Chapter 6: Infrastructure and Energy

CONTENTS

Infrastructure and Energy

Briefly ....

INFRASTRUCTURE

Marlborough's growth over the past 10 to 15 years has had major implications for services such as energy supply, sewerage and stormwater disposal, water supply and our transport infrastructure.

ISSUES

- Meeting national environmental standards to protect sources of human drinking water, and upgrading reticulated supplies to meet drinking water quality standards.
- Replacing ageing infrastructure.
- Land use activity affecting the road network and safety on Marlborough Sounds roads.
- Heavy vehicle use on highways and through urban areas.
- Use of the Marlborough Sounds as part of Marlborough's overall transport network.
- Protecting the operation of Marlborough's airports.

PRESENT AND FUTURE MANAGEMENT

Water Supply

The Council operates seven water supply networks serving Blenheim, Picton, Havelock, Renwick, Riverlands, Wairau Valley and the eastern Awatere area, which includes Seddon. These systems involve in excess of 300 kilometres of water pipeline, 2 dams, 15 reservoirs, 19 pump stations, 3 treatment plants and approximately 15,000 water connections. The Council will need to upgrade most of these supplies to meet central government drinking water standards.

With the exception of Picton, there is generally sufficient water available to meet demand for the next 15 to 20 years. However, there may be a need to increase more efficient water use to protect supplies for the future. Annual average water consumption in urban areas throughout New Zealand is about 450 to 600 litres person per day compared with 700 to 800 litres per person in Marlborough. This average rises significantly to 1,200 litres plus on peak summer days.

Sewage Disposal

The Council operates sewerage networks and treatment plants in Blenheim, Havelock, Seddon, Spring Creek and Picton. All have been upgraded and expanded in recent years to meet growing populations but also growth within industry. Upgrading has also meant the quality of discharges to the receiving environment has been improved. However, ageing infrastructure will become a challenge in future. Wet weather events are already beginning to highlight the beginning of failures within the network.

The Council has identified unsewered areas that have been creating unacceptable discharges to the environment through failing on-site wastewater treatment systems. Renwick was one such community, which now has a community sewer network.

Stormwater disposal

Urban stormwater disposal systems are in place in Blenheim, Picton, Havelock, Seddon, Spring Creek, Renwick and at Riverlands. For Blenheim, the major health and environmental risks from stormwater is considered to be from stormwater discharges affecting the receiving environment, rather than from the risk to health from major flooding; this risk is considered low. Because of this, the Council is preparing a strategy to manage Blenheim's stormwater so water quality in the Taylor and Opawa Rivers is improved.

Regional Land Transport Strategy for Marlborough (2006)

This strategy attempts to identify all of Marlborough's land transport needs. Roads, rail, public transport, cycling, walking, and the movement of freight are all considered. The strategy recognises a need to balance the economic development of Marlborough against the impact on the land transport network. One important aspect of the strategy is the use of a roading hierarchy to help identify the purpose of roads and therefore how they should be managed.

Walking and cycling strategy

Census data shows the proportion of people walking and cycling in Marlborough is declining. In response, the Council has prepared a strategy to

promote greater use of these forms of transport. Two projects currently being looked at include setting up a pathway between Spring Creek and Riverlands along railway designated land and on-road cycle lanes along routes such as between southern Blenheim and the central business area. Traffic design engineers now also include cycle lanes when designing new roads.

Monitoring road use trends

Consistent with national trends, vehicle trip movements have continued to grow in Marlborough in recent years. Total vehicle kilometres travelled on local roads is estimated to have increased from 128,260,000 in 2002 to 137,336,000 in 2006 - an increase of 7%. Vehicle movements on state highways have gradually increased over this period.

Traffic investigations

A lot of the investigations about roading issues have occurred in and around the Wairau Plain. This area has the highest population density in Marlborough and is also where much of the current primary production activities are based. The start of the investigations initially arose out of a review of the policy framework for subdivision and land use activity on the Wairau Plain, which took place in 2001. A safety study on Rapaura Road was undertaken and the most recent study (2008) had a broad focus looking at arterial routes through Blenheim and the Wairau Plain. The study concluded that the road network is generally in reasonable condition both from a safety and capacity perspective, although highlighted some roads where further investigation was needed in the short term.

Water transportation

Shipping activity in the Marlborough Sounds is an important part of the social and economic wellbeing of Marlborough, especially in terms of the transport link between the North and South Islands. The Council has recognised this by identifying the actual route followed by the inter-island ferries through the Sounds in the Marlborough Sounds Resource Management Plan.

Airports

The Council has been investigating the future use, development and protection of airports at Blenheim, Omaka and Picton. Landings of aircraft have increased at Blenheim airport although on current projections, it is unlikely that the main runway will reach capacity in the foreseeable future. Despite this there may be a need to safeguard the option of extending the main runway. Noise levels from the airports have also been looked at in the investigations.

ENERGY

The use of Marlborough's energy resources is essential to maintaining quality of life. We rely on energy for things like warmth, light, transport, food, fresh water and recreation and the social and economic wellbeing of our district will continue to rely on the sustainable use of our energy resources.

ISSUES

- Growth throughout Marlborough is driving a need for increased energy supplies.
- The reliance on out-of-district energy sources make us vulnerable.

PRESENT AND FUTURE MANAGEMENT

The energy situation in Marlborough is significantly influenced by central government policy and initiatives. For example the Energy Efficiency and Conservation Authority promote energy efficiency, energy conservation and renewable energy across all sectors of the economy. It prepared a national strategy with two specific targets: a 20% increase in energy efficiency by 2012; and an increase in the supply of renewable energy by a further 22% by 2012. So far only modest improvements in energy efficiency have been achieved.

Changes to the Building Act will mean a change to the way in which homes are insulated, water is heated and commercial buildings are lit. This is so that power and gas bills become cheaper and homes and workplaces become warmer, drier, healthier, and more comfortable.

Renewable Energy Assessment

The Energy Efficiency and Conservation Authority assessed the renewable energy potential of Marlborough. It was found that there was considerable hydro, marine and solar electrical energy potential and also the potential to produce ethanol from grain for transport fuel.

Maximising Marlborough's solar energy

Blenheim has consistently high sunshine hours and the remainder of Marlborough also enjoys a sunny climate. Solar radiation is therefore an obvious and abundant source of renewable energy. Solar radiation can be used to heat hot water, instead of using electricity or gas, or can be converted into electricity. Solar energy can also be used to passively heat homes and reduce the need for other forms of heating during winter months.

Infrastructure

In depth ....

Marlborough's growth over the past 10 to 15 years has had major implications for essential services such as energy supply, sewerage and stormwater disposal, water supply and transport infrastructure. The Council currently has in place significant infrastructure in a number of Marlborough's main townships, especially for the essential utility services of sewerage reticulation and treatment, water supply and stormwater disposal.

Roading is also a big component of the Council's overall infrastructure network. However, Marlborough does have some rather different challenges to face than other districts around the country in terms of its transport network. While many councils deal with a transport network that is largely a built resource, i.e. roads, this Council relies on the natural resources of the Marlborough Sounds as part of a significant transport network in and through Marlborough.

There have also been national initiatives with implications for some aspects of Marlborough's infrastructure like the introduction of mandatory drinking water standards. With a need to upgrade most reticulated drinking water supplies under these standards, this will be a costly exercise for Marlborough's communities. Additionally, there are increasing public expectations over environmental standards. Society is much more aware of environmental matters and the Council has a major role in ensuring its utility services have a positive environmental and health impact.

RETICULATED WATER SUPPLIES

The Council operates seven water supply networks serving Blenheim, Picton, Havelock, Renwick, Riverlands, Wairau Valley and the eastern Awatere area, which includes Seddon. These systems involve in excess of 300 kilometres of water pipeline, 2 dams, 15 reservoirs, 19 pump stations, 3 treatment plants and approximately 15,000 water connections.

Water is sourced from wells for Blenheim, Havelock, Renwick, Riverlands and Wairau Valley, while water is sourced from wells and a stream catchment for Picton. The Awatere water supply is sourced from the Black Birch Stream. Table 6.1 provides a summary of these supply systems, the origin of the water, the areas served and the form of treatment they receive.

Quality of water

Drinking water quality in New Zealand has generally been very good. However, disease causing micro-organisms (including from animal and human waste) are present in many of New Zealand's water sources, including in some of Marlborough's water sources. Marlborough's reticulated water supplies are managed as follows:

- The wells supplying water to Renwick, Havelock and Wairau Valley township are shallow and considered insecure, that is, they may be influenced and contaminated by what happens on the surface. Because of this these three water supplies are chlorinated.
- Picton's water supply is sourced from Barnes and Essons Valley Dams in the head waters of Waitohi Stream and several shallow wells at Speeds Road. Both water sources are pH corrected, and chlorinated and the water from the Waitohi Stream system is given additional filtration before being reticulated.
- Blenheim's water supply is from deep wells (25 metres in depth) and until recently had not experienced contamination issues. The water is untreated, with the exception of being pH corrected. A new water treatment plant is currently being constructed in Middle Renwick Road, which will use ultra violet light for disinfection of water before it is pumped into the network. pH correction of water will also continue at the treatment plant.
- The Awatere water supply is sourced from the Black Birch Stream and is untreated. Generally where water is sourced from a stream it is at risk from being contaminated from animals within the catchment. Water testing of Black Birch

TABLE 6.1: COUNCIL OPERATED RETICULATED WATER SUPPLIES

System	Water Origin	Areas Served	Water Treatment
Awatere (including Seddon)	Black Birch Stream	Lower Awatere Valley including Seddon	None
Blenheim	Wells	Blenheim Township and Marlborough Ridge	pH correction
Havelock	Well	Havelock Township	Chlorination
Picton	Wells	Picton and Waikawa	Chlorination and pH correction
Picton	Open catchment (Essons Valley)	Picton and Waikawa	Filtration, chlorination and pH correction
Renwick	Wells	Renwick Township	Chlorination
Riverlands	Well	Riverlands Industrial Estate	None
Wairau Valley	Well	Wairau Valley township	Chlorination

Stream supply has regularly shown there to be faecal contamination within the supply network. Because of this, people using the water supply are advised to boil water before it is used for drinking, personal hygiene or for food preparation.

- The Riverlands water supply is also from a deep well and is untreated.

It is important the risk of contamination of drinking-water is reduced from initial sourcing of water through to the treatment plant and on to the distribution system. There are several stages in ensuring this occurs. What has happened at a national level has been the introduction of national environmental standards to protect sources of human drinking water, and a requirement for reticulated supplies to meet certain water quality standards.

The national environmental standard focuses on reducing risks to the sources of drinking water in the environment. This is an area that comes under the control of the Resource Management Act. However, once water has been extracted from its source and enters a treatment or distribution system, legislation in the form of the Health Act applies.

National environmental standard for drinking water

Central government introduced the national environmental standard to protect sources of human drinking water in June 2008. The standard aims to reduce the risk of human drinking water sources being contaminated by requiring councils to do a number of things:

- Decline discharge or water permits likely to result in community drinking water becoming unsafe for human consumption following existing treatment.
- Be satisfied that permitted activities in regional plans will not result in community drinking water supplies being unsafe for human consumption following existing treatment.
- Place conditions on relevant resource consents requiring notification of drinking water suppliers if significant unintended events occur (e.g. spills) that may adversely affect sources of human drinking water.

Drinking Water Standards for New Zealand 2005

All of the Council's reticulated water supplies, with the exception of Riverlands, will require treatment or an upgrade of current treatment systems to meet the requirements of the Health Act 1956 and the Drinking Water Standards for New Zealand 2005. Where work needs to be carried out to meet the standards, this has to be done within certain timeframes depending on the size of population being served or assessment of risk. Within those timeframes the Council has to introduce public health risk management plans to satisfy that all practical steps to comply with the drinking water standards have been taken.

Leaving the Awatere water supply to one side, all of the other supplies reticulated by the Council only meet the drinking water standards in part. These supplies have met the microbiological compliance section of the standards, however almost all of them fail to meet the requirements of the protozoa standards. (Protozoa are micro-organisms such as *Cryptosporidium* and *Giardia* found in the faeces of humans and animals [wild, farm and domestic]. Many surface waters and non-secure groundwaters have the potential to be contaminated by protozoa.)

For water sourced from an aquifer the standards require drinking water to be shown that it is not influenced by water from the surface. For surface water, this must be treated to remove protozoa. There will be some significant cost for the Marlborough community to achieve the required water standards and this has been estimated to cost around $22.7 million.

The Awatere drinking water supply does not meet either the microbiological or protozoa standards and will require treatment for both in order to meet the drinking water standards.

Water availability

Generally all supplies have sufficient quantity of water available to meet demand for the next 15 to 20 years, except for Picton - see box 'Picton water supply upgrade'. Upgrades to pumping equipment will be necessary for some supplies however, sources will meet demand.

One aspect that may affect water availability in the future is that the Council's 'on demand' water supply networks do not encourage efficient water use. During summer all networks experience large increases in water consumption. Annual average water consumption in urban areas throughout New Zealand is in the range 450 to 600 litres person per day. Marlborough's annual average is 700 to 800 litres per person per day but during the summer period this rises significantly to 1,200 litres plus on peak summer days. The additional demand is created by the dry climate but the on demand supply does not encourage householders to irrigate wisely. While education about water use does help to reduce consumption, the Council may need to look at other options such as water metering to help reduce demand effectively.

PICTON WATER SUPPLY UPGRADE

Census figures show the growth rate in Picton and Waikawa over the last 15 years has been about 2% per annum. This means around 1,000 additional people every 10 years, or close to 400 extra households. In peak summer it is estimated that there are now around 2,100 occupied dwellings.

The problem for Picton and Waikawa is that the use of existing water sources is approaching capacity. Even now in a drought, restrictions have been necessary, but before long there will not be enough even during a normal summer. Because of this the Council has been investigating additional sources for some time. Two main options to supply water to Picton and Waikawa have been considered: from an aquifer in Grahams Valley to the east of Waikawa; and from the Wairau Aquifer. Both options would require long lengths of pipeline to pump water to Picton and Waikawa before being reticulated. For the Grahams Valley option this would mean piping water along the windy Port Underwood Road to Waikawa, while for the Wairau Aquifer option, water would be piped all the way from around the Spring Creek area through to Picton.

Estimated costs are similar for both options, although the Grahams Valley site might require more extensive treatment. Because this site would be a new water source location for Marlborough and is a bigger "unknown", it is being investigated first. Exploratory drilling and testing have started - but to date the indications are not good because a good flow of water has not been achieved with the drilling that has taken place so far. At this stage it would appear more likely that the Wairau Aquifer may have to be the source.

SEWAGE DISPOSAL

The Council operates five sewerage networks and treatment plants. The location of these and the nature of them are described in Table 6.2.

Each sewerage treatment plant operates under a resource consent issued under the Resource Management Act, with conditions that require monitoring and regular reporting. All of the treatment plants have been upgraded and expanded in recent years to meet growing populations but also growth within industry. Upgrading has also meant the quality of discharges to the receiving environment has been improved.

Networks have been expanded to meet growth, particularly in Blenheim and Picton. The extension of sewer mains and upgrades of existing infrastructure have been completed ahead of land being subdivided in areas such as the north west of Blenheim.

Ageing infrastructure will become a challenge in future. Wet weather events are already beginning to highlight the beginning of failures within the network. High stormwater inflow or infiltration rates overload the sewer network causing sewer overflows to occur in some instances. The infiltration in areas where pipes become submerged by rising groundwater during significant rainfall highlights poor pipe jointing or cracking within pipes. The general sewer flows generated in Blenheim average 14,000 cubic metres per day, peaking at 50,000 during significant rainfall events. This can be compared to design sewer flows of 7,500 cubic metres per day for a population of 25,000. At present localised repairs are completed to reduce the level of infiltration, although at some point complete pipe replacements will be required.

Through the Long Term Council Community Plan, and in working with communities, the Council has identified unsewered areas that have been creating unacceptable discharges to the

TABLE 6.2: COUNCIL OPERATED SEWERAGE NETWORKS AND TREATMENT PLANTS

Location	Nature of Plant
Blenheim	Blenheim sewage treatment plants serves the Blenheim, Renwick and Woodbourne communities and the Riverlands Industrial Estate. Treatment is through a series of oxidation ponds at the Hardings Road treatment facility, where domestic and industrial wastewater are treated separately.
Havelock	A small oxidation pond treatment facility near the Kaituna River serves the Havelock community.
Seddon	An oxidation pond treatment system serves the Seddon Township.
Spring Creek	An oxidation pond system adjacent to the Wairau River serves the Spring Creek township.
Picton	A sewer treatment plant west of Gravesend Place, incorporating extended aeration, clarification and UV disinfection serves the Picton and Waikawa communities.

RENWICK SEWERAGE SCHEME

During the 1970s it became apparent that the township of Renwick could not continue to develop by sourcing water from shallow wells on each property, while at the same time disposing domestic effluent by way of septic tank onto the same property. The then Marlborough County Council discussed the possibility of a sewerage scheme and a water supply scheme. The two schemes were promoted as alternatives; either a sewerage scheme needed to be constructed or a town water supply scheme built with a source unaffected by septic tank effluent. The water supply was installed.

Despite the water supply having been installed, there have been ongoing investigations that have highlighted serious septic tank effluent disposal problems. This is because the ground is becoming saturated in winter and soakage rates are unable to cope with septic tank discharges. This has lead to contamination of surface water in the township including in School Creek. A high density of septic tank and disposal systems has compounded the problem with serious public health risks being identified.

As the community became more aware of the issues and risks to health, it indicated strong support for a reticulated scheme. A range of local disposal options was considered along with the option of combining with an upgraded Blenheim sewerage scheme. The combined scheme was decided upon, as it was identified as being the most cost-effective option with the lowest capital and operating costs, and with a high degree of community acceptance.

The scheme is sized to accommodate 50-year peak wet weather flows based on a projected population density dictated by the current zoning of the township in the Wairau/ Awatere Resource Management Plan.

The Renwick sewerage scheme became fully operational from 17 July 2006 following a construction program of just over 2 years. Only a few minor odour complaints were received during the initial operation because of low initial flows. Odour problems have now been eliminated by regular flushing with fresh water and by increased sewer flow as more properties have connected to the network.

environment through failing on-site wastewater treatment systems. Renwick was one such community, which now has a community sewer network. This network is now collecting wastewater and discharging it to the Blenheim sewage treatment plant - see box 'Renwick sewerage scheme'.

The Council is currently working with the Grovetown community to have a sewerage network installed to relieve ongoing problems with discharges to open waterways.

Upgrading sewerage infrastructure

TABLE 6.3: URBAN STORMWATER DISPOSAL SYSTEMS

System	Stormwater Goes to	Areas Served
Blenheim	Taylor and Opawa rivers and Co-op Drain system	Blenheim
Havelock	Havelock Harbour	Havelock township
Picton	Picton Harbour and Waikawa Bