

6 Community infrastructure

30-year vision

City North will support a high quality of life to all generations. People of all life-stages and abilities will feel healthy, safe and connected through a public realm that contributes to a sense of place and belonging.



LEUCADENDRON
YELLOW PEAR
\$8.50

LEUCADENDRON
'MAURI SUNSET'
\$8.50



6.1 Introduction

94 Overview

Social infrastructure and community facilities in City North must meet the diverse needs of the community including primary healthcare facilities, children's play and recreation facilities, services for young people, older people and people with disabilities as well as libraries, sports and recreation facilities, open space, schools and arts related activities. The built environment influences people's living, working and travel patterns, local economies and opportunities to access local food and be active. Diverse communities have a range of housing types and tenures, well-designed public transport, walkways and cycle routes, streets and open spaces that support opportunities for physical activity and local social connection. People of all life-stages and abilities in City North will feel healthy, safe and connected through a high quality public realm that supports community and belonging, mixed use, connectivity, local character and adaptability. New and upgraded community and cultural facilities and services will need to be provided in City North to support the health and wellbeing of the growing community. New community infrastructure will be delivered in City North, which strengthens community values and builds upon existing community and cultural assets, in particular the Queen Victoria Market and the cluster of medical and educational facilities in the area.

6.2 Objectives

Principle 2

Create a liveable local neighbourhood

1. Community and cultural facilities and services support the health and wellbeing of the community.
2. People's everyday needs are met through the provision of diverse local services and amenities.
3. Community and cultural facilities are adaptable to provide for a range of functions.
4. Local services and jobs are retained and created.

Principle 7

Develop liveable dwellings that house a diverse and inclusive community

1. A variety of accommodation types and sizes is provided. These are adaptable for different lifestyles, life-stages and households.
2. Short and long term public, private and student accommodation is well-integrated and well-designed.

Principle 8

Create a connected and accessible place

1. Community facilities are integrated with local centres and conveniently clustered with complementary services that the community uses regularly.
2. Community facilities are located within walking distance of homes.
3. Community and cultural facilities are connected by safe streets which are designed for universal access.
4. Community facilities are visually prominent and clearly signposted.
5. Community and cultural facilities and services are accessible by good public transport, day and night.

Principle 9

Support a culturally and socially engaged community

1. The community cares for young and old and supports families and individuals to achieve their optimal health and wellbeing.
2. Public spaces and activity are a focus for community life and interaction.
3. Education and cultural activities are accessible to all.
4. Community and cultural facilities include diverse spaces for use by all of the community.
5. People of diverse backgrounds and experiences are supported through programs and services.

6 Community infrastructure

6.3 Issues

1. Existing provision of community infrastructure

City North accommodates some of the state's primary health facilities, including the Royal Melbourne Hospital, Royal Women's Hospital, Melbourne Sexual Health Clinic and the Centre for Cultural Ethnicity and Health. These facilities are co-located in this area with the University of Melbourne and RMIT. The area, however, has minimal local level community services and facilities, creating a reliance on those provided in adjacent suburbs, particularly the Central City, North Melbourne, Carlton and Parkville. Anticipated future demand for services cannot be met by existing services in City North and the broader area.

The existing provision of services is as follows:

- There are few childcare facilities and preschools in City North and adjacent suburbs.
- Maternal and child health services in Carlton and North Melbourne are operating at capacity.
- There are currently no aged services or senior citizen's centres within City North. This reflects the small population of older residents.
- There are no youth services in the area, although around half of the current population residing in City North is between 15 and 24 years old.
- Existing community health services, particularly counselling services, are experiencing high demand from tertiary students.

- Community health centres and aged and disability facilities in the broader area are outdated and require upgrading.

To cater for a growing residential and working population, in addition to large daily influxes of students and visitors, the provision of local services and facilities in City North will need to be improved and increased.

2. Provision of arts and cultural facilities

Within and around City North, there is a wealth of regionally and internationally valued arts and cultural facilities including the Melbourne Museum, Royal Exhibition Building, the Trades Hall, the State Library of Victoria, La Mama Courthouse Theatre, the Melbourne Meat Market, the Little Errol Street Studio, the Multicultural Hub, Queen Victoria Market and the galleries, libraries and theatres at the University of Melbourne and RMIT. These are major attractors to City North and the broader area. Local artists have also been occupying vacant, underutilised, warehouse and storage spaces as studios in City North. Arts and cultural facilities play a significant role in engaging and connecting the community and are imperative for supporting the innovation inherent in the knowledge precinct. Retaining live music and performance venues will provide vibrancy and activation during the evenings and strengthen the cultural life of City North. These creative spaces have the potential to further activate City North and contribute to the area's character and identity.

3. Responding to increasing demand for community facilities

As the demographic profile changes, and the community grows, more community and cultural facilities and services will need to be provided. The proposed Parkville and CBD Metro stations will impact on the demand for community and cultural services in City North. In addition, there is potential for workers to generate additional demand for services such as childcare and healthcare. Responding to increasing demand will need to take into account legislative and regulatory changes, which may require new models of service delivery and new or additional community infrastructure. Existing community facilities may need to be upgraded, or more appropriately located to respond to community demand.

New community facilities will be integrated into a community hub within local activity areas. This hub may be a single building or incorporate several buildings within close proximity to form an accessible service. The level of development and value of land within City North impacts on the opportunities to integrate new community and cultural facilities, particularly where these require a lot of land. Therefore it is important to capitalise on existing assets such as the Queen Victoria Market, the Multicultural Hub, the Carlton Baths and the cluster of hospitals and institutions in the area. The Kathleen Symes Centre, located to the east of City North, offers a strategic opportunity to deliver another community hub.

4. Education facilities

The Victorian Government's Department of Education and Early Childhood Development is responsible for the management, design and development of schools. There are no schools in City North. There are several schools located in close proximity, including North Melbourne Primary School, Carlton Gardens Primary School, Carlton Primary School and University High. According to the Department of Education, the North Melbourne Primary School is nearing capacity. There is, however, some capacity at primary schools in Carlton. The Department of Education has identified the need for new schools in inner Melbourne. The Government is committed to promoting schools as community hubs through the co-location and integration of services (Blueprint for Education and Early Childhood Development 2008). The City of Melbourne will advocate for the Department to identify and deliver new schools to service inner Melbourne and will advocate for the co-location of complementary services.

From 2013, the Federal Government is committed to providing 15 hours of kindergarten per week for children in the year before they commence primary education. This has implications for the provision of kindergarten services across the municipality. The City of Melbourne will need to advocate for the provision of kindergartens to be integrated within community hubs or proposed school sites, to provide a high level of accessibility and convenience.

5. Diverse community

To support a diverse community, there is need for a range of housing options in terms of style, size, tenure and affordability. Housing must be accessible for people of all ages and abilities.

6.4 Strategies

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Community infrastructure

Strategy 1

Establish integrated and accessible community hubs

A range of community facilities and services will be integrated into accessible community hubs in City North.

These hubs will provide the opportunity for the expansion of many services to meet community need. The City of Melbourne's Community Infrastructure Plan will consider and determine the appropriate location and specific delivery of services within each hub. Consideration should be given to providing space for delivery of the following services:

- Family services
- Childcare facilities
- Preschool education facilities
- Aged services
- Playgroups
- Planned activity group
- Community art activities
- Youth support services
- Neighbourhood house programs
- Community and mental health services
- Allied health services
- Library.

The integration of complementary commercial and social enterprise uses should also be considered where appropriate.

These proposed hubs will be located to strengthen City North's existing activity nodes and capitalise on key community local service destinations and attractions.

Community hubs will be considered for incorporation in the proposed local centres at the Queen Victoria Market precinct, the Haymarket

(hospital) vicinity, and the Carlton United Brewery site, in addition to the Kathleen Symes building which is located to the immediate east of City North.

These hubs will be clustered with complementary services and community cultural and health anchors including public spaces, retail and education activities, to provide a high level of convenience and accessibility for residents, workers, visitors and students. A variety of activities, shops and services will be clustered to gain benefits from association and multi-purpose trips. These community hubs will be within walking distance of residents and workers, accessible for all and integrated with public space and streets.

For additional information on local centres see Chapter 2, Activities and land use.

Queen Victoria Market precinct

The Queen Victoria Market is a key focus for the local community and a key cultural and tourist attraction which is located on a 7 hectare site in the heart of the growing City North.

There is a significant opportunity to enhance the Queen Victoria Market's role as a local centre and destination by enhancing the provision of community, cultural and social activities in the vicinity. These functions will complement the operations of the market and support the needs of the growing local community.

The integration of community facilities and services within the Queen Victoria Market should focus on enhancing its significant role as a market for fresh produce and community gathering and event space in the northern end of the city. This has potential to build on the capacity of the market as a

centre for locally produced food and education, including cooking and nutrition, and sustainable resource consumption. This also has the potential to strengthen the facilities and services provided in proximity at the Multicultural Hub.

Haymarket

Community facilities will be integrated into the new local centre in the vicinity of the Haymarket. This will consolidate community services with the existing health services provided at the Royal Melbourne and Royal Womens' Hospitals, in addition to the Victorian Comprehensive Cancer Centre which is under development. This provides the opportunity for cross referral among service providers. This hub will provide convenient services to the large number of workers, students and visitors to the hospitals, the University of Melbourne and the research institutes, as part of an active 'main street'. The hub in this vicinity will be highly accessible by trams and the proposed Metro station. The community hub will be complemented by a civic space integrated into the redesign of the Haymarket roundabout, which will enable opportunities for social interaction and play. (See also Chapter 5, Public realm.)

Carlton and United Brewery site

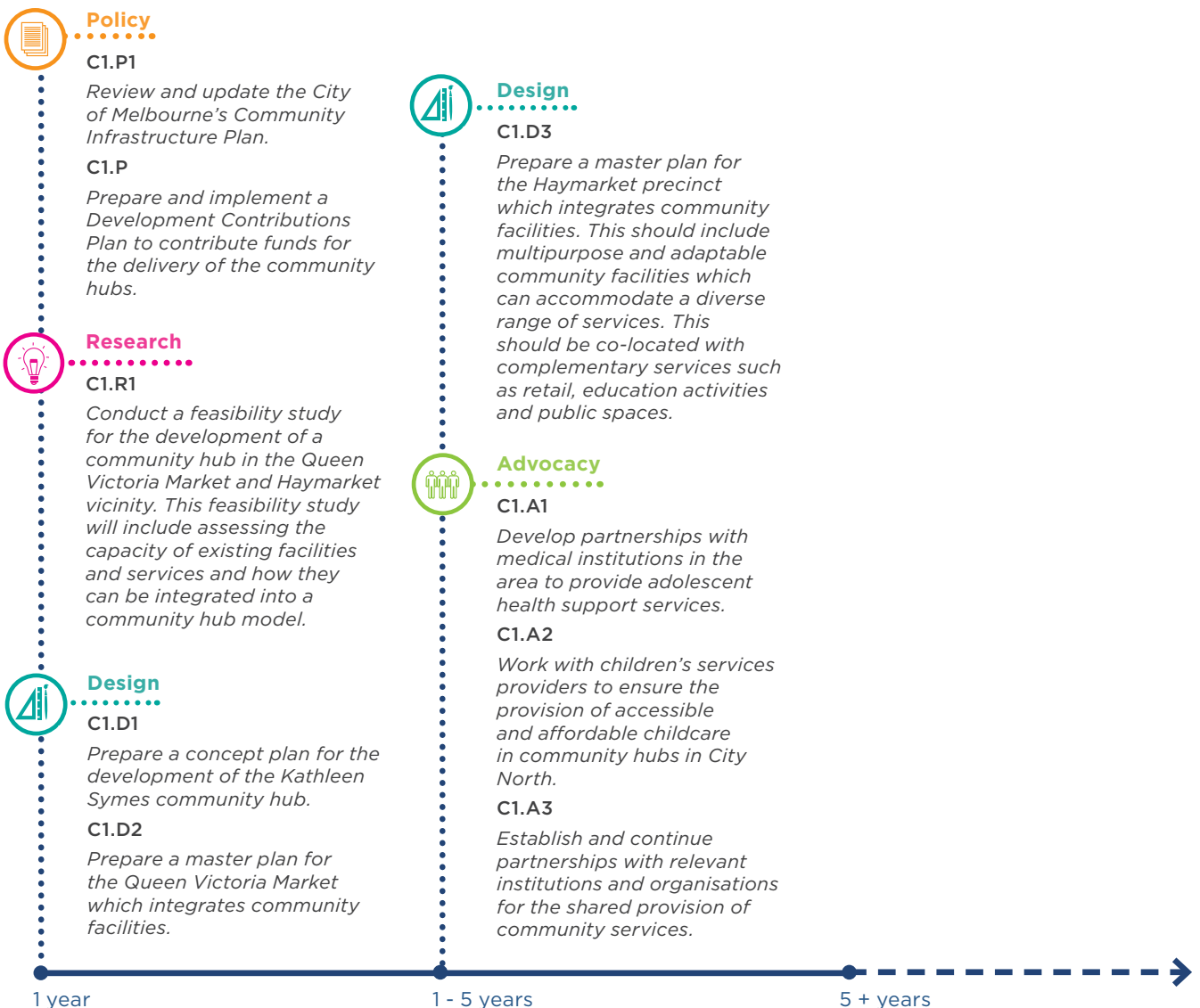
The Carlton and United Brewery redevelopment site is subject to a separate master plan. Any opportunities to integrate community uses will be investigated by the City of Melbourne.

Kathleen Symes building

A community hub is being developed at the Kathleen Syme Centre, located to the east of City North on Faraday Street in Carlton. It is anticipated that this hub will be functional by 2013.

Actions

This strategy will be implemented through the following actions.





1:10,000

Figure 5.12: public realm proposals

Strategy 2

Enhance access to education facilities

It is imperative that access to schools is enhanced in City North to support a diverse and growing community. The State Government's Department of Education and Early Childhood Development (DEECD) is responsible for building and funding schools. The DEECD has identified the need for new primary schools in inner Melbourne. The City of Melbourne will continue to support the DEECD to identify an appropriate site for a new primary school.

The DEECD will ultimately determine where a new primary school will be delivered, however, the City of Melbourne will continue to advocate for a new primary school in the vicinity of City North. The development of a new school in the vicinity will alleviate pressure on North Melbourne Primary School and provide additional capacity for students in City North.

The City of Melbourne considers that the Victorian Archives site located to the west of City North, in Shiel Street, North Melbourne, which is owned by the State Government, offers a suitable site for a potential school, as it is:

- Located centrally to local catchment in growing community
- Located in proximity to public transport including train and bus to provide access to a larger catchment
- A large site which is underutilised as an expansive open air car park. This site has potential to be developed over in a manner which supports the Government's *Blueprint for Education and Early Childhood Development* (2008) which promotes schools as community hubs through the co-location and integration of services
- Located in proximity to several existing recreational areas.
- Located in proximity to the proposed activity centre and community hub along Macaulay Road - Canning Street to provide a high level of convenience to families

The City of Melbourne will continue to advocate to DEECD for a new school to be developed at this site and the potential co-location of early years services, integrated arts programming, open space and indoor recreation facilities to support and connect the broader community.

Actions

This strategy will be implemented through the following actions.



Advocacy

C2.A1

Continue to work with the Department of Education and Early Childhood Development to identify sites which are appropriate for schools.

C2.A2

Continue to advocate to the Department of Education and Early Childhood Development for the development of a new school to be integrated into the Victorian Archives site, located to the west of City North, to improve capacity of North Melbourne Primary School.

C2.A3

Advocate for the co-location and integration early years services, arts programming and indoor recreation facilities within any proposed schools in the vicinity of City North.

1 year

1 - 5 years

5 + years

Strategy 3

Encourage shared use of existing facilities and resources

There is a rich supply of regionally and internationally valued arts and cultural amenities, tertiary institutions and major hospitals located in or near City North. There is potential for enhanced community access to facilities of major institutions, particularly the the University of Melbourne and RMIT.

There is also an opportunity to work with these institutions to expand existing services and facilities to cater for the needs of the growing student, visitor, resident and worker population in the area and to share and co-locate them to ensure efficient and effective service delivery.

Actions

This strategy will be implemented through the following actions.



Advocacy

C3.A1

Continue to work with RMIT and the University of Melbourne, to increase and encourage the provision of community and cultural spaces. Advocate for increased community access to these campuses and building resources, such as libraries, galleries, meeting rooms and recreation facilities.

C3.A2

Continue to work with the Royal Melbourne Hospital, the Royal Women's Hospital and the Royal Children's Hospital, located to the north of City North, to increase and encourage the provision of community and cultural services.

C3.A3

Continue to develop partnerships with medical institutions and other organisations for shared provision of community health services.

1 year

1 - 5 years

5 + years



Strategy 4

Provision of affordable, accessible and diverse housing

It is important that housing in City North is designed to accommodate a diverse population. New housing will be supported by amenities such as public transport, local services and local employment opportunities.

Future Melbourne established a goal for the provision of 20 per cent affordable housing in all new developments.

The City of Melbourne will develop a housing policy and work with the State and Federal Government, developers, institutions and community housing providers to support the delivery of affordable, accessible, adaptable and diverse housing options to ensure an inclusive community.

The policy can assist in delivering affordability by ensuring diversity in size, storeys, number of bedrooms, density, accessibility, style, and so on.

The built form controls in City North will support the delivery of a range of housing options and enable buildings to be adapted in the future. A high quality of life will be supported by well designed public transport, walkways and cycle routes, streets and open spaces that enhance opportunities for physical activity and local social connection. Housing will be designed to engage with the street and have a positive interface with the public realm. To support an inclusive and diverse community it is important that these are designed to be accessible for people of all ages and abilities.

Actions

This strategy will be implemented through the following actions.



Strategy 5

Enhance the Meat Market as an arts hub

The Arts House at the Meat Market will be reinvigorated as an arts hub, building upon the area's creative talent and strengthening opportunities for the development of independent arts production and presentation. The arts and cultural programming at the Meat Market will be an arts and cultural anchor which engages the growing community of City North.

The City of Melbourne presents a curated program of contemporary art including performances, exhibitions, live art, installations and cultural events at the Meat Market. However, the Meat Market is currently owned by the Victorian Government.

As the Meat Market is an important cultural and community asset, there is an opportunity to investigate the City of Melbourne acquiring this venue from the Victorian Government. This would enable the City of Melbourne to strengthen the use of the diverse gallery, workshop and rehearsal spaces within the Meat Market for creative development and enhanced participation and engagement with the arts.

Actions

These strategies will be implemented through the following actions.



Research

C5.R1

Investigate opportunities for the City of Melbourne to acquire the Meat Market to secure this arts hub as an important cultural and community asset.



Advocacy

C5.A1

Continue to support an engaging arts and cultural program at the Meat Market.

1 year

1 - 5 years

5 + years



Strategy 6

Provision of creative and cultural spaces

Spaces for the development, production and presentation of arts based creative work will complement and strengthen the knowledge precinct's identity. Some buildings may offer the opportunity for the integration of creative spaces to support local artists and designers. These studios and workspaces will be designed to support local enterprise and productivity. Strengthening the role of creative spaces in City North will offer numerous benefits including:

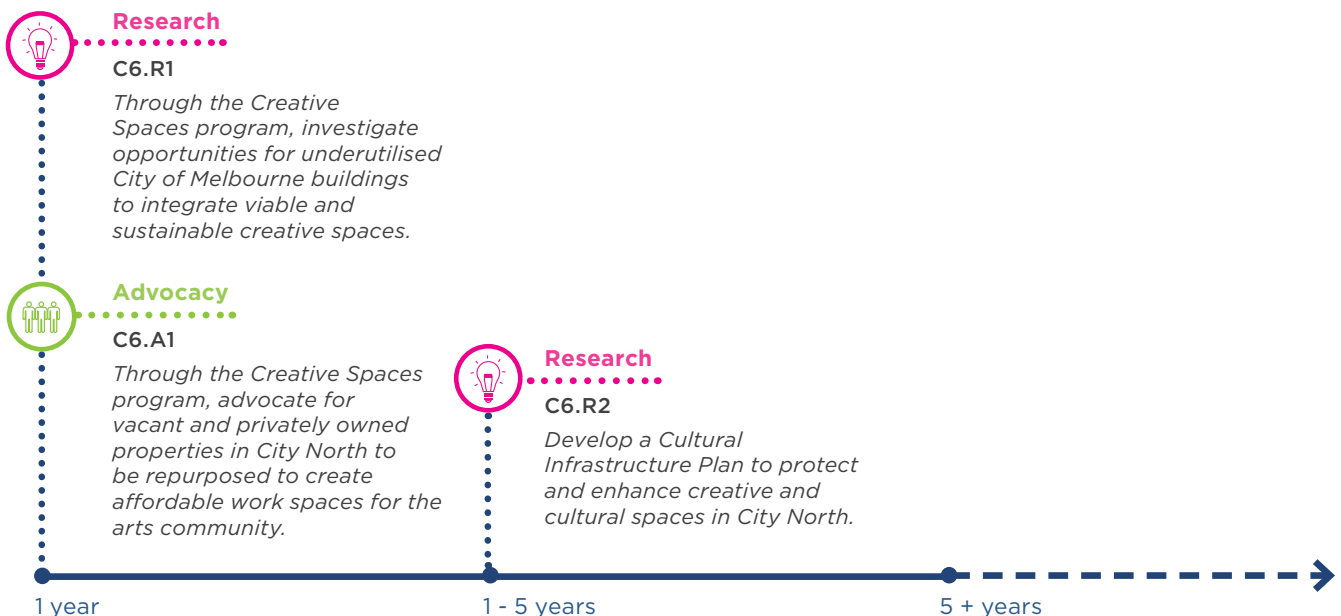
- Activating underutilised buildings
- Supporting local employment
- Contributing to the reputation and identity of the area.

The development of a Cultural Infrastructure Plan has potential to investigate the opportunities in City North to protect and enhance:

- Live/work artist studios
- Theatres
- Independent cinemas
- Rehearsal spaces
- Creative workshops
- Live music venues.

Actions

These strategies will be implemented through the following actions.



30-year vision

City North will be an eco-city district with integrated and efficient private and district energy, water and waste systems that will also proof the area against drought, heat wave and extreme weather events.



7.1 Introduction

Overview

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Sustainable infrastructure

Cities consume significant quantities of resources and have a major impact on the environment that extends well beyond what can be managed within their borders (Melbourne Principles for Sustainable Cities, DSE, 2002). This trend is unsustainable. It needs to be halted and then reversed. Future cities must reduce demand on the finite resources available, be smarter about how they reuse resources and, ultimately, become self-sustaining.

Australia has approximately 0.3 per cent of the world's population, but contributes approximately 1.5 per cent of total greenhouse gas emissions. This puts Australians among the highest per capita emitters (Garnaut, 2008). Reducing greenhouse gas emissions is necessary to mitigate human-induced climate change.

Over 90 per cent of Australia's electricity is generated by burning fossil fuels, with coal contributing 76 per cent (ABARE, 2008). Given that 37 per cent of Australia's greenhouse gas emissions (GHG) result from the generation of electricity (DCCEE, 2011), if energy generation and supply is to meet the challenges of reducing greenhouse gas emissions, cities must reduce their reliance on fossil fuels. A shift away from solutions involving large, centralised generation systems to smaller decentralised systems is likely to be an important part of the response.

Australia has one of the highest per capita water consumption rates in the world (Melbourne Water, 2009). While two thirds of all the people on Earth use less than 60 litres of water a day, the average Australian uses more than twice that amount during a single shower (Melbourne Water, 2011). In an average year, metropolitan Melbourne consumes approximately 500GL of water (Melbourne Water, 2009).

While water storage supplies in Melbourne have steadily declined over the last decade, water consumption has been steadily increasing. Over the past 100 years Melbourne's total water consumption has increased from 50,000ML per year to over 550,000ML per year. While largely attributable to Melbourne's growth in population, the available water supply in Melbourne is finite – it is not a growing resource. As the City North precinct grows, it is important to find ways to ensure that water consumption does not grow with it.

With climate change and global warming expected to reduce future rainfall and hence Melbourne's water supply (DSE, 2008), reduced water storage coupled with future population growth will lead to water scarcity. Through initiatives such as the re-use, recycling, and conservation of water, water sensitive urban design (WSUD), sewer mining and stormwater harvesting, new and better ways of managing water resources can be implemented.

The significant increase forecast for City North's residential and worker population will require a considerable level of investment in new infrastructure to meet future increases in demand. In order to assess the capacity of City North to accommodate this growth, a comprehensive analysis of the current infrastructure provision will need to be undertaken.

The current provision of energy and water services adequately meets existing levels of demand, however the way the City North precinct is developed now and into the future presents significant opportunity to plan for and identify mechanisms for the delivery of these services in a more sustainable form, to reduce the environmental impacts generated in urban environments, and to embed and deliver City of Melbourne Future Melbourne Eco-City goals through Zero Net Emissions by 2020, Climate Change Adaptation and Total WaterMark strategies. It is an opportunity to demonstrate that a more sustainable future for the City North precinct is achievable.

7.2 Objectives

Principle 10

Grow a city that prospers within the earth's ecological limit

1. City North is established as a vibrant, attractive and self-sustaining precinct, which better services the community through an urban and built form that is energy efficient and adapted to climate change.
2. Energy and water services are constructed and supplied sustainably.
3. An integrated concept supports and informs the development and delivery of services in City North.
4. The City of Melbourne looks beyond the boundaries of City North for opportunities involving neighbouring precincts.

7.3 Issues

1. Utility Infrastructure

Unsustainable infrastructure

Existing infrastructure in City North is unsustainable and ageing. Infrastructure will need to be updated to accommodate increased residential, worker and visitor population numbers. City North is generally regarded as a high cost construction zone due to the high costs of reinstatement and traffic management and other asset congestion in the ground.

Existing services for electricity, water supply, gas, sewerage and drainage have major trunk pipelines traversing the precinct. An overview of the current method for the delivery and management of each of these services is outlined below.

Electricity

CitiPower is the responsible authority for maintaining and operating the electricity distribution and subtransmission network within City North.

These systems transfer power from the high voltage transmission network (operated by SP AusNet) to the major load centres via terminal stations and zone substations. The distribution system then accepts power from the zone substations and distributes it to consumers.

The existing electricity supply infrastructure uses ageing technology and has insufficient capacity to meet the potential increase in demand. Two electricity zone substations are located just outside the boundary of the City North precinct, at the Queen Victoria Market and Bouverie Street.

The major constraint with the current electricity infrastructure is that it is not designed for distributed energy generation.

Gas

Gas is distributed to most consumers from a high pressured transmission pipe through a reticulated network which operates at lower pressures. The responsible authority is APA Group, as the owner of the high pressured network. There is a gas reticulation system within the precinct, however, the exact location of the gas trunk infrastructure will need to be sourced.

Water supply

City West Water manages an extensive potable water main network. There are several water mains in and near the City North precinct, including water mains that run east-west under Queensberry and Victoria Streets and another running north-south under William Street and Royal Parade. These require further investigation.

Sewerage

City West Water manages and maintains an extensive sewer pipe network which extends along most roads in City North (with occasional pumping stations) servicing the City North precinct. The network requires further investigation, however it discharges to Melbourne Water's sewage treatment plant. A sewerage mains is located along Gatehouse and Harker Streets, south of the Royal Children's Hospital.

Drainage (stormwater)

The existing drainage trunk infrastructure relies on overland flow paths to accommodate part of the flows resulting from rainfall events, with a 100-year annual recurrence interval frequency. Several large stormwater drains converge at the intersection of Therry and Elizabeth Streets. Climate change is expected to impact adversely on drainage outfall arrangements through both sea level rise and increases to peak flows.

City North Structure Plan 2012

2. Natural Resources

Climate change is expected to increase the severity of flooding, while reducing the long term average annual rainfall. Reduced water supplies, coupled with future population growth, are likely to lead to greater water scarcity so there will be a benefit in having a range of water supply options. A water balance for City North has not been developed and catchment flows have not been modelled to date. Seasons are a critical factor, as periods of peak demand (summer) and peak supply (winter) are not synchronised. Consideration needs to be given to how alternative water supplies will be collected, treated, stored and distributed. Other considerations include likely energy demand when evaluating the benefits of wastewater treatment.

3. Access to solar

Solar radiation can be converted into energy, using photovoltaics to generate electricity, and solar hot water units to generate hot water. The generation of energy is affected by the availability of sunlight. The height of existing and future building structures in City North will need to give consideration to access to sunlight.

4. Protecting the urban forest

The City of Melbourne has an existing 'urban forest' which insulates the city against heatwaves, winds and heavy rain events. City North's tree cover currently stands at 14 per cent. Increasing this cover to 30, 40 or 50 per cent can reduce peak summer temperatures by 7 degrees Celsius, which will significantly reduce the energy load of air conditioners.

5. Land supply

Distributed energy and water supply systems will require a significant amount of space to house plant and equipment. Land ownership is also a significant obstacle in reducing the environmental impact of the precinct. In general, sustainability initiatives will not provide a high commercial return for existing private land owners, so it is likely that the location of initiatives that require a significant parcel of land, such as distributed energy generation, may be limited to government-owned or low value land.

6. Regulatory barriers

At present, the regulatory barriers governing the supply and distribution of utility services do not support the implementation of the proposed distributed servicing study. The City of Melbourne needs to take on a stewardship role to drive the realisation of the sustainable infrastructure servicing concept.

7.4 Strategies

Strategy 1

Establish central services hubs (CSHs)

City North is well positioned to realise new ways of providing energy and water that are less resource intensive. Several interconnected central services hubs (CSH) could be located within the area to meet City North's energy and water needs.

A CSH is a large area that can store wastewater and house plant and equipment that generates recycled water and energy.

CSHs provide an efficient method of generating and managing resources as they take advantage of the cross-benefits between the different systems. For example, the generation of electricity creates heat as a by-product that can be used to treat captured stormwater. Excess heat can be circulated through the area and used to heat or cool buildings, or for other applications such as heating swimming pools or industrial applications.

Locations for the CSHs have been identified, based on the location of, and proximity to, existing services and the space opportunities proposed redevelopments present. Following consultation with several stakeholders, and consideration of these issues, seven sites have been nominated for further investigation as a CSH.

The chilled, heated and recycled water generated within the CSHs will be distributed across the precinct via the combined services tunnel for consumption by individual buildings (see strategy 4). Energy will be generated in CSH 1, 2, 4, 5 and 6 (see Figure 7.1). For CSH 2, 4 and 5 electricity will be fed into the electricity substations, and for CSH 1 and 6 all generated electricity will be consumed on site. Stormwater

will be harvested from the existing stormwater pipes and stored and recycled in CSH 2, 3 and 7.

The CSHs will:

- House the plant and equipment required to generate energy and water resources.
- Avoid the loss of electricity in transmission and distribution from the generator to the end user.
- Reduce refrigerant pollutants by reducing the need for building air conditioning.
- Offer greater efficiency than a building by building approach to the generation of energy and water.

District scale combined heat and power systems are proven technologies which have been in operation in other parts of the world for many decades. District cooling systems have also been developed and proven overseas. Combining these energy systems with water treatment plants is an innovative concept however the technologies proposed are proven and operate in various developments in Australia and internationally.

In selecting an appropriate area within City North to locate the CSHs the following factors need to be considered:

- Access to services, including electrical, heating and fuel supplies.
- Noise emissions.
- Exhaust emissions.
- Ventilation and air quality requirements.
- Delivery, access and positioning of the system.
- Maintenance requirements.
- Land area relative to system size.

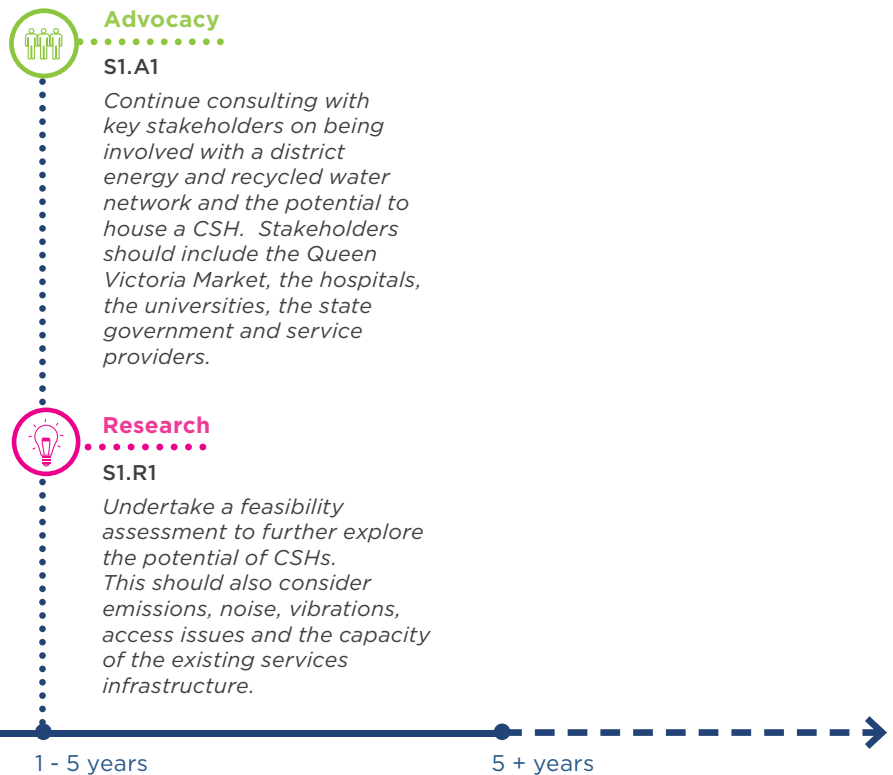
As far as possible, the plant building should be screened from the public realm, preferably by other land uses, for example commercial premises. Locating these sites early on will ensure that future development does not establish land use activities that will preclude the delivery of this infrastructure at a later date.

7

Sustainable infrastructure

Actions

This strategy will be implemented through the following actions.



Strategy 2

Generate non-potable water

Existing water supplies on site include mains water (a potable supply), rain water, stormwater and waste water. Reducing the demand on the potable supply would require an increase in the use of one of these alternate sources.

Treating stormwater or waste water to drinking quality would be difficult to justify economically with an existing potable supply system in place. Providing Class A water to the area, however, would provide an alternate and more affordable water supply that could be used for:

- Toilet flushing and laundry use.

- Heat rejection (in cooling towers which can be up to 50 per cent of on-site water demand).
- Irrigation for public and private open space, green roofs or green walls. This would significantly reduce the urban heat island effect.
- Redistribution through the area as hot and chilled water (heated within the tri-generation plant).

Stormwater is proposed to be collected, treated, stored and distributed across the precinct as Class A water to service these applications.

The treatment and harvesting of stormwater will also reduce energy consumption and greenhouse gas emissions, through a reduction in the pumping of water and sewerage to and from centralised treatment plants. Through these initiatives up to 80 per cent of the local stormwater run-off and up to 50 per cent of the external run-off from the main stormwater drains could be harvested.

Stormwater is proposed to be collected from underground stormwater pipes located at the intersection of Therry and Elizabeth Streets and Flemington Road near the Royal Children’s Hospital. The stormwater would then be sent for storage to the CSH located at either the Queen Victoria Market, the Flagstaff Gardens, an aquifer or the underground car park at the old Royal Childrens Hospital. Within the CSH the stormwater would be treated and then discharged across the precinct for use via the central services tunnel. (See Strategy 4).

Actions

This strategy will be implemented through the following actions.

Research

S2.R1

Investigate the technical feasibility of treating and storing stormwater in a public open space - aquifers, the Flagstaff Gardens, the old Royal Children’s Hospital underground car park or the Queen Victoria Market.

S2.R2

Undertake a water balance to determine seasonal non-potable water demand, volumes of stormwater that can be harvested and the potential sizing requirements of a system to store and treat the stormwater.

Advocacy

S2.A1

Liaise with the water authority (City West Water) to ensure a sustainable stormwater outcome can be achieved for City North.

