

- Discussion Paper -
Natural Environment / Sustainability



Natural Environment / Sustainability

TABLE OF CONTENTS

1.	Sustainability in Willoughby	3
	How does Sustainability fit within Council's integrated planning framework?	4
	The Regional Context	4
	E.restore 3 – Council delivering action on Sustainability	5
	Target Areas.....	6
2.	Climate Change and Energy Consumption.....	7
	How Council is becoming ClimateClever	8
	Preparing Council for rising utility costs	8
	Demand management and decentralised energy production	9
	Helping our community become ClimateClever	9
	Future Direction	9
3.	Sustainable Transport.....	9
	Future Direction	10
4.	Water Quality and Conservation.....	12
	Future Direction	13
5.	Resource Recovery and Waste Avoidance.....	14
	Waste collection and treatment is discussed further in the Transport and Infrastructure discussion paper.	15
	Future Direction	15
6.	Biodiversity and Ecological Integrity	16
	Future Direction	17
7.	Sustainability Education	17
	Future Direction	19
8.	Air and Noise	20
	Air Quality	20
	Noise management	21
	Future Direction	21
9.	Sustainable Building	22
	Future Direction	23
10.	Sustainable Business.....	24
	Future Direction	24
11.	Flooding	25
	State Context.....	25
	Catchments in Willoughby	26
	Council Actions.....	26
	Future Directions for Public.....	27
	Future Direction for Council	27

1. Sustainability in Willoughby

Willoughby City Council is committed to striving towards sustainability, by providing leadership and working with the community to achieve a more sustainable Willoughby. This commitment is reflected in the Willoughby City Strategy (WSC) which is underpinned by the principles of sustainability.

The WSC states:

“The overarching principles of sustainability, social justice and community form the basis of the Willoughby City Strategy and underpin the actions that will be carried out in each of the six strategic directions” (Willoughby City Strategy 2010-2025).”

Council also recognises the importance of ecological sustainability and the need to restore the balance and work towards protecting our local environment. Council’s Sustainability Charter sets the broad directions for Council in responding to the sustainability challenge.

The Sustainability Action Plan details Council’s next steps on the journey towards sustainability. It provides the plan of action for what Council will do over the coming four years to ensure the Council protects and enhances our environment.

The journey is however a shared journey, one that requires the community’s support and participation. With community support, Council needs to work on continuing environmental initiatives in the key areas of climate change and energy consumption; development and the built environment; water and sewerage; business sustainability; biodiversity conservation and protection; resource recovery and waste avoidance and finally transport and traffic. The main aims of these are to:

- lead by example, showcasing best practice and latest technology;
- go beyond Council borders;
- tackle barriers and enhance benefits to change;
- continually improve.

The WCC Sustainability Charter was adopted by Council in 2008. The Charter sets out our vision, principles and directions. This has been followed by a recently endorsed Sustainability Action Plan (SAP). The SAP sets out the detailed actions that are required to be undertaken over the next four years to meet the vision set out for Council. Each action has a Key Performance Indicator linked to it and results will be reported annually.

Willoughby City Council has also recently aligned its planning and reporting structure with the NSW Government’s Integrated Planning and Reporting Framework. To this end the current Willoughby City Strategy and Delivery Program is underpinned by economic, social and ecological sustainability and together with the Sustainability Charter and the Sustainability Action Plan provides a roadmap for Council to ensure the organisation is moving steadily towards a more sustainable future.

The Local Government Act 1993 requires councils, councillors and council employees to have regard to the principles of Ecological Sustainable Development (ESD). This legislation states that Council has a responsibility to properly manage, protect, restore, enhance and conserve the environment of the area for which it is

responsible. Council strives to meet this important responsibility, however also recognises that the contemporary concept of sustainability is considered to be much broader than ESD. Council's Sustainability Charter introduced in 2008 recognises that when striving towards sustainability Council must balance ecological, social and economic factors to ensure sound decision-making.

How does Sustainability fit within Council's integrated planning framework?

Willoughby City Council embraces an integrated approach to planning, reporting and policy development. This means that while individual policies and plans have the capacity to specifically inform decision making, they should still reflect and support the overall vision and long-term strategy of the Council.

Council's leading strategic document is the Willoughby City Strategy "Together Towards Tomorrow" and provides the long-term strategy that guides decision making by Council. This is a 15 year plan which is reviewed every four years to ensure its alignment with community values, priority issues and gaps in service provision.

Further to this, the strategy defines the three overarching principals of social justice, community and sustainability that guide the outcome of the Strategy. In this context sustainability is about balancing environmental, economic and social needs for the long-term while ensuring good governance. Willoughby City Council therefore aims to build sustainability into all facets of our City, community and the Council as an organisation.

The Regional Context

Willoughby City Council is a member of the Northern Sydney Regional Organisation of Councils (NSROC). This voluntary organisation of local government was established to provide strong local government leadership; to work co-operatively for the benefit of the Northern Sydney region; and to effectively advocate on agreed regional positions and priorities. The seven member councils are Hornsby, Hunters Hill, Ku-ring-gai, Lane Cove, North Sydney, Ryde and Willoughby.

The NSROC councils are committed to the sustainable management of an area which covers nearly 700 square kilometres, and together they serve a population of over half-a-million people. The region is home to a diverse collection of landscapes and communities, ranging from scenic waterways, bushland parks and areas of historical significance through to residential high-rise living and thriving commercial and retail centres.

In 2009 NSROC finalised its first Regional Sustainability Plan (RSP) to provide an overarching, flexible framework that articulates the shared sustainability for the region and to facilitate the regional alignment of responses to common environmental challenges facing the region. Importantly the RSP aims to promote increased collaboration between councils, in particular resource sharing which will ensure a more efficient and coordinated approach to taking action regionally. The RSP aligns with various state-level plans including the NSW State Plan, the Metropolitan plan for Sydney 2036 and the Division of Local Government's Integrated Planning and reporting framework.

The RSP covers seven dimensions or key focus areas for the region. The Plan lists these as follows:

- 1) Climate Change and Energy Consumption;
- 2) Development and Built Environment;
- 3) Water and Sewerage;
- 4) Business Sustainability;
- 5) Biodiversity Conservation and Protection;
- 6) Resource Recovery and Waste Avoidance; and
- 7) Transport and Traffic

The WCC Sustainability Action Plan strives to align with the NSROC Regional Sustainability Plan.

E.restore 3 – Council delivering action on Sustainability

In 2000, Council adopted the Environmental Management Plan (EMP) which identified that our local natural environment was degraded and required restoration and ongoing attention. Council's resources were insufficient to deliver an adequate response while still delivering the existing level of works and services to our community. To address this, an environmental levy was introduced in July 2000 to provide funding for action. Strong community support extended the program for a second term from 2003 until 2008.

From July 2008 a new Sustainability Levy in perpetuity replaced the environmental levy to fund the third round of the e.restore program. Known as e.restore 3, this program continues the important local environmental works that have been underway since 2000, while introducing a new focus on responding to climate change.

This Sustainability Action Plan replaces the Environmental Management Plan and defines the actions Council will undertake in striving towards ecological sustainability. These actions will be resourced primarily by the Sustainability Levy as part of the e.restore 3 program in addition to other funding sources such as grants from the Australian and NSW Governments and the existing Domestic Waste charge which funds residential waste collection services and waste avoidance and recovery programs.

The Sustainability Levy is subject to rigorous auditing by the Department of Local Government and open reporting to ensure accountability to the community. It should be noted that the Sustainability Levy can only be spent on sustainability projects.

Target Areas

The following target areas are identified in the 2011 – 2014 Sustainability Action Plan:

- Climate Change and Energy Consumption;
- Sustainable Transport;
- Water Quality and Conservation;
- Resource Recovery and Waste Avoidance;
- Biodiversity and Ecological Integrity;
- Sustainability Education;
- Air and Noise;
- Sustainable Building;
- Sustainable Business.

2. Climate Change and Energy Consumption

An overwhelming body of scientific evidence now clearly indicates that climate change is a serious and urgent issue (Stern 2006). The earth's climate is rapidly changing, mainly as a result of increases in greenhouse gases caused by human activities.

Global average temperatures have continued to track a warming trend. The year 2010 ranked with 2005 and 1998 as the warmest on record, with global average temperatures 0.53°C above the 1961–90 mean. For Australia, 2009 was the second-warmest year on record and the decade ending in 2010 has easily been Australia's warmest since record keeping began (Garnaut 2011).

To project the likely impact of continued climate change scientists have modelled several scenarios based on various assumptions about human behaviour, economic growth and technological change, ranging from “business as usual” without implementing actions specifically aimed at reducing net greenhouse gas emissions, to scenarios that include various levels of actions to slow climate change by stabilising carbon dioxide concentrations. These scenarios indicate a projected global-average warming of 1.1-6.4°C from 1990 to 2100 (Department of Climate Change and Energy Efficiency 2010).

Under a “business as usual” scenario the Commonwealth Scientific and Industrial Research Organisation (CSIRO) project Australia will experience the following:

- up to 80per cent fewer frost days by 2030;
- 66per cent reduction in snow cover in the Australian Alps by 2030; and
- doubling or even trebling of days above 35°C by 2070.

Given these impacts, there is a clear need to stabilise and reduce greenhouse gas urgently. However even if this is achieved, it should be noted that the effect of the current concentration of greenhouse gases in our atmosphere will continue to contribute to climate change and sea level rise “for centuries due to the time scales associated with climate processes and feedbacks” (IPCC 2007).

According to the National Greenhouse Gas Inventory in 2008, over 65 per cent of greenhouse gas emissions in Australia were caused through energy consumption. In NSW about 90 per cent of electricity needs are currently met from coal-fired power stations (Department of Primary Industries 2010). This type of energy production is extremely greenhouse gas intensive compared to other means such as solar or wind. Therefore, as an organisation and a community it is important that we consider our patterns of usage and sources of energy in order to achieve significant reductions, in our greenhouse gas emissions.

Willoughby City Council, in line with the Northern Sydney Regional Organisation of Councils Sustainability Plan, recognises climate change and energy consumption to be the number one ecological sustainability issue.

Climate change action can be divided into two parts – action to reduce greenhouse gas emissions to the atmosphere (mitigation) and action to adapt to climate change (adaptation).

Mitigation is about lowering the volume of greenhouse gas emissions humans release to the atmosphere, so as to reduce or stop the resulting climate change and its impacts.

Adaptation is about adapting to the effects of climate change that will occur due to the greenhouse gases that have already been emitted into the atmosphere. According to the joint Sydney Coastal Councils Group and CSIRO "Mapping Climate Change Vulnerability Report" released in 2008, the Willoughby Local Government Area is likely to have a high vulnerability to future climate change in the areas of extreme heat and human health effects, extreme rainfall and urban stormwater management and threats to natural ecosystems and assets. In response to this, adaptation planning for Council has commenced and is a key action in the SAP.

How Council is becoming ClimateClever

In relation to mitigation, Council has adopted a 'three-tier' approach to reduce our corporate carbon footprint as follows:

1. Where possible avoid energy usage and activities that create greenhouse gas emissions (both directly and indirectly);
2. Improve the efficiency of activities. For example, making Councils operations more energy efficient;
3. Increase onsite energy production (e.g. cogeneration) and renewable energy generation (e.g. solar).

As part of Council's Energy Savings Action Plan, Council has made significant progress in implementing actions to improve energy efficiency and increase onsite renewable energy production. Examples of projects completed include the replacement of electric hot water systems at Chatswood Oval with a gas-fired hot water system and the installation of a 20kW solar power system at Council's East Chatswood depot. These projects have resulted in an ongoing annual greenhouse reduction of 163 tonnes.

Through a combination of energy efficiency measures, renewable energy production and the purchase of accredited offsets Council met its 50 per cent greenhouse gas reduction target in 2010. Council has however decided that, in future, expenditure on offsets in order to achieve reduction targets should be applied to funding additional tangible actions that will reduce emissions. This approach may also mean that the carbon neutrality target may not be achieved in the short term if the funds previously set aside for offsets are to instead fund a major emission reducing project. This might include projects such as a co- or tri- generation plant or a large scale solar collector "farm".

Preparing Council for rising utility costs

Whilst climate change is the number one ecological sustainability issue for Council (and for the NSROC), an economic incentive for taking decisive action now is the emerging need to prepare Council for the impact of rising utility costs. Already there have been significant rises in electricity costs and these are predicted to continue by around 10 per cent per annum rising to a total of 35 per cent by 2012/13 (Independent Pricing and Regulatory Tribunal (IPART) 2010). Further price rises will occur with the introduction of the carbon tax and future carbon trading scheme. Council can manage the impact of future rises by investing in actions that reduce Council's ongoing energy demand now, particularly those with short pay back periods.

Demand management and decentralised energy production

Another significant factor adding to the need for Council to reduce energy use is the increasing need to reduce electricity demand in the AusGrid Network “Willoughby Supply Area”, which is reaching capacity, and avoid the need to invest significantly in upgrading power supply infrastructure. While this is the responsibility of the AusGrid Network, the cost would ultimately be borne by consumers including Council. In addition, such an upgrade may necessitate the installation of additional high voltage transmission infrastructure which may conflict with existing land uses. One solution to this emerging challenge is the idea of Council facilitating investment into decentralised local energy production such as solar power and combined heat and power systems (cogeneration and trigeneration). These systems also have significant greenhouse gas benefits such as the reduction of “transmission losses” as electricity is being produced closer to where it is being consumed.

Helping our community become ClimateClever

Council is also working to assist our community take action and reduce its carbon footprint and reduce its electricity consumption. With this in mind Council has developed the ClimateClever Community Education Campaign. This campaign provides information and programs that assist our community to implement energy efficiency measures, install renewable energy systems such as solar power systems, solar hot water and promotes the purchasing of GreenPower. As part of the campaign, Council is working with several target groups. For example, the ClimateClever Schools program is encouraging school communities to develop School Environmental Management Plans (SEMPs) and the ClimateClever Apartments program is working with Owners Corporations and occupiers to reduce the carbon footprint of their apartment building and reduce operating costs.

Future Direction

Key Actions:

- Reduce electricity consumption of Council buildings and streetlights and reduce the consumption of vehicle fuel;
- Implement measures to reduce peak electricity demand;
- Implement Carbon Management software System to enable real-time monitoring and reporting of energy consumption and greenhouse gas emissions;
- Climate Change Risk Assessment and Adaptation Action Plan developed and implemented;
- Adaptation measures implemented into Council planning, policies and strategies;
- Renewable and decentralised energy projects implemented such as the Solar Farm;
- Implement and evaluate the ClimateClever education campaign strategy;
- Investigate the feasibility of decentralised energy production and low carbon zones within the Willoughby LGA;
- Promote sustainable design of new buildings through implementation of the WDCP; and
- Ensuring BASIX is implemented in Development Applications for residential buildings.

3. Sustainable Transport

The transport sector is of growing environmental concern as it has impacts on climate, air quality, water quality, habitat destruction, biodiversity loss, noise levels, local amenity, equity

and health. The increasing trend towards private vehicle travel cannot be sustained. In the five year period between 2005 and 2010, vehicle ownership rates in Willoughby have increased. Road infrastructure within the Willoughby LGA is coming under increasing pressures due to the number of key regional roads traversing the area that are used as a thoroughfare for regional travel. Our local roads are increasingly used by both local residents and commuters from other LGAs for all day parking whilst accessing the local CBDs and public transport hubs.

Recently there has been growing recognition of the importance of supporting sustainable transport modes such as walking, cycling and public transport. Willoughby City Council acknowledges the need to work actively to minimise the adverse environmental effects of car use within the City by working in partnership with government agencies, striving for best possible development outcomes and by delivering practical local initiatives to ensure more sustainable transport options.

Council has been implementing a number of initiatives to promote active travel in the area and ensure that appropriate facilities are provided for bicycles, pedestrians and public transport. These include the introduction of local shuttle bus services, the development of walking and cycling maps, support for car share schemes, hosting a number of annual events to promote active travel and reduced parking provision requirements for new developments in proximity to major public transport corridors. Council is also working with schools and the local community on innovative pilot programs to encourage travel behaviour change.

Transport is discussed further in the Transport and Infrastructure discussion paper.

Future Direction

Key Actions:

- Implement updated bike plan recommendations;
- Provision of pedestrian safety measures and crossing facilities to enhance safety and attractiveness of walking for short trips;
- Continue to work with and lobby STA for bus service improvements and end of trip facilities;
- Continue to develop and promote CouncilCab services;
- Develop a parking management strategy to discourage high car ownership levels and travel to business centres in single occupant vehicles;
- Implement demand management measures recommended in the transport study for the Chatswood CBD (based on 2008, with projection modelling also done for 2013 and 2018);
- Promote sustainable transport services to the community;
- Continue sustainable transport educational activities, workshops and events;
- Maintain parking provision requirements in WDCP;
- Expand and monitor the Artarmon Bus Loop Service;
- Limited bus loop service to other suburbs (than Artarmon) where the highest needs have been identified;
- Provide and maintain street furniture (bus shelter or seat) in accordance with Council policy to major bus stops within the Willoughby LGA;
- Ongoing liaison with public & private transport providers;
- Work with State Government to improve sustainable transport options;
- Review Council's Workplace Travel Plan;
- Maintain the Council staff bike fleet and encourage staff use for site visits;
- Provide adequate staff bicycle parking;

- Maintain Council carpooling system and encourage staff to use;
- Develop new programs and initiatives to encourage more sustainable travel options for employees; and
- Maintain the staff travel pass policy to reduce staff car travel to work.

4. Water Quality and Conservation

Most of the multitude of water issues revolve around water conservation, water quality and education about them.

Water conservation issues have recently increased in importance as a result of the severe and long drought. Australia is the driest inhabited continent in the world and has an extremely varied rainfall. Therefore Australia will be extremely susceptible to the impacts of climate change, and water conservation has become of critical importance. Water conservation has been identified as a key issue in the SAP both for Council and the community. A number of large rainwater tanks projects have been undertaken in recent years however the 5 ML stormwater reuse system at The Concourse will be a main contributor to water savings into the future reducing the potable water demand at The Concourse by some 80% per annum. Over the next few years Council will review further stormwater reuse potential around the City in particular for use on sporting ovals.

Water quality however is about keeping our waterways clean and aquatic ecosystems healthy. Monitoring has an important role to play in ascertaining and tracking the health of our waterways by measuring key chemical and biological parameters such as the number and variety of macro-invertebrates, the level of dissolved oxygen, pH and concentration of faecal coliforms.

When considering water quality it is important to understand the built and natural environment influences within our water catchments. Willoughby Local Government Area is located within two catchment areas of the larger Sydney Harbour Catchment, with 83 per cent of the City within the Middle Harbour catchment and 17 per cent within the Lane Cove catchment. Urbanisation has changed water flows and increased runoff, which has created a higher potential for water pollution and a decrease in water quality within local creeks.

Water monitoring has indicated that the creeks within the City are highly stressed with degraded water quality. This is typical of creeks in highly urbanised areas. This is a result of pollutants entering our waterways from urban areas. These include both point source (pollution from particular sites or spillages) and diffuse pollution (such as fertilisers washed into waterways from gardens or runoff from roads). Minimising water pollution can be done through a combination of engineering (such as gross pollutant traps), regulation, education and through appropriate planning controls which restrict site coverage and require soft landscaping which improves water infiltration. Council has developed an Environmental Incident Response procedure which assists in responding and dealing with pollution incidents in the City. Regulatory action is also undertaken in cases where the source is determined and notices (to prevent further pollution and clean up the pollution) are issued together with Penalty Infringement Notices. Education is also undertaken through schools, local community events.

Urban consolidation has resulted in increased pressure on Sydney's sewerage system where stormwater infiltration into sewerage systems causes the sewer mains to become overloaded. Willoughby LGA experiences problems with sewer overflows to our creeks during rainfall events, however these are the responsibility of Sydney Water who are licensed with Office of Environment and Heritage (OEH). Council will continue to liaise with Sydney Water and OEH to ensure these overflows are minimised.

Water infrastructure is discussed further in the Transport and Infrastructure discussion paper.

Future Direction

Key Actions:

- Reduce consumption of potable water by Council;
- Increase the reuse of stormwater by Council;
- Undertake communication activities that increase awareness of Council's water saving initiatives;
- Encourage reduced water consumption by the community;
- Implement Stormwater Outlets to Bushland Remediation projects and maintain remediated sites;
- Continue drain stencilling program in Middle Harbour and Lane Cove Catchments;
- Enhance riparian vegetation in conjunction with regeneration contract works;
- Continue to implement WDCP controls for stormwater management on building sites;
- Implement recommendations of Reserve Action Plans relating to waterways;
- Implement recommendations from Estuary Management Plans;
- Monitor local water quality;
- Develop projects that prevent pollutants entering local water ways; and
- Prevent and manage spills through implementation of the Spills Response Plan.

5. Resource Recovery and Waste Avoidance

Waste is a by-product of an industrialised 'throwaway' society. Resources are consumed in increasing quantities, with greater amounts of packaging, increasingly shorter lifespans, and which are made of materials which cannot be reused or recycled.

Disposing waste in landfill impacts both on the environment and human health. Landfills are visually unattractive, noisy and smelly and decrease land values. They pollute surface and groundwater with toxic compounds and generate methane, a greenhouse gas, thus contributing to climate change. Finding landfill space is a problem for city-based councils because residents do not like to have landfill near their properties.

Litter is the visible result of waste being dumped in public areas. It is not only unsightly but it impacts on the environment. Litter includes not only rubbish lying around streets but also cigarette butts, dumped garbage and garden clippings.

Today, environmental legislation, increasing community awareness and changing technologies have allowed new waste disposal methods to develop. Willoughby City Council and the community have been progressive in embracing best practice waste and recycling services. Council has utilised advanced waste recovery processes such as the UR-3R Facility in Western Sydney. This facility employs a combination of mechanical and biological treatments to process waste and recover recyclable materials from the garbage stream as well as producing an organic material which can be used in agriculture and land rehabilitation.

Willoughby City Council is also responding to emerging waste challenges such as the recycling of e-waste and other hazardous materials such as compact fluorescent light globes (CFL's) and batteries. In terms of litter prevention Willoughby City Council is actively working with our community to minimise litter through community education campaigns such as "Dumping its Dumb" and through compliance measures.

In the last year (2009/10) our community has generated 12,257 tonnes of garbage which was sent to landfill, whereas we have recycled 21,744 tonnes of material. 17 per cent of this is vegetation recycled through the weekly green-lidded bin collection. Council has diverted 65 per cent of our generated waste away from landfill.

Council strives to adhere to the philosophies of zero waste and acknowledges the enormous efforts of residents in minimising waste to landfill by recycling.

Waste collection and treatment is discussed further in the Transport and Infrastructure discussion paper.

Future Direction

Key Actions:

- Reduce waste generated by Council through audits, sustainable procurement and education;
- Hold Waste Wise Events;
- Investigate opportunities for re-use of spoil (asphalt, concrete, tile, brick etc);
- Education program for depot works staff.
- Monitor performance of construction waste processing contract.
- Implementation of waste management plans for Councils own developments.
- Continue to employ technology to improve recycling;
- Continue monitoring of waste services & finalise contract options;
- Investigate regional opportunities with NSROC to implement OEH waste management strategy;
- Provide quality waste service and education programs;
- Initiate a price competitive recycling service for the business community;
- Approval of developments with acceptable waste management plans;
- Approval of development consistent with Part C.8 of WDCP - Waste Management;
- Provide and promote industry best practice waste services;
- Increase recycling rates;
- Increase diversion of organics from general waste;
- Increase in waste avoidance;
- Conduct annual e-waste recycling events;
- Reduce dumped rubbish incidents, issue infringement notices, and illegal dumping education campaigns;
- Host Household Hazardous Waste drop-off events in collaboration with OEH.

6. Biodiversity and Ecological Integrity

Biodiversity is “the variety of life forms, the different plants, animals and microorganisms, the genes they contain, and the ecosystems they form” (DECCW 2008). Biodiversity can be considered on three interconnected levels:

- Genetic diversity – genetic variation within and between populations of species;
- Species diversity – variety of species;
- Ecosystem diversity – variety of ecosystems such as rainforests, heath, rivers.

Habitat is the environment where a given animal or plant lives and grows. Everything within an ecosystem is interrelated in some way, although the interrelationships are not always clear until humans impact on biodiversity, and discover the effects years later. Genetic diversity within any species is necessary for its long-term viability and to maintain evolutionary potential. The genetic diversity of native species needs to be conserved at the ecosystem level also.

More than 70 species found in NSW at the time of the First Fleet are now presumed extinct, and over 1000 more are listed as threatened. The great majority are from the best-known groups of species: birds, mammals and vascular plants. In addition, a number of key *threatening processes* have been listed under the Threatened Species Conservation Act 1995. While loss and fragmentation of habitat through land clearing has generally been considered the greatest threat to biodiversity in Australia, other major threats include invasive species, pollution, and climate change (DPI 2005).

Conservation of biodiversity requires long-term commitment and cooperation between all levels of government and the community. The importance of biodiversity to Aboriginal culture and the value of Aboriginal people’s contribution to conservation are recognised. Maintaining the integrity, dynamics and resilience of natural systems is critical to their functioning. Biodiversity is best conserved in situ. Stopping the degradation and loss of biodiversity habitat is the first priority. This is significantly more cost-effective and less risky than recovery and restoration. Once the damage is done, however, management needs to address both retention and repair of ecosystems. Holistic conservation of habitats and species across the whole landscape is central to biodiversity. Habitat linkage (known as connectivity) is vital.

Willoughby City Council is committed to protect, conserve and improve our natural environment. Council managed bushland provides essential ecosystem functions that support the native biodiversity of the LGA. Bushland filters stormwater runoff, which improves water quality before entering Middle Harbour and the Lane Cove River. Trees filter the air, provide oxygen and improve air quality. A healthy native ecosystem supports clean air, clean water and thus the health of our community. In Willoughby, past clearing has created a fragmented reserve system. This means bushland is particularly susceptible to ‘edge effects’ or impacts along boundaries with urban areas, such as: nutrient runoff; altered drainage; sedimentation; erosion; weed invasion; clearing (approved and illegal); feral animals; suppression of natural fire regimes; encroachment by buildings; and dumping.

Protection and restoration of Willoughby’s natural areas such as Blue Gum high forest is required by State legislation, several planning controls, and Council policies and management plans. Current bushland management practices are seeking to ameliorate and reverse degrading influences, and to improve habitat and connectivity between reserves. Actions include: education; managed removal of introduced plants and animals; managing drainage and siltation; implementing a bushfire hazard and ecological burn program; and

habitat restoration programs. The effectiveness of these actions is illustrated by an increase in the area of native plant communities that are in good condition, and in the increase in observed native fauna.

Future Direction

Key Actions:

- Reserve Plans of Management to be reviewed and relevant Urban Bushland POM actions to be implemented;
- Maintain biodiversity using both contract teams and Council staff;
- Approve development that is sensitive to its environmental setting;
- Implement recommendations of Reserve Action Plans relating to waterways;
- Continue catchment awareness initiatives;
- Implement relevant actions outlined in Estuary Management Plans;
- Undertake safety audits on tracks;
- Upgrade and extend walking track network, linked to the Sharing Sydney Harbour program;
- Prepare Bushfire Hazard Reduction and ecological burn plans in conjunction with Regional Bushfire Management Committee;
- Prepare, implement and maintain scheduled burns based on a 4 year program;
- Undertake bush fire prone land mapping and development assessment for bushfire prone land;
- Implement Rural Fire Service and WDCP bushland and bushfire hazard management controls;
- Plan and coordinate interactive Bushland educational activities;
- Schedule environmental events with community groups;
- Involve field and office staff in major events such as the Fauna Fair and Street Fair;
- Maintain supervision and support for volunteers. Improve & extend Bushcare sites;
- Conserve the natural and cultural values of the reserve network;
- Integrate management approach to link stormwater, weed and feral animal control with biodiversity conservation;
- Restore degraded bushland as outlined in Reserve Action plans;
- Review and update Reserve Action Plans with the Natural Heritage and Bushland Advisory Committee and staff to provide framework based on 5 year work programs.

7. Sustainability Education

Solving environmental problems and preventing new ones requires an understanding of the linkage between environmental and human well-being. This is where education is crucial to bringing environmental, social and economic concerns to people's attention and to enable them to understand the linkages, to equip them with the appropriate skills and encourage them to take action.

Education is "the most effective means that society possesses for confronting the challenges of the future" (UNESCO, 1997). Sustainability education is a lifelong learning process that leads to an informed and involved community having the creative problem-solving skills, scientific and social literacy, and commitment to engage in responsible individual and co-operative actions. These actions will help ensure an environmentally sound, economically prosperous and equitable society.

The United Nations has declared 2005-2014 the Decade of Education for Sustainable Development. It has called upon governments at all levels to realign their

education policies and strategies towards learning that empowers the community to take responsibility for creating and enjoying a sustainable future. Its focus is on learning that is participatory and results in change - be it environmental, organisational, cultural or a personal shift in thinking about the environment and community.

Council delivers a range of education programs to schools, businesses, the community and its own staff. These programs are tailored to meet the specific needs and expectations of each group. Council aims to engage the community in action for sustainability. This goes beyond informing with facts, to seeking to empower and inspire the community to change their behaviour and take action to reach a more sustainable lifestyle and society.

An example of this is the ClimateClever Community Education Campaign which was developed in response to a growing concern in the community regarding the effects of climate change. This campaign encompasses a suite of programs including workshops, activities, events and the provision of information materials such as fact sheets that enable the community to take action on climate change and improve their sustainability.

The ClimateClever campaign has received awards including the Keep Australia Beautiful award for outstanding Environmental Education Campaign, the Local Government Management Associations Award for Excellence in Service Delivery for ClimateClever Apartments and the Local Government and Shire Association for Communication, Education and Empowerment Award.

Future Direction

Key Actions:

- Promote and manage the e.restore brand;
- Coordinate and market the online ClimateClever shop;
- Promote workshops and events;
- Engage all divisions of Council in environmental programs;
- Implement the ClimateClever education strategy and undertake a range of programs, workshops and events to achieve the outcomes identified in the strategy;
- Evaluate the ClimateClever education strategy;
- Continue to develop tailored programs and materials for the culturally and linguistically diverse (CALD) community;
- Encourage community and schools to participate in sustainability programs;
- Maintain and participate in networks such as Willoughby Schools Environmental Network;
- Build partnerships with other councils undertaking sustainability initiatives;
- Develop Sustainable Events Policy;
- Develop and implement of a Sustainable Food Policy;
- Promote Council sustainability messages at community events such as Spring Fair;
- Host environmental events such as Earth Hour and World Environment Day, and assist external groups to hold environmental events.

8. Air and Noise

Air Quality

'Action for Air' began in 1998 and is the NSW Government's 25 year plan for managing air quality in Sydney. The most recent update was undertaken in 2009, with the primary focus being reducing air pollution. The Office of Environment and Heritage (OEH) leads the implementation of the plan in consultation with other agencies.

There have been significant improvements in air quality in NSW since the 1980s and Sydney consistently meets the national air quality standards for four of the six major air pollutants (OEH 2009). The two pollutants of primary concern are photochemical smog and fine particle pollution (typically referred to as 'particulate matter' or 'PM'). Photochemical smog occurs in high sunlight conditions and is a mixture of pollutants that include particulates, nitrogen oxides, ozone, and unreacted hydrocarbons. Particulate pollution consists of dust, dirt, soot particles, smoke, and liquid droplets. The main sources of air pollution in the local area are emissions from motor vehicles, industry, commercial/domestic sources and natural occurrences such as bushfires and dust storms.

In the past methods used to maintain air quality have been through controls on industry, changed fuel use for vehicles, technological advancements and the prohibition of open air burning. To protect our air quality into the future we should not only continue with what we are doing, but also look at improving our behaviour. This may be harder than providing regulatory controls or improving technology. We all need to make positive choices about improving air quality to protect both our environment and our own health.

The closest and only NSW government funded air monitoring station is located at Lindfield. Arrangements are currently being finalised to relocate this air monitoring station to Macquarie University. Local monitoring is conducted by Willoughby City Council with an Ambient Air Quality Monitoring Station (AQMS) established in the grounds of Mowbray Primary School. The AQMS was initially installed to monitor the existing background air quality as well as monitor the impacts of the Lane Cove tunnel ventilation stacks on the local shed and surrounding community.

Vehicle emissions from the Lane Cove tunnel are vented via two stacks: one at the western end, Sirius Road (within Lane Cove Council LGA); and one at the eastern end, in the Artarmon industrial area, Marden Street (within Willoughby City Council LGA). Both stacks have potential impacts on land within the Willoughby LGA. Detailed environmental assessments were undertaken at design stage either by or on behalf of the Roads and Maritime Services (RMS), specifically in relation to potential impacts on existing buildings that are situated in proximity to the two stacks. The ventilation system was designed to ensure air impacts were acceptable to all existing buildings.

The WDCP in 2012 incorporated a new section 'Development near Lane Cove Tunnel Ventilation Stacks' addressing land within an 800 m radius of the stacks in Sirius Road, Lane Cove and Marden Street, Artarmon. The objective of this section is to:

- Ensure new buildings are not exposed to excessive air pollution from the Lane Cove Tunnel ventilation stacks;
- Ensure new development does not reduce the effectiveness of the ventilation stacks.

Noise management

Noise levels are likely to increase due to urbanisation which results in high density living, greater car ownership and the development of industry. Road traffic noise is generally the most widespread source of environmental noise in urban areas. In an urbanised area like Willoughby, other likely noise sources include industry, commercial premises, train movements, construction works, recreational and general neighbourhood noise (domestic animals, air conditioners, pool pumps, power equipment and amplified music). Noise management is based on a spectrum ranging from long-term strategic approaches to prevent noise, to covering the need to remedy existing unacceptable noise impacts causing disturbance to the community. Willoughby City Council continues to monitor and respond to noise complaints as they arise to ensure peaceful neighbourhoods and address the NSW Protection of the Environment Operations Act 1997.

Future Direction

Key Actions:

- Monitor and report on local air quality;
- Identify significant contributors to local air pollution;
- Monitor and report on local noise incidents;
- Minimise potential for noise through DA process;
- Resolve noise complaints;
- Consider development near the Lane Cove Tunnel ventilation stacks in accordance with WDCP;
- Require development to be consistent with acoustic privacy provisions of WDCP;
- Require industrial development to be consistent with the POE Act and WDCP air emissions and acoustics provisions.

9. Sustainable Building

The building sector is responsible for almost a quarter, or 23 per cent, of Australia's greenhouse gas emissions but there is huge potential to make our buildings more energy efficient. According to government energy end use projections, emissions from the building sector in Australia will more than double by 2050 if we do not address energy use in buildings (ASBEC 2007).

Therefore it is critical that we strive to build new buildings and retrofit existing building stock to minimise their energy requirements. More broadly we need to ensure that buildings have the lowest possible environmental impact and can be operated in the most sustainable manner.

The key aspects of achieving this outcome include:

- Passive design - Designing the building so that it requires minimal mechanical heating or cooling. This is about designing and building buildings appropriate for the climate in which they are situated;
- Thermal performance - This involves appropriate levels of insulation and draught exclusion - so that less heat enters in summer and more stays inside in winter;
- Water efficiency - This may involve the inclusion of water tanks, grey/black water treatment system, and water-efficient devices such as shower roses, taps and toilets;
- On site energy generation (ideally renewable energy) - Reducing the need to import energy from outside and thus improving efficiency by avoiding transmission losses and potentially using waste heat etc on site;
- Efficient cooling and heating - Utilising the most efficient systems possible;
- Materials selection - Utilising materials with the lowest environmental impact. This means selecting materials that have a low embodied energy, are sustainably harvested and where ever possible utilise recycled products.; and
- Pre-installing piping in new developments to allow for future connections to district heating and cooling systems and recycled water schemes.

Willoughby City Council is striving to incorporate sustainable building principles into its new and existing buildings. For example, Council has recently developed the Devonshire Street Sustainability Hub which involved the retrofitting of a small 1920s red brick building in the heart of Chatswood. The objective of the sustainable renovation was to develop a multi-use space for Council staff and commercial tenants during office hours and the community out of office hours.

Council's new development 'The Concourse' includes many innovative sustainability features including a stormwater reuse system that includes a 5000m³ underground storage tank. This system will save around 103 million litres of drinking water a year.

Through the ClimateClever education campaign Council is also working with the community to promote sustainable building principles. For example, Council provides a range of programs and fact sheets containing practical tips and advice. Through the ClimateClever Home Assessment Service Council provided over 230 homes with face-to-face advice on

actions that can improve the sustainability of the participant's homes. Similarly the ClimateClever Apartments Program provided tailored advice to 25 Owners Corporations of Apartment Buildings. Council is currently investigating future programs to assist our community retrofit and build more sustainably.

Future Direction

Key Actions:

- Develop a Sustainable Building Policy that strives to enhance the sustainability design and ongoing performance of Council buildings;
- Integrate best practice sustainable building design into new Council developments and retrofitting of existing Council buildings;
- Develop and deliver programs that assist the Community improve the sustainability performance of new developments and retrofits;
- Advocate to the NSW government for stronger statewide sustainable building design requirements for new development than the current BASIX;
- Review WDCP – Sustainable Development requirements.

10. Sustainable Business

The business community is responsible for roughly three quarters of the electricity consumption in the Willoughby LGA. Businesses are also major consumers of water and other resources. Therefore, businesses are an essential partner in achieving a sustainable community. Many organisations are now actively embracing sustainability – economic, environmental, governance and social. Businesses are starting to appoint dedicated sustainability officers to look beyond environmental compliance, and actively manage their carbon and water footprints. Council's task is to strengthen our relationship with the local business community, and help businesses make the transition to sustainability and maintain it.

Council facilitates a number of programs to help achieve this task:

- Sustainability Advantage (OEH) - This program works with businesses to identify what sustainability means to them, use resources more efficiently, manage environmental risk, measure their carbon footprint, enhance customer and supplier relationships, and engage and train staff in sustainability;
- ClimateClever Commercial Office Buildings - This program provides subsidised energy audits and technical advice to help save commercial building owners money and prepare for rising electricity costs and the requirements of mandatory disclosure;
- CitySwitch Green Office - The CitySwitch program helps office tenants improve energy efficiency, and provides a formal assessment and reporting process. Signatories commit to achieving a minimum four star NABERS energy efficiency rating for their office;
- Energy Efficiency for Small Business Program (OEH) - This program offers small businesses a subsidised energy assessment, a tailored action plan, and a 50 per cent rebate for energy efficiency measures;
- Better Business Partnership - Funded by the Environmental Trust, this program works in collaboration with Willoughby, North Sydney and Ku-ring-gai Councils. The program will help businesses save on electricity, water and waste. The program also incorporates a labelling and promotional scheme to provide recognition for the implementation of actions by participating businesses.

Council also engages with the business community through other established events such as Earth Hour, Clean Up Australia Day, World Environment Day and host information sessions and networking events.

Future Direction

Key Actions:

- Increase implementation of sustainable practices by local business and industry.
- Increase implementation of energy efficiency measures.
- Provide assistance to businesses to access funding for tools and equipment.
- Provide education and networking events on relevant topics e.g. energy efficiency, engaging staff etc.
- Work with other council and Government agencies to deliver/support programs that support local business to implement sustainable practices.

11. Flooding

Flooding is a natural process that happens periodically as a result of heavy rainfall in a catchment when the water level in a creek or river rises. Specifically, it occurs when the runoff generated from the storm exceeds the capacity of the drainage system. The effects of flooding in the Willoughby City LGA are magnified by the proximity of urban development to natural and modified creeks and channels. Floodwaters overflow the banks of creeks and channels inundating the floodplain which may include roads, residential, commercial and industrial properties.

Flooding causes severe economic damage and emotional distress. Flooding in urban and rural NSW is estimated to cost our economy about \$250 million each year, and the human impact is even greater.

Flooding can be dangerous to people and animals and cause damage to buildings, infrastructure and utilities. It may also cause the loss of valuable belongings and disruption of essential services.

Flash flooding occurs following intense rainfall with resulting flood levels rising to their peak within a very short time, typically between 30 minutes and 2 hours. This tends to occur in steep urbanized catchments such as in the Willoughby City LGA and gives residents very little warning time and little time to prepare.

A 1 in 100 year flood is a large flood that has a 1% chance of occurring in any year. If an area has experienced a 1 in 100 year flood in a certain year, it does not mean that there is no chance of another 1 in 100 year flood occurring in the next 99 years. In fact, some parts of NSW have had more than one of these floods in a single decade.

The Probable Maximum Flood (PMF) is the largest flood that could conceivably occur within a particular catchment, and is a very rare and unlikely event.

State Context

In NSW, local government has the primary responsibility for controlling the development of flood prone land, but the NSW Government, through the Office of Environment and Heritage (OEH) and the State Emergency Service (SES), also has an important role to play in managing the flood risk across the State.

The NSW Government's Flood Prone Land Policy is directed at providing solutions to existing flooding problems in developed areas and ensuring that future developments will not create flooding problems in other areas. The State Government subsidizes flood mitigation works to alleviate existing problems and provides specialist technical advice to assist councils with their floodplain management responsibilities.

The NSW Government provides technical and financial support to local councils to develop Floodplain Risk Management Plans which consist of the following stages:

1. Flood Study
2. Floodplain Risk Management Study
3. Floodplain Risk Management Plan
4. Implementation of the Plan

Catchments in Willoughby

The drainage system in the Willoughby Council area is all within the Sydney Harbour Catchment and is made up of a number of small catchments on the eastern and western sides of the Pacific Highway. Catchments on the west side of the Pacific Highway include Blue Gum Creek and Swaines Creek which are part of the Lane Cove River system. On the east side of the Pacific Highway catchments include Scotts Creek, Sugarloaf Creek, Sailors Bay Creek and Flat Rock Creek which are part of the Middle Harbour system.

In time Council will produce Floodplain Risk Management Plans for all of these catchments.

Council Actions

Willoughby City Council's responsibility is to manage lands subject to flooding on two levels.

Firstly, in accordance with the NSW Government's Flood Prone Land Policy, Council is responsible for formulating and implementing Floodplain Risk Management Plans. These plans involve catchment-wide studies that identify significant flooding issues and floodplain management studies that identify potential flood mitigation solutions and strategies. Flood mitigation options could typically involve floodplain modification, property modification and emergency response measures.

Secondly, Council has a responsibility to ensure future developments are compatible with flood hazards and do not create flooding problems in other areas. As such Council may enforce planning (development) controls such as minimum heights of floor levels above ground level and prohibiting specific land uses in areas prone to flooding.

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.

The overland flow modelling also provided an opportunity to refine the previous flood studies for Flat Rock Creek and Scotts Creek Catchments. The updating of these flood studies is now complete.

The development of a floodplain risk management plan is the next stage of the process after the completion of a flood study. Council has engaged consultants to carry out the Floodplain Management Study and Plan for Sugarloaf Creek catchment and formed a Floodplain Management Committee. The report is close to completion and will be placed on public exhibition in 2012.

Future Directions for Public

Flooding is a significant issue which affects the entire community, and actions by individuals may have serious consequences on others within the catchment. The public should:

- be aware if their property is affected by flooding or contains a potential overflow path;
- be aware of what drainage easement affects their property;
- be conscious of flow paths around their dwelling and keep them clear. Also be careful not to dispose of grass clippings and other garden cuttings in or near the watercourse and remove any obstructions that may cause blockages;
- ensure new fences for properties subject to flood related planning controls comply with Council requirements in Technical standard 3 Nov 2009;
- not construct raised gardens or plant significant trees or vegetation within flow paths. Certain species such as Jacaranda, Poplar, Willow, Fig, Camphor Laurel, rubber Trees and other types with aggressive root systems can cause pipelines to become blocked or cracked;
- not perform any significant work (earthworks, creek bank protection, bridges, piping. etc) to the watercourse through their property without first consulting Council;
- not lay any pipes, construct a bridge or divert a watercourse without first consulting Council;
- not fill in low lying areas of their yard without seeking Council approval due to potential ponding. Ponding will increase flooding potential on both the subject property and neighbouring properties.

Future Direction for Council

- Blue Gum Creek Catchment Flood Study is planned to commence in the financial year 2012-13 pending the approval of the grant application from the Federal Government;
- Floodplain Management Study and Plans and mitigation measures for the catchments are planned to follow the flood studies in the coming years. It should be noted that the timeline for future flood and floodplain management studies depends on the outcomes of the flood studies, approval of grant applications by the Office of Environment and Heritage and budget constraints;