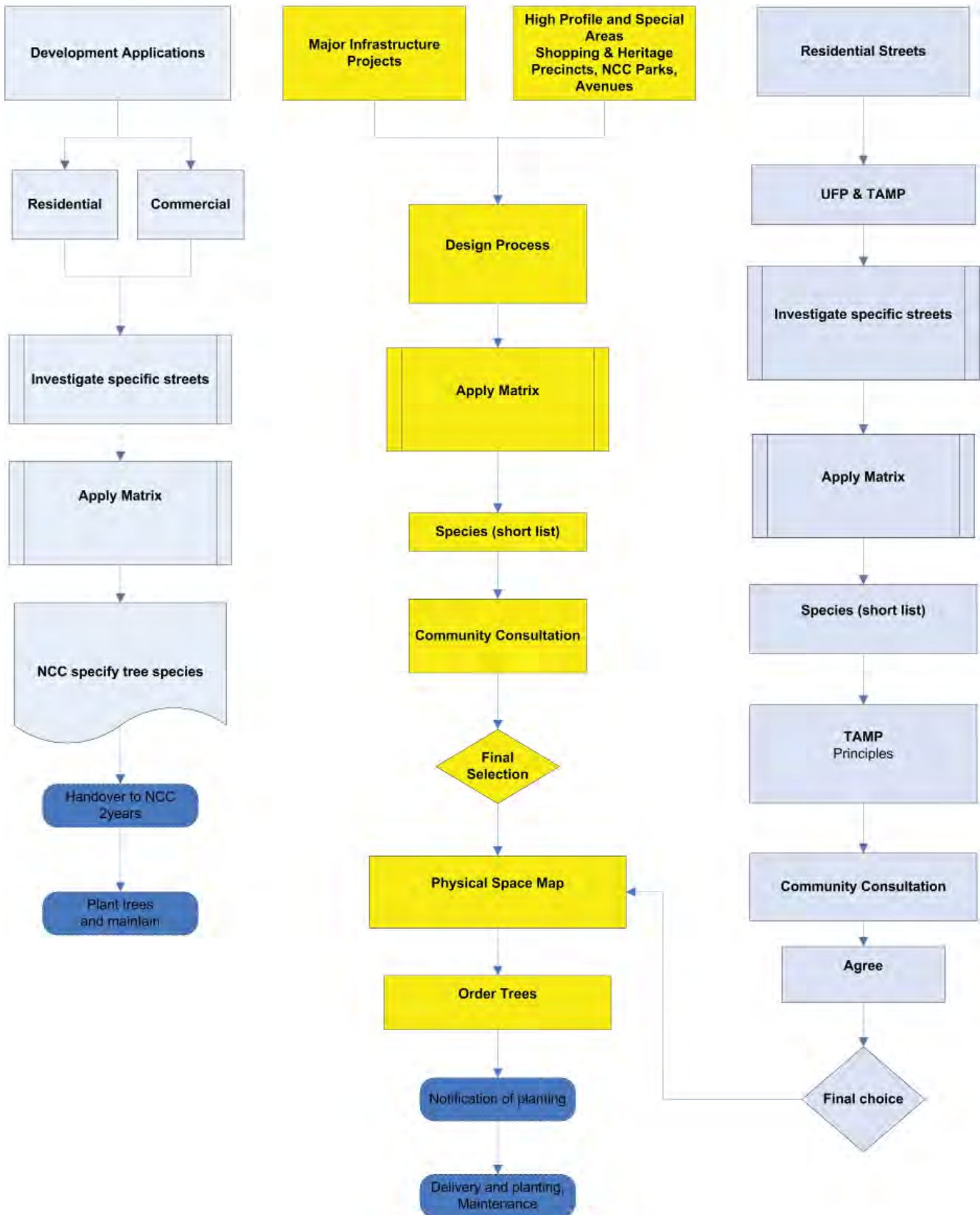


1.0 Residential Streets

PROCESS STEP	NOTES
Urban Forest Policy and Draft Tree Asset Management Plan (TAMP)	<ul style="list-style-type: none"> Plant where and when within the suburb using GIS mapping The data analysis and applying tree asset management planning objectives provides a map of prioritisation for planting residential streets. (Infrastructure Management Services)
Investigate specific streets	<ul style="list-style-type: none"> Two years prior to planting Site inspection of selected streets using Site Inspection Form (Appendix 7) (microclimate, soils, clearances, drainage, aspect) Confirm vacancies/additional vacancies Locations that are <2.5m (grey code) will be assessed for alternative design options to incorporate tree planting with community request taking priority.
Apply Matrix	<ul style="list-style-type: none"> Sort by applying footway width and power line Y/N Sort by additional criteria per record of site inspection.
Species (short list)	<ul style="list-style-type: none"> Species options identified
Draft TAMP principles	Review TAMP principles of <ul style="list-style-type: none"> Species diversity Canopy cover Tree size = refined short list
Community Consultation	<ul style="list-style-type: none"> Approx 20 months prior to planting community is consulted Choice given of two species per side of street where form varies/with powerlines. Propose majority vote Options for choice from the two recommended species
Agree on final choice	<ul style="list-style-type: none"> Species finalised and recorded (yes/ no majority vote)
Physical space map	<ul style="list-style-type: none"> Review GIS mapping for number of trees
Order trees	<ul style="list-style-type: none"> Contract tree growing 18 months prior to planting to ensure species chosen is available for project and to ensure quality



Tree Species Selection Process



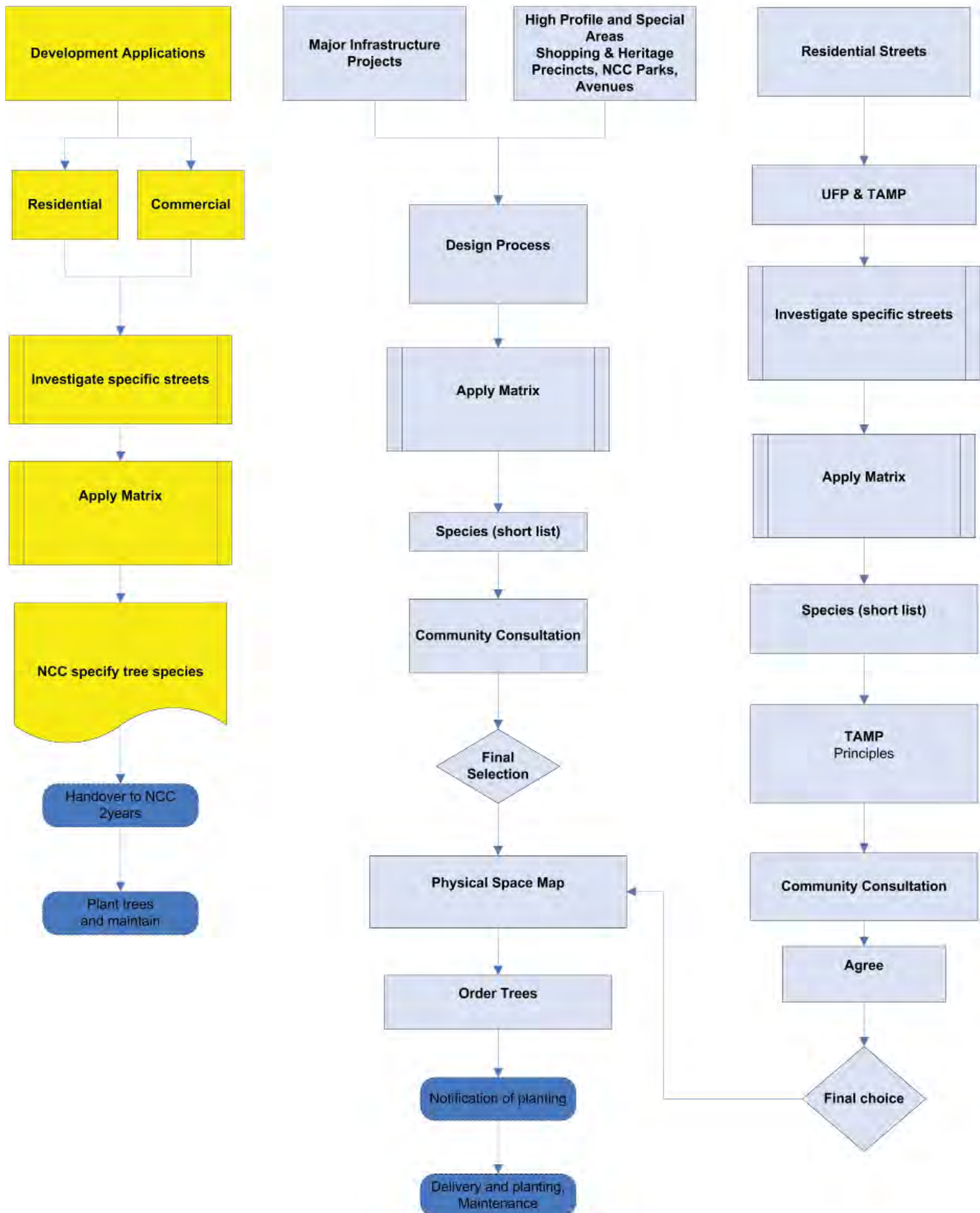
2.0 High profile and Special Areas and/or Major Infrastructure Projects Street Tree Planting***

PROCESS STEP	NOTES
Design Process	<ul style="list-style-type: none"> • Project at a scale that includes setting up project management teams, project scoping, site investigations and research • Locations include parks, boulevards, shopping/commercial precincts and other public domain locations • Initial consultation with stakeholders, eg Mainstreet committees, Placemaking committees • TAMP principles considered, Multi-disciplinary input includes site investigations, POMS, Planting Site Inspection Form • Confirm vacancies and locations
Apply Matrix	<ul style="list-style-type: none"> • Sort by applying footway width and power line Y/N • Sort by additional criteria per record of site inspection and design criteria • Species options identified
Species (short list)	<ul style="list-style-type: none"> • Short list options for discussion
Community Consultation	<ul style="list-style-type: none"> • Final consultation with community stakeholders as required
Final Selection	<ul style="list-style-type: none"> • Species finalised and recorded
Physical space map	<ul style="list-style-type: none"> • Review GIS map for number of trees
Order trees	<ul style="list-style-type: none"> • Contract tree growing - prior to planting to ensure species chosen is available for project and to ensure quality

***major infrastructure projects – may not occur in locations above.
Could be road or drainage rebuild in any location, could result in larger trees, vaults, utility redesign.



Tree Species Selection Process



3.0 Development Applications

PROCESS STEP	NOTES
Development Application	<ul style="list-style-type: none"> • Can be in any location that impacts on the public road • Internal processing Council – investigate site, compile data, planting site inspection form
Investigate specific streets	<ul style="list-style-type: none"> • Planting site inspection of selected street(s) adjacent to development site using Site Inspection Form (ref) (microclimate, soils, clearances, drainage, aspect) • Confirm vacancies • Locations that are <2.5m (grey code) will be assessed for alternative design options to incorporate tree planting with community request taking priority.
Apply Matrix	<ul style="list-style-type: none"> • Sort by applying footway width and power line Y/N • Sort by additional criteria per record of site inspection. • Species options identified.
Council specify tree species	<ul style="list-style-type: none"> • Provide advice for species, number and location for conditions of consent.
Tree planting	<ul style="list-style-type: none"> • Circumstances will vary depending on type of development • Planting and handover will be in accordance with relevant DCP elements and conditions of consent



Part D

Where, when and what to plant

Throughout 2008/2009 every street tree and vacant planting site in the Newcastle LGA was surveyed and the data was recorded in Council's Tree Asset Management System (TAMS database). During 2010 - 2011 Council developed a draft Tree Asset Management Plan (TAMP) which provides a range of measures to sustain the public urban forest (street tree component) and meet the Newcastle Urban Forest Policy goals and objectives. These measures are the product of an analysis of the data held in TAMS which has provided an age profile, useful life expectancy, tree size and species composition for the street tree population.

This information informs decisions on annual planting priorities.

The Newcastle Urban Forest Policy (UFP) goals and objectives and the Draft TAMP are the key drivers that determine where annual planting will occur. An annual planting program will identify priority planting suburbs within a given year. The program will be developed in a GIS map format and is subject to further analysis of data in the Tree Asset Management System including tree vacancy rates and the age distribution profile of existing trees. The program will provide for a 10 year planting projection.

The two specific goals of the Newcastle Urban Forest Policy relevant to this plan are to:

1. Maximise the capacity of Newcastle's urban forest to provide ecological, economic, social and aesthetic benefits to both present and future generations; and
2. Sustain and expand Newcastle's urban forest on an inter-generational life cycle basis.

The UFP sets a number of objectives to achieve these goals, one of which is to improve the overall structure, health and condition of the urban forest. These are achieved through the draft TAMP which guides the prioritisation of planting to diversify tree species and age structure over time. Areas are prioritised subject to analysis of suburb vacancy rates and age distribution. Planting within any given year will be spread across a number of suburbs so as to avoid concentrating large numbers of same age trees in one suburb. Suburbs with high vacancy rates will require planting to be staggered over a number of years to provide age diversity.

The STMP provides the methodology for implementing planting programs and other activities involving the renewal of public trees.

planting our streets

Implementation

Residential Streets Program

Each year selected residential streets will be planted in accordance with the annual planting program.

Resident requests for street tree planting often occur on an adhoc basis.

These requests may be received from individual residents seeking a single tree or as a result of petitions by a group of residents for whole of street planting. All such requests will be considered subject to the STMP species selection process.

Major Infrastructure Projects and High Profile Special Areas

The integrating of tree planting into place making and infrastructure project design is an important contributor to the goals and objectives of the UFP 2008. A key principle of the STMP is to use large, long-lived trees wherever possible. It is therefore necessary to consider creating additional space within the design to achieve this. The Urban Forest Technical Manual details a range of innovative methods and technologies for achieve this space. Council's construction program will determine where and when such planting will occur across the Newcastle local government area.

The STMP species selection process will be applied to these situations to determine a suitable planting outcome.

Development Applications

Residential and commercial development approvals generate adhoc demand for planting of street trees. These are generally funded by the development applicant with a requirement to establish and handover within a set time frame.

The STMP species selection process will be applied to these situations to determine a suitable planting outcome.

before



after



Part E

1. Snapshot of Newcastle's Trees 2011
 2. The Origins of Tree Planting In Newcastle
 3. The Species Matrix
 4. Space Available Mapping - Sample Street Maps
 5. Guide Lines for Street Tree Placement – Typical Cross Sections
 6. Suburb Assessments
 7. Site Inspection Form
 8. Compliance with Statewide Obligations
- References

Appendices

1. Snapshot of Newcastle Trees

109,000 street and park trees (not including bushland)

30% of public tree population affected by aerial power lines

28,000 potential planting sites (streets only)

4,194 new trees planted as part of 2007-2010 Major Asset Preservation Program (street tree replacement and strategic planting)

500 trees per annum is the average removal rate over 8 years



The Myrtle plant family contributes 52% of the total street tree population in TAMS. The Myrtle family includes Paperbark, Turpentine, Eucalyptus, Angophora, Bottlebrush, Lilly Pilly and Brushbox.

Asset Values

Public tree asset replacement cost estimated \$115,500,000 – cost sourced from Percy Allan 2007.

Estimated value of net annual benefits from existing tree resource \$11,020,000 – based on benefit value estimates by Adelaide University 2006.

Condition of public street tree resource

The overall health of the street tree resource is fair to good with 55% of trees in reasonable health, with adequate canopy density for the species. However 22% of the population is in poor structural condition.

Useful Life Profile

About 30% of the public tree resource has an estimated 15-25 year useful life expectancy with only 11% estimated to have a useful life expectancy of 25-50 years. The implication of this imbalance in life expectancy distribution is that a large proportion of the existing public tree population will require replacement within a relatively short time. This equates to an 80% loss of existing street trees within 30 years and 66% within 20 years.

Plant Diversity

With 72 plant families, 168 genera and 436 different species, the public tree resource appears to be very diverse. However there is a severe imbalance due to 55% of the population being represented by just 10 genera which includes Eucalyptus, Corymbia, Bottlebrush, Casuarina, Brushbox, Paperbark, Fig, Wattle, Lilly Pilly, Crepe Myrtle and Robinia. A number of plant families are represented only by single individual.

Summary

Although the public tree population is reasonably healthy, it is ageing and in relatively poor structural condition.

Many of the city's mature and important trees have outgrown their street locations and the costs and difficulties of retaining such trees are increasing. If these species are to continue to be planted then space will have to be engineered within the street environment to accommodate their large root systems at maturity.

Development, utilities, road works, new pests and diseases and a changing climate continue to put pressure on the existing street tree population. Because the park and street tree population is not self-renewing, it is necessary to plan for tree renewal in order to sustain the overall benefits of public trees through time.



2. The Origins of Tree Planting In Newcastle

Background

As the second oldest city in Australia the built form of Newcastle dates from the early 1800s and provides a distinct layer of heritage and cultural significance.

The Newcastle local government area covers approximately 214 square kilometres with a population of 142,000 (2006 census). Newcastle is the sixth largest urban area in Australia and is the cultural and economic heart of the Hunter region. The city is located on the coast 160 kilometres north of Sydney in the Lower Hunter region which embraces the local government areas (LGAs) of Cessnock, Lake Macquarie, Maitland, Port Stephens and Newcastle.

Newcastle's natural assets are diverse, including coastal headlands, beaches, estuarine wetlands, mangrove forests, steep ridges, rainforest gullies and dry wooded inland slopes. Since the first European settlement at Port Hunter in 1804 this environment has been altered significantly.

In 2006 the NSW State Government identified the Hunter as one of six key regional areas for growth. Through employment and housing opportunities and by becoming a more liveable city Newcastle is to underpin economic growth in the Hunter region. The State Government's vision identifies the value of trees and vegetation as part of the urban environment.

In response Newcastle Council adopted an Urban Forest Policy in 2008 to improve management of the city's urban forest. The Street Tree Master Plan provides the tool for maintaining and extending canopy coverage across Newcastle and provides a framework for consistent and sustainable provision of street trees.



Newcastle's harbour a strong industrial and commercial base has allowed it to become the sixth biggest population centre in Australia.

Historical Context

Pre European Settlement

The Awabakal and Worimi are the local Aboriginal people, the first people of the land in Newcastle's LGA. Prior to European settlement the physical environment in which the locals lived was lush and heavily forested, in stark contrast to present day Newcastle.

The Hunter River was known as 'Coquun' by the local people. Prior to European settlement, the environs was one of a mangrove fringed river with dense brush and large trees lining the banks.

Joseph Lycett, a well renowned convict artist commented on the landscape of Newcastle (1815 - 1819) "There are immense quantities of the finest timber of the different sorts of the Eucalyptus, grown in the vicinity of Newcastle, and the Casuarinas' grown to considerable size". This image supported by H.W.H Huntington in his History of Newcastle (1897-78) where he describes the area around Newcastle as having "Magnificent forests of lofty Eucalyptus and Casuarinas as well as Swamp Oak, Tea Tree and Mangrove in abundance stretching far and wide along the branches of the river".



The foreshore as it was: view of Newcastle Harbour Wharf during its industrial hey day in the early 1900s, with Nobbys and the break wall in the background.

Post European Settlement

Five elements interwoven into Newcastle's history have shaped urban development and help explain the settlement pattern of modern Newcastle. These elements are the penal settlement 1804-1822, coal, the harbour, port, railways and heavy industry. The first penal settlement was formed in 1804. The convicts were a source of labour for the exploitation of coal, timber, salt and lime. Newcastle ceased to be a penal colony in 1822 when the convicts were relocated to Port Macquarie. At this time the government surveyor Henry Dangar was directed to prepare a town plan on the site of the penal settlement. Dangar overlaid the irregular arrangement of the penal settlement with a rigid grid pattern that still exists today as central Newcastle.

The entry of the Australian Agricultural Company into coal mining during the 1830's had a dramatic effect. The company received a grant of 2,000 acres to the west of Newcastle and proceeded to extract coal via two steam engines. By the mid 1850's Newcastle was still small but the impact of coal mining on the environment was apparent with the township being described as "these shores of sand and coal dust".

The second phase in Newcastle's expansion was brought about by the advent of the railway system. Construction of The Great Northern Railway Line commenced in 1857 with a connection between the port of Newcastle and Maitland. Private rail systems developed simultaneously with the public system resulting in a network of private colliery steam trains servicing the coal mines and linking the villages. The port facilities in Newcastle Harbour expanded in response to the growth of the rail network greatly accelerating the export of coal to ports in Asia and America.

By the 1860's Newcastle was a major shipping and commercial centre, with a settlement pattern characterised by a series of small villages centred on coal mines and linked by a private rail system. Townships developed close to the mines to accommodate miners and their families. When mining ceased the colliery land was then further subdivided and sold off for commercial and residential development. With their supply of affordable residential land and convenient rail connections to Newcastle CBD the fledgling townships expanded to become the suburbs we know today.

Newcastle became a centre for heavy industry with the advent of the steel works in 1917. Significant industrial expansion has continued, particularly with open cut coal mining, aluminium smelters and ongoing development of port facilities.

Although modern Newcastle is still an industrial centre the closure of BHP in 1999 brought an end to the city's reliance on heavy industry. The BHP closure resulted in massive job losses and depopulation which Newcastle is only beginning to recover from now. The release of former industrial lands particularly along the foreshore has initiated a period of economic and environmental renewal for the core of the city. With new public open spaces and commercial and residential developments that incorporate modern built forms Newcastle is beginning to become the post industrial 'liveable' city envisaged by State Government.

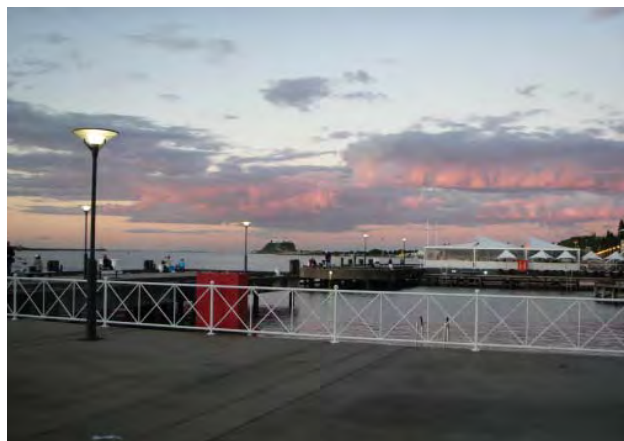
The History of Tree Planting

Street trees form an important part of the cultural and historic landscape of Newcastle. The type of trees chosen, their location and grouping provide an insight into the past. Tree planting was undertaken to mark events, to celebrate and remember people and as a functional response to land use. Collectively the street tree population in Newcastle exhibits distinctive characteristics of a culture, a way of life and signifies a particular response of people to a place over time.

By the 1930's it was evident that industrialisation had created a landscape that was devoid of vegetation, with Newcastle often referred to as 'Coaly Town' and as being 'drab' in appearance. In 1931 Alderman Parker, the Lord Mayor commented in response to this industrialised landscape, 'It is on all sides admitted that the city streets sadly lack the beauty and picturesque appearance which well ordered and suitably planted avenues of trees would afford'. In response an extensive policy of tree planting and five year city beautification program was initiated. Alderman Shedden spoke of an intention to create a 'tree sense' in the public, the best way to nurture this being to provide trees for private citizens to plant and attend.

Newcastle's intent to overcome its bleak industrial character has been closely aligned with tree planting programs implemented over time. The twelve individual councils, which were amalgamated to form the Greater Newcastle Council in 1938, had been active in beautifying their areas. The Newcastle Herald on the 5th of August 1937 reported that 'the suburban councils have planted hundreds of trees.... and it is expected that in a short time the suburbs will do much to explode the belief that Newcastle is a treeless city'.

The historically significant stand of Moreton Bay Fig trees along Islington Park's boundary with the Pacific Highway was first planted in 1880 by Wickham Municipal Council.



The foreshore today: Public open space and recreation-based commercial activities such as pubs and restaurants



View of Newcastle Town Hall and Civic Park in circa. 1936 showing how sparse Newcastle's street tree population was at the time.

A group of protesters gathered in 1935 to protect the Figs in Islington Park when they were under threat.

The original planting was supplemented circa 1937 to commemorate the golden jubilee of Islington School. In 1941 E.G. Waterhouse, a prominent professor from Sydney University was invited by the Newcastle Tree Planting and Preservation League to inspect the trees in Islington Park. He commented that the grove of Figs is 'one mass of greenery, the one landmark on which the eye dwells with pleasure in the otherwise uninspiring city landscape'.

A dense planting of Hills Fig trees along Port Waratah's boundary with Industrial Drive is a prime example of tree planting in response to the industrial

environment. When steel was being produced at BHP these Figs assisted in absorbing airborne particulates and providing an effective visual screen to the vast industrial complex. As these Fig canopies have matured they have merged to form a massive hedge that has outlived BHP and still enhances Industrial Drive today.

Inspired by a trip abroad Alderman Armstrong, President of Newcastle Rotary Club, stated 'trees planted on main traffic routes into overseas cities gave one a tremendous first impression'. An Avenue of Remembrance first planned in 1961 in association with the Rotary Club was implemented along the Pacific Highway from Hexham Bridge to the abattoir at Mayfield.

The avenue had a dual objective to beautify the northern approach to the city and commemorate the early pioneers of Newcastle. In addition Council commenced planting of Hills Figs along the Pacific Highway west of Mayfield. Tree planting along these routes was instrumental in improving Newcastle's presentation to visitors.

Over the years Newcastle's citizens have been divided on the importance of trees in Newcastle. A negative attitude to trees was expressed in an article from the Newcastle Herald March 1941 from a ratepayer in Wickham complaining about the Fig trees that lined Albert Street in Wickham Park, 'They are dirty, and make our homes look like rubbish tips. We are always cleaning up the mess they make.' Council's Park Superintendent Mr Richard H Patterson countered, stating the importance of trees for four reasons first their 'beauty', second for their 'sanitary and hygienic value', then for the 'convenience in keeping the city cool'; and lastly for 'their architectural value in creating harmony where non uniform buildings exist'. Patterson continues, recognising key environmental benefits identified in today's urban forest, 'Who would believe that trees absorbed the surplus carbon dioxide in the air and that they prevented much dust from flying over the city'.



The Moreton Bay Figs in Islington Park were saved in 1935 by a group of protesters.



The Moreton Bay Figs in Islington Park were originally planted in 1880. Today they are a historically significant landmark.

The benefits of trees recognised by Patterson back in 1941 are still relevant today. Council's Urban Forest Policy recognises that quality tree canopy cover across the city provides aesthetic, health, environmental and monetary benefits, helping to offset the negative effects of increasing urbanisation, the heat island effect and climate change.

Newcastle currently benefits from the canopy of trees planted from the 1930s onward, however this canopy has a limited lifespan and there are many parts of the city that still lack trees. The Urban Forest Policy requires that the current canopy is properly managed so residents of Newcastle can continue to enjoy the benefits of trees.

3. The Species Matrix

Species Matrix Key

The species list must be read in conjunction with the key below. The data is specific to Newcastle streets and should not be seen as defining characteristics outside of this LGA.

In the event of species substitution use height and crown shape as starting filters to ensure substitute species to attain similar size and form as per the original selection.

KEY

Use In Footway. **F1** = 2.5 - 3.0m **F2** = >3.0m - 3.4m **F3** = 3.5 - 4.5m **F4** = > 4.5 **M** = suitable for median and park planting along street-front.

Height. The estimated range in metres for trees growing under typical street conditions. Soil factors and site environs commonly limit mature height.

Width. The estimated diameter (spread) of the mature crown in metres

ULE. Estimated time that benefits will exceed costs. **Short** <25 yrs; **Medium** 25-50yrs; **Long** >50 yrs; * = timber is recyclable

Crown shape. **BD** = broad dome **D** = dome; **ND** = narrow dome; **MD** = medium dome; **C** = columnar

Shade. An indicator of shade benefits. **L** = low shade; **M** = medium shade; **D** = dense shade

Flower. **Sp** = spring; **Su** = summer; **Au** = autumn; **W** = winter; **NA** = not applicable

Recycle. Capacity to lock up some stored carbon after tree is removed. **T** = timber can be used eg furniture/craftwork; **M** = primarily mulch value

Shedding. Propensity to shed fruit, twigs, bark, flowers. **L** = low (insignificant) **M** = moderate (some seasonal increase) **H** = high (sheds more or less continuously)

Biodiversity. Contribution to local biodiversity through nectar, habitat, arthropods, insects etc; **H** =High; **H*** = high but should not be planted close to bushland; **L** = low

Leaf Habit. (decid) **N** = Evergreen habit; **Y** = seasonal leaf colour and fall; **Semi** = short period of leaflessness

Salt Air. Tolerance to salt laden winds typical of coastal Newcastle. **Y** = Yes, but not front line tolerance; **YF** = yes frontline tolerant; **N** = not tolerant

Drainage. The species tolerance for soil drainage. **G** = must be rapid draining eg sand; **M** = tolerates slower drainage eg loamy soil; **P** = tolerates slow drainage eg clays

Powerlines.(EA) Suitable for growing under or near powerlines. Not an indication that trimming will not be required in some circumstances

Origin. **A** = Australian non local; **L** = Locally Native; **E** = Exotic

Trial Species. Species that may be suited to street planting but that need to be trialled first. **Y** = yes; **N** = no

Tree Quality. Currently there is no national standard for tree stock quality. The use of any species in this list assumes that the selected trees conform to the NATSPEC guide for tree quality (Ross Clark as published by Construction Information Systems) Poor performance of street tree species is commonly attributable to one or a combination of the following: 'J' rooting at seedling stage of production; inappropriate root pruning program and methods during production; lack of proper formative pruning of the branching system during production; poor stock handling in transit and at planting time; inadequate establishment care especially watering;

Tree Establishment. Trees will only achieve their potential where establishment practices are routinely carried out. Formative pruning is most important. Crown lifting is commonly applied as substitute for formative pruning, which it is not. Formative pruning has to be carried out over a number of growing seasons and requires considerable skill.

Tree Maintenance The cost of whole-of-life maintenance varies considerably between tree species. Costs rise significantly if maintenance requires the use of aerial towers and chippers, OHS requirements, utilities investigations and traffic planning. Even though some species require regular low level sucker pruning, the cost of this work is low due to small volume of material arising and less need for machinery, traffic interruptions and complex OHS considerations.

Matrix Data Breakdown

35 plant families

115 species

35 Australian non-local species

26 Exotic species

54 Local native species

Tree Selection Table

Scientific Name	Common Name	Family	Use In	EA	Drainage	Salt Air	Hght	Wdth	Crown shape	Shade	Decid	ULE	Flower	Recycle	Shedding	Biodiv	Origin	Trial Spp
<i>Acacia maidenii</i>	Maidens wattle	Mimosaceae	F3	N	G	N	8-12	6-8	MD	M	N	M	Su Au	T	L	H*	L	Y
<i>Acacia melanoxylon</i>	Black Wattle	Mimosaceae	F4	N	M	N	12-15	6-8	MD	M	N	L	W	T	L	H*	L	N
<i>Acer rubrum</i> 'Fairview Flame'	Red Maple	Aceraceae	F4	N	G	N	12-15	6-8	D	M	Y	L	NA	M	L	L	E	Y
<i>Acronychia imperforata</i>	Beach Acronychia	Rutaceae	F1	Y	M	Y	< 8	3-6	ND	M	N	S	Su	M	L	H	L	Y
<i>Acronychia oblongifolia</i>	White Aspen	Rutaceae	F1	Y	M	Y	< 8	3-6	ND	M	N	M	Su	M	L	H	L	Y
<i>Acmena smithii</i>	Lilly Pilly	Myrtaceae	F3	N	M	Y	8-12	6-8	D	D	N	M	Su	T	M	H	L	N
<i>Agathis robusta</i>	Kauri Pine	Araucariaceae	M	N	G	N	20+	6-8	ND	D	N	L	NA	T	L	L	A	N
<i>Alectryon tomentosus</i>	Woolly Rambutan	Sapindaceae	F3	Y	G	Y	< 8	3-6	ND	M	N	M	NA	M	L	H	L	Y
<i>Alectryon coriaceus</i>	Beach Birdseye	Sapindaceae	F1	Y	G	Y	< 8	3-6	ND	L	N	M	NA	M	L	H	L	Y
<i>Alloxylon flammeum</i>	Tree Waratah	Proteaceae	F3	N	G	N	12-15	6-8	ND	M	N	L	Sp	T	L	H	L	Y
<i>Alphitonia excelsa</i>	Red Ash	Rhamnaceae	F3	N	G	Y	8-12	6-8	ND	M	N	M	Su	T	L	H	L	N
<i>Alphitonia petriei</i>	Pink Almond	Rhamnaceae	F3	N	G	N	8-12	3-6	MD	M	N	M	Su	T	L	H	A	Y
<i>Angophora costata</i>	Smooth-barked Apple	Myrtaceae	F4	N	G	N	12-15	8-10	D	L	N	L	Su	M	M	H	L	N
<i>Angophora hispida</i>	Dwarf Apple	Myrtaceae	F1	Y	G	YF	< 8	3-6	ND	M	N	M	Su	M	L	H	L	N
<i>Araucaria cunninghamii</i>	Hoop Pine	Araucariaceae	M	N	M	N	20+	8-10	D	M	N	L	NA	T	L	H	A	N
<i>Araucaria columnaris</i>	Cook Pine	Araucariaceae	F4	N	M	Y	15-20	3-6	Col	M	N	L	NA	T	L	H	A	N
<i>Araucaria heterophylla</i>	Norfolk Pine VUB1+2C	Araucariaceae	M	N	M	YF	20+	6-8	Col	M	N	L	NA	T	L	H	A	N
<i>Archtophoenix cunninghamiana</i>	Bangalow Palm	Arecaceae	F1	N	P	N	8-12	3-6	Col	L	N	M	Su	M	M	H	L	N
<i>Argyrodendron actinophylla</i>	Black Booyong	Sterculiaceae	M	N	G	N	15-20	12-15	BD	D	N	L	NA	T	L	H	L	Y
<i>Backhousia anisata</i> (syn <i>Anetholia</i>)	Aniseed Tree ROTAP2RCa	Myrtaceae	F3	Y	G	N	8-12	6-8	MD	M	N	L	Su	M	L	H	L	Y
<i>Backhousia citriodora</i>	Lemon Myrtle	Myrtaceae	F1	Y	G	N	< 8	3-6	ND	L	N	M	Su	T	L	H	L	N
<i>Backhousia myrtifolia</i>	Grey Myrtle	Myrtaceae	F1	Y	G	N	< 8	3-6	ND	M	N	M	Su	T	L	H	L	N
<i>Banksia integrifolia</i>	Coastal Banksia	Proteaceae	F2	Y	G	YF	< 8	3-6	D	M	N	S	Su	T	L	H	L	N
<i>Brachychiton acerifolius</i>	Illawarra Flame Tree	Sterculiaceae	F4	N	M	N	8-12	6-8	ND	M	Semi	L	Su	T	L	H	A	N
<i>Brachychiton discolor</i>	Lacebark	Sterculiaceae	F4	N	M	N	12-15	6-8	ND	M	N	L	Su	T	L	H	A	N
<i>Brachychiton populneus</i>	Kurrajong	Sterculiaceae	F4	N	M	N	12-15	6-8	D	M	N	L	Sp	T	M	H	A	N
<i>Buckinghamia celsissima</i>	Ivory Curl Flower	Proteaceae	F1	Y	G	N	< 8	3-6	ND	M	N	M	Su	T	L	H	A	N
<i>Buckinghamia ferruginiflora</i>	Noah's Oak	Proteaceae	F2	Y	G	N	< 8	3-6	D	M	N	M	Su Au	T	L	H	A	N
<i>Caesalpinia ferrea</i>	Leopard Tree	Caesalpinaceae	F3	N	M	N	8-12	6-8	MD	L	Y	L	Su	T	L	L	E	N
<i>Callistemon salignus</i>	Willow Bottlebrush	Myrtaceae	F1	N	P	N	8-12	3-6	ND	M	N	M	Su	M	L	H	L	N
<i>Calodendrum capense</i>	Cape Chestnut	Rutaceae	F4	N	M	N	8-12	6-8	D	D	Semi	L	Su	T	L	L	E	N
<i>Carya illinoensis</i>	Pecan	Juglandaceae	M	N	M	N	12-15	8-10	MD	M	Y	L	Su	T	L	L	E	N
<i>Castanospermum australe</i>	Blackbean	Fabaceae	M	N	M	N	15-20	10-12	D	D	N	L	Su	T	L	H	A	N
<i>Corymbia maculata</i>	Spotted Gum	Myrtaceae	F4	N	M	N	15-20	6-8	MD	L	N	L	Su	T	M	H	L	N
<i>Corymbia eximia</i>	Yellow Bloodwood	Myrtaceae	F3	N	G	Y	12-15	6-8	D	M	N	L	Su	M	M	H	L	N
<i>Cupaniopsis anacardioides</i>	Tuckeroo	Sapindaceae	F2	Y	M	Y	< 8	3-6	D	M	N	M	Su	M	L	H	L	N
<i>Decaspermum humile</i>	Silky Myrtle	Myrtaceae	F3	Y	M	N	< 8	3-6	D	M	N	M	Su	T	L	H	A	Y
<i>Diploglottis cunninghamii</i>	Native Tamarind	Sapindaceae	F4	N	M	N	8-12	3-6	ND	L	N	M	Su	M	L	H	A	Y
<i>Doryphora sassafras</i>	Sassafras	Monimiaceae	F4	N	M	N	15-20	6-8	ND	D	N	L	Su	T	L	H	L	Y
<i>Drypetes deplanchei</i>	Yellow Tulipwood	Putranjivaceae	F3	N	M	N	8-12	3-6	ND	M	N	M	Su	T	L	H	A	Y
<i>Elaeocarpus eumundi</i>	Smooth-leaved Quandong	Eleocarpaceae	F3	N	M	N	8-12	3-6	ND	D	N	L	Su	T	L	H*	A	N
<i>Elaeocarpus grandis</i>	Blue Quandong	Eleocarpaceae	M	N	M	N	15-20	6-8	ND	D	N	L	NA	T	M	H	L	N
<i>Elaeocarpus obovatus</i>	Hard Quandong	Eleocarpaceae	F1	N	G	N	8-12	3-6	ND	M	N	L	Su	T	L	H	L	N
<i>Elaeocarpus reticulatus</i>	Blueberry Ash	Eleocarpaceae	F1	Y	G	N	< 8	3-6	ND	L	N	M	Su	T	L	H	L	N
<i>Eucalyptus capitellata</i>	Brown Stringybark	Myrtaceae	F4	N	M	N	8-12	6-8	D	M	N	L	Su	M	M	H	L	N
<i>Eucalyptus curtisi</i>	Plunket Mallee 3RC	Myrtaceae	F1	Y	M	N	< 8	3-6	ND	L	N	L	Su	M	L	H	A	N
<i>Eucalyptus microcorys</i>	Tallowwood	Myrtaceae	F4	N	M	N	15-20	6-8	D	M	N	L	Su	T	L	H	L	N
<i>Eucalyptus punctata</i>	Grey Gum	Myrtaceae	F4	N	M	N	15-20	6-8	D	L	N	L	Su	T	M	H	L	N
<i>Eucalyptus sideroxylon</i> 'Rosea'	Ironbark	Myrtaceae	F3	N	M	N	12-15	6-8	MD	L	N	L	Su	M	L	H*	A	N
<i>Ficus macrophylla</i>	Moreton Bay Fig	Moraceae	M	N	M	Y	20+	15-20	BD	D	N	L	NA	M	H	H	A	N
<i>Ficus microcarpa</i> var. 'Hillii'	Hills Weeping Fig	Moraceae	M	N	M	Y	15-20	15-20	BD	D	N	L	Su	M	H	H	A	N
<i>Ficus rubiginosa</i>	Port Jackson Fig	Moraceae	M	N	M	YF	12-15	10-12	D	D	N	L	NA	M	H	H	L	N
<i>Ficus superba</i> var <i>Henneana</i>	Deciduous Fig	Moraceae	M	N	M	N	12-15	10-12	D	D	Y	L	NA	M	M	H	L	N
<i>Flindersia australis</i>	Crows Ash	Rutaceae	F4	N	M	N	12-15	8-10	D	M	Semi	L	Su	T	M	H	A	N
<i>Flindersia xanthoxyla</i>	Yellowwood	Rutaceae	F3	N	M	N	15-20	6-8	ND	M	N	L	Su	T	L	H	A	Y
<i>Fraxinus griffithii</i>	Himalayan Ash	Oleaceae	F2	Y	M	N	< 8	3-6	D	M	N	M	Sp	T	L	L	E	N
<i>Fraxinus pennsylvatica</i> 'Urbanite'	'Urbanite' Green Ash	Oleaceae	F4	N	M	N	12-15	6-8	D	M	Y	M	NA	T	L	N	E	Y

Scientific Name	Common Name	Family	Use In	EA	Drainage	Salt Air	Hght	Wdth	Crown shape	Shade	Decid	ULE	Flower	Recycle	Shedding	Biodiv	Origin	Trial Spp
Geijera parviflora	Wilga Wilga	Rutaceae	F1	Y	M	N	< 8	3-6	ND	M	N	M	Su	T	L	H	A	Y
Glochidion ferdinandi	Cheese Tree	Euphorbiaceae	F3	Y	P	N	8-12	3-6	MD	M	N	L	NA	T	L	H	L	N
Gmelina leichhardtii	White Beech	Verbenaceae	M	N	M	N	8-12	6-8	D	M	Semi	L	Su	T	L	H	L	Y
Gordonia axillaris	Gordonia	Theaceae	F2	Y	M	N	<8	3-6	MD	M	N	L	Su	M	L	L	E	N
Grevillea baileyana	White Oak	Proteaceae	F3	N	M	N	8-12	6-8	D	M	N	L	Sp	T	L	H	A	Y
Grevillea hilliiana	White Silky Oak	Proteaceae	F4	N	M	N	12-15	6-8	ND	M	N	L	Su	T	L	H	A	Y
Grevillea robusta	Silky Oak	Proteaceae	M	N	M	N	12-15	6-8	ND	L	Semi	L	Su	T	M	H	A	N
Harpullia pendula	Tulipwood	Sapindaceae	F3	Y	M	N	< 8	6-8	D	M	N	L	Su	T	L	H	A	N
Hibiscus tiliaceus	Beach Hibiscus	Malvaceae	F2	Y	G	YF	< 8	3-6	BD	M	N	S	Su	M	L	H	L	N
Jacaranda mimosifolia	Jacaranda	Mimosaceae	F3	N	M	N	8-12	6-8	MD	L	Y	L	Sp	M	L	L	E	N
Koelreuteria paniculata	Golden Rain	Sapindaceae	F2	Y	M	N	< 8	3-6	D	M	Y	L	NA	M	L	L	E	N
Lagerstroemia indica 'Biloxi'	Crepe Myrtle	Lythraceae	F1	Y	M	N	< 8	3-6	ND	L	Y	M	Su	M	L	L	E	N
Liquidambar formosana	Formosan Sweetgum	Altingiaceae	F4	N	M	N	12-15	6-8	MD	M	N	L	NA	M	L	N	E	N
Liquidambar styraciflua	Liquidambar	Altingiaceae	M	N	M	N	15-20	10-12	D	M	Y	L	NA	T	L	N	E	N
Lagunaria patersonii	Norfolk Island Hibiscus	Myrtaceae	M	N	P	YF	8-12	6-8	ND	M	N	L	Su	M	M	L	A	N
Lepiderma pulchella	Fine Leaved Tuckeroo	Sapindaceae	F1	N	M	N	< 8	3-6	ND	M	N	M	Su	M	L	H	A	Y
Leptospermum petersonii	Lemon Scented Tea Tree	Myrtaceae	F2	Y	M	N	< 8	3-6	MD	L	N	S	Su	M	L	H	A	N
Livistona australis	Cabbage Palm	Arecaceae	F3	N	P	Y	8-12	3-6	Col	L	N	M	Su	M	L	H	L	N
Lophostemon confertus	Brushbox	Myrtaceae	F3	N	M	N	12-15	6-8	MD	D	N	L	Su	T	M	H	A	N
Macadamia integrifolia	Queensland Nut	Proteaceae	M	N	G	N	15-20	12-15	BD	D	N	L	Su	T	L	H	A	N
Magnolia grandiflora 'Exmouth'	Evergreen Magnolia	Magnoliaceae	F4	N	M	Y	12-15	6-8	D	M	N	L	Su	M	L	L	E	N
Magnolia grandiflora 'Little Gem'	Little Gem Magnolia	Magnoliaceae	F2	Y	M	Y	8-12	3-6	MD	M	N	L	Su	M	L	L	E	N
Melaleuca quinquenervia	Swamp Paperbark	Myrtaceae	M	N	P	Y	12-15	6-8	MD	M	N	L	Su	M	M	H	L	N
Melia azederach 'Elite'	Low fruiting White Cedar	Meliaceae	F3	Y	M	N	< 8	3-6	MD	L	Y	L	Su	T	L	H	A	N
Melicope elleryana	Pink Euodia	Rutaceae	F1	Y	G	N	< 8	3-6	ND	M	N	M	Su	M	L	H	L	Y
Nyssa sylvatica	Blackgum	Cornaceae	F3	N	P	N	8-12	3-6	ND	L	Y	L	Sp	T	L	L	E	N
Olea europea	Green Olive	Oleaceae	F3	Y	M	Y	8-12	3-6	D	M	N	L	Su	T	L	L	E	N
Pararchidendron prinosum	Snowwood	Meliaceae	F1	Y	M	N	< 8	3-6	ND	L	N	M	Su	T	L	H	L	Y
Phoenix canariensis	Canary Island Date Palm	Arecaceae	M	N	M	YF	8-12	3-6	MD	L	N	L	NA	M	M	L	E	N
Pistacia chinensis	Chinese Pistachio	Anacardiaceae	F2	Y	G	N	< 8	3-6	BD	M	Y	M	NA	M	L	L	E	N
Platanus orientalis 'Autumn Glory'	Autumn Glory Plane	Platanaceae	F4	N	M	N	12-15	6-8	D	L	Y	L	NA	T	L	L	E	N
Platanus x Hybrida	London Plane	Platanaceae	F4	N	M	N	15-20	10-12	D	M	Y	L	Sp	T	M	L	E	N
Podocarpus elatus	Plum Pine	Podocarpaceae	F4	N	M	Y	8-12	6-8	MD	D	N	L	Su	T	M	H	L	N
Polyscias murrayi	Pencil Cedar	Araliaceae	F3	N	G	Y	8-12	3-6	ND	M	N	M	Au	M	L	H	L	Y
Pittosporum rhombifolium	Diamond-Leaf Laurel	Pittosporaceae	F1	N	M	N	8-12	3-6	ND	M	N	M	Sp	M	L	H	L	N
Pyrus calleryana 'Capital'	Callery selection	Rosaceae	F3	N	M	N	8-12	3-6	ND	M	Y	M	Sp	T	L	L	E	N
Pyrus calleryana 'Chanticleer'	'Chanticleer' Callery Pear	Rosaceae	F4	N	M	N	8-12	3-6	ND	M	Y	M	Sp	T	L	L	E	N
Quercus ilex	Holm Oak	Fagaceae	M	N	M	N	15-20	10-12	BD	H	N	L	NA	T	L	L	E	N
Rapanea variabilis	Muttonwood	Myrsinaceae	F3	Y	P	Y	8-12	3-6	ND	M	N	M	Su	M	L	H	L	Y
Rhodospaera rhodantha	Tulip Satinwood	Anacardiaceae	F1	N	M	N	8-12	6-8	ND	H	N	L	Su	T	L	H	L	Y
Scolopia braunii	Flintwood	Flacourtiaceae	F1	N	M	N	< 8	3-6	ND	D	N	L	NA	T	L	H	L	Y
Stenocarpus sinuatus	Firewheel Tree	Proteaceae	F3	N	G	N	8-12	3-6	ND	L	N	L	Su	T	L	H	A	N
Streblus brunonianus	Whalebone Tree	Moraceae	F1	N	M	N	8-12	3-6	ND	M	N	M	Su	T	L	H	A	Y
Syncarpia glomulifera	Turpentine	Myrtaceae	F4	N	P	N	12-15	6-8	MD	D	N	L	Su	T	L	H	L	N
Syncom glandulosum	Scentless Rosewood	Meliaceae	F3	N	M	N	8-12	3-6	ND	M	N	L	Su	T	L	H	L	N
Syzygium australe	Brush Cherry	Myrtaceae	F3	N	M	N	8-12	6-8	ND	M	N	L	Sp	M	L	H	L	N
Syzygium jambos	Rose Apple	Myrtaceae	F3	N	M	N	8-12	6-8	D	M	N	L	Su	M	L	H	E	N
Syzygium luehmannii	Small-leaved Lilly Pilly	Myrtaceae	F4	N	M	N	8-12	6-8	ND	M	N	L	Su	M	M	H	L	N
Syzygium moorei	Rose Apple	Myrtaceae	F3	N	M	N	8-12	6-8	MD	M	N	L	Su	M	L	H	L	N
Syzygium oleosum	Blue Lilly Pilly	Myrtaceae	F3	N	M	N	8-12	6-8	D	M	N	L	Su	M	L	H	L	N
Syzygium paniculatum	Magenta Cherry	Myrtaceae	F3	N	G	Y	8-12	6-8	D	M	N	L	Su	M	M	H	L	N
Toona ciliata	Red Cedar	Meliaceae	F4	N	M	N	8-12	6-8	MD	L	Y	L	W	T	L	H	L	N
Tristania laurina	Watergum	Myrtaceae	F2	Y	M	N	< 8	3-6	MD	M	N	L	Su	T	L	H	L	N
Tristania laurina 'Luscious'	Luscious Watergum	Myrtaceae	F2	Y	M	N	< 8	3-6	MD	M	N	L	Su	T	L	H	A	N
Taxodium distichum	Swamp Cypress	Cupressaceae	M	N	P	N	15-20	6-8	ND	M	Y	L	NA	T	L	L	E	N
Ulmus parvifolia 'Burnley Select'	Chinese Elm	Ulmaceae	F3	N	M	N	8-12	6-8	MD	L	Y	L	NA	M	L	L	E	N
Waterhousea floribunda	Weeping Lilly Pilly	Myrtaceae	F4	N	M	N	12-15	8-10	MD	M	N	L	Su	T	L	H	L	N
Xanthostemon chrysanthus	Golden Penda	Myrtaceae	F3	N	M	N	8-12	6-8	ND	M	N	M	Su Au	T	L	H	A	Y

4. Space Available Mapping - Sample Street Maps

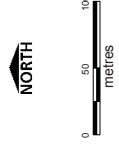




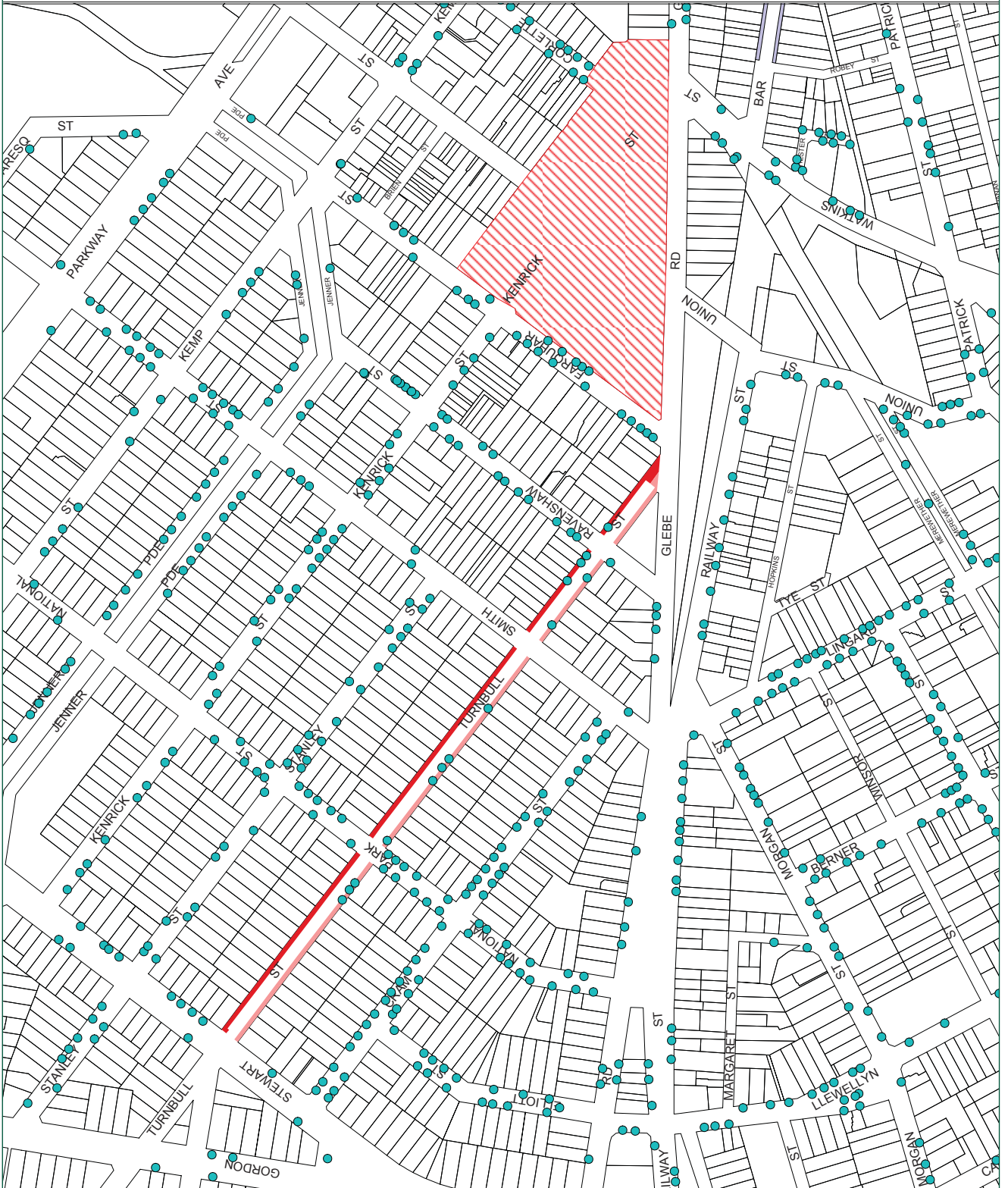
Turnbull Street
Merewether/ The Junction
Example

- Vacant Tree position
- 3.6 m to 4.5 m
- 3.6 m to 4.5 m - PL
- The Junction District Centre

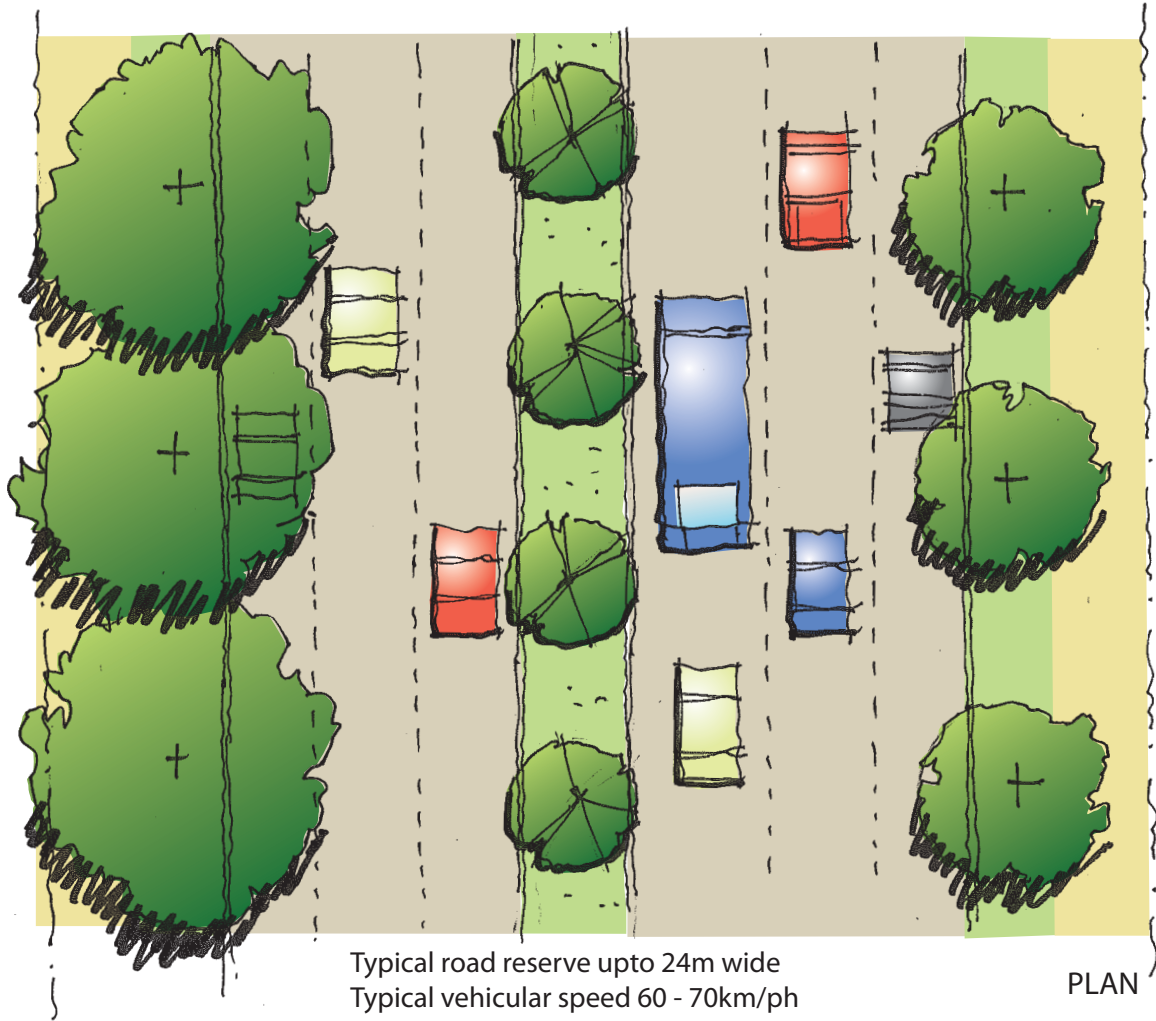
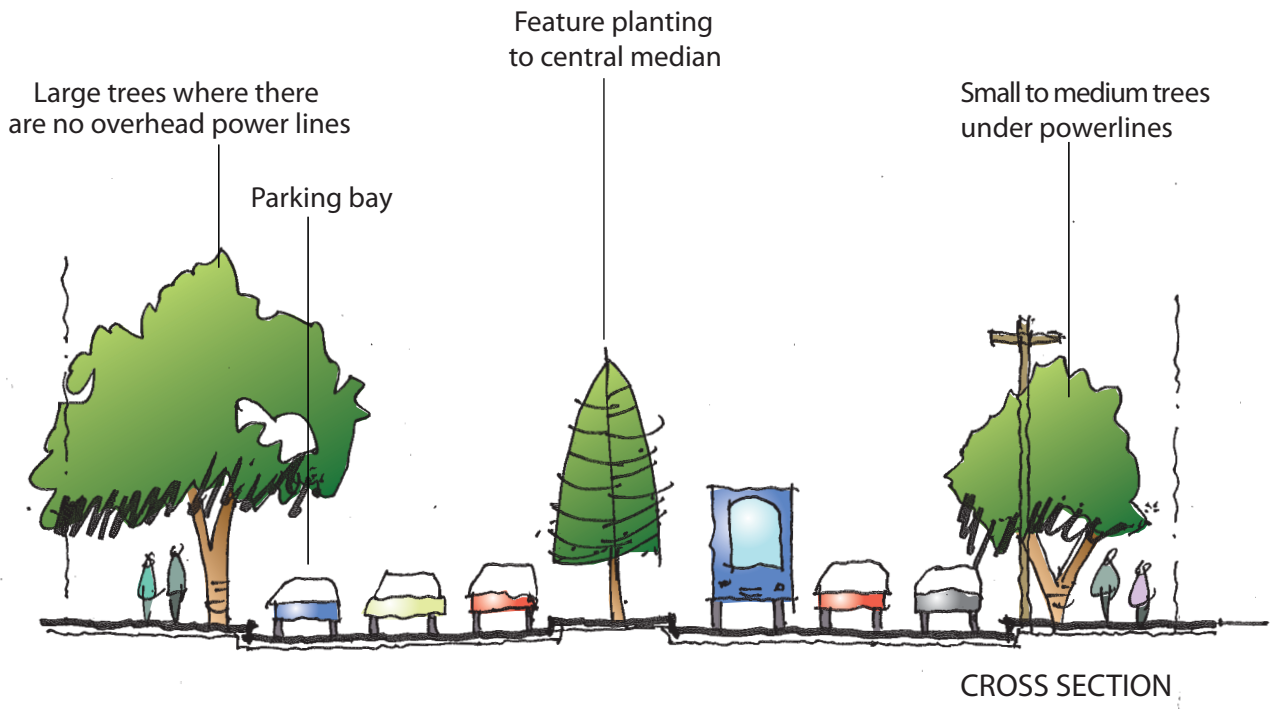
* PL denotes Powerlines present



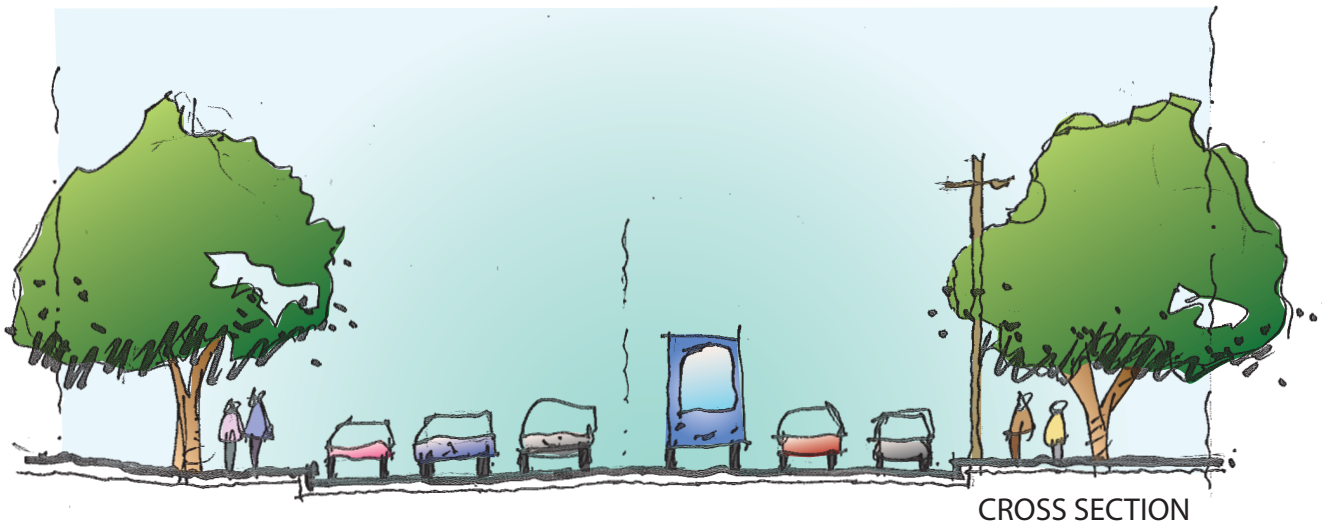
Draft 28 March 2011
© Newcastle City Council



5. Guide Lines for Street Tree Placement – Typical Cross Sections

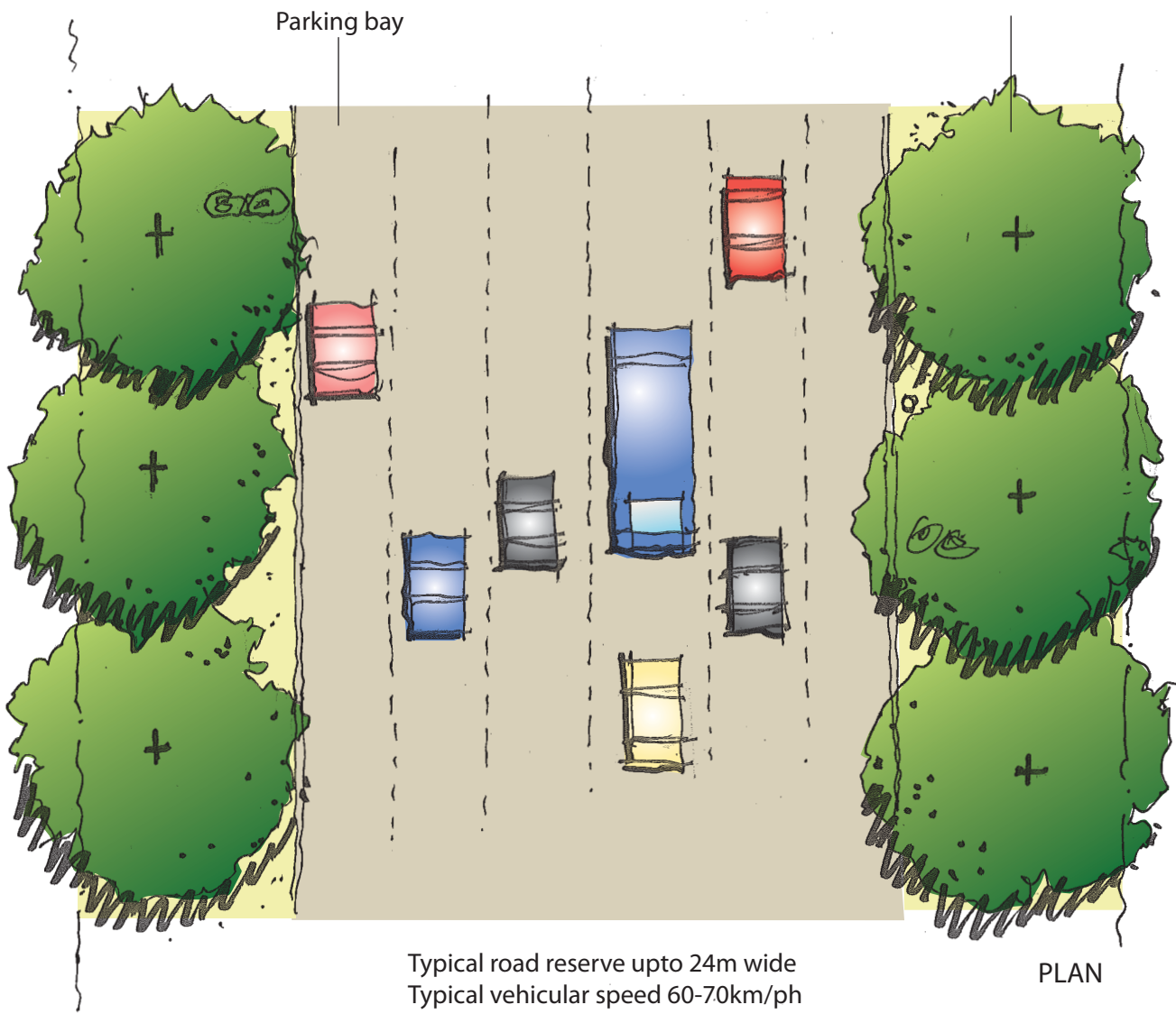


1. Arterial Road:
Planting to Central Median



CROSS SECTION

Where verge space allows set trees back from kerb line

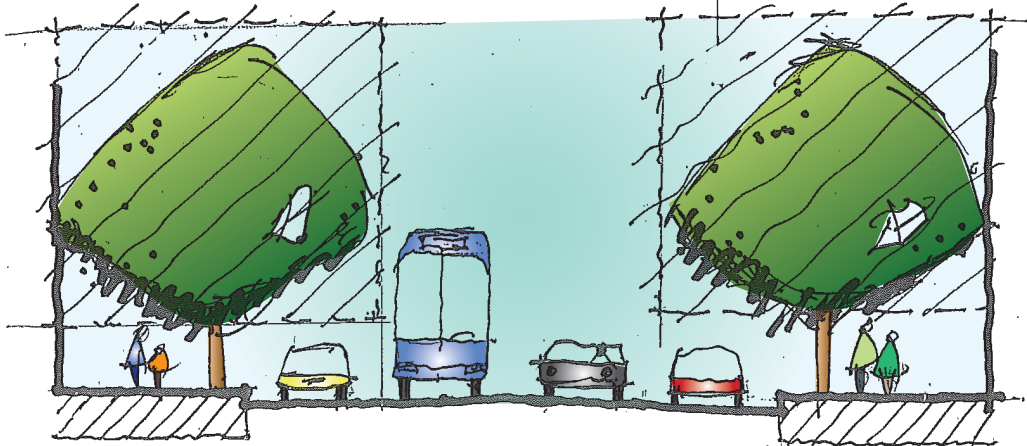


Typical road reserve upto 24m wide
Typical vehicular speed 60-70km/ph

PLAN

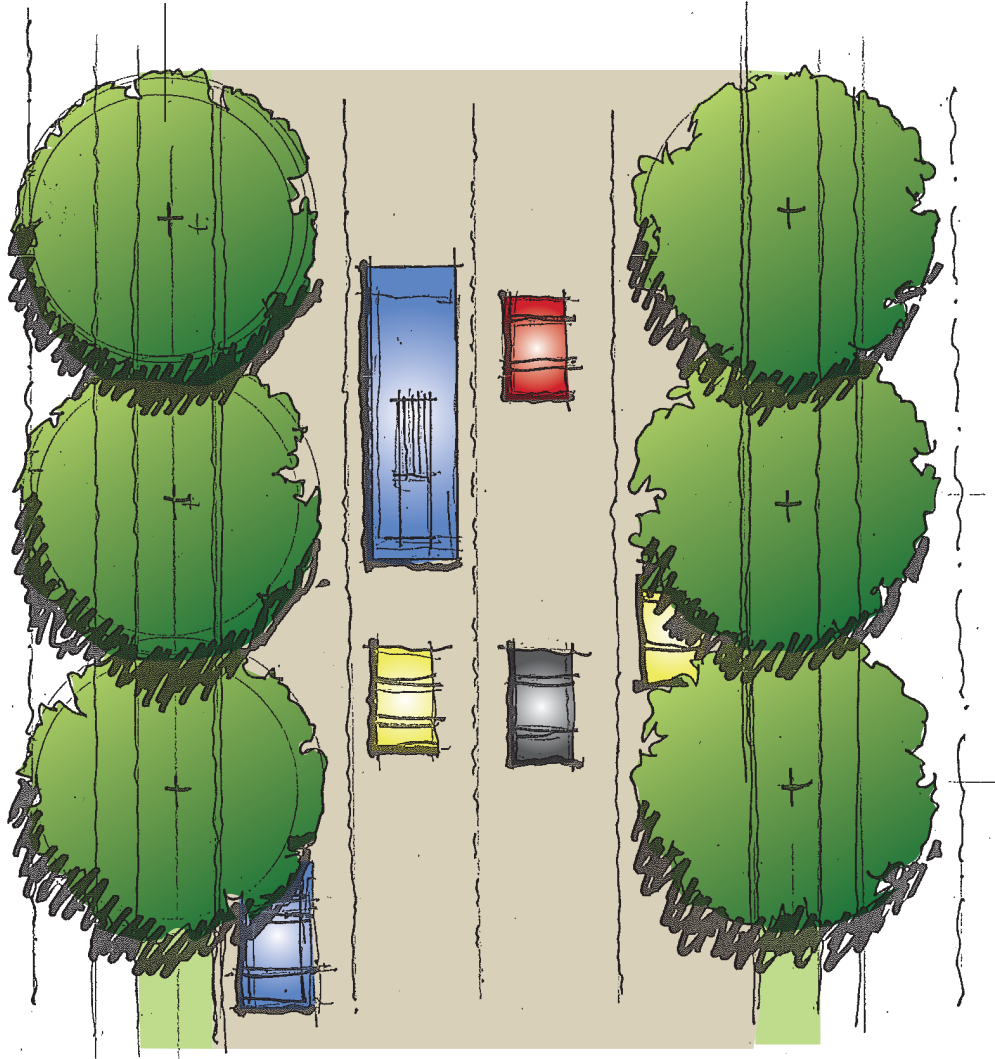
2. Arterial Road:

No overhead services
Maximum canopy space



Medium to large tree selected depending on verge width

CROSS SECTION



Typical road reserve upto 20m
Typical vehicular speed limit 60km/ph

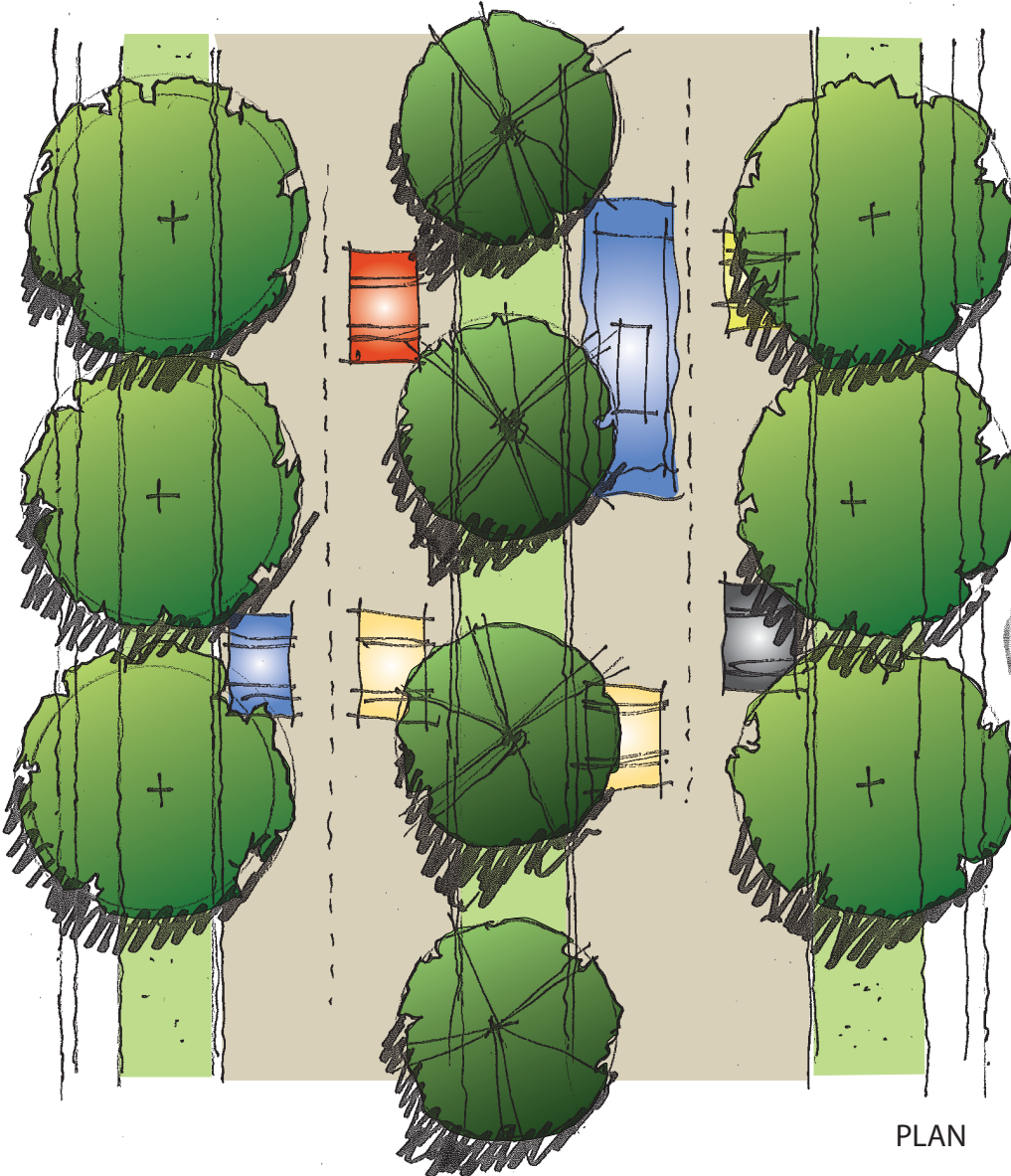
PLAN

3. Sub-arterial Road: No Overhead Services



CROSS SECTION

Typical road reserve upto 20m wide
 Typical vehicular speed limit 60km/ph



PLAN

**4. Sub-arterial Road:
 With Central Median**

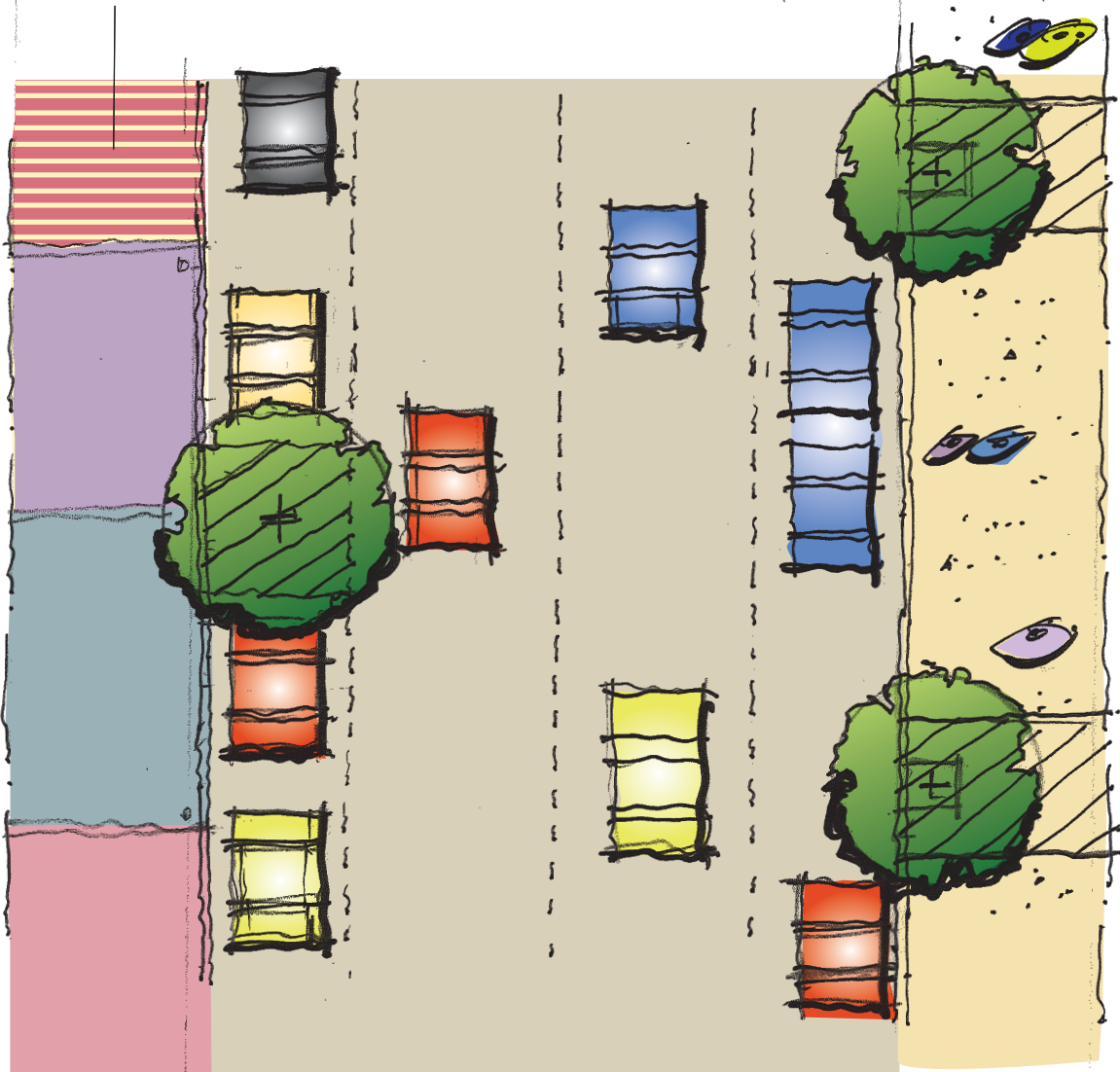
Where dense urban development restricts opportunities for tree planting. Trees can be established in structural soil vaults in parking bays

Option for tree planting in structural soil vaults in surfaced pedestrian zones.



CROSS SECTION

Awnings in commercial areas reduce opportunities to plant trees in the pavement



PLAN

**5 Urban Road:
With Tree Vaults**



CROSS SECTION

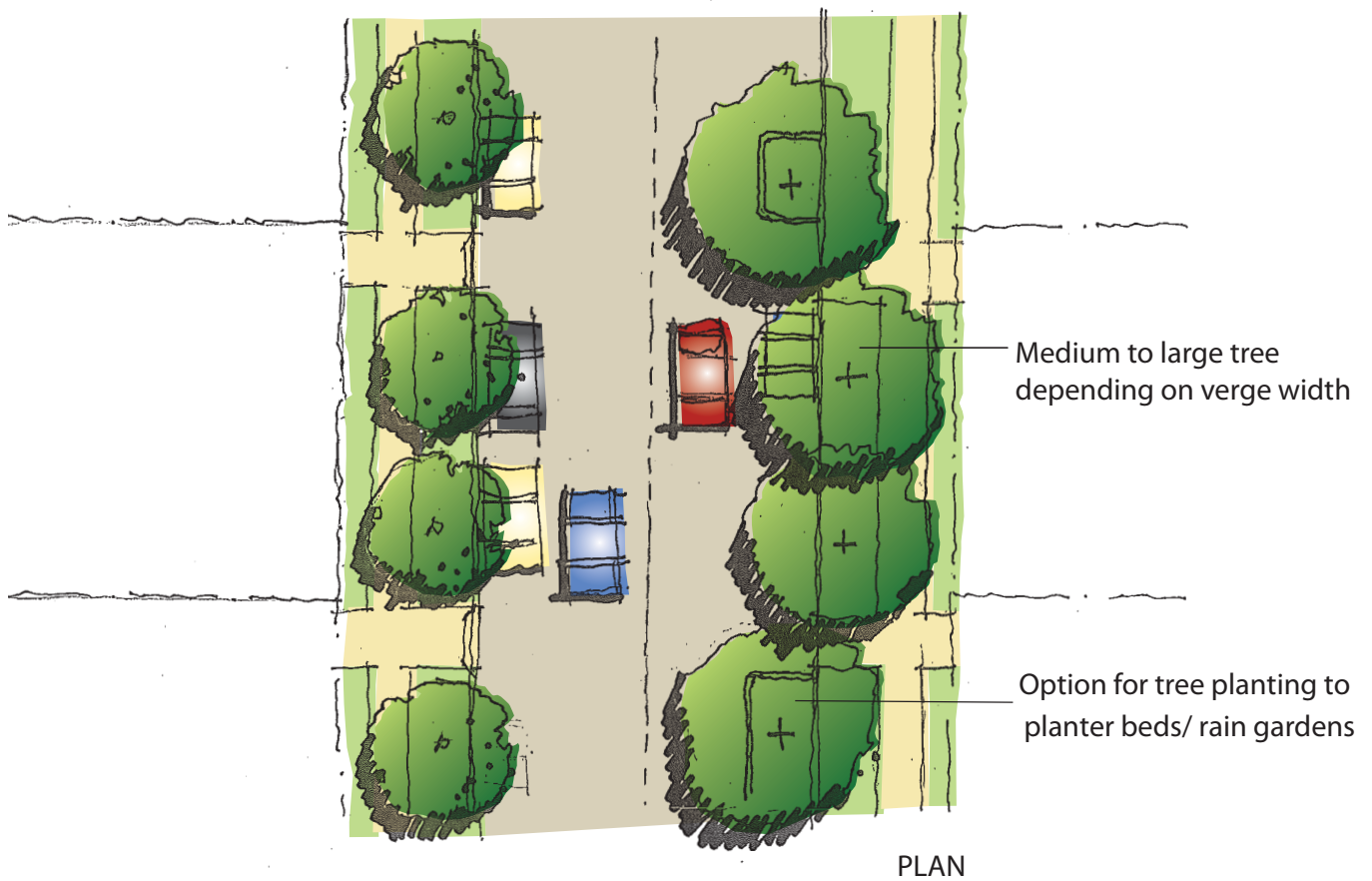
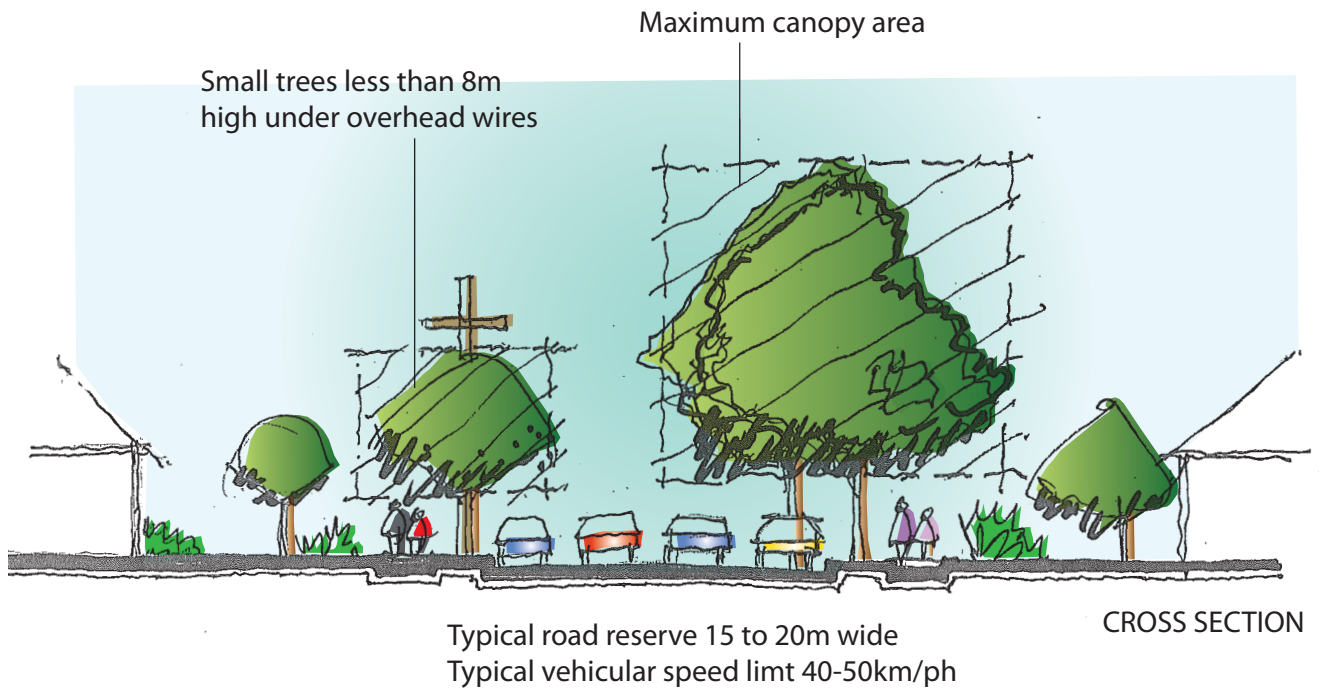
Option for tree planting to planter beds/rain gardens



PLAN

Typical road reserve upto 20m wide
 Typical vehicular speed 50 - 60km/ph

6. Collector Street:
 No overhead services



7. Local Road:
Overhead services to one side

6. Suburb Assessments

Adamstown

Introduction

The precinct of Adamstown covers the suburbs of Adamstown and Adamstown Heights. The area is bound to the north by The Great Northern Railway, to the west by Northcott Drive and Princeton Avenue, to the south by the Pacific Highway and Merewether Golf Course and to the west King and Chatham Streets.

Topography

The area is categorised as Undulating Suburban Precinct (Green Corridors and Landscape Precincts Plan, 2005). Views from the Pacific Highway and Northcott Drive overlook this precinct.

Built Form and Road Hierarchy

The street patterns vary between the two suburbs. The older Adamstown to the north east has a strong grid pattern imposed on a relatively flat undulating landform. Adamstown Heights to the south west has a curvilinear pattern of streets that follow the contours of the steep topography.

Adamstown is predominately residential with light industrial and commercial developments. The building stock is pre-war to post-war. Adamstown Heights was developed post-war with a larger contemporary housing style. The street widths are generally 18-20 metres wide with narrower roadways clustered next to Merewether Golf Course. Adamstown is a long settled suburb that is urban in character, with a consistent built form and street pattern, contrasting with the low density residential bushland character of Adamstown Heights.

The principal roadways within the precinct are Bruncker Road, Northcott Drive and Glebe Road. Glebe Road traverses the north of the precinct in an east-west direction passing through the Adamstown commercial centre where it intersects with Bruncker Road. Bruncker Road runs north south and passes through a diversity of landscapes, from a dense urban environment in the north contrasting with the bushland character in the south.



LOCATION MAP



This view of Bourke Street in Adamstown typifies the character of the suburb with residences consisting of pre and post WWII cottages.

The commercial centre is dominated by one and two storey buildings. Overall street trees are the missing landscape element in Adamstown. Vegetated ridgelines and parklands characterise and contribute to the landscape amenity of Adamstown Heights.

Soil and Geology

The soils range from sandy loams through clay to fine sandy loam. The soil is subject to seasonal water logging, are acidic with low fertility.

Significant Features

Adamstown Park, Raspberry Gully Reserve, Bruncker Road Commercial Area, St Columbia Church.



Bruncker Road is one of the main roads running through the precinct. It passes through a diversity of landscapes, from a dense urban environment in the north contrasting with the bushland character in the south.



This view from Rachael Street illustrates the elevation and bushland setting of Adamstown Heights.



The character of Ashbury Street is typical of Adamstown Heights, exhibiting lower density residential development than Adamstown and a good opportunity for street tree planting.

Bar Beach

Introduction

Bar Beach is located 1.6km southwest of Newcastle's CBD and is bound by Greenslope Street to the north east, Brooks and Darby Streets to the north west, Empire Park to the south west and Memorial Drive and Bar Beach to the south east.

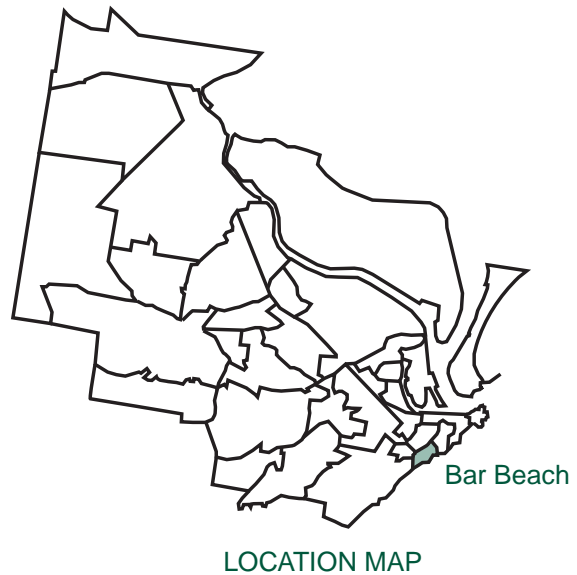
Topography

The topography of the area is characterised by a ridgeline that runs along Greenslopes Street east to Shepherds Hill before descending south down to the relatively flat area of Bar Beach and Empire Park. The massive sandstone rock face of Shepherds Hill Reserve adjoining Bar Beach is a major landscape feature of the area. The area is classified as Coastal (Green Corridors and Landscape Precincts Plan, 2005) and is heavily influenced by salt laden winds.

Built Form and Road Hierarchy

Throughout the precinct the streets are generally wide and exposed to solar access and coastal influences due to their openness and lack of street tree planting. The precinct is characterised by a uniformity of housing, consisting of cottages built on individual allotments during pre and post war periods. Recently there has been the addition of a contemporary housing style located predominantly along the coastal frontage and adjoining streets.

Parkway Avenue is a culturally significant grand boulevard running east west and terminating at Bar Beach. This boulevard is characterised by mature plantings of Norfolk Island Pines in a broad central median. There are presently plantings of Norfolk Island Hibiscus in the median at the Bar Beach end of the boulevard. The Norfolk Island Hibiscus plantings are poor in form and require replacement.



A Norfolk Island Pine avenue along Parkway Avenue provide a significant visual link to the coast from residential areas. These trees will gradually form a buffer for salt-laden winds.

Existing Canopy

Metrosideros was planted throughout the precinct during the 1980s but the trees have failed or died due to insect infestation and require replacement. The streetscapes currently have inconsistent planting characterised by poor performance and loss of trees. There is no canopy coverage at all along the Bar Beach frontage.

Soil and Geology

The soils are dominated by sandy beach dunes that are well drained, alkaline and have low fertility.

Significant Features

Bar Beach, Empire Park, Shepherds Hill Reserve, Parkway Avenue.

Bar Beach and Empire Park dominate the character of this precinct, forming a major recreational resource. Memorial Drive is a popular scenic route that runs along this coastal strip providing significant views of the beach and environs.

Street Tree Planting Objectives

Tree planting recommended for this area will be hardy species that also reflect the coastal character and provide much needed shade and amenity.

Beresfield/Tarro

Introduction

Beresfield Tarro is located in the far north-west of Newcastle on the boundary of Maitland LGA. Bound to the north by the Great Northern Railway line and Woodberry Marsh, to the west by Beresfield Golf Course, to the south by the New England Highway and by rural land to the east.

History

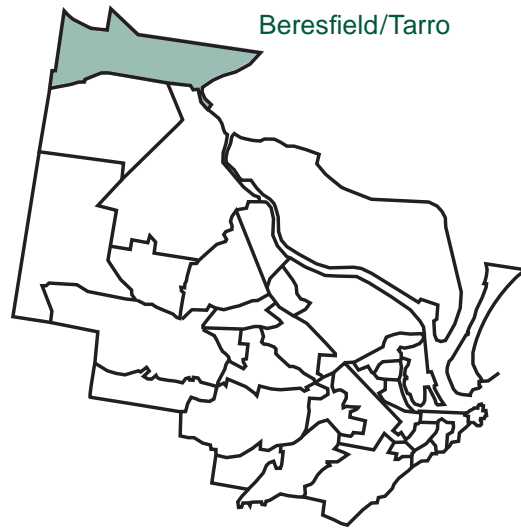
The area was rural until 1920 when the first residential subdivision commenced. The precinct was described as an extension of Newcastle and was modelled on the garden suburb concept popular at that time. Most of the residential development occurred post war and forms part of the Newcastle-Maitland corridor.

Topography

The topography is generally flat with wetlands to the north and east. The land rises slightly to a broad plateau at the junction of Lawson Avenue and Anderson Drive before descending towards the golf course in the west and the commercial centre and railway to the east.

Built Form and Road Hierarchy

Anderson Drive runs east-west and is the main sub arterial road, bisecting the residential areas into two distinct street patterns. The north is a strong grid pattern typified with wide streets and characterised by generous boulevards such as Beresford Ave. To the south the street pattern is random with a less structured layout, characterised by cul-de-sacs. The built form consists of single storey bungalows interspersed with recent two storey cottages.



LOCATION MAP



Irving Street, Beresfield is an example of successful street tree planting. The trees provide shade and amenity while allowing for sight lines and movement of pedestrian and vehicle traffic.

Existing Canopy

The existing tree palette is limited and includes many mature Brushbox plantings that characterise the earlier settled areas and generally smaller inconsistent plantings of Bottlebrush to the recently developed areas. Overall the street tree plantings are poor with the public open space reserves and Golf course providing the only significant canopy coverage.

Soil and Geology

The low lying areas of the precinct are characterised by poorly drained seasonally water logged silty beach clay loams. The remaining areas are generally silty clay loams that form a moderately deep topsoil layer. The soils are highly acidic.

Significant Features

Beresfield Golf Course, WR Lindsay Memorial Park, Newcastle Memorial Park, Primary Schools, Tarro Recreation Area and Wetlands.



Broad verges on Beresford Avenue provide an opportunity for establishment of a tree lined boulevard.



Fletcher Street is an example of successful Brushbox street tree planting that provides appropriate shape and form.



Gateways to precincts provide opportunities for street tree planting as an entry statement.

Birmingham Gardens/ Callaghan

Introduction

The Birmingham Gardens precinct includes the suburbs of Birmingham Gardens and Callaghan (predominantly Newcastle University Callaghan Campus). Newcastle University manages the streetscapes within Callaghan Campus and makes its own planting selections. For this reason a separate map has not been provided for Callaghan in this document.

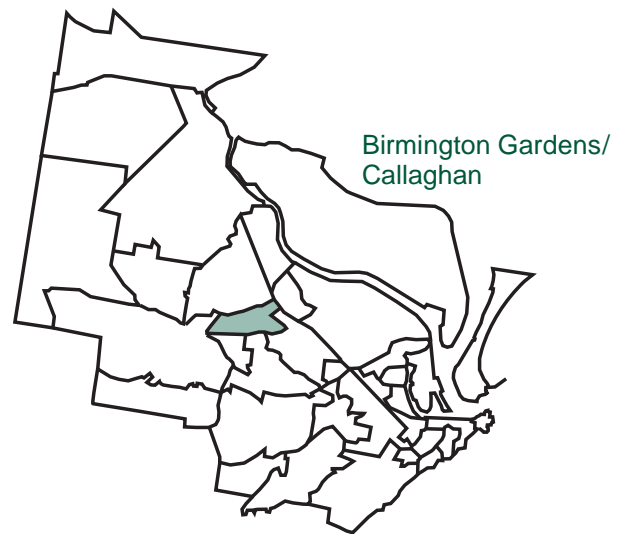
Birmingham Gardens is bound by Sandgate Road to the north, by Tillie Street to the west, by Wilkinson Avenue combined with University Drive to the south and by the Newcastle University Callaghan Campus to the east.

Topography

The topography gradually increases from south to north where Sandgate Road follows the higher ground, providing views towards Shortland Wetland in the west. Confined to a concrete drainage channel Dark Creek passes through the south west corner of the precinct to drain into Shortland Wetland and Hexham Wetland beyond. Here Harold Myers Park occupies flat flood plain land adjacent the creek. Like other open spaces along Dark Creek Harold Myers Park has limited canopy cover.

Built Form and Road Hierarchy

University Drive, Jesmond Bypass and Sandgate Road are the principal transport corridors within the precinct. University Drive is an important east-west connection and its streetscape benefits from the borrowed bushland scenery of Callaghan Campus and North Lambton Park. Jesmond Bypass is a major north-south arterial route connecting to the Pacific Highway to the north and Newcastle Road to the south. It has dual carriageways, in a deep cutting that physically divides Birmingham Gardens to the west from Callaghan to the east.



LOCATION MAP

The two suburbs have contrasting characters. Callaghan Campus has large institutional buildings set in privately managed bushland that enhances the landscape quality of adjoining streets. Birmingham Gardens has low density residential development characterised by a uniform built form, consisting predominantly of inter war and post war cottages on individual allotments. The street pattern is irregular with road reserves varying between 15 and 24 metres in width.

Existing Canopy

The existing street tree population is characterised by a mix of exotics and native species which provide limited landscape amenity. An exception is Wilkinson Avenue which has a unified streetscape lined with mature Brushbox.

Soil and Geology

Soils are generally sandy loam through clay to fine sandy loam. The topsoil ranges from shallow to moderate and are characterised by acidity, moderate drainage and low fertility.

Significant Features

University of Newcastle, Birmingham Lookout.



The wide verges characteristic of Birmingham Gardens provide ample room for street tree planting to provide summer shade and reduce the heat load from the street.

Broadmeadow

Introduction

Broadmeadow Precinct is bound by a large railway depot to the north, by Turton and Melville Roads to the west, by Darling Street and Broadmeadow Racecourse to the south, Blackall Street and Broadmeadow Road to the east.

History

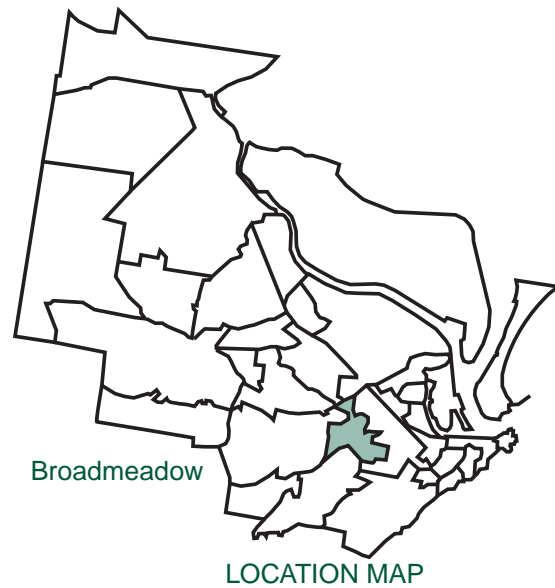
Broadmeadow was developed as an important transport node. Broadmeadow Station and The Great Northern Railway, which bisect the precinct in a north-south direction were constructed in the 1880's. Nineways centred on Chatham Street near the train station developed as a major road/tram interchange where three arterial routes converge.

Topography

The topography is generally flat lending itself to large recreational open space uses such as Broadmeadow Racecourse, Hunter International Sports Centre and Newcastle Showground. Broadmeadow Racecourse has a number of significant mature plantings located along its boundary that contribute to the visual amenity of the surrounding streetscapes.

The Hunter International Sports Centre to the north of the precinct is a major regional complex containing a large grandstand structure that dominates the skyline.

Styx Creek is a concrete lined water course running through the precinct. It has an established mix of Poplars, Figs and Eucalypt trees planted along its banks that contribute to the visual amenity of the streets adjoining the creek. Dumaresq Street has a significant planting of mature Hills Fig trees to a central median, forming a strong boulevard along the northern perimeter of Broadmeadow Racecourse.



Built Form and Road Hierarchy

Broadmeadow is heavily urban in character with a mix of commercial, residential, industrial and service uses.

Nineways is the prime commercial area and areas of light industry are located toward the railway line. The street layout is a grid pattern with roadways running parallel to the railway line, becoming finer grained around Broadmeadow Station. Both the commercial and industrial areas have poor street tree amenity. Due to the absence of tree canopy, urban development dominates the streetscapes.

The main arterial roadways are Tudor Street becoming Lambton Road which runs east-west, Chatham Street which runs north-south and Bruncker Road running south west to connect with the Pacific Highway.

Soil and Geology

Soils are generally well drained sandy loam characterised by low organic matter and low fertility. The soils are highly modified due to extensive urbanisation of the precinct.

Significant Features

Broadmeadow Railway Station, Nine Ways Commercial Centre, Styx Creek Drainage Corridor, Hunter International Sports Centre, Broadmeadow Racecourse.



This view of Australia Street shows a treeless streetscape with small scale industry typical of Broadmeadow.



Workers cottages typical of Broadmeadow look out onto a wide treeless street.

Carrington

Introduction

Carrington was originally an estuarine island that was known by the aboriginals as the place of the mud crab “Wuna-r-tee”. Once known as ‘Bullocks Flat’, the former tidal mud flat became land over a period of time from the early 1800’s with the depositing of ballast and through reclamation work. This saw the emergence of an island which eventually became a peninsula attached to Mayfield at its northern end, but separated from the rest of Newcastle by the Hunter River to the east and Throsby Creek to the west.

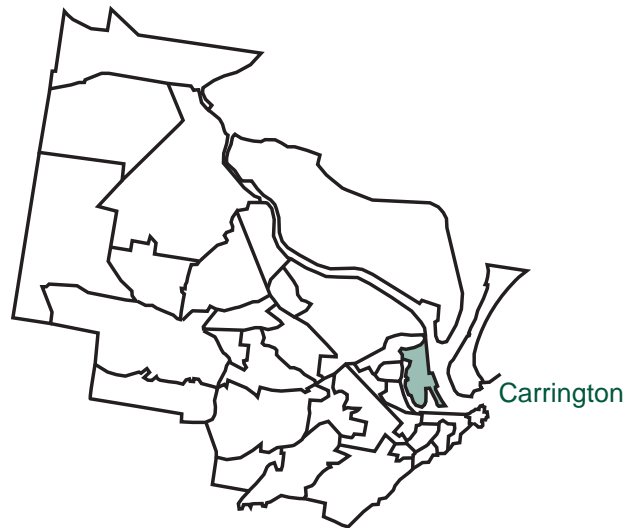
Topography

Carrington is classified as an Estuarine and Wetland precinct (Green Corridors and Landscape Precincts Plan, 2005) and is topographically flat. It benefits from the protection of the Stockton Peninsula which filters the salt laden coastal winds.

Built Form and Road Hierarchy

Carrington is significant for its industrial heritage which is still prominent today. Residential development arose in the 1870’s to service the thriving coal loading and engineering industries. The coexistence of residential and industrial uses still persists today with large scale port facilities dominating the landscape along Hunter River.

The street layout is a grid pattern that is askew around Howden Street. Overall the carriageway widths throughout the suburb vary dramatically from generous wide boulevards to narrow laneways. The housing style is a mix of small working cottages and single and two storey terraces.



LOCATION MAP



This very narrow residential laneway with views of industry in the background is characteristic of Carrington. Street planting is often very limited.

The main road access and gateway to the precinct is via Cowper Street Bridge which crosses Throsby Creek and provides a vehicular connection to the CBD. The open space reserves Pat Jordan Oval and Connolly Park adjacent Cowper Street have a mix of mature Fig trees and recent tree planting which provide a sense of entry to the precinct.

The commercial core along Young Street is currently undergoing renewal.

Existing Canopy

Young Street has an avenue of Hills Figs planted in the 1990's that require assessment due to management issues. The historic avenues of Canary Island Date Palms in Gipps and Hargraves streets are culturally significant and reflect the Garden Suburb Movement of the 1920's.

Soil and Geology

Soils have been highly modified due to reclamation works and deposition of ballast clay with a variance in fertility and drainage capacity. Poorly drained clay soils are located along the river fringes.

Significant Features

Young Street Commercial Centre, Hotels, Industrial Port Facilities, Community Centre (Former Council Chambers), Public School and Gipps and Hargrave Streets.

Street Tree Planting Objectives

Tree planting recently undertaken on Cowper Street is recommended to be continued.



Canary Island Date Palm planting to the central median in Gipps Street, a culturally significant boulevard.



At the southern end of Young Street is Carrington's commercial centre, characterised by art works and fig trees installed in the 1990's.

Cooks Hill

Introduction

This precinct is listed as the Cooks Hill Conservation Area in NLEP, 2003. The area is bound by Union Street to the west, Brooks Street to the east, Gibson Street and Civic Park to the north and Parkway Avenue to the south. The precinct is small and enclosed, and adjoins the Cultural and Civic precinct of Newcastle.

History

The land was originally granted to the Australian Agricultural Company on the 26th June 1915 and released in the second half of the 19th century for subdivision. Small allotments were purchased on a street grid that aligned with the company's railway line. This resulted in a pattern of small allotments that were developed with modest cottages by the resident workforce. The first commercial development occurred along Darby Street. The location of AA Company's mines and railways influenced the nature of development and the layout of roads and parklands.

Topography

The landform is generally flat rising at Laman Street and is categorised as part of the Coastal Landscape Precinct (Green Corridors and Landscape Precincts Plan, 2005).

Built Form and Road Hierarchy

The northern end of the precinct features densely packed houses on small allotments, whereas the southern end contains a greater number of large detached houses. Especially distinctive are Victorian Regency terrace houses that exhibit cantilevered balconies and weatherboard exteriors. Overall the low scale built form and north easterly aspect allows good solar access.



LOCATION MAP

Darby Street commercial centre is located along Darby Street and consists of a mix of retail and restaurants resulting in a vibrant streetscape. The scale of the built form on Darby Street is a mix of one and two storey buildings, complimented by street tree plantings of Brushbox. Other significant features of the precinct are the route of the former Merewether Coal Company railway that ran along Glover's Lane through Civic Park to Burwood Street.

Existing Canopy

Large figs are a dominant feature in Cooks Hill. Significant avenues of mature Hills Figs provide dense canopy coverage such as Council and Bull Streets. Both Laman Street and Civic Park are distinguished by plantings of Hills Figs that have matured into significant landscape features. Across Cooks Hill the Hills Fig trees are reaching the end of their urban life span and require management.

Soil and Geology

Soils are predominately sandy soil loams interfaced with sandstone along the coastal edge. Soils are generally deep well drained sands overlying estuarine clay. The soils are highly disturbed due to urban development.

Significant Features

St Andrews Presbyterian Church, Cooks Hill Primary School, Darby Street Commercial Area, Laman Street, Civic Park, Railway Street Residential Precinct.



Darby Street is a busy commercial centre planted with Brush Box street trees. Power lines have been bundled.

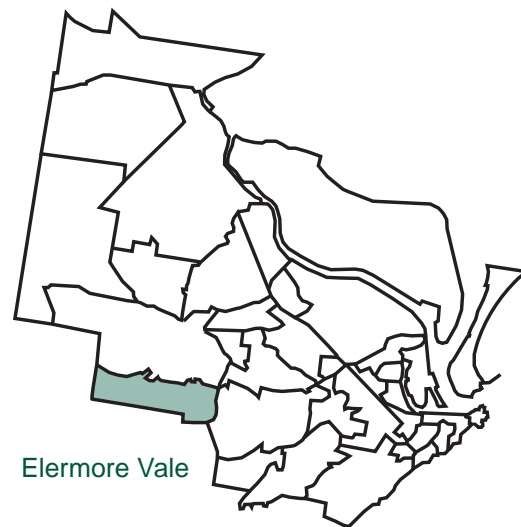


Mature fig trees in Centennial Park contribute to the surrounding streetscape.

Elermore Vale

Introduction

This precinct covers the suburbs of Elermore Vale and the northern part of Rankin Park. The precinct is bound to the south by Aries Way, Gemini Avenue, Justin Parade and Coniston Close toward the Lake Macquarie Local Government boundary. The precinct is bound to the east by Cambridge Drive and Dangerfield Drive which adjoin the bushland reserve of George McGregor Park. The precinct is bound to the north by Croudace Road and Dangerfield Drive and to the west by Lake Road and Gretley Colliery beyond.



LOCATION MAP

Topography

The topography is classified as part of the Ridgeland Landscape Precinct (Green Corridors and Landscape Precincts Plan, 2005). The ridgeline and sloping remnant bushland of George McGregor Park and Dangerfield Reserve to the east visually enclose the precinct and contribute significantly to its landscape character. The natural landscape morphology throughout the precinct consists of ridges, steep gullies and creek lines. Ironbark Creek threads through a network of bushland reserves in an east-west direction.

Built Form and Road Hierarchy

The distinctive landscape morphology determines the pattern of development, resulting in a precinct that is a mosaic of residential development interspersed with open space and bushland reserves. The resulting street pattern is irregular and curvilinear.

The main transport corridors are Cardiff Road and Croudace Road. Overall the road reserves are 20 metres wide with 4 metre wide verges. In recent subdivisions adjoining Grandview Road the road reserves are reduced to 17 metres in width, however the verge widths of 3.5 metres still provide good opportunities for street tree planting. The commercial centre is located along Croudace Road. It is defined by native plantings predominantly of Eucalypt species which require careful management in an urban environment.



The road pattern in Elermore Vale is curvilinear in response to the undulating topography.

Existing Canopy

Generally street tree planting lacks scale and is inconsistent. For streetscapes that adjoin remnant bushlands it is recommended that endemic species are planted to reinforce the character of these areas.

Soil and Geology

This precinct possesses two types of soil. The Elermore Vale area possesses shallow clay loam topsoils that are acidic and prone to seasonal water logging. In the Rankin Park area the soils are strongly acidic, have a high clay content and poor drainage.

Significant Features

George McGregor Reserve, Ironbark Creek.



This view along Aquarius Avenue showing recent residential development with wide verges characteristic of the precinct.

Georgetown

Introduction

Georgetown is a small triangular shaped precinct located six kilometres north west of Newcastle's CBD. The precinct is bounded by Waratah Park and the Great Northern Railway to the north east, Turton Road to the west, and by a large rail depot and associated rail connection to the south east.

History

The area was first developed as a residential area for workers to service local industries such as Goninans Copper Smelting Works which opened in 1870 and is still running today.

Topography

The topography is generally flat and is classified as part of the Flat Urban Landscape Precinct. (Green Corridors and Landscape Precinct Plan, 2005).

Built Form and Road Hierarchy

The street layout is a grid pattern that changes orientation at Georgetown Road. To the south of Georgetown Road the streets run in a north-south direction, to the north of Georgetown Road the streets run in an east-west orientation. The streets are generally 18-20 metres in width. A few streets are narrower with narrow grass verges, for example Asher Street, which is 12 metres wide. The building stock is a mix of working cottages, bungalows and newer contemporary houses as infill development. The small commercial centre located along Georgetown Road has a low scale mix of one and two storey buildings. Street tree planting is poor in the commercial area because planting opportunities are constrained by awnings and overhead services.



LOCATION MAP



Paperbarks contribute to the streetscape along Parkview Road.

Existing Canopy

Brushbox plantings have performed well in several locations such as Chatham Street, Wentworth Ave and Bowker Street. Waratah Park is planted with a mix of native trees. These trees combine with several mature Hills Figs located in the road reserve adjoining Waratah Technical Campus, to significantly contribute to landscape quality and public amenity.

Street Tree Planting Objectives

There is potential for extensive street tree planting throughout the area using medium to large trees to increase the diversity in tree species, increase canopy coverage and subsequently enhance the character of the precinct.

Significant Features

Commercial Centre, Waratah Park.

Soil and Geology

Soils are typically well drained sandy loams. The soils are characterised by low organic matter and are slightly acidic.

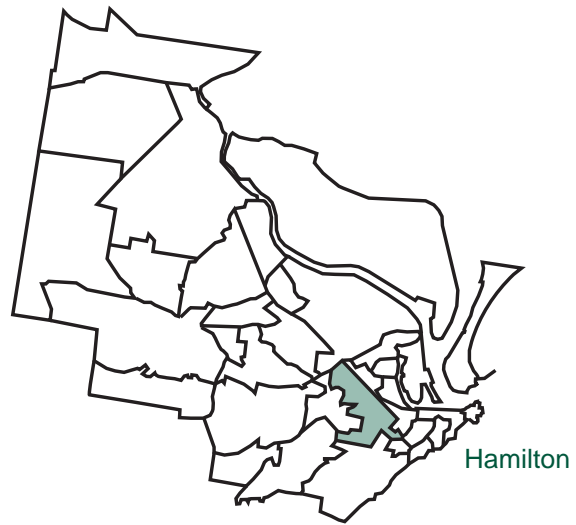


An avenue of mature Brushbox provides excellent canopy cover on Chatham Street.

Hamilton

Introduction

Hamilton Precinct is a large precinct made up of four distinct suburbs consisting of Hamilton North, Hamilton South, Hamilton East and Hamilton. The precinct extends from National Park and Stewart Avenue (Pacific Highway) in the east as far as Chatham Street, Broadmeadow Road and Newcastle Showground in the west and north west. Parry, Donald and Hudson Streets define the northern boundary and Glebe Road defines the southern boundary.



LOCATION MAP

The principal east west arterial routes through the precinct follow Tudor Street, Belford Street, Griffiths Road, Donald and Parry Streets. The principal arterial route north-south is the Pacific Highway which follows Stewart Avenue.

The street trees along these major transport corridors are a mix of Figs, Brushbox and Norfolk Island Pine trees which provide amenity, scale and canopy coverage. Many of the mature figs have been heavily pruned due to the overhead services.

Hamilton includes residential development from the 1800's and the commercial core centred on Beaumont Street, whilst Hamilton North, South and East are predominantly residential garden suburbs dating from the 1900's.

History

The precinct's rich industrial heritage dates from the discovery of coal in Cameron Hill. The Great Northern Railway line and Hamilton Station opened in 1887. The railway line was instrumental in the growth of the commercial core on Beaumont Street and the precinct as a whole.



James Street Plaza off Beaumont Street is part of Hamilton's commercial centre

Topography

The precinct is predominantly flat, and is categorised as falling within the Coastal Landscape Precinct (Green Corridors and Landscape Precincts Plan, 2005). The area is vulnerable to flooding. Broadmeadow Race Course, National Park and Newcastle Showground utilise large expanses of flat ground for recreational use. The area rises slightly near Denison Street, formerly known as Cameron Hill.

Soil and Geology

Soils are typically well drained coarse loamy sand of 1-3m depth overlying clay. The soil is slightly acidic with low organic matter and low fertility.

Significant Features

Beaumont Street Commercial Area, Parkway Avenue, Gregson Park, Newcastle Public School and Hamilton South Heritage Conservation Area.

Beaumont Street Commercial Area

Beaumont Street is listed as a Heritage Conservation Area in Newcastle LEP 2003. It has a commercial corridor that extends from Denison Street at its southern end to Hudson Street at its northern end. Buildings in this corridor are generally two storey in height. Beaumont Street between Hamilton Railway Station and Maitland Road, is lined with Callery Pears that are performing well and provide seasonal change to the commercial district.

Gregson Park is major open space west of Beaumont Street. Its mature trees form an important visual gateway to Hamilton from the west along Tudor Street. Learmonth Park is located to the east of Beaumont Street and the Fig Trees along its boundary contribute to the surrounding streetscapes.



Mature Norfolk Island Pines planted within a broad central median are a dominant landscape feature of Parkway Avenue.



Brushbox plantings along Gordon Avenue offer amenity and scale that is appropriate for the width of this main road.

Hamilton South

Hamilton South is predominantly residential, characterised by a uniformity of building styles consisting of Federation and Californian bungalows, inter war and post war cottages constructed in the 1900's. Generally the streets and verges are wide consisting of a grid pattern on a larger scale with more regular housing allotments than those found in the older core settlement of Hamilton.

Hamilton South Garden Suburb Conservation Area is Heritage Listed in the Newcastle LEP 2003. Roads and housing allotments are laid out in a strong rectangular pattern reflecting the 'Garden Movement' design philosophy.

The conservation area is characterised by major streets including Stewart Ave (Pacific Highway), Gordon Ave and Parkway Avenue. These major traffic routes are gateways to Newcastle CBD. Lining these grand avenues and boulevards are significant trees that are a signature element of the conservation area, providing canopy cover and framing important vistas. Stewart and Gordon Avenues retain their original road verge plantings but have lost their central medians. Parkway Avenue retains its wide central median which is planted with mature Norfolk Island Pines. Parkway Avenue is a prominent boulevard connecting the eastern extents of the precinct, terminating at Bar Beach.

Street Tree Planting Objectives

Many of the existing trees within this precinct are already mature. A key challenge for the Urban Forest will be the successful management of these trees. Species selected for planting in this precinct reflect coastal influences.



Mature figs in Gregson Park contribute to the character of adjoining streets and create a gateway to Hamilton commercial centre.



Hexham

Introduction

Hexham is located 16 km to the northwest of Newcastle CBD and forms part of the northern gateway to the city. The area is bound by natural systems, including the Hunter River, Hexham Swamp and Ironbark Creek. Historically the township developed in the mid 1800's in response to coal shipments from the banks of the Hunter River.

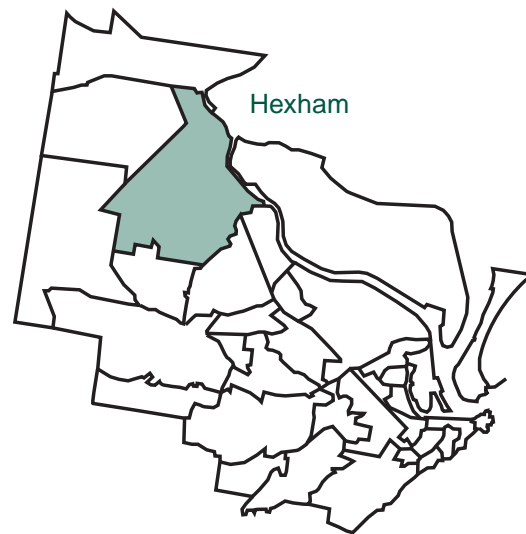
Topography

Hexham is part of the Estuarine and Landscape Precinct (Green Corridors and Landscape Precincts Plans, 2005). The precinct is characterised by flat topography that is periodically inundated. The precinct is partly reclaimed land in a linear strip between the Hunter River to the east and the Hexham Swamp to the west.

Built Form and Road Hierarchy

Hexham Precinct is an important transport corridor with Hexham Bridge functioning as both a landmark and a gateway to Newcastle. The Great Northern Railway line runs north-south defining the southern side of the precinct. The Pacific Highway (Maitland Road) also running north-south is a major arterial road with dual carriageways that connects with the New England Highway running inland towards Maitland's LGA. At Hexham Bridge it crosses the Hunter River to connect to Port Stephens LGA in the north.

In the southern part of the precinct the Pacific Highway runs parallel with the south arm of the Hunter River which is screened by mangroves. North of Hexham Park a kilometre long avenue of mature Poplars and Swamp She Oaks defines the western side of the highway.



LOCATION MAP



A remembrance avenue of Poplars and Swamp She Oaks along the Pacific Highway.

This avenue is part of a planting undertaken in the 1960's to commemorate Newcastle's pioneers. Opportunities exist for additional tree planting on the western side and central median of the highway to reinforce the entry to Newcastle.

The industrial area has wide road reserves of minimum 20 metres, some with unformed edges. The residential area is a small pocket of only several streets. The built form is characterised by small single storey cottages on individual allotments built predominantly of fibro and timber.

Existing Canopy

Overall the street tree amenity is poor with very limited tree canopy. Established tree planting of Brushbox in Sparke Street reduces the visual impact of the industrial area. Remnant pockets of Swamp She Oak and Paperbark provide some landscape amenity.

Soil and Geology

The soils in the precinct are characterised by silty clay loam topsoil. The soils are periodically water logged, moderately acid, and poorly drained with potential acid soils with low fertility.

Significant Features

Hexham Swamp, Hunter River, Foreshore Reserve.

Islington

Introduction

The precinct of Islington is located north west of the Newcastle CBD. The area is bound by railway line and Hunter Institute Tafe to the north, by the Great Northern Railway line to the west and by Albert and Ivy Streets to the south. To the east the boundary follows Throsby Creek, The Avenue and the line of Milford Street.

Topography

The area is predominately flat and is categorised as part of the Flat Urban Precinct (Green Corridors and Landscape Precinct Plan, 2005).

Built Form and Road Hierarchy

Maitland Road, which forms part of the Pacific Highway, runs in a north south direction bisecting Islington. This arterial road is an important connection to Newcastle CBD and carries heavy traffic.

Islington Park is a major recreational open space fronting onto Throsby and Styx Creeks. It provides shared pathway connections with neighbouring precincts and valuable canopy cover.

With the exception of Maitland Road and Albert Street the majority of streets are on a fine grained east west grid with narrow carriageways and footpaths typical. Islington contains residential and light industrial development typical of Newcastle's inner west city precincts. The building form includes a mix of small cottages and terraces on small lots and light industrial development. Light industrial land use is concentrated to the west of the precinct toward the railway line. The precinct has undergone some urban renewal with former wool stores in Milford Street converted to mixed commercial and residential use.



LOCATION MAP



The historic avenue of Figs along Islington Park's boundary with Maitland Road forms an attractive gateway.

Existing Canopy

Where Islington Park shares a boundary with Maitland Road, avenues of Moreton Bay Figs provide substantial canopy cover and a landmark gateway to the precinct and city centre. These culturally significant figs were planted early last century and require management options.

Overall street tree planting is constrained by a combination of narrow carriageways and overhead services leading to poor canopy coverage. The planting of Taxodiums as part of the Woolstore redevelopment will contribute to an improved public domain.

Soil and Geology

Soils are typically well drained comprising of deep coarse sandy loam soils with low fertility and generally alkaline. Some areas of soils are highly modified due to urbanisation and industrial activity.

Significant Features

Throsby Creek, Islington Park, Hunter Institute TAFE, Fig Trees in Islington Park.



Chin Chen Street benefits from a row of Paperbarks planted inside the T.A.F.E boundary.

Jesmond

Introduction

Jesmond precinct is bound by Mordue Parade to the west, Cameron Street and University Drive to the north, Henry Street to the east and Jesmond Park and Newcastle Road to the south.

Jesmond is a small predominantly residential precinct that adjoins Newcastle University's Callahan College. The suburb provides a commercial centre as well as residential area for students of the University and also aged housing facilities.

History

Jesmond was originally known as Dark Creek. The area developed from the landowners steam saw mills and employment in local orchards, quarries, mines and soap works.

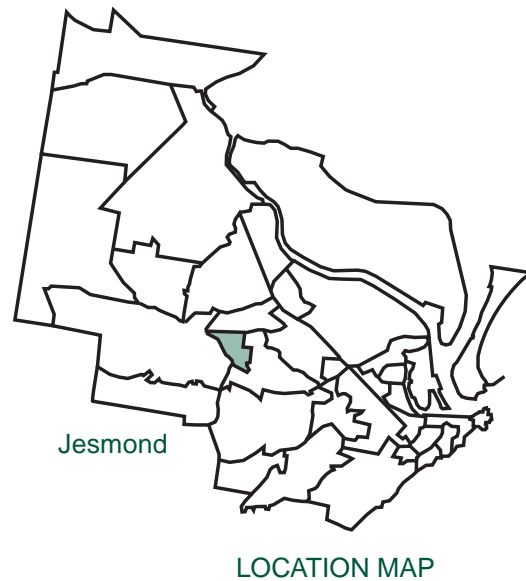
Topography

The topography of the area consists of gently undulating slopes grading from the south towards the north. The area is classified as part of the Undulating Suburban Landscape Precinct (Green Corridors and Landscape Precincts Plan, 2005).

Built Form and Road Hierarchy

The precinct is dominated by dual carriageway arterial roads. The main road corridor east-west is Newcastle Road, a major gateway connecting the freeway and western districts to Newcastle's CBD. The main road corridor north-south is the Jesmond Bypass which connects to the Pacific Highway in the north. Where the Jesmond Bypass ends at Newcastle Road there is a large roundabout intersection.

The precinct consists of low density single storey brick and fibro cottages on individual allotments. The street layout is a grid pattern that generally runs east-west with narrow streets. Stockland Jesmond, a large commercial shopping mall is located between Mordue Parade and Blue Gum Road. The substantial built form of the centre visually dominates the surrounding landscape.



Jesmond Park located on Newcastle Road is a prominent open space that contributes to the amenity of the area. It provides diverse recreational opportunities within a bushland setting. Heaton Park and Maclure Reserve are flat and open with limited canopy cover.

Existing Canopy

Brushbox has been planted extensively throughout this area with success in Mordue Parade and Janet Street. Overall amenity is poor with numerous streets devoid of street trees or possessing specimens that are senescent or poor in form.

Soil and Geology

The precinct soil type ranges from sandy loam through clay to fine sandy loam. Generally acidic with low fertility and subject to seasonal water logging.

Significant Features

Jesmond Park, Commercial Precinct, Blue Gum Road.

Kooragang

Introduction

Kooragang is a large island in the Hunter River located north-west of Newcastle CBD. At Kooragang Island the Hunter River splits into northern and southern arms creating deep water docking opportunities that make the island a prime location for industry and shipping.

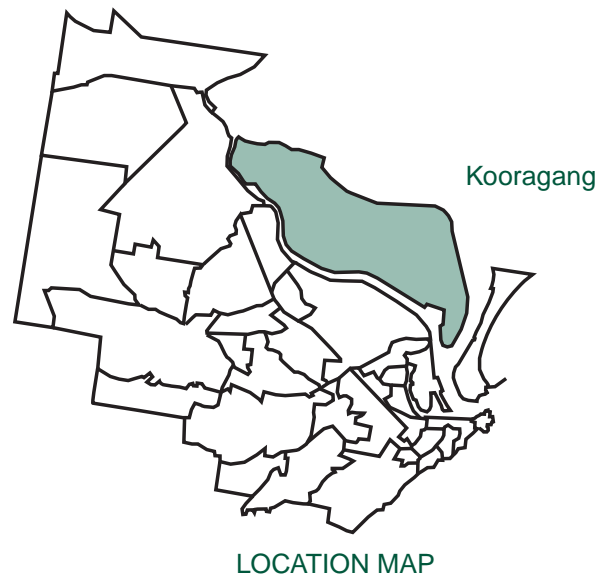
Kooragang is primarily a deep water port used for coal loading. The precinct is unique as it is a significant industrial zone. The large scale and distinctive forms of industrial infrastructure such as grain silos, coal loading equipment and wind farming contribute to the character of this precinct.

Kooragang Nature Reserve is an important conservation area located to the north of the precinct. The reserve is characterised by mangroves that fringe the Hunter River and remnant woodland vegetation that is being rehabilitated, forming a strong contrast with the industrial area. The reserve was originally a number of islands separated by channels that were gradually infilled for agricultural use.

With the exception of Kooragang Nature Reserve, Walsh Point Reserve is the only public open space within the precinct. It is located at the far southern point of Kooragang Island and provides unique views to Newcastle CBD.

Topography

The precinct is part of the Estuarine and Wetland Landscape Precinct (Green Corridors and Landscape Precincts Plan, 2005), it is flat and subject to periodic inundation.



Greenleaf Road is extremely wide to cater for industrial traffic. Mature figs balance the wide roadway and industrial infrastructure.

Built Form and Road Hierarchy

Kooragang Island is connected by bridges to neighbouring precincts. Stockton Bridge is an elegant high arching structure providing vehicular connection to Stockton and Port Stephens. Tourle Street Bridge provides a vehicular connection to Mayfield. This new low level bridge was completed in 2009 replacing an old and deteriorating bridge at the same location. In addition to bridges carrying road traffic a rail connection crosses the river north of Tourle Street Bridge.

Cormorant Road is the principal road link across the island. It runs in an east-west direction to connect Stockton Bridge on the eastern side of the island with Tourle Street Bridge on the western side. The approaches to Tourle Street Bridge are characterised by pockets of Broadleaf Paperbark and Swamp She Oak in a wetland environment. The remainder of the road is visually dominated by industrial infrastructure with minimal street tree planting.

Existing Canopy

Street tree plantings are sparse with some streets completely devoid of trees. The exception is Greenleaf Road where mature Fig trees successfully reduce the visual impact of the industrial development and contribute to the visual amenity of the streetscape.

Soil and Geology

The soil types in this precinct are divided into two areas. The riparian areas are characterised by highly disturbed soils which contain fill material. The remainder are poorly drained loam with peat that is saline with potential acid sulphate soils.

Significant Features

Coal Loaders, Kooragang Nature Reserve, Hunter River, Stockton Bridge, Tourle Street Bridge, Wind Mill.



Boardwalk through mangrove in Kooragang Nature Reserve.

Kotara

Introduction

Kotara is bound by Blackbutt Reserve to the north, Marshall Road to the west, Boundary Street, Inglis Street, and Myall Road to the south and by Northcott Drive and the parklands of Nesbitt Park and Kullaiba Reserve to the east. This precinct adjoins Blackbutt Reserve, a major regional park with remnant bushland and recreational facilities. The forested slopes and ridgeline of Blackbutt Reserve enclose Kotara and contribute significantly to its landscape character.

Topography

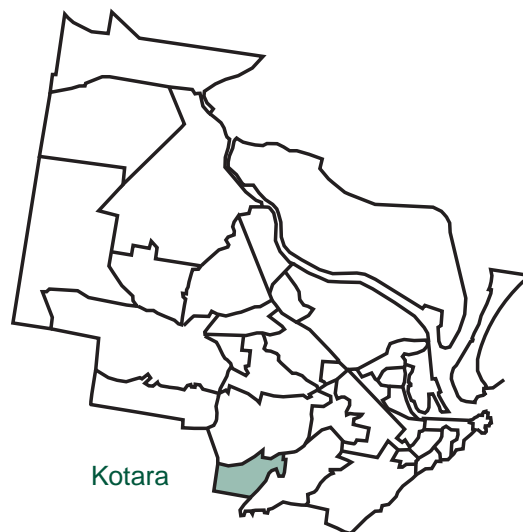
The precinct forms part of the Ridgeland Landscape Precinct (Green Corridors and Landscape Precinct Plan, 2005), characterised by high ridges and deep gullies.

In contrast the southern area is flatter and undulating. These two areas of differing landform are divided by The Great Northern Railway which bisects the precinct east-west. In both landscape zones the natural drainage network runs east-west, strongly influencing the pattern of development.

Built Form and Road Hierarchy

Kotara is predominantly low density residential development. To the south of the Great Northern Railway a large regional commercial district is located on flat land at the intersection of Northcott Drive and Park Avenue.

The development which includes Westfield Kotara and Kotara Homemaker Centre visually dominates the landscape. The large commercial warehouses and shopping mall structure contrast with surrounding low rise residential development.



LOCATION MAP



Carnley Avenue defines Kotara's northern boundary. Its streetscape benefits from the 'borrowed landscape' of Blackbutt Reserve.

The main roads running east west are Carnley Avenue and Park Avenue. Carnley Avenue sits to the north of the Great Northern Railway Line and forms the southern boundary of Blackbutt Reserve. To the south of the Great Northern Railway Line and running parallel with Carnley Avenue, Park Avenue connects Kotara's commercial centre with Charlestown Road. Charlestown Road is a visually dominant north-south arterial road that connects to the Pacific Highway in the south via the West Charlestown bypass. Both Charlestown Road and Carnley Avenue benefit from the borrowed scenery of Blackbutt Reserve which contributes significantly to the visual amenity and character of these two transport corridors.

Existing Canopy

Generally the street tree population is good with remnant native vegetation in gully and ridgeline reserves enhancing streetscapes. Bottlebrush is over represented in the street tree population, for example in Meredith and March Streets. These trees are senescent, have poor form and require replacement.

Soil and Geology

Soils range between sandy loams to a clay loam dependant on topographic location. The soils are acidic are moderately permeable and have low fertility.

Significant Features

Blackbutt Reserve, Raspberry Gully Reserve, Regional Commercial Centre.



Homes on Grayson Avenue are characteristic of Kotara's low-density residential development.

Maryland

Introduction

Maryland is adjacent to Hexham Swamp on Newcastle's north western fringe. The area is bound by Minmi Road to the south, Hexham Swamp to the north and west, and by Creek Road, a private airstrip and Ironbark Creek to the east.

Topography

Maryland is part of the Undulating Suburban Precinct (Green Corridors and Landscape Precincts Plan, 2005). The topography is flat close to wetland areas, rising through the residential areas.

Built Form and Road Hierarchy

Originally an agricultural area, Maryland was developed into a residential suburb in the 1970's. Today the precinct is predominantly residential in character incorporating community facilities, schools, light industry and a shopping centre. The wide open space of Hexham Swamp to the north is visually dominant and enhances the semi-rural character of the precinct. Large high voltage electricity infrastructure traverses the edge of the precinct. The power lines are visually dominant, in contrast to the low scale urban development of the suburb.

The area is characterised by a uniformity of building style consisting predominantly of brick veneer houses on individual allotments. The subdivision design is based on the Radburn pattern having a street layout that is hierarchical and curvilinear with some separation of pedestrian and vehicular traffic. Road reserves vary greatly in width from a narrow 12 metres through to 20 metres with the recent residential developments averaging 15 metres. This has resulted in narrow verges of less than 3 metres that reduce street tree planting opportunities.



LOCATION MAP



Maryland Drive has a wide carriageway and broad verges, providing space for large street trees.

Maryland Drive and Minmi Road are the main roads. Minmi Road winds through the south of the precinct connecting to Newcastle Road via Longworth Avenue. Maryland Drive is the main route across the suburb.

The precinct incorporates several public open space reserves including Tumpoaba Reserve, Bindowan Crescent Reserve, Grange Avenue Reserve and Fletcher Park. Many of the public reserves are based on natural drainage lines feeding into the surrounding wetlands. The network of recreation spaces creates fingers of natural vegetation that reach into developed areas and allows vistas from the residential area onto open wetlands.

Existing Canopy

Due to the infancy of the residential development, street tree planting is either immature or sporadic with pockets of native plantings reflecting design themes of the 1970's and 1980's.

Soil and Geology

The lower swampy areas are poorly drained silty heavy clays. The higher urban areas range from sandy soils through to clay and fine sandy loam. Soils are acidic with moderate drainage capacity.

Significant Features

Hexham Swamp, Tumpoaba Reserve, Fletcher Park.

Street Tree Planting Objectives

It is recommended that new street tree planting enhances the semi-rural character of the precinct, primarily by reinforcing views to the wetland environment. Further opportunities exist to improve the overall landscape amenity of the area by planting the edge of the reserves that adjoin the street.



The edge of Tumpoaba Reserve would benefit from street tree planting to provide a wind buffer for residences.

Maryville

Introduction

Maryville is a small inner city precinct located northwest of the CBD. It occupies the land enclosed by a large meander in Throsby Creek, its boundaries being defined to the east, north and west by water.

Topography

The precinct topography is flat and is categorised Estuarine and Wetland Precinct (Green Corridors and Landscape Precincts Plan, 2005) with the climate influenced by the proximity to the coast.

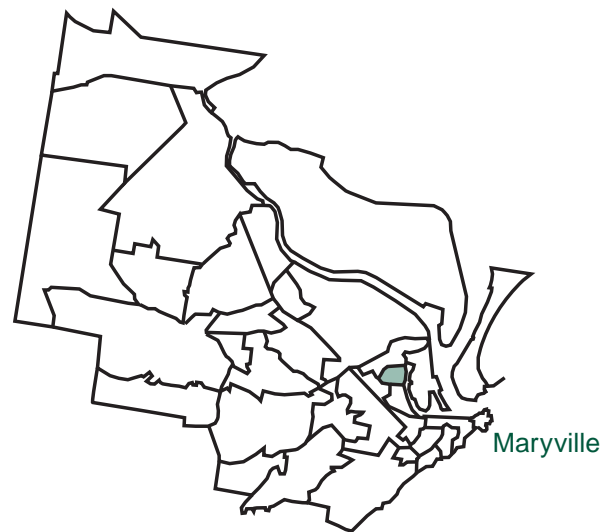
Built Form and Road Hierarchy

The area is predominately residential development, with a large industrial development to the north and recent commercial development along The Avenue in the south.

Hannell Street is an arterial road running in a north south direction providing an important connection to Newcastle's CBD. Hannell Street has mature Araucaria's planted along the central median creating a boulevard entry to Carrington and Newcastle West.

Hannell Street divides older residential development to the west from newer residential development, known as Linwood, to the east. The Linwood development is located between Throsby Creek and Hannell Street on a site formerly occupied by industrial wool sheds. This medium to high density development includes two to three storey terraces and blocks of units. The streets within the development are a narrow east west grid.

Walking and cycling are encouraged by the shared foot/cycleways through the parkland along Throsby Creek. The parkland is planted with semi mature Figs and Norfolk Island Pines and there are views of regenerating Mangroves on the Carrington side of Throsby Creek. Semi mature Fig trees planted along Hannell Street frontage provide an effective green barrier between Linwood and the busy road.



LOCATION MAP



Modern medium density development in Linwood to the east of Hannell Street.

Existing Canopy

Overall the canopy coverage throughout the precinct is poor and inconsistent, with only the recent commercial and residential developments providing new street tree plantings. O'Hara Street retains mature planting of Brushbox planted in the 1980's which are performing well. There was a strong preference for planting specimens from the Myrtaceae family during the 1980's, including Callistemons, Paperbarks and Willow Myrtles that now require assessment and are generally poor in form.

Soil and Geology

Generally the soils are characterised by deep coarse sandy loam soil. The soils consist of low organic matter and possess low water retention and fertility characteristics.

Significant Features

Throsby Creek and parklands, consistent street-grid layout.

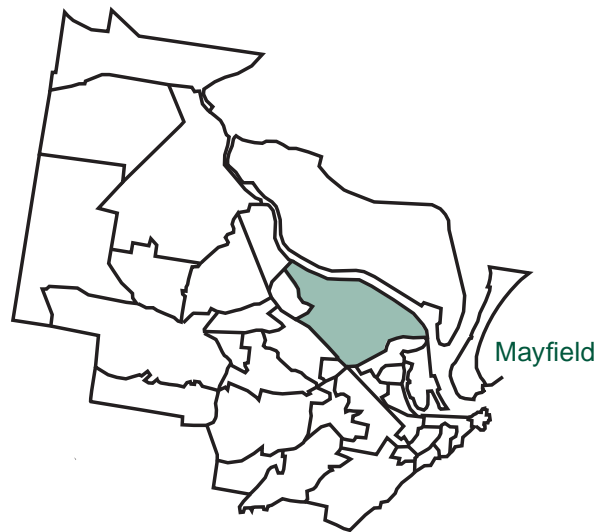


Existing street tree planting on Downie Street, is heavily pruned because of overhead power lines. Alternative design solutions for tree-planting could be considered.

Mayfield

Introduction

The precinct of Mayfield covers the suburbs of Mayfield West, Mayfield North, Mayfield East and Mayfield. The precinct is bound to the east by Industrial Drive, Selwyn Street, and the rail link from the Great Northern Railway line to Port Waratah Coal Loader. To the south the precinct is bound by the Great Northern Railway line, and to the west by Maitland Road (Pacific Highway), Vickers and Carandotta Streets. To the north industrial land fronts onto the riparian boundary formed by the Hunter River. Industrial Drive forms the northern road extent of residential development.



LOCATION MAP

History

Mayfield developed as a residential area in the 1880's to house the labour force of the expanding local steel industry. In addition to the workers cottages typical of this era, there are a number of larger villas constructed by wealthy industrial families. Mayfield House and Winnicourt are examples of this type of residence.

Topography

The area is classified as part of the Flat Urban Landscape Precinct. (Green Corridors and Landscape Precinct Plan, 2005).

Built Form and Road Hierarchy

The precinct is characterised by a mix of land uses. Quiet residential streets lined with single storey houses contrast with a busy commercial strip along Maitland Road and large industrial infrastructure located north of Industrial Drive.

The residential street layout is a grid pattern that forms a consistent urban element throughout the precinct. Some of the streets are fine grained with carriageways measuring 10-12 metres in width, with narrow verges, in some instances less than 2 metres wide. The remainder of the streets generally measure 18 – 20 metres wide.



Hills Weeping Figs perform well along Industrial Drive providing an appropriately scaled visual buffer to the adjoining industrial area.

The major north-east to south-west orientated streets are Hanbury Street and Maud Street. The major arterial roads that run north-west to south-east are Industrial Drive and Maitland Road (Pacific Highway) which carry large volumes of traffic through the precinct.

Existing Canopy

Dangar Park is a focal point along Maitland Road with significant landmark plantings of Canary Island Date Palms. This reserve is a prominent landscape feature and an important recreational resource. Hills Figs perform well along Industrial Drive providing an appropriately scaled visual buffer to the adjoining industrial area.

Street tree planting in the commercial zone is constrained due to awnings and overhead services and is currently limited to Fig trees in planters which are poor in appearance and scale. Chinese Pistachio has been successfully planted at the junction of Victoria Road and Maitland Road and provides appropriate canopy coverage to this commercial corner.

Soil and Geology

The soil type in this precinct is characterised by well drained sandy loam profile. The soils are slightly acidic and have low organic matter. The soils are highly modified due to urban and industrial development.

Significant Features

Maitland Road Commercial Centre, Dangar Park, Institutional Buildings, Street Typology.

Merewether

Introduction

Merewether precinct covers the coastal suburbs of Merewether and Merewether Heights. The area is bound to the south by Glenrock State Recreation Area and the Tasman Sea. Merewether Golf Course defines the western boundary. Glebe Road, Stewart Avenue and Jenner Parade form the northern boundary. Ravenshaw Street, Darby Street, Patrick Street and Kilgour Avenue form the eastern boundary.

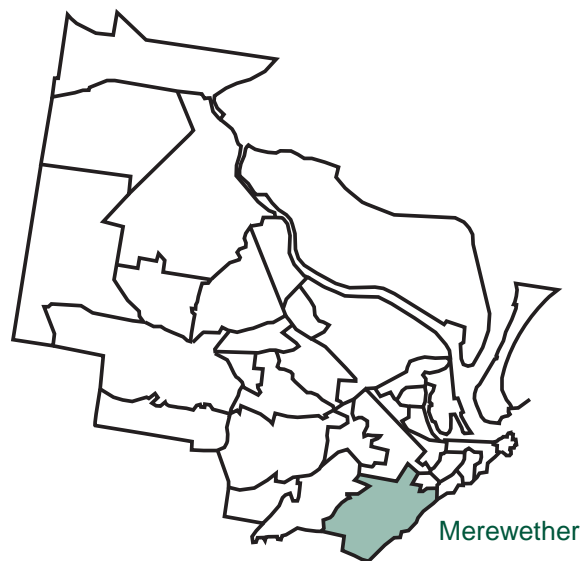
Topography

The precinct traverses two landscape types comprising of the Coastal and the Ridgeland Landscape Precincts (Green Corridors and Landscape Precinct Plan, 2005). The precinct is distinguished by its topographic range, from flat coastal beach strip, through to steep gradients and a ridgeline to the west that is Merewether Heights. Severe growing conditions are created by exposure to salt laden winds and highly permeable sandy soils with low fertility along the coastal zone.

Built Form and Road Hierarchy

The topography results in street patterns that vary between the two suburbs. The suburb of Merewether exhibits a grid pattern that radiates south east from the Pacific Highway, the grid becoming irregular towards Merewether Beach. The suburb of Merewether Heights sits along a ridge line and exhibits a pattern of long winding streets that follow the steep contours. The built form is characterised by large contemporary houses on the slopes with views toward beaches and the city. The lower undulating areas of Merewether are urban in character, predominately residential with variety of building forms on standard setbacks.

The Pacific Highway is a major gateway to Newcastle. In the west it traverses the ridgeline, flanked to the south by the suburb of Merewether Heights and by Merewether Golf Course to the north. It descends in a distinctive rocky cutting to the urban lowlands of Merewether and on through Hamilton South to Newcastle West.



LOCATION MAP

Scenic Drive diverges from the Pacific Highway from the east to form a route defining the southern extent of Merewether Heights with views along the coastline. It follows the ridge line east along the top of Glenrock State Recreation Area, an important bushland reserve and major recreational resource. The roadway here is characterised by dramatic views of the coast and natural bushland. As Scenic Drive winds down toward Merewether Beach the bushland character dissipates becoming urban in character and Scenic Drive becomes Frederick Street.

Existing Canopy

Existing amenity is low with a large number of vacant planting sites. The coastal strip is devoid of canopy coverage and presents a poor coastal frontage. Opportunities exist to supplement the planting of Norfolk Island Pine trees in the wide central medians of Watkins and Merewether Streets to reinforce the boulevard character. The strong coastal character of the precinct will be reinforced with the planting of tree species adaptable to harsh conditions.

Soil and Geology

Along the coastal edge the soil type is beach sand and dunes which are alkaline with low fertility levels. The remainder of the precinct along the ridges are characterised by high clay content with shallow acidic top soils.

Significant Features

Merewether Beach, Merewether Baths, Glenrock State Recreation Park, Dixon Park, Merewether Surf Club.

Merewether Beach

Merewether Beach is a major recreational resource and has iconic status in the surfing world. The historically significant Merewether Baths are located at the southern end of the beach and to the north Merewether Beach becomes Bar Beach. The urbanised beach frontage has been significantly modified through the construction of sea walls and promenades. In conjunction with Dixon Park located opposite the beach this area provides a significant recreational open space. Urban development dominates the beach environs.

Street Tree Planting Objectives

There is an absence of street trees and extensive planting adapted to the conditions is recommended to improve the landscape quality and public amenity.

Minmi/Fletcher

Introduction

The precinct is comprised of two suburbs, Minmi and Fletcher located along the western boundary of the Newcastle LGA. The precinct is bound by Hexham Swamp to the north, the Sydney to Newcastle Freeway to the west, Blue Gum Hills Regional Park and Summerhill Waste Management Centre to the south and Minmi Road to the east.

Topography

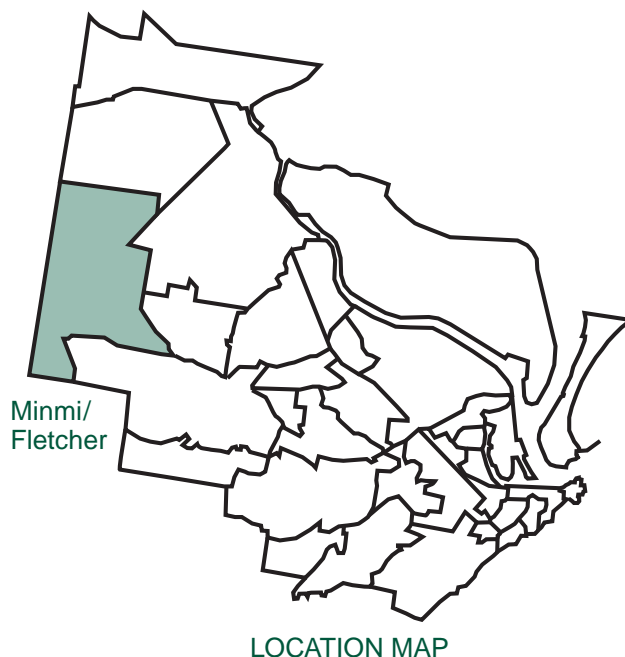
The area is part of the Ridgeland's Landscape Precinct (Green Corridors and Landscape Precincts Plan, 2005) and is characterised by treed ridgelines, steep slopes and rolling hills.

Built Form and Road Hierarchy

Minmi's origins as a mining village have shaped its development. The village is relatively isolated, enclosed by rural lands, water courses and remnant landforms from the mining era. Its built form is broken up by patches of natural woodland and public open spaces.

In contrast with Minmi, Fletcher is a low-density residential subdivision developed during the 1990s. It forms part of the suburban development along the Newcastle/Maitland corridor that is currently expanding into adjoining bushland, Minmi and Fletcher are separated by a low ridgeline that follows Minmi Road.

Minmi Road and Woodford Street are the precinct's major roads. Minmi Road running east-west defines the northern extent of the precinct. Woodford Street running north-south, parallel to the Sydney to Newcastle Freeway, defines the western boundary of the precinct. The Sydney to Newcastle Freeway is physically separated from Woodford Street by Minmi Creek.



The old courthouse in Minmi is a heritage building dating from the village's mining era.

Minmi Village is comprised of a school, low scale shopping centre, community facilities and parklands. The residential area is low density with a mix of recently developed residential and semi rural subdivisions with brick cottages contrasted against historic buildings particularly the Courthouse and Church residence. The residential road reserves are generally between 15-20 metres in width with grassed verges between 3 – 3.5 metres wide.

Existing Canopy

The street tree population throughout Minmi consists of mainly deciduous species that provide autumnal colour and a strong contrast to the surrounding bushland. In Fletcher the streets are planted with a mix of native species predominantly rainforest and Eucalypt species. Blue Gum Hills Regional Park is a natural bushland reserve and conservation area that provides recreational open space and contributes significantly to the landscape character of the precinct.

Soil and Geology

Soils are strongly acidic with a high clay content. Shallow to moderate topsoil dependant on topography. Soils have low permeability and low fertility.

Significant Features

Blue Gum Hills Regional Park, Minmi Village, Hexham Wetlands.



This view from Minmi Road illustrates the rolling topography and wooded hills characteristic of the area.



Lack of overhead power lines maximises street tree planting opportunities along Bottlebrush Boulevard.

New Lambton

Introduction

This precinct combines New Lambton and New Lambton Heights, and Blackbutt Reserve which is sandwiched between them. The precinct is bound by Croudace Street and Marshall Street to the west, by the Great Northern Railway Line to the south, by Turton Road and Kings Road to the east and New Lambton Park, Railway Road and Mitchell Avenue to the north.

History

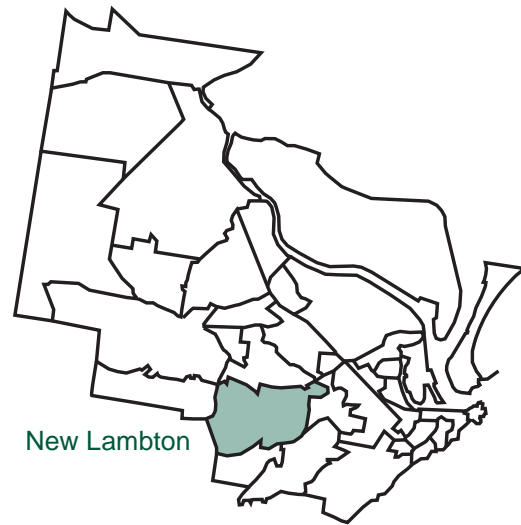
Development in the precinct originated with a colliery located between Oxford Street and St James Road. The colliery had a train line that traversed New Lambton Park and Royal Street. From this industrial beginning the precinct developed into two predominantly residential suburbs.

Topography

New Lambton is located to the east of the precinct where the topography is generally flat. New Lambton Heights is located to the west of the precinct where the land slopes up steeply through the bushland of Blackbutt Reserve. Blackbutt Reserve is a large regional bushland park that is both a major tourist attraction and a recreational open space for the Newcastle region. The bushland and sloping landform contribute significantly to the visual amenity of the precinct.

Built Form and Road Hierarchy

The street layout of the precinct is a grid pattern in the flatter areas to the east becoming irregular to reflect the steeper topography towards the west. Generally the streets and verges are wide. The houses are a mix of pre and post war cottages and bungalows located on individual allotments. In the higher areas of the precinct benefiting from a bushland setting, the villas are grander and located on larger lots. The residential streets that are contiguous with Blackbutt Reserve will be planted with endemic species to reinforce the bushland character.



LOCATION MAP

The major roads are Lambton Road running east-west through the north of the precinct and Bridges Road running north-south to the east. Lookout Road is an important north-south vehicular route to the west of the precinct and forms the western boundary of Blackbutt Reserve. John Hunter Hospital dominates the ridgeline, with extensive vistas across Newcastle to the east. The streets adjoining Lookout Rd are planted successfully with Jacarandas which contrast with the bushland character of this area.

Industrial development is located toward the rear of Broadmeadow Railway depot. It is characterised by warehouses of varying size and a lack of overhead services. The verge widths here are generous and present opportunities to plant species that are larger in scale than is often possible in urban areas.

An active commercial centre is located around the junction of Alma Road and Regent Street it is defined by successful plantings of Bull Bay Magnolia.

Soil and Geology

The precinct is the soil interface between coarse sandy loam in the lower areas with loam and clay shallow top soils in the higher ridge areas of the precinct.

Significant Features

Blackbutt Reserve, Commercial Centre, John Hunter Hospital, New Lambton Park.



Ann Parade looking west toward a small local reserve with the bushland of Blackbutt Reserve beyond.



These Jacarandas on Ridgeway Road in New Lambton Heights demonstrate how planting of a single species can unify a streetscape.

Newcastle

Introduction

Newcastle is one of the oldest European settlements in Australia, discovered in 1797. In 1804 Newcastle was established as a penal colony. The Newcastle precinct stretches east to west along the southern harbour foreshore from Foreshore Park in the east through to Wickham and Honeysuckle, encompassing the retail and commercial cores of Civic and Hunter Street Mall. The area is bound to the east by Newcastle Beach and King Edward Park. The Newcastle precinct integrates cultural, administrative, commercial and retail development with numerous public open spaces.

History

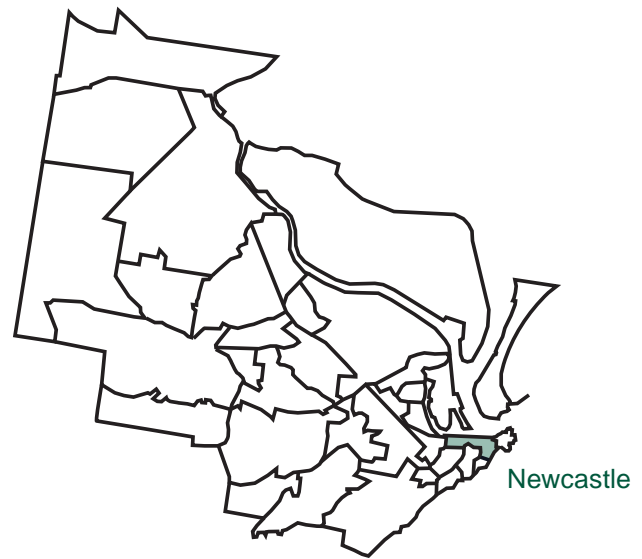
This precinct is listed as a Conservation Area under Newcastles LEP (2003) and is distinguished by its rich heritage. Henry Dangar imposed a regular grid pattern on the topographically arranged settlement of 1804 - 1823.

Topography

The precinct is generally flat along the harbour and the residential and commercial areas before rising to an escarpment that overlooks Newcastle Beach.

Built Form and Road Hierarchy

The street grid pattern was laid out by Henry Dangar in 1823. Hunter and King Streets form the east west road corridor through the precinct and feature plantings of mature Plane trees and Broadleaved Paperbarks. The city precinct is made up of commercial and retail buildings with a streetscape evocative of the late 19th and early 20th century. Some examples of the architecture of the period are Customs House and the former Post Office. The built form is generally low level commercial with apartments above, mixed with some older residential dwellings and some recent high rise residential developments.



LOCATION MAP



Large trees in Civic Park enhance the streetscape of King Street, Newcastle.

Existing Canopy

Mature Fig trees form the boundary of Civic Park and provide dense canopy coverage and amenity to adjoining streets. There are mature plantings of Norfolk Island Pines at the eastern end of Hunter Street with Plane Trees used extensively throughout Newcastle's CBD. Mature Brushbox and Camphor laurels form high canopy coverage to the steep sloping Newcomen and Brown Streets respectively.

Soil and Geology

The precinct contains a mix of estuarine poorly drained soils along the riparian edge, well drained beach sands and high rocky headlands with thin topsoils located along the coastal strip. The soils are highly disturbed due to urban development. The low lying areas along the river edge have been reclaimed and soil drainage can vary.

Significant Features

Civic Precinct, Honeysuckle, Hunter Street Mall, Foreshore, Newcastle Beach, Post Office and Christ Church Cathedral.

Civic Precinct

The Civic and Cultural Precinct are centred on the Town Hall and Civic Park. Civic Park is one of the city's most popular open space areas containing the Captain James Cook Memorial Fountain with a backdrop of Fig trees that provide a distinctive canopy over Laman Street. The Art Gallery, Council Administrative Centre, historic Civic Workshops and the Civic Theatre are located here.



Honeysuckle Drive is a wide boulevard planted with Norfolk Island Pines to match the scale of new development and tolerate salt-laden winds.

Honeysuckle

Honeysuckle to the west of the precinct is former industrial land redeveloped by the State Government as a mixed use precinct. The builtform is a mix of refurbished wharves and modern high rise apartments, activating the northern edge of the city. The main road through the new development is Honeysuckle Drive a boulevard planted with Norfolk Island Pines. Honeysuckle Drive runs adjacent to the foreshore providing a gateway to the CBD from the west.

Newcastle Beach

High rise residential apartments combined with carparks and roadway dominates the beach area and lacks any tree canopy to reduce its visual impact on the coastline. King Edward Park provides a strong contrast to the beach front. This area is exposed to coastal conditions and subjected to harsh winds.

Newcastle East

Introduction

Newcastle East is listed as a Heritage Conservation Area in Newcastle's Local Environment Plan (NLEP) 2003, and is located at the eastern end of the Newcastle city peninsular. The street layout is an extension of the city's grid pattern, along an east – west axis, in some places modified to reflect the topography of the ridgeline.

Topography

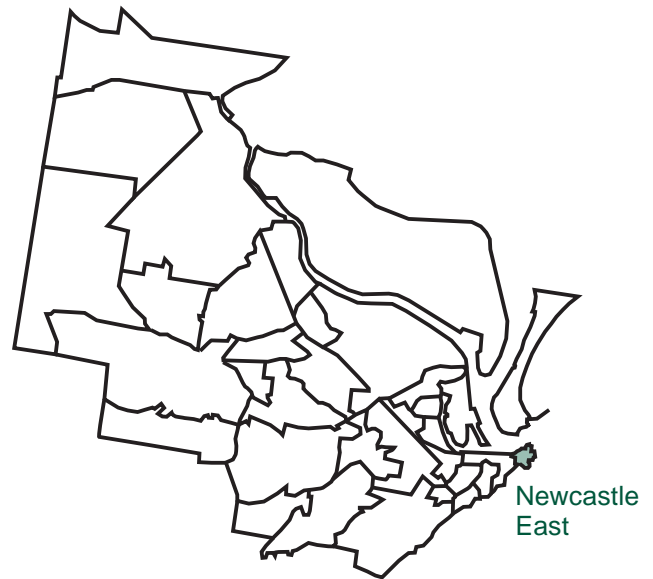
The significance of the precinct lies in the topography, typified by headlands and high rocky cliffs which provide dramatic views of the coast and the entry to the Hunter River. The area is part of the Coastal Landscape Precinct (Green Corridors and Landscape Precincts Plan, 2005). The climate is temperate and vegetation is heavily influenced by salt laden winds.

Built Form and Road Hierarchy

The precinct is characterised by narrow streets and laneways with a mix of two and three storey terraces on narrow allotments. The streets and footpaths are narrow with no building setbacks.

Existing Canopy

Street tree amenity is low, as there are many poorly performing specimens, notably the *Metrosideros excelsa* (New Zealand Christmas Bush) which require replacement. Some canopy coverage is provided by Foreshore Park and Parnell Place reserves.



LOCATION MAP



The precinct is characterised by narrow streets and laneways with a mix of two and three storey terraces on narrow allotments.

Soil and Geology

Soils are characterised by thin topsoils overlying sandstone that form part of the rocky headlands. Beach and dune sands form the remainder of the precinct. These sandy soils are low in fertility, are alkaline, have poor water holding capacity and are highly disturbed due to urban development.

Significant Features

Customs House, terrace houses, Foreshore Park, Pacific Park, Fort Scratchley, Parnell Place, Newcastle Beach and Baths, Convict Lumberyard, Stockade, Bond Stores and breakwater sites.



Norfolk Island Pines shown here at Parnell Place are a proven successful coastal species.

Newcastle West

Introduction

Newcastle West is a key gateway to the Newcastle CBD and is bounded by the Great Northern Railway line to the north, Union Street to the east, Parry Street and National Park to the south and Selma Street to the west. The area is in the initial stages of an urban revitalisation programme which advocates a diverse mix of commercial, retail and residential land uses that will encourage people back into the city.

Topography

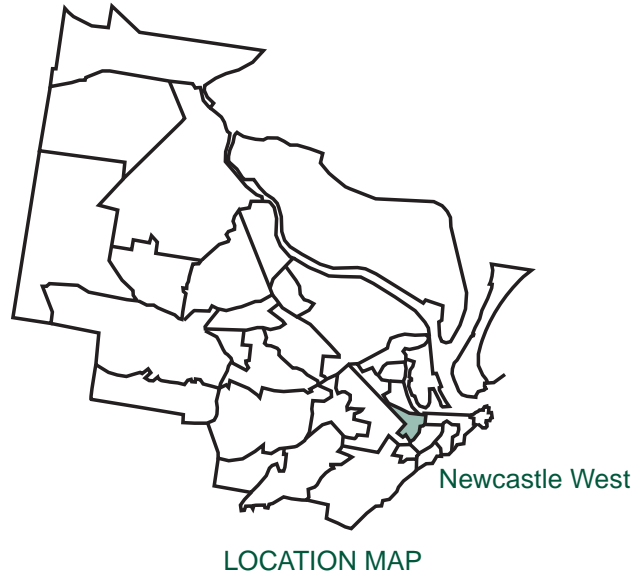
The area is flat and classified as part of the Estuarine Precinct (Green Corridors and Landscape Precincts Plan, 2005). The area is influenced by light salt winds.

Built Form and Road Hierarchy

Three arterial roads run through the precinct, these are Hunter Street, King Street and Stewart Avenue. Hunter Street and King Street run parallel with the Great Northern Railway line and form a major transport corridor. Stewart Avenue runs in a north-south direction. Hunter Street is a wide undivided road with a continuous built form of predominantly two or three storey commercial buildings some with heritage significance such as the former Bank of New South Wales and the Technical College. The local shopping centre at Marketown has recently (2011) been extended to become a commercial focus for this suburb.

Existing Canopy

King Street is a wide boulevard with plantings of Paperbarks in a central median and Plane trees line the street verges. These plantings successfully contribute to a sense of city entry. Hunter Street is planted with mature Oriental Plane trees that provide a framework for the vision of a gateway to the city centre. National Park is a large recreational space on Parry Street which contains significant Fig trees plantings that contribute to the amenity of adjoining streets.



Trees in the central median on King Street provide a successful green buffer between busy traffic lanes.

Soil and Geology

Soils predominately consist of well drained coarse loamy sand. The soils are highly modified due to urban development.

Significant Features

The ex Bank of New South Wales - known as 'Bank Corner', Technical College, Hunter Street, King Street, Birdwood Park, National Park.



Paperbark Trees in Parry Street provide amenity and shade for pedestrians.

Sandgate

Introduction

Sandgate is located on the bank of the Hunter River approximately 10 km north west of Newcastle CBD. The precinct is bound by the Hunter River to the east, by Old Maitland Road to the north, by the Great Northern Railway Line to the west and by a railway connection to Kooragang Island to the south.

Topography

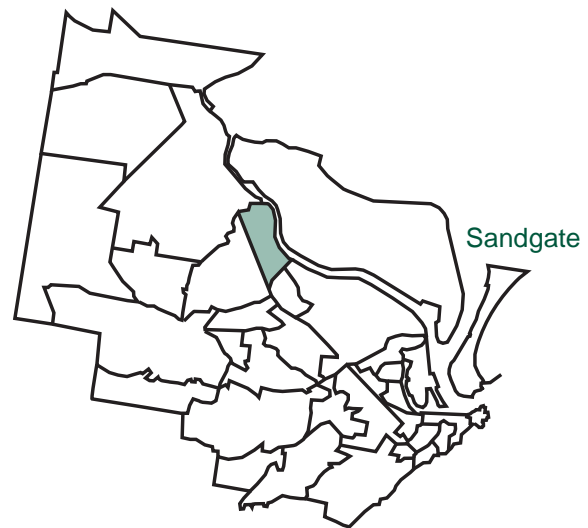
Sandwiched between Shortland Wetland and the Hunter River, Sandgate forms part of the Estuarine and Wetland Precinct (Green Corridors and Landscape Precincts Plan, 2005). It is flat, low lying and subject to periodic inundation.

Built Form and Road Hierarchy

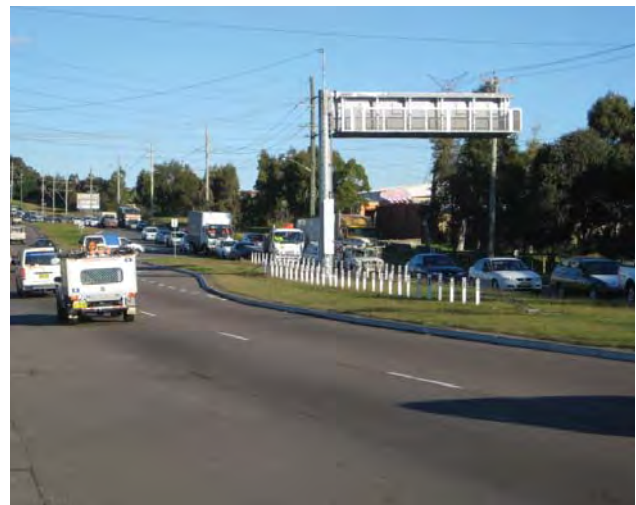
The area has a mix of development including aged care facilities, industrial and commercial subdivision, a large cemetery and a small number of residences. The developed land is surrounded by and interspersed with open water, mangrove and wetland vegetation.

The principal roads are Wallsend Road and Maitland Road (the Pacific Highway). Wallsend Road connects to Sandgate Road forming an arterial route which defines Newcastle's north western extent. The Pacific Highway runs north-west to south-east conveying large volumes of traffic into Newcastle's CBD. Sandgate is an important gateway to Newcastle and opportunities exist to enhance the road corridor by planting the wide medians.

Sandgate Reserve, a large area of mangrove, sits between the Pacific Highway and the Hunter River, enhancing the landscape character of the precinct.



LOCATION MAP



The Pacific Highway at Sandgate is a major gateway to Newcastle. Opportunity exists to enhance this gateway with planting to the wide central median.

Sandgate Cemetery is a major land use visible from the highway which also contributes to the character of the precinct. The boundary of the cemetery is lined with African Olive and Brushbox which enhance the adjoining streetscapes however the interior of the cemetery is very open, with poor canopy cover.

The industrial estate to the south consists of large industrial blocks of land with semi-mature stands of native trees particularly Eucalypts and Brushbox. Generally street tree planting is poor or non-existent, providing little landscape amenity.

Soil and Geology

Soils are generally silty to medium heavy clays. The area is low lying and the soils are characterised by poor drainage, low fertility and subject to saline conditions.

Significant Features

Sandgate Cemetery, Hunter River, Sandgate Reserve.



Old Maitland Road has a rural streetscape character with no kerb and gutter.

Shortland

Introduction

Shortland is a small residential suburb on Newcastle's north-western fringe. The precinct is bound by the Shortland Wetlands to the north and west, and by Sandgate Road to the south and east. The precinct is characterised by residential development surrounded by large areas of open space.

Topography

Shortland is part of the Estuarine and Wetland Precinct (Green Corridors and Landscape Precincts Plan, 2005). The topography falls gently from the south, becoming flat in the north and west where development gives way to Shortland Wetland.

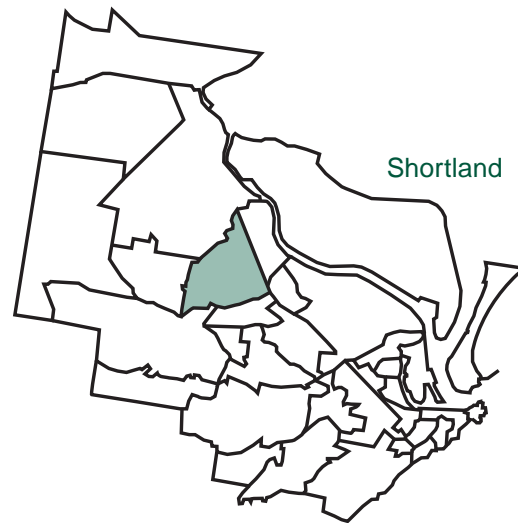
Built Form and Road Hierarchy

The residential areas are characterised by single storey cottages served by a small low scale commercial centre. The road reserves are generally 18 to 20 metres in width with verges typically 3.6 metres wide.

The main north south roads are Sandgate Road and the Jesmond Bypass. The Jesmond Bypass is an arterial road that physically divides Shortland Precinct from Shortland Waters Golf Course and the Newcastle University Callaghan Campus. The bypass is planted with a mix of native species along its boundaries which act as a visual buffer to the university. Sandgate Road runs the length of the precinct. To the north it passes through low wetland areas characterised by Swamp She Oak and Paperbark forests. The road rises as it passes through residential and commercial areas planted with young Tuckeroos to the south.

Existing Canopy

A variety of tree species have been planted throughout the precinct. Many are poor specimens, and trees that have been removed have not been replaced, resulting in poor landscape amenity. An exception is Lovell Parade which is successfully planted with Brushbox.



LOCATION MAP



Tobruk Crescent is typical of Shortland with broad verges offering opportunities for street tree planting but overhead power lines limiting species selection.

Soil and Geology

Soils are poorly drained, seasonally water logged, slightly acidic and range from silty clay loam to light plastic clay. There is a permanent high water table, with potential acid sulphate soils of low fertility.

Significant Features

Hunter Wetland Centre, Northcott Park, Shortland Waters Golf Course.

Hunter Wetlands Centre

The Hunter Wetlands Centre is a regional facility with recreation, conservation and education value. The established vegetation in these open spaces enhances the character of the precinct. High voltage powerlines traverse the wetlands and are a prominent feature dominating the skyline.



Lovell Parade looking toward one of Shortland's many open space reserves.



The Hunter Wetlands Centre is a regional facility with recreation, conservation and education value.

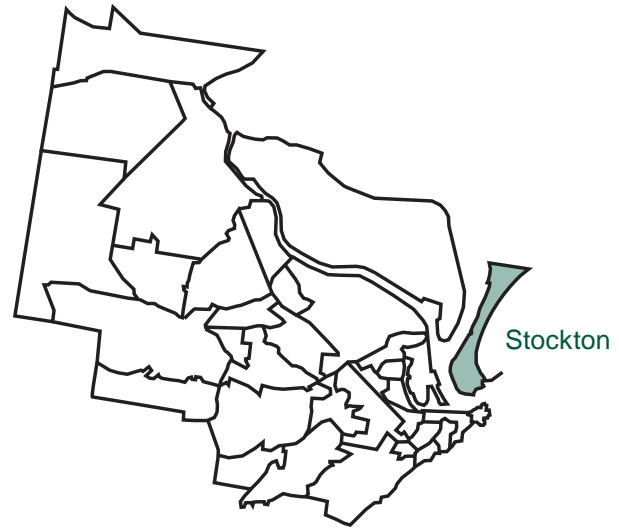


Shortland commercial area on Sandgate Road would benefit from street tree planting.

Stockton

Introduction

Stockton is a topographically flat peninsula located to the north of Newcastle CBD. The precinct is surrounded by water on three sides with the Tasman Sea to the east and the Hunter River to the south and west. The Hunter River separates Stockton from the rest of Newcastle. To the north Stockton is connected to Newcastle by road via Stockton Bridge and Kooragang Island. To the south a ferry terminal located close to Stockton's commercial centre on Mitchell Street facilitates a ferry connection to the Newcastle CBD.



LOCATION MAP

The perimeter of Stockton has been extended by land reclamation works to form a linear open space known as Stockton Foreshore. The foreshore defines the edge of the precinct and is characterised by mature plantings of Norfolk Island Pines and Moreton Bay Figs. These large trees form prominent landmarks visible from Newcastle CBD. There are good views from Stockton foreshore across the harbour towards Newcastle CBD and the working port.

History

Pre-colonial Stockton was a land of abundance, with plentiful wildlife and fishing opportunities. Post-colonial Stockton has a rich industrial heritage with coal mining and shipbuilding during the 1800's. Today Stockton is a mix of residential and tourist development.

Topography

The area falls within the Coastal Landscape Precinct. Due to its flat topography Stockton is exposed to strong salt laden winds.

Built Form and Road Hierarchy

The street layout is a grid pattern which runs in a north-south orientation. The original settlement of Stockton developed around a wharf that was located near the present day ferry terminal. This area is characterised by narrow streets and laneways with small timber cottages. In contrast the northern end of the precinct has a garden suburb layout, planned in 1918 by the Government. The resulting residential character is a mix of low rise timber cottages and brick bungalows with some contemporary houses along the beachfront.

Fullerton Street is the only entry road, providing a link to Stockton Bridge in the north. For the most part Fullerton Street runs alongside the western foreshore. At its northern end the foreshore's mature plantings of Norfolk Island Pines provide an impressive gateway to this precinct. Hereford Street is a culturally significant boulevard terminating at the War cenotaph. This boulevard is generous in width, with a central median planted with a mixture of Norfolk Island Pines and Broadleaf Paperbarks.

Existing Canopy

Overall the existing tree amenity is poor with minimal canopy coverage.

Soil and Geology

The soils are predominately beach sands and dunes. Soils are well drained and possess low fertility and alkaline characteristics. Much of the reclaimed parkland surrounding Stockton consists of ballast.

Significant Features

Street Pattern, Breakwater, Slipways, The Laurels, Harbour and River Environments.

Street Tree Planting Objectives

Proposed street trees have been selected to withstand the coastal influence and reflect the coastal character.



Hereford Street is a culturally significant boulevard terminating at the War cenotaph.

The Hill

Introduction

This precinct is currently listed as 'The Hill Conservation Area' in the NLEP, 2003. The area was originally known as Church Hill and Prospect Hill.

History

The Hill is dominated by Christ Church Cathedral, a gothic cruciform structure, designed by architect John Hunt. The Cathedral is arguably the most significant building in Newcastle and when viewed from a distance is the symbolic centre of Newcastle. The higher social status associated with The Hill is reflected in the grand villas that were built here in the second half of the 19th Century.

Topography

True to its name this precinct is a significant elevated landform which is steep in places.

Built Form and Road Hierarchy

The nature of the area is open and expansive due to its elevation, coupled with King Edward Park and Nesca Park which provide panoramic views. The street layout is a grid pattern to the northern part from Church Street through to Ordinance Street before becoming curvilinear west of The Terrace, in response to the steep topography.

Existing Canopy

Terrace Avenue is a culturally significant streetscape embodying Victorian themes through both architecture and mature plantings of Canary Island Date Palms. A row of mature Canary Island Date Palms in King Edward Park contributes significantly to the visual character of the area.

The precinct's landform and steep topography is reinforced by street tree plantings that enhance view corridors to the harbour, for example plantings of Norfolk Island Pine and Brushbox along Wolfe and Perkins Streets.



LOCATION MAP



Norfolk Island Pines along Wolfe Street frames views of the harbour.

Soil and Geology

Soil types are a combination of beach and dune sands in contrast with rocky headlands and outcrops with thin topsoil along the coastline. The sandy soils are well drained, alkaline and have low fertility. The rocky headlands are characterised by sandstone overlaid with a shallow layer of topsoil that are acidic and highly erodible.

Significant Features

The Terrace, King Edward Park, Nesca Park, Christ Church Cathedral, The Obelisk.

Street Tree Planting Objectives

The street tree planting objective is the enhancement of the existing Victorian character of the precinct while providing shade.



King Edward Park offers a borrowed landscape for residents of The Terrace.



Victorian style avenue of Canary Island Date Palms on Anzac Parade.

The Junction

Introduction

The Junction has a rich industrial heritage based on the coal industry. During the 1800's it was located between two large mining estates, one belonging to the AA Company and the other to its competitor the Merewether family. The Merewether Estate mines were not permitted rail access to Newcastle Harbour across AA Company land, so they constructed tramways as far as The Junction and transported coal from that point by road. Hence the village was named for its location at the convergence of tramways servicing the collieries of the Merewether area.

Topography

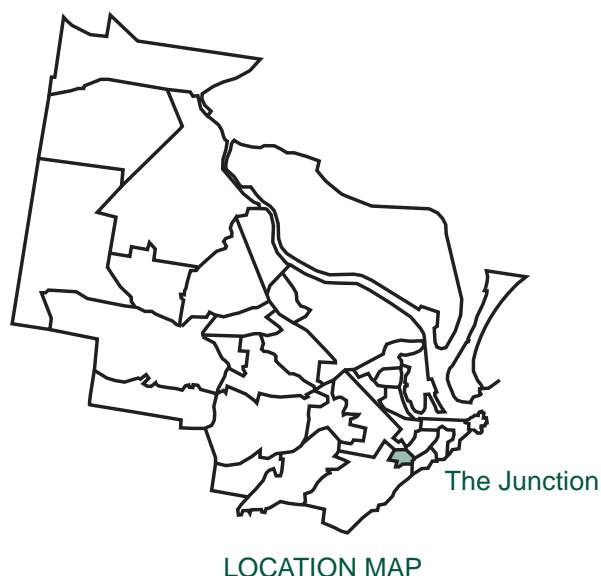
The Junction is close to the coast and subject to salt winds, however due to the low scale built form and flat topography the precinct is relatively protected.

Built Form and Road Hierarchy

The Junction is located in close proximity to the Newcastle CBD. The built form is characterised by a mix of low level terrace houses, cottages and apartments on a road pattern that echoes the original tramlines. Historic terrace houses built in the early 1800's are located in Brien and Farquhar Streets and contribute to the historic streetscape character of this area.

The commercial area is centred on Union Street, Kenrick Street and Glebe Road. A diverse mix of services enhance the distinctive village character, e.g. Plane trees along Kenrick Street provide shade and add to the amenity.

Rowland Park is a long linear park running parallel with Glebe Road in an east-west direction. The park has two rows of Canary Island Date Palm trees that are from the Victorian design era. These Canary Island Date Palms form a strong visual entry to The Junction from the west.



Successful planting of Plane Trees after the 1989 earthquake provides welcome shade in summer and a distinctive local character for The Junction commercial centre.

Union Street is planted with mature Plane trees that are performing satisfactorily. Existing Judas trees located further along Union Street are to be phased out and replaced with Tuckeroos.

Soil and Geology

The precinct soils are characterised by well drained deep sandy soils overlying clay, are slightly acidic and have low organic matter. Soils are highly disturbed due to urban development.

Significant Features

Commercial Centre, War Memorial designed by William Dobell, Rowland Park.



Canary Island Date Palms in Rowland Park form a strong visual entry to The Junction Shopping Centre.

Tighes Hill

Introduction

Tighes Hill is enclosed by Maitland Road to the west, Throsby Creek to the south and Industrial Drive to the east. The northern boundary is formed in part by Ferndale Road which runs parallel to the railway servicing Port Waratah and in part by Industrial Drive and the Port Waratah coal loader facilities.

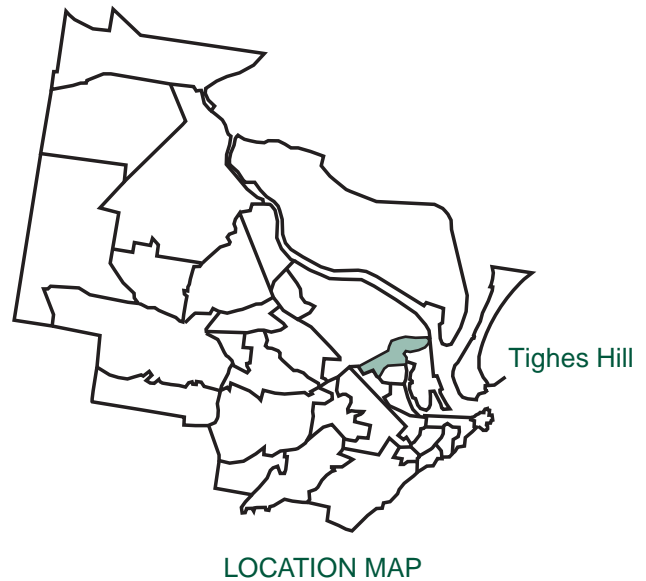
Topography

The topography of the precinct consists of land gently grading up from Throsby Creek to Elizabeth Street. The land then flattens extending toward the railway cutting adjoining Ferndale Street. A significant landscape feature is the cutting along Elizabeth Street between William St and Kings Road where the road descends to the flatter estuarine landscape. Throsby Creek forms a significant riparian corridor. There are opportunities to extend the existing character by planting endemic trees in the streets adjoining the creek line.

Built Form and Road Hierarchy

Tighes Hill like many of the precincts near to the Hunter River is a mix of residential and industrial development. The industrial heritage originated in 1877 with the Fernleigh Colliery and bridge construction over Throsby Creek. The street patterns are in a grid form and vary in width ranging from broad 20 metre wide roads to narrow 6 metre wide laneways. The built character comprises of a mix of terraces and workers cottages with low level warehouses. Industrial development including recent commercial development in Revelation Close is concentrated in the east of the precinct.

The commercial centre of Tighes Hill is located to the west of the precinct on Maitland Road. Maitland Road is part of the Pacific Highway. The precinct is distinguished by historic buildings including The Post Office, Public School and School of Arts.



At Tighes Hill commercial centre on Maitland Road street tree planting is constrained by overhead services and awnings.

Several streets such as Queens Rd and Kings Road have wide verges that enable planting of larger species. Existing mature Figs in Kings Road enhance the amenity of the streetscape. The coal loader infrastructure located on the northern side of Industrial Drive is screened by a line of mature Hills Figs that enhance the main transport corridor. Mature Lophostemon species in John Street are performing well. Generally street tree plantings are inconsistent and performing poorly.

Soil and Geology

There are two soil types in this precinct. The organic soil type is characterised by deep coarse sandy loams that are well drained with low fertility. In the industrial area east of Industrial Drive the soil is classified as disturbed terrain and is highly modified with varying drainage capacity.

Significant Features

Throsby Creek, Tafe College, Convent of Mercy, Public School and Post Office.



Existing mature Figs in Kings Road enhance the amenity of the streetscape and provide a buffer to the industrial/commercial zone to the east.

Wallsend

Introduction

Wallsend is located on the western perimeter of Newcastle's LGA. The precinct is bound by Minmi Road and Sandgate Road to the north, by Energy Australia Wallsend Depot to the east, Croudace Road, Webb Street and Invermore Close Reserve to the south and Boundary Road and Gunambi Street to the west. The area has a strong mining history with the coal industry still active today.

History

Plattsburg and Wallsend originally developed as townships on opposite sides of the valley. The construction of Nelson Street across Ironbark Creek allowed the two townships to merge, forming the suburb of Wallsend. Ironbark Creek still bisects the precinct today and strongly influences the pattern of development.

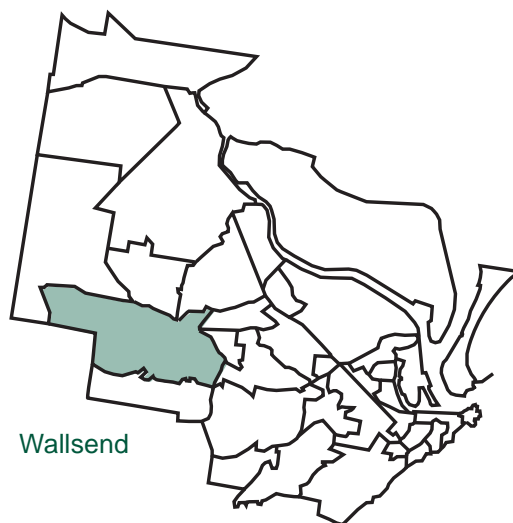
The precinct contains numerous heritage items including the Terminus Hotel, historic railway goods shed and gates, the Post Office and Plattsburgh Courthouse.

Wallsend Brickworks Park sits within the recent Birchgrove Drive subdivision. The former brick making site features remnant bushland, and a prominent escarpment and wetland resulting from the extraction of coal and clay.

The site was developed into a public open space in 2005 with a focus on interpretation of both the industrial heritage and natural environment. The remnant vegetation and landform enhance the surrounding residential streetscapes.

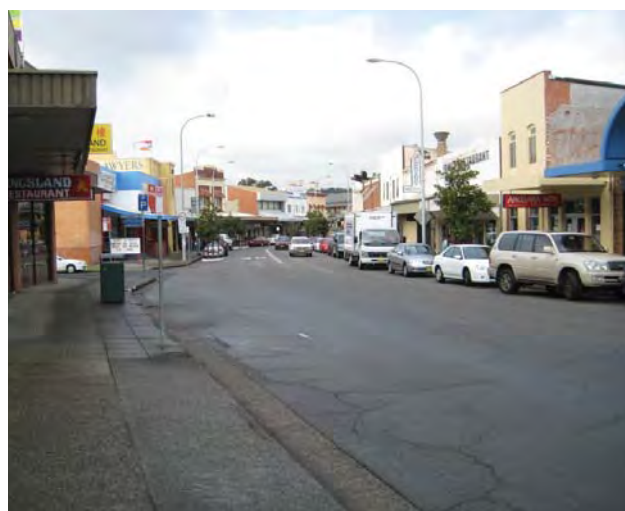
Topography

Wallsend is part of the Ridgeland Landscape Precinct (Green Corridors and Landscape Precincts Plan, 2005) and is characterised by suburban development interspersed with open space, bushland and colliery land. The precinct sits in a valley defined by ridgelines to the south, east and west.



Wallsend

LOCATION MAP



The commercial core of Wallsend is often flooded due to its location at the foot of a large catchment.

Built Form and Road Hierarchy

Wallsend commercial centre developed around Nelson Street sits within a loop of Ironbark Creek. Here the creek is constrained within a concrete channel and is prone to flooding. From the commercial centre northward the valley becomes a floodplain broadening through Federal Park to connect with the Hexham Wetlands beyond.

The street pattern is grid like, becoming irregular and narrow closer to the commercial core. In contrast the recent residential subdivision off Birchgrove Drive has a curvilinear street pattern that follows the contours of the steep topography. There are a number of recreational reserves occupying floodplain land adjacent to Ironbark Creek. With the exception of development around Nelson Street these reserves link to form a linear open space that bisects the precinct. Federal Park sits to the north of the commercial area and Wallsend Park sits to the south. Wallsend Park is the main focal point entering the commercial area from the west and is lined with a mix of Hoop Pines and semi-mature Magnolias.

Existing Canopy

The commercial centre is planted with semi-mature Magnolias that are performing well. Mature Brushbox trees successfully create a unified streetscape in Martindale and Metcalfe Streets. Generally however the precinct has a mixed tree population that currently provides limited landscape amenity.

Soil and Geology

The soil type for this precinct ranges from loamy sand to clay loam and are generally shallow to moderate in depth. The soil is characterised by poor drainage, acidity and low fertility.

Significant Features

Former railway lines, Nelson Street Commercial Area, Wallsend Brickworks Park, Wallsend Park, Plattsburgh Court House, Post Office, Public School and new Wallsend District Library.

Warabrook

Introduction

Warabrook is located north-west of Newcastle CBD. The precinct is bound by the Great Northern Railway line to the west, by Carandotta and Vickers Streets to the south, by Maitland Road (the Pacific Highway) to the east and by a railway connection to Kooragang Island to the north. Warabrook was originally a cattleyard and abattoir. Today the precinct consists of modern residential, commercial and light industrial subdivisions.

Topography

The topography is undulating, grading down gently from the south east to the north west.

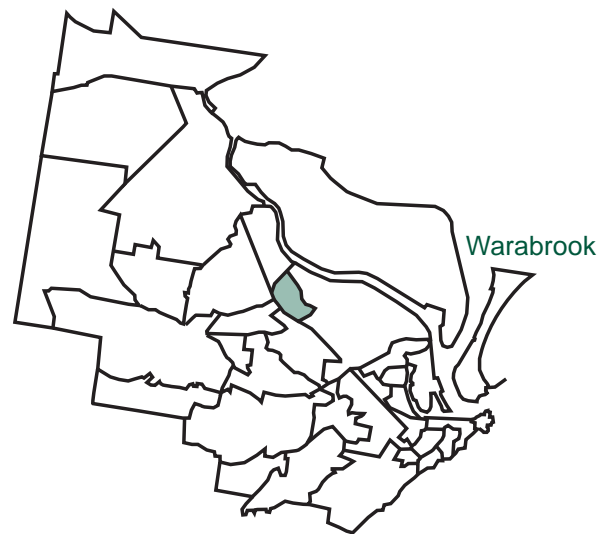
Built Form and Road Hierarchy

The precinct has been developed recently and, although it has a train station, it exhibits a reliance on road transport. It has poor connectivity with neighbouring precincts with only one road entry and exit to Maitland Road (the Pacific Highway).

Industrial development consists of large blocks of land with mature stands of native trees particularly Eucalypts. The local commercial centre at Angophora Drive is defined by plantings of mature Eucalypts. It consists of development on large lots designed to be accessed by car.

To the north west of the precinct Eucalyptus Circuit Reserve features large freshwater ponds and stands of Eucalypts. This reserve is integral to the surrounding residential development and enhances the environmental quality of the area. High voltage powerlines traverse the reserve and visually dominate the skyline.

In response to the undulating landform the street pattern is curvilinear with circuits and cul-de-sacs. Generally the road reserves are 20 metres in width with 4 metre wide grass verges offering opportunities for tree planting. Housing stock is a mix of contemporary single and double storey brick veneer homes on individual allotments.



LOCATION MAP



This streetscape is typical of recent residential development with underground services maximising potential for street tree planting.

Existing Canopy

Existing street trees consist predominantly of established Eucalypts and Chinese Tallowood. Trees along the precincts eastern boundary provide a successful green buffer to Maitland Road (Pacific Highway). Warabrook Boulevard is a significant access road with mature Moreton Bay Figs retained within the central median and recent plantings of Fig trees along the street verges. The existing mature Figs are senescent and require management.

Soil and Geology

Soils range from sandy through clay to a fine sandy loam. Soils are acidic with moderate drainage.

Significant Features

Eucalyptus Circuit Reserve, overhead power lines.



Use of cluster plantings to create a visual buffer between the streetscape of Callistemon Close and industrial land.



Overhead powerlines viewed from Warabrook train station dominate the landscape and provide unique design challenges for street tree planting.

Waratah

Introduction

The Waratah precinct is comprised of Waratah and Waratah West. It is enclosed by Turton Road to the east, Griffith Road to the south, a combination of Acacia Avenue, Alnwick Road and The Reservoir to the west and by the Great Northern Railway to the north.

History

Prior to the discovery of coal, Waratah was a 'tent town' developed in 1856 for workers that constructed the Great Northern Railway.

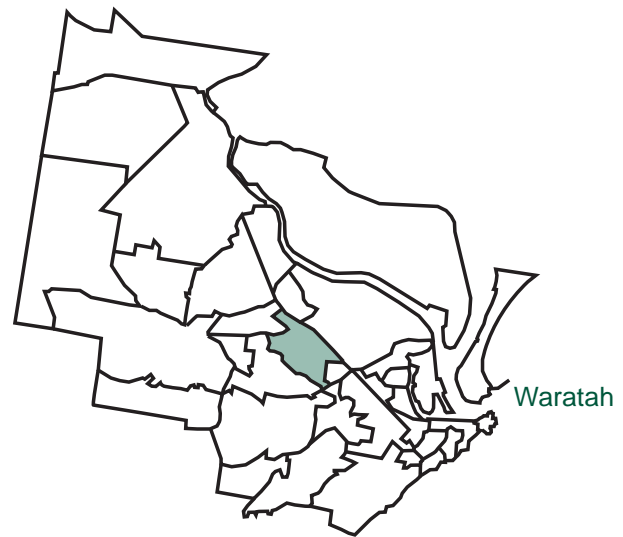
Topography

The land form in Waratah is undulating becoming steeper in Waratah West.

Built Form and Road Hierarchy

Waratah was settled earlier than Waratah West and exhibits a regular grid street pattern. In contrast Waratah West has a street pattern which is irregular and curvilinear in response to its steeper topography. The precinct is predominantly low density single cottages and bungalows on individual allotments.

The major roads are Lambton Road, Edith Street and Turton Road. The street hierarchy comprises of 30 metre wide arterial roads such as Turton Road, and standard 18 - 20 metre wide road reserves that are typical of the later subdivision developments throughout Waratah West. The main commercial centre is located on Turton Road with a smaller village centre at Station Street, consisting of low scale one and two storey buildings.



LOCATION MAP



An avenue of Canary Island Date Palms along Station Street enhances the historic character of the area.

Existing Canopy

Street trees are generally in fair to good condition, although there are several streets that are devoid of any street tree plantings. Awnings and overhead services constrain the opportunities for tree planting along Station Street commercial area, which has been intermittently planted with Crepe Myrtles. There is a significant landmark planting of mature Canary Island Date Palms along Station Street that enhances the historic character of the area. Major road corridors such as Turton Road have limited planting and poor landscape amenity. Brushbox have been successfully planted throughout the precinct.

Soil and Geology

Soils range from sandy loam through clay to fine sandy loam. The soils are acidic, have low organic matter and are highly modified due to industrial development.

Significant Features

Waratah Park, Braye Park, Mater Hospital, Canary Island Date Palms in Station Street, Commercial Village in Station Street.



This view of Jarrett Street is typical of Waratah West, exhibiting sloping topography and recent residential development. Broad grass verges provide opportunities for street tree planting.

Wickham

Introduction

Wickham precinct is enclosed by Throsby Creek to the east and the Caltex terminal to the north, with the Great Northern Railway line forming the western and southern boundaries. The area has a strong connection to the CBD with a diverse transport system including rail, road and cycleway. The area has a mix of residential and industrial development and has active port facilities.

Topography

The topography is flat and is classified as falling within the Estuarine and Wetland Precinct. (Green Corridors and Landscape Precinct Plan, 2005).

Built Form and Road Hierarchy

Hannell Street is an arterial road running in a north-south direction. It defines the eastern boundary of Wickham and connects at its southern end with the Pacific Highway near to Wickham Station. Hannell Street has large mature Araucaria's planted to the central median creating a strong architectural boulevard entry to Newcastle West.

Commercial activities are located between Hannell Street and Throsby Creek, including the Yacht Club Marina and Fishermans Co-Op, contributing to an active waterfront.

To the west of Hannell Street the precinct comprises of narrow east-west streets in a fine grid pattern. Most of the streets are narrow with the road reserves being 10 – 14 metres wide. The built form is dense, characterised with cottages and semi-detached terraces close to warehouses and low level factories. Several urban renewal projects have been undertaken in the form of medium density residential developments designed to activate local streets.

Wickham Park is a large open space in an otherwise densely developed area. The park's boundary is lined with mature Fig trees that make a strong visual contribution to the adjoining streets. The Fig trees extend along Albert Street and form a significant avenue.



LOCATION MAP



Narrow laneways are enhanced with planting of appropriate species, e.g Bishopsgate Street.

Soil and Geology

The soils are characterised by coarse loamy sand, consisting of low organic matter and low water retention. Areas of disturbed terrain are located along the Throsby foreshore which is occupied with commercial developments.

Significant Features

Former Council Chambers, Port Facilities, Hannell Street and Wickham Park.



Street tree plantings should enhance and not hide significant features, e.g the former Council Chambers.

7. Site Inspection Form (sample)



Planting Site Inspection Form

Inspector:

Site/Address:

Location:

Special value: specimen heritage habitat gateway/avenues

Site character: shopping commercial industrial park natural residential

Footway width: Even _____ m Odd _____ m

Footpath: Even Yes No Odd Yes No **Off street parking:** Even Yes No Odd Yes No

Road width: _____ m

Parking Lane: Yes No **Potential for planting in road** Yes (consider previous 4 points)

Use under tree: parking traffic pedestrian recreation landscape

Powerlines: Yes No Odd # HV LV Service ABC
Even # HV LV Service ABC

Building setback: <1m 1 – < 2.5 2.5 > 2.5 - < 3.5 3.5 > 3.5 - < 4.5 4.5 > 4.5 - < 6 > 6

Solar consideration - side of building to be planted:

Odd N S E W Even N S E W

Vacancy clearances: driveways 3m power poles 5m intersections 10m (kerb) storm water inlet 2m bus stop 8m approach/3m depart traffic lights 10m major underground junction box 3m

Clear of underground services to property: gas water telecommunications

Soil type: sand loam silt clay fill

pH: neutral alkaline acidic Remediate Yes No Phosphonate Lime Gypsum

Drainage: good moderate poor

Slope: flat moderate steep

Microclimate

Aspect: N S E W

Prevailing wind: N S E W

Exposure to wind: exposed protected ridgeline gully

Salt Exposure: salt frontline salt other Nil

Frost Potential: No Mild Severe

Existing street trees performing: Good Fair Poor

8. Compliance with Statewide Obligations

Table 1 Council Responsibilities under the Statewide Mutual Insurance Scheme

AUDIT REQUIREMENT	HOW MET
Council is encouraged to adopt a responsible planting procedure for new trees to ensure that the problems faced today from past plantings are not repeated into the future	STMP species selection process
The characteristics of the tree, within the environment or intended location, should be known prior to being planted. Only trees that have been reviewed for their characteristics should appear on the preferred species list	STMP Species Matrix
Council needs to implement a systematic identification and evaluation process that will ensure that new tree plantings will not interact with services or structures	STMP mapping and site inspection checklist
In some instances, a case can be made to plant trees within the minimum distances for damage control. These circumstances may include trees of significant value or trees to compliment an existing street scene. If the situation warrants deviation from the procedure then risk control strategies must be initiated	Newcastle DCP 2005 - Urban Forest Technical Manual – Risk Control Strategies
Council should develop policies to support its decisions	Urban Forest Policy 2007; City Wide Maintenance Policy – Tree Amendment 2008

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