

- Discussion Paper -
Infrastructure



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1. Infrastructure Executive Summary

A bustling City like Willoughby cannot achieve its full potential unless it is supported by adequate physical infrastructure. This includes:

- Transport networks including all public transport and all public roads and associated kerb and guttering, footpaths, off street car parks and cycle ways;
- Public buildings and facilities (including administration, sports, arts & cultural facilities, street furniture, street lighting etc);
- Water infrastructure including the water supply, sewerage system, stormwater and waste water systems;
- Open space and recreation facilities (playing fields, parks, gardens, bushland areas);
- Waste collection and treatment (domestic and commercial);
- Educational facilities (including public & private schools, TAFE);
- Health sector facilities (including RNSH, private hospitals, medical centres);
- Telecommunications networks (including land line, broadband & mobile networks).

Key Facts

- A large proportion of Willoughby's infrastructure is aging;
- Significant redevelopment that has taken place in recent years was not envisaged or taken into consideration at the time of the infrastructure construction;
- Increased pressure from recent developments within the Council area has resulted in a deterioration of its infrastructure;
- Cost shifting by State Government to Councils and increasing infrastructure costs mean that the long term maintenance and replacement costs of infrastructure are increasingly beyond the revenue base of Council;

Challenges

Key challenges include:

- Adoption of a Strategic Asset Management approach (rather than being reactionary), ensuring existing and new infrastructure is designed and maintained so that contemporary design standard complying infrastructure improves the amenity of the city;
- A comprehensive audit of all infrastructure within the City, facilitating any subsequent assessment of the infrastructure capacity to cope with existing and projected development;
- Increasing greater community awareness and participation in establishing the required levels of service for infrastructure;
- Addressing sustainability in terms of its economic, social and environmental factors;
- Implementation of sustainable water and energy supply and including increasing use of green energy and demand management principles where persons and businesses are required to pay a price that reflects the true cost of energy and water consumption;
- Establishing an integrated and sustainable water management system addressing capture and storage, 'fit for use' treatment and re-use opportunities;
- Overcoming funding shortages & providing alternative revenue sources to meet ongoing infrastructure maintenance, upgrading and replacement costs
- Integration of social & physical infrastructure;

- Ensuring infrastructure is appropriate for the end users including an aging and ethnically diverse population;
- Advocacy and working in partnership with the state government, regional organisation of councils, local residents and the business community as appropriate to improve infrastructure.

2. Infrastructure in Willoughby

For the purposes of this paper, infrastructure is defined as all physical infrastructure whether owned by the Federal, State or Local Government or privately owned as follows:

1. Transport networks including all public transport and all public roads and associated kerb and guttering, footpaths, off street car parks and cycle ways (Note: Transport issues are discussed under the Transport paper).
2. Public buildings and facilities (eg. libraries, administration, arts, cultural and other community facilities and amenities, The Concourse, Dougherty community centre, commercial property assets, minor assets such as street furniture, street lighting, retaining walls, fences etc).
3. Water utilities
 - (i) water supply (safe drinking water, other uses);
 - (ii) sewerage system;
 - (iii) stormwater & wastewater systems (ie. drains, pits, pipes and water quality control devices, on-site detention systems, flood protection systems, minor assets such as street furniture, street lighting, retaining walls, fences).
4. Open space and recreation facilities, playgrounds, barbeques, walking trails etc.
5. Waste collection and treatment (garbage collection & maintenance of public areas, streets).
6. Educational & health sector facilities.
7. Telecommunications networks (TV, radio, telephone, cable broadband networks).

(Transport, social and housing infrastructure are included under the Transport, Community and Housing discussion papers. Energy supply systems are included in the Natural Environment discussion paper.)

Well designed and maintained infrastructure is the cornerstone of public well being and safety. Infrastructure networks provide everyday services to the community and are the platform for economic and social development. A bustling City like Willoughby cannot achieve its full potential unless it is serviced by adequate infrastructure. It needs good roads, drains, car parks, community buildings, open space areas, sewers, schools and hospitals.

When discussing infrastructure, consideration should be given to sustainability in terms of economic, social and environmental factors (known as “the triple bottom line”). Infrastructure management planning supports this strategy by promoting sustainable use of the physical as well as the natural environment.

Like all Sydney metropolitan local government areas, Willoughby’s infrastructure is aging, and this older infrastructure needs to be maintained and upgraded requiring an increase in funding. It is important that the investment by all three levels of government and the business sector in existing infrastructure and facilities is maintained and expenditure optimised. Local infrastructure such as local roads and waste services are Council’s responsibility. However, much of the other infrastructure in Willoughby is the responsibility of the State Government. In this regard, Council has a vital advocacy role and the opportunity of working in partnership with the state government and business community where appropriate.

Despite aging infrastructure, the population and economic growth experienced in recent years as a result of new development has meant that significant new infrastructure has been added to the City. However, the need for new infrastructure has not kept up with the demand brought about by growth. To keep up with the demand, new infrastructure must be well designed, have adequate capacity, and be managed and maintained in a cost effective way, taking into account not only the construction costs, but also the ongoing and replacement costs. It must extend beyond traditional infrastructure improvement and embrace environmental sustainability and include alternative ways of reducing impacts on the natural environment.

Responsibilities and co-ordination of infrastructure provision

Council's role in infrastructure provision

Infrastructure provision has always been recognised as a core business of local government. This is reflected in the often referred to three "R's": rates, roads and rubbish. However Council's role has expanded to provide many community services which also rely on adequate infrastructure provision. A summary of Council owned physical infrastructure and asset condition is contained in the Asset Management Improvement Strategy, June 2012:

- The total length of the road network in Willoughby is 234 km. Of this, 23 km are classified as State Roads and Freeways and are maintained by the NSW Roads and Maritime Services. Council is responsible for the care and control of the remaining 211 km of sealed roads.
- The kerb and gutter network provided by Council conveys stormwater run off from roads, adjoining footpaths and property into the stormwater network, supports the edge of the road pavement and prevents vehicles parking on footway areas. Excluding those constructed in-situ materials, Council is responsible for 372 km of kerb and gutter.
- Council is responsible for approximately 436 km of footways, 387 km of which is located within road reserves, with the remaining 49 km located within open space areas. The types of footpaths provided by Council include: concrete, bitumen and paved footpaths; unsealed footpaths of turf or natural materials; shared paths for pedestrians and cyclists; and stairs (excluding suspended stairs, which are treated as bridges for structural inspection purposes).
- As of 30 June 2011, Council is responsible for 71 bridges (21 major bridges, 8 major culverts, and 42 minor structures).
- Council is responsible for the care and control of approximately 162 km of stormwater conduits and 4,815 various stormwater pit types.
- Council owns 130 buildings and is responsible for their maintenance unless otherwise specified in lease agreements. Buildings may fall into the following functional classifications: amenities; child care centres; commercial premises; residential; community centres; council halls; council housing; council libraries; council offices; depots; and other facilities. Council has completed its new cultural facility (including the Chatswood library), known as The Concourse in 2011.
- The total area of all open space areas within the Willoughby LGA is 424 hectares. Of this, approximately 130 hectares of passive recreation spaces exist across 78 sites.
- Council provides sporting facilities at 18 sites throughout the LGA in both open space areas and state government school grounds. The types of facilities include: ovals; basketball and netball courts; cricket pitches and practice nets; tennis courts; croquet greens; bocce courts; a skate park; and an athletics field. The provision of these facilities is possible due to the installation and maintenance by Council of various types of assets such as playing surfaces, fencing, goalposts and lighting.

- Council is responsible for 50 playgrounds, of which 39 fall within open space areas and 11 are associated with Council owned childcare centres.
- Council is responsible for a total of 290 hectares of bushland.

Council also owns a fleet of vehicles, plant and equipment.

Much infrastructure was constructed when the City of Willoughby developed in the early 1900's. The significant development that has taken place in recent years was not envisaged or taken into consideration when designed at the time. As a result, the increased pressure from recent developments within the Council area has resulted in a deterioration of its infrastructure as demand exceeds the designed capacity.

Council's 2012 Community Survey identified the community's satisfaction with the condition of the majority of infrastructure as in the medium range.

The following are recent achievements in infrastructure provision:

- The completion in 2011 of The Concourse, containing a Performing Arts Centre, the new Chatswood Library and open space;
- The completion in 2011 of the internal and external restoration of the Walter Burley Griffin designed Willoughby Incinerator as an art space and artist's studios;
- The finalisation of flood studies for the Sugarloaf Creek Catchment and Overland Flooding Investigation for the entire LGA;
- Installation of a synthetic multi-purpose exercise court in Northbridge.

In addition to management of Council owned infrastructure, Council also has an advocacy role to ensure that the significant level of state government and private sector infrastructure located within Willoughby is maintained to an acceptable level for use. In addition, actions of other utility providers can impact on Council owned infrastructure e.g. opening up and patching roads to lay new services. There is a need for greater information sharing and coordination between Council and the other service utilities to protect and optimise the life of this infrastructure.

Federal Government role

Commonwealth funding is provided for major projects through Infrastructure Australia and under the Roads to Recovery program and a number of other initiatives.

Cooperation between Local, State and Federal government increases the capacity for information sharing and strategic planning and management of infrastructure in a sustainable way.

State Government role

Over the last 5 decades successive state governments have required local government to implement a policy of urban consolidation in order to accommodate increasing population growth over the metropolitan region whilst at the same time reducing expenditure on infrastructure that is necessary to support this growth. Willoughby has made a major contribution towards urban consolidation by implementing and exceeding its residential strategy. In the decade from 2001-2011, Council approved an additional 1456 dwellings to cater for its growing population. During this time the state government has constructed the Epping to Chatswood Rail link (with a new Chatswood interchange) and the Lane Cove Tunnel. However projects such as the widening of the Pacific Highway in Chatswood have not been undertaken.

In addition, a proportion of urban consolidation within Willoughby City has occurred through the sale of large state government owned lands and assets. Council policy is that it does not support the outright sale of any public land by any government body unless it has been demonstrated that all other options have been fully explored and that such a sale can be shown to provide local and public benefits. Given the nature of the relationship between councils and State and Federal Government, the power of Council to enforce this policy is limited.

A first step in addressing long term infrastructure needs is that State government in conjunction with Council provide evidence regarding the capacity of infrastructure before further housing and employment growth is imposed. A comprehensive government audit of the remaining capacity of the City's water/ sewerage, transport and other infrastructure for which State government is responsible should be made available to Council and industry groups prior to accommodating any further growth. This includes ageing water/ sewerage systems and finite road networks that have inherent limitations for growth. An analysis of this capacity and its limitations for growth and a matching commitment to upgrade infrastructure is required to support additional development in Willoughby that already has pressures on its infrastructure.

A second step is that clear targets for employment and population increases that respond to this infrastructure capacity assessment (and any constraints) are then required to be set by the state government in order for Council to effectively plan for future infrastructure needs. These targets then need to be met by infrastructure funding. The state government has continued to exercise its powers overriding councils to provide 'critical infrastructure' by classifying it as State Significant Development (SSD) (eg. Chatswood Railway Station upgrade). Such development includes government as well as private development. A range of development types are considered to be SSD if they are over a certain size or located in a sensitive environmental area. Some projects may also be considered SSD because they are located in precincts regarded as important by the NSW Government. Development that is not identified in the SEPP may be declared to be SSD by the Minister for Planning and Infrastructure after obtaining, and making publicly available, advice from the Planning Assessment Commission (PAC) as to the State or regional planning significance of the proposed development. SSD projects are assessed by the NSW Department of Planning and Infrastructure, with input sought from local government, other NSW Government agencies and the community as part of the assessment process.

Concern exists with Metro Strategy papers which are not translated into specific detail of infrastructure commitments and sufficient provision of funding. In addition, provisions for state significant development allow a reduction in the environmental assessment of major infrastructure projects under the guise of expediency.

Current state government funding is not sufficient to maintain assets such as roads in the long-term.

There is a widespread practice of 'cost shifting', whereby services traditionally provided by State Government are moved onto Council with either no monetary compensation, or only start up funding that is withdrawn once a service is established. Rate pegging exacerbates this problem, which limits local government's reserves to upgrade existing infrastructure and provide new infrastructure. The State Government should be working closely with the private sector and local government to confront this challenge.

Governments are caught in the short-term political cycle and must have the political will to make the difficult decisions now, preventing the continuance of unsustainable practices. This includes implementation of sustainable demand management principles where persons and

businesses are required to pay a price that reflects the true cost of what they are consuming (water and electricity).

For decades there has been a lack of co-ordination between different branches of government and the proposed centralisation of agencies by a single minister to co-ordinate planning is supported. There is also a greater role for each Regional Organisation of councils for policy development, government and state agency advocacy and co-ordination of infrastructure funding. The current Green Paper 2012 on a proposed new planning system for the state suggests this situation may improve through Sub Regional Delivery Plans.

3. Current trends in Infrastructure – where are we heading?

Fostering a Council culture of Strategic Asset Management and Planning

Asset management refers to many activities traditionally undertaken by Council, such as road pavement maintenance, park landscaping and the provision of high need services such as cultural centres.

The goal of infrastructure asset management is to meet a required level of service in the most cost-effective way through the creation, acquisition, maintenance, operation, rehabilitation and disposal of assets to provide for the present and future community. Improvement in asset management involves formalising the knowledge about asset performance, maintenance levels and community expectations in order to optimise both expenditure and service provision over a long time scale.

Key elements of infrastructure asset management are:

- developing cost-effective management strategies for the long term;
- providing a defined level of service & monitoring performance;
- managing risks associated with asset failures;
- environmentally sustainable development and triple bottom line.

Council has engaged external asset management expertise since 2008 to provide guidance and regularly assess improvements in asset management practices. In 2009 Council adopted its first Asset Management Policy, which provides the framework for managing its large portfolio of assets.

Council has an asset management system in place, being part of Council's overall Resource Strategy. Council developed Asset Management Plans for each major asset class at the end of 2010 (first generation), with second generation plans completed in 2012. For each class of asset the Plan provides, where available, the following information:

- Dimensions and attributes of assets;
- Condition (physical, capacity, fitness for purpose);
- Levels of service;
- Risk analysis; Financial summary;
- Future demand forecasts;
- Goals for future service delivery through assets; Actions to achieve desired service delivery;
- Funding for future maintenance (10+ years planning);
- Funding for future capital works (10+ years planning);

- Decision making methodologies and supporting documentation.

The Asset Management Plans produce information for a 20 year planning horizon, despite long term financial planning being based on a minimum of ten years. This is because major asset renewals due to occur just outside the ten year planning horizon often need to be budgeted and planned for several years in advance.

As of August 2012, a total of nine plans have been prepared as follows:

- Parks – Passive Recreation Asset Management Plan;
- Stormwater Asset management Plan;
- Sports Grounds Asset Management Plan;
- Playgrounds Asset Management Plan;
- Buildings Asset Management Plan;
- Kerb and Gutter Asset Management Plan;
- Bridges Asset Management Plan;
- Footpaths Asset Management Plan;
- Road Pavements Asset Management Plan.

It should be also noted that Council's infrastructure works program, although increasingly being based on condition audits, is at times response based. Whilst it is important that Council continue to respond to demand, this sometimes leads to complaints overriding the works plan priorities set in the context of an overall strategic asset management plan.

The culture and attitudes of all stakeholders, including Council officers, Elected Councillors and the resident and business community, is in the process of changing to support strategic asset planning. This involves a whole of council approach, in best practice asset management, that will optimise the life cycle of an asset, maintaining an acceptable level of service, and enhancing the value. It will also enable impacts of future development to be more accurately considered.

Sustainable infrastructure maintenance and development

Sustainable development principles require the implementation of a triple bottom line approach that addresses the environmental, social and economic aspects of the future planning of existing and new infrastructure within Willoughby. A quadruple bottom line impact report is to be provided for all new infrastructure projects.

Environmental sustainability

On a per capita basis, Australians have one of the world's largest ecological footprints per person. Addressing this issue calls for extending beyond traditional infrastructure approaches to be environmentally sustainable and include alternative ways of reducing the impacts on the natural environment including:

- protection and enhancement of both the built and natural environment promoting good design and the principles of ecologically sustainable development;
- reduction of greenhouse gas emissions including promotion of the use of low emitting fuels and renewables;
- management of bushland so as to protect biodiversity and maintain areas of special ecological value;
- minimisation of pollution in the air, land and the natural water ways;
- reduction of resource consumption through water and energy conservation; and
- applying reduce, reuse and recycle approaches for waste management.

Social sustainability

Provision of infrastructure is to have regard to access and equity principles for all within the community ensuring that there is no adverse impacts on community health and well being. Maintaining appropriate infrastructure service levels will facilitate improved employment opportunities within Willoughby.

Community awareness and participation in decision making plays a crucial part in assessment of the social implications of infrastructure planning. Apart from the completion of new infrastructure, the community often takes the maintenance of existing infrastructure for granted until the level of service of the infrastructure deteriorates or fails, when it is too late. Council has a role to play in raising community awareness of the importance of asset maintenance in order to gain support for the maintenance of existing infrastructure in budget and resource allocation. This process will be facilitated by opportunities for community input into establishing 'levels of service' and infrastructure needs.

Economic sustainability

A summary of the financial implications for Council maintaining infrastructure is contained in the Asset Management Improvement Strategy, June 2012:

- The total replacement cost of Council's civil infrastructure asset portfolio is approximately \$599.5 million, and is broken down as follows:
 - Road Pavements (\$179.6 million);
 - Buildings (\$139.7 million). ;
 - Stormwater (\$94.3 million);
 - Kerb and gutter (\$79.8 million);
 - Footpaths (\$59.1 million);
 - Passive recreation (parks) (\$18.3 million);
 - Sportsgrounds (16.5 million);
 - Bridges (\$10.3 million)
 - Playgrounds (\$1.9 million)

The above figures highlight the cost of maintaining and replacing existing infrastructure at the end of its lifespan. Infrastructure and capital expenditure is often the easiest area to be reduced when attempting to reduce budget deficits. This practice has been adopted by all levels of government over the last few decades with a focus on reducing government debt levels and is not sustainable. The avoidance of short term costs, ongoing maintenance costs and occupational health and safety to retain identified levels of service of infrastructure results in higher long term costs in infrastructure replacement.

Infrastructure maintenance costs are continually rising due to changes in public liability exposures, community expectations, and today's increased environmental performance standards. Increasing operating costs beyond the direct control of Council continually erode the funds available for major infrastructure works. The State Government severely restricts Council's revenue raising capacity by pegging council rates each year at the level of inflation. Council is therefore required to utilize alternative revenue sources including:

- Council obtained a special rating variation for the e-restore levy in 2000 that funds an environmental restoration program within the City. Subsequently the e-restore levy has been extended, currently as e-restore 3.
- Section 94A – levy on development for contributions towards the capital infrastructure costs of Council facilities. The funds available are limited and only meet a proportion of total cost.

- Grants from state and federal government reflecting the regional nature of facilities. Currently funds available are limited.
- Council to investigate opportunities for Public Private Partnerships (PPP's) but maintain control of the public asset.
- Following on from significant improvements already gained, Council to look at further ways to reduce operating costs (however there is a limit to savings in this area particularly as service, transparency and accountability in decisions and good community consultation is a key objective of the Council).

Council will continue to diversify revenue sources so that sufficient funds are available that are required to improve aging infrastructure. When insufficient funds are available, strategic asset management principles will determine infrastructure priorities to maintain the most appropriate levels of service. The financial sustainability of infrastructure needs to address initial and re-occurring impacts and costs through out the lifecycle of the infrastructure.

Council will lobby the State and Federal Governments through the Local Government Association to consider new ways to fund infrastructure projects.

4. 15 Year Vision for Infrastructure in Willoughby

Council's Infrastructure goal for the next 15 years is to:

“To provide sustainable physical infrastructure that enhances the public domain, improves the amenity, safety and health of the City and meets the needs of the community.”

It is proposed to achieve this goal with three objectives, which are outlined below together with the supporting strategies.

1. Efficiently operate and manage infrastructure assets.

Strategies

- a. Integrate and coordinate the provision of services and infrastructure by authorities and providers.
- b. Manage and maintain Council assets for whole of life-cycle.
- c. Increase the funding base where appropriate through user pays and special levies.
- d. Undertake “quadruple bottom line” reporting for all infrastructure related decisions.
- e. Advocate for safe, efficient and best practice upgrading of utilities infrastructure by government and the private sector.
- f. Provide and maintain an efficient and effective emergency management system.
- g. Provide risk management programs to enhance public safety and protect Council's assets.

2. Sustainable provision and use of infrastructure.

Strategies

- a. Assess infrastructure capacity with population and employment targets set in negotiation with the NSW Government.

- b. Investigate new, innovative ways to finance the provision of Council infrastructure.
 - c. Require developers to contribute to the provision of infrastructure and facilities.
 - d. Design infrastructure that responds to the impacts of climate change.
 - e. Monitor the implications of climate change and weather behaviour on infrastructure provision and reviewing strategies accordingly.
 - f. Undertake flood studies and preparing flood management plans for local catchments.
 - g. Ensure that infrastructure works adopt a whole of life cycle approach where sustainability principles are considered at each stage including planning and design.
 - h. Provide leadership in new environmental practice and pilot projects.
 - i. Apply the principles of water sensitive urban design to all development in the City.
3. Minimal urban runoff into waterways.

Strategies

- a. Stormwater reuse for open space irrigation.
- b. Develop and implement plans for capture and reuse of stormwater.

5. How to achieve the vision and strategies

Following is a summary of the specific issues and strategies that relate to all physical infrastructure within Willoughby City, including that under the ownership of Council, State Government and the private sector.

Public Buildings and Facilities

Council's buildings are maintained and enhanced where required in accordance with Council's recurrent service contract requirements and programmed building maintenance. Council's Property Section ensures that all council buildings and amenities are kept in a clean and hygienic state and that rental income from Council's assets and real estate properties is maximised.

Council's Senior Management are reviewing Council's property portfolio to ensure that the assets held within the portfolio are consistent with Council's future directions and that usage is being optimised. An Asset Management Plan and Policy have been developed to identify Council's long-term vision for its properties. There is a need to ensure that facilities are more multifunctional in order to maximise their access for a range of activities and users.

Water infrastructure

- (i) *water supply (safe drinking water, other uses)*
- (ii) *sewerage system*
- (iii) *stormwater & wastewater systems (ie. drains, pits, pipes and water quality control devices, on-site detention systems, flood protection systems)*

The current practice over the Sydney Metropolitan Region of piping in large amounts of water supplies and piping out equally large quantities of waste water is not sustainable. This

practice is detrimental to the environment and represents a waste of what otherwise would be a valuable water resource.

Planning for water aims at conserving and protecting water quality and quantity and involves an integrated whole of water cycle management approach that emphasises water conservation and water sensitive urban design (WSUD). This approach is achieved by a number of varied actions and has the objectives of minimising impacts on the natural water cycle to reduce environmental impacts, improve water quality and minimise the need for expanding water related infrastructure to match a growing population.

(i) Water supply

National level

The National Water Initiative was agreed to by the Commonwealth of Australia Governments (COAG) and sets out objectives, outcomes and actions for the ongoing process of national water reform. This is to be implemented by the National Water Commission that has identified a number of key areas which will be critical to water reform. A key aim of the Initiative is to restore surface and groundwater systems to environmentally sustainable levels by development of water sharing plans. The initiative also addresses **urban water reform** to ensure healthy, safe and reliable water supplies; increase water use efficiency in domestic and commercial settings; encourage the re-use and recycling of wastewater; facilitate water trading between and within the urban and rural sectors; encourage innovation in water supply sourcing, treatment, storage and discharge; and achieve improved pricing for metropolitan water.

State Level

Sydney Water is the corporation responsible for the entire Sydney Metropolitan's water supply that comes from a series of 11 dams. Sydney which is continuing to increase its size, is using more water than is sustainable during periods of drought.

Water Conservation

Water conservation and recycling achieves a number of benefits including reduced water costs, use of less finite water resources and cost savings in the need for additional water infrastructure. Sydney Water, Department of Planning and Infrastructure (BASIX) and Council are conducting ongoing awareness and education programmes and requiring development to adopt water conservation measures (see below under actions).

Sydney's water prices have been reviewed over recent years and are now charged at approximately \$2 per kilolitre. (Sydney Water Usage Charges 2011-2012)

Water Reuse

Sustainable water management systems are based on the "water quality cascade" approach to match water sources with end uses in terms of the required water quality. For example, the mains supply is used for drinking, kitchen and bathroom uses, roof water used for toilet flushing, and settled stormwater used in parks and gardens irrigation.

A key component to improving sustainable water practices is increasing the recycling of water. Recycling has increased to over 27 billion litres of water in 2008–09. By 2015, recycled water will provide up to 70 billion litres a year, 12% of the water needs (Sydney Water Annual Report 2009).

Dual reticulation (i.e. provision of a second set of pipes for recycled water for non-drinking purposes) is provided in some new housing areas including the Rouse Hill Development area. However, Sydney Water advises that dual reticulation is not an option in established areas where it is too expensive to retrofit.

Grey Water is made up of waste water collected from our showers, baths and laundries and can be reused through direct diversion or a grey water treatment system, subject to meeting public health standards for the reuse.

Council's WDCP encourages the reuse of rainwater and stormwater for non-drinking water purposes and requires all new development to address WSUD objectives.

WDCP also requires provision of a rainwater tank for all new commercial, retail and industrial development within Willoughby. Requirements for new dwellings are addressed by the State Government's BASIX standard.

Rainwater tanks provide a valuable non-drinking water source for flushing toilets, laundry and garden use. They also reduce stormwater runoff. Council has a number of water re-use initiatives which are discussed below in this report.

The significant international use of treated effluent (black water) as drinking water has demonstrated that this is feasible in the long term, with no health risks and community support. However, given significant health, financial and technological constraints in the use of treated blackwater (i.e. sewage), the preference is for increased reuse of grey water and stormwater for both non-drinking and drinking purposes (subject to overcoming perceived community concerns) at this point in time.

New water infrastructure projects

In addition to water conservation and recycling initiatives, the state government has a number of strategies aimed at more efficient water use including accessing deep water at the bottom of dams, increased transfers from the Shoalhaven, use of groundwater including a combined Federal State Government project to use groundwater in regional river systems, and returning a proportion of river flows for the health of rivers and the health and safety of residents within the catchment. Emergency water supplies are also required for drought stricken regional areas.

The construction of another dam to serve Sydney is not favoured by the Government given that it would be expensive, ineffective and result in environmental degradation. For the same reasons, the State Government's construction of Sydney's first desalination plant at Kurnell to convert seawater into fresh water using reverse osmoses was not favoured.

Leak detection

It is estimated that over 6.6% of Sydney's water is lost through leaking pipes (Sydney Water: June 21, 2012). This is addressed by Sydney Water's Leak detection activities and is also to be supplemented by a consultant project to minimise water leakage within the network by replacement of water mains. Further emphasis on increasing response times to leaking pipes, coupled with a systematic regime of asset condition audit to prevent catastrophic pipe failures should be considered.

(ii) Sewerage System

Maintenance of Infrastructure

Willoughby's sewerage system is under the care and control of Sydney Water who conducts a regular maintenance program aimed at improving the performance of the sewerage system by leak detection and repair/mains replacement. Leaks occur during dry weather as a result of leaking pipes and blockages caused by debris, tree roots, or failing infrastructure. Overflows also occur in wet weather, when stormwater infiltrates the sewerage system through cracks, breaks and illegal stormwater connections.

There are approximately 35 known designed sewage overflows within Willoughby including two major overflow areas close to Middle Harbour at Tunks Park, Northbridge and Scotts Creek, Castle Cove. These result in raw sewage discharge onto adjoining premises and environmentally sensitive catchments. This runs contrary to Council's actions and investment of significant resources into regeneration of the riparian vegetation in these catchment areas. In order to facilitate the detection of sewer leakages, Council will lobby Sydney Water to introduce mandatory sewage piping inspections on sale of private property

Amplification of infrastructure

Amplification of the network occurred with the construction of the northside storage tunnel in 2000 that has helped to reduce wet weather overflows. Amplification of the Chatswood CBD sub-main occurred in 2003, with the increased capacity also allowing for projected population growth over the next 20 years. Sydney Water is also considering amplification in Naremburn and St Leonards.

In addition to the Sydney Water network, Council is responsible for the approval and licensing of approximately 100 'pump out' on-site sewerage management systems for the health and safety of users and protection of the environment. These are located around the foreshores of the City.

(iii) Stormwater & wastewater systems (i.e. drains, pits, pipes and water quality control devices, on-site detention systems, flood protection systems)

Much of Council's stormwater infrastructure has insufficient capacity and is aging. The most significant impact has been an increase in hard paved areas due to continuing development and fewer opportunities for infiltration and ponding. The traditional response to this has been to pipe or channel water to creeks or rivers. This leads to an increased incidence of flooding, channel erosion, increased sediment stormwater volumes and pollutant loads. WDCP aims to maintain a more natural water balance as occurred prior to development and emphasises an integrated approach to water resource management within new development to minimise the impacts on the natural water cycle and the use of on-site detention to reduce the volume and velocity of peak flows.

A comprehensive audit of stormwater infrastructure is being undertaken in 2012 as part of Council's Total Asset Management Program.

In 1999, two Stormwater Management Plans were developed for the Lane Cove and Middle Harbour Catchments, which were subsequently reviewed in 2003. These plans are being implemented.

Flood Studies have been completed to define main stream flooding on Scotts Creek and Flat Rock Creek and Sugarloaf Creek catchments. Flood Studies for Swaines Creek catchment

and Sailors Bay Creek catchment commenced in 2012 and are in progress. They are due for completion in early 2013. The development of a floodplain risk management plan is the next stage of the process after the completion of the flood study.

On 27 February 2009, the NSW State Government introduced the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (Codes SEPP) which enabled the development of dwelling houses to be approved by private certifiers subject to meeting set criteria. In response to the introduction of Codes SEPP, Willoughby City Council considered that it had a duty of care to advise present and future property owners of the likely nature and pattern of flooding in the event of a 1 in 100 year flood. Council subsequently undertook a City-wide investigation to broadly define flooding patterns in the various catchments which drain the Willoughby City area for a flood of this magnitude. The flooding investigation identified areas at potential risk of flooding.

Council currently conducts catchment based riparian zone drainage channel upgrading works and regeneration of native vegetation throughout the various catchment areas. Flood prone land is managed such that: it is not to be developed or manipulated to allow fill in one area to result in flooding elsewhere; steps are taken to prevent soil erosion and pollution of watercourses and appropriate fauna is retained and introduced. Consideration is being given to strategically prioritise these works based on the characteristics of each catchment including proportion of hard paved area and existing environmental quality.

Council is a participant in the Middle Harbour Strategic Water Management Network along with neighbouring Council's Ku-ring-gai, Manly, North Sydney and Mosman. The network has been established to exchange information, identify and address gaps in knowledge and expertise in stormwater management. The group has been investigating alternative water sources including stormwater/rainwater harvesting and bore water.

Pilot Projects

Pilot projects have been conducted by Council on a number of issues as an effective means of providing leadership and demonstrating the feasibility of implementing WSUD principles as required under WDCP. These include:

- Use of a number of measures to reduce drinking water usage and remove pollutants including rainwater tanks, vegetated ponds, swales, waterways, streetscape bio-retention;
- Use of rain gardens, grass swales and natural filtration in street maintenance.
- Use of stormwater planter box to bushland areas, much like an OSD;
- Rainwater tank, for use in toilet flushing (eg. Warners Park);
- Development consent issues for use of on-site detention, rainwater tanks for toilet flushing, laundry, irrigation and car washing, pervious pavement to reduce stormwater runoff;

Other Council initiatives involving engineering pilot projects including the following:

- The Concourse development has involved the harvesting and reuse of stormwater to replace a significant proportion of demand currently met by fully treated mains supply. This includes water conservation and reuse, as well as the provision of temporary detention storage of overland flows to mitigate downstream flood peaks in the Chatswood CBD, which is subject to flooding. It involved locating a large excavated stormwater storage facility within the local street system. This project aims to be a National demonstration project for stormwater harvesting in an urban environment;

- sports ground and golf course water re-use to replace mains water and other initiatives including use of bores, sewer mining recycled water, baseflows, etc;
- green gutters for cleansing of runoff and infiltration into street gardens, mini wetlands along local creeks for habitat, slowing and cleansing of stormwater flows;
- the conversion of OSD tanks to rainwater reuse/stormwater tanks;
- The use of artificial surfacing for playing fields and the utilization of the additional runoff onto neighbouring open space areas.

Water quality

Comprehensive regulation of sediment and erosion control on building sites is required.

Council has installed 5 Gross Pollutant Traps (GPT's) that are designed to collect large pollutants sediments, plastic, pollution etc filtered out at the end of the line. As a result of a recent review, the service frequencies of GPT's are to be altered and additional maintenance provided. GPT's are to be operated optimally on a cooperative regional (rather than individual Council) basis. Opportunity exists for Council to receive additional GPT's from the State Government following completion of the Lane Cove Tunnel Project.

Anecdotal evidence suggests that GPT's only trap 60% of gross pollutants. The isolated location of GPT's in large catchment areas, with only 5 of the 12 sub-catchment areas covered suggests only limited application to this 'end-of-pipe' approach. In addition to gross pollutant control, effective source control measures at the 'front-of-process' should be considered at the locations and infrastructure that is responsible for the pollution. Council's cleaner production program is currently being conducted on local industries to minimise waste and pollution as well as reduce use of energy and water resources.

Following is a summary of the future actions on water infrastructure within Willoughby:

Water supply

1. Water conservation initiatives to promote reduced water usage by residents and businesses. Both Council and Sydney Water run a community education and awareness of water conservation programme;
2. Promote installation of water efficient products in existing dwellings;
3. Continuation of BASIX requirements;
4. Continued support for higher water efficient labelling and performance standards on appliances;
5. Support for water pricing reforms and increasing water bills for those who overuse water and apply the principles of demand management;
6. Implementation and enforcement of water restrictions, perhaps on a permanent basis;
7. Catchment management and environmental engineering programs including rainwater harvesting projects and reuse of stormwater;
8. Promote installation and use of rainwater tanks;
9. Investigate and implement large scale ways of increasing greywater and stormwater use for both potable and non-potable purposes.

Sewerage

10. Council will lobby Sydney Water to introduce mandatory sewage pipe inspections before the sale of private property;
11. Implement measures to eliminate sewage overflow with priority given to environmentally sensitive catchments.

Stormwater and wastewater

12. Complete a comprehensive audit of Council's Drainage System as part of Council's Total Asset Management Strategy and the development of a long-term stormwater drainage improvement plan;
13. Prepare flood studies for each creek catchment with sufficient funding and develop Floodplain Risk Management Plans in conjunction with stake holders.
14. Identify new WSUD projects;
15. Monitor and enforce sediment and erosion control measures on development sites;
16. Develop a strategic plan for the future management of natural water resources passing through Willoughby which targets water quality and quantity, gross pollutants, sedimentation, heavy metals, etc.

Open space and recreation facilities

The type of land available for open space and recreation in Willoughby City is composed of:

- Bushland, foreshores and harbour beaches;
- Developed parkland, sportsgrounds and playgrounds;
- Indoor facilities.

Private providers on Council and / or private land run tennis, golf, squash, indoor fitness / pool and sailing.

Public open space is an increasingly valuable resource as Council experiences urban consolidation, changing demographics and social expectations. As land values rise, the amount of public land becomes more finite as the prospect of purchasing more land becomes unaffordable for councils. Hence, the pressure on the available land to provide 'more facilities for more people' continues. Council's response to these demands is:

- Increase the area of open space. This is a high priority (rather than just an improvement in the quality of public open space areas) however it is constrained by high land values and the availability of appropriate sites;
- Alienation of parkland and access to foreshores is not supported;
- A change in thinking from a "standards approach" (where a specified quantity of open space is provided per person) towards the "needs approach" (where the specific needs of the community are addressed);
- Upgrading of existing recreational facilities;
- Conversion of existing facilities for other recreation uses subject to:
 - a public benefit being clearly demonstrated,
 - the public open space not being diminished in quantity or quality,
 - the proposal having broad community support.
- Higher maintenance levels on top of existing management and maintenance;
- Joint ventures/use of other facilities eg. schools.

Council may also need to consider changing current policies that limit maximum usage of existing facilities (eg. Sundays and nights).

The Northern Sydney Regional Organisation of Councils (which includes Willoughby) is coordinating a Regional Sports Strategy to assist the future provision of sports facilities across the region. The strategy will assist decision making for large or expensive sport facilities, such as aquatic centres and synthetic grass sportsgrounds, and will ensure that available funds are targeted at the highest priority needs. The strategy will also benefit inter-

council partnerships for facilities provision, as the community use facilities according to convenience and suitability and not according to municipal boundaries.

The Draft Open Space and Recreation Plan 2012 identifies the following priorities over the next five years:

- Informal recreation
 - Completion of the new Market Gardens Park, Willoughby;
 - Gore Hill Parklands, St Leonards.
- Trails and Routes
 - Implement proposals for pedestrian access to waterways and foreshores in the 'Sharing Sydney Harbour' Access Plan;
 - Implement the new bike and pedestrian paths into and through the Chatswood CBD area as per the Willoughby Bike Plan 2012, and Pedestrian Access and Mobility Plan;
 - Complete the Street Tree Master Plan.
- Sport
 - Conversion of another sports field to a synthetic sports surface;
 - Implementation or conversion of existing underutilised sports courts into multi-use recreational surfaces for training, junior sports and casual recreational use.
- Access to water
 - The establishment of a kayaking base on the Middle Harbour foreshore;
 - Completion of a new foreshore park on Sugarloaf Point, Castlecrag.
- Aquatic facilities
 - Completion of Stage 1 improvements at Willoughby Leisure Centre.
- Interaction with nature
 - Strengthen community engagement in all volunteer programs;
 - Complete a Schools Nature Guide to the Council's bushland reserves.

Waste collection and treatment (garbage collection & maintenance of public areas, streets)

Australia is currently one of the highest consuming societies in the world. The generation and disposal of waste can impact human health, pollute waterways and groundwater, contaminate land, and contribute to air pollution and global warming. By managing waste more sustainably through waste reduction and encouraging recycling we can reduce the impacts of its production on the environment and human health. Council has limited control over construction, demolition industrial and commercial waste. A minimum requirement of 85% of demolition and construction waste is required to be recycled on development sites including the submission of associated waste management plans.

Council has direct control over domestic waste disposal. Council's waste infrastructure comprises household and some commercial garbage bins. Waste removal is carried out on a weekly basis throughout the residential & business areas of the City. It is contracted to SMS Municipal Services who own the collection vehicles and the recyclable material when it leaves the City.

Waste is currently disposed of via a landfill site at Eastern Creek in Western Sydney. SITA Australia now own and operate the landfill as well as the alternative waste technology (AWT) at its Eastern Creek site called the UR-3R. This facility processes municipal solid waste (MSW) and extracts any remaining recyclable material as well as converting any organic material into compost by treating the material in an Anaerobic Digester. This results in a higher recovery of waste for recycling and less waste sent to landfill. It also helps to produce more inert waste that is less harmful to the environment.

In 2012 Council is conducting a tender for the provision of waste services for a period of seven years starting in 2013.

A Waste Transfer Station is located in Artarmon that is now owned and operated by SITA . Willoughby Council's waste is deposited here before being transported to the Eastern Creek landfill and UR-3R Facility.

Street cleaning services are provided by Council on a regular basis throughout all areas of the City.

The key issue in waste management is sustainability. The best way to minimise the impacts of waste is to avoid generating it or to reduce, reuse, recycle and reprocess waste wherever possible. Over the last 10 years, the trend for Willoughby domestic waste has been a gradual reduction in waste taken to landfill and a significant increase recyclables collected for processing, so that at present, approximately 61% of waste collected is recycled.

WDCP has controls on the minimisation of waste resulting from development. Other Council actions include:

- Working in partnership with the Regional Organisation of Council's and State Government to develop a long-term strategy for sustainable waste alternatives to landfill;
- Exploration of opportunities for regional recycling contracts;
- Continued education programs with the community in sustainable waste practices, including the promotion of worm farms and domestic composting;
- Partnership approach with the waste contractor to explore alternative waste technologies and processes to achieve domestic waste strategy targets;
- Provision of 240 litre wheelie bin serviced weekly for recycling and garden organics.

The council clean up service also allows for more resource recovery with separate bulk vegetation, metals and white goods collection services allowing more materials to be diverted from landfill.

Educational & health sector facilities

Education

Education facilities within Willoughby provide a community focal point and include the St Leonards NSW Technical and Further Education (TAFE) campus, the Macquarie Community College at Chatswood, the College of Law at St Leonards, 9 primary and 6 secondary government and private schools and a number of preschools. (Child care and pre-schools are covered under the Community issues paper).

Given the increases in surrounding resident population as a result of urban consolidation, Council does not support any reduction of educational facilities and land for such within Willoughby.

Council remains concerned with state government education funding and the adequate maintenance and refurbishment of public school infrastructure in the Willoughby area. The recent Federal Government program (BER) resulted in new and upgraded buildings and facilities at Willoughby's primary and secondary schools.

Health Care

There are a significant number of health and medical facilities within Willoughby that includes Public and Private hospitals, medical centres and professional consulting rooms.

Any reduction in health care facilities within Willoughby is not supported given demands of an ever-increasing population base. The growing trend of regionally grouping health facilities on the same campus is not necessarily appropriate for some services that are best located within the local community.

The Royal North Shore Hospital (RNSH) located at St Leonards is the major hospital servicing the North Shore region. It also serves as a teaching hospital of the University of Sydney and University of Technology Sydney. It acts as a magnet for health related services within close proximity in the St Leonards and Artarmon employment precincts. A Concept Plan has been approved by the State government in 2007 for redevelopment of the hospital facilities and associated services as well as the sale of land for commercial and residential purposes. The hospital campus has been under redevelopment since 2008, with the project involving:

- A new Main Hospital Building containing 730 beds (to be fully operational by December 2012).
- A new Community Health Centre.
- A Clinical Services Building.
- A total of 29 procedure and operating rooms.

In order to meet the current and likely future demands of the regions healthcare, the redevelopment of the hospital land should retain health care as the predominant use. This may include integration with hospital related activities such as medical centres, specialists, aged care, and integration with education research. This integration reflects a shift in health care services that places a growing importance on prevention rather than the traditional “fix me up” model.

Council has expressed concern with the proposed sale of “surplus” hospital land and residential development unrelated to hospital activities and considers the land should be retained in public ownership for future long term needs. Council has also sought pedestrian and cyclist access between adjoining land uses and St Leonards Railway station, and integration with the Gore Hill Oval and Gore Hill Cemetery precinct.

Telecommunications infrastructure (TV, radio, telephone, cable broadband networks)

Telecommunication networks provide a vital service for the community, business and government sectors. They also are fundamental to public safety because of their use in emergency response. Within the Willoughby Local Government area are situated the Channel 9, 7/10 and ABC/SBS television and communication towers. These facilities were built in the 1950's and 60's and have had an important role to play in the regional and national communication networks. These towers also host a multitude of microwave, radio and satellite transmitters for various telecommunications purposes. Willoughby City also has a high take up rate of broadband technology connections. The Federal government confirmed in the NBN Corporate Plan 2012 – 2015 that the national broadband network would be delivered, or under construction, to more than 3.5 million homes, businesses, schools and hospitals across Australia by 2015.

Telecommunications networks for continually advancing technology form a vital group of infrastructure for business, government and private sectors located within the Chatswood and St Leonards CBD's and other employment zones within the City. Infrastructure is continuing to be rolled out by telecommunications carriers in order to meet an increasing demand.

The proliferation of mobile phone base stations and supporting infrastructure has resulted in considerable community concern about the effects of this infrastructure on the visual amenity of their locality, their property values and the potential health risks from electromagnetic radiation (EMR). Council has adopted a precautionary approach, such that until such time as there is conclusive scientific proof that there are no adverse health impacts as a result of EMR, Council will not approve applications that result in an increase in EMR.

Council does not have regulatory control over "low impact facilities". These are facilities described in the *Telecommunications (Low Impact Facilities) Determination 1997* which exempts low impact facilities from State and Territory planning and environmental laws.

Council has a role to play as an advocate for further research into the field of impacts on human health and the changing community attitudes and expectations to help influence amendments to Federal government policy.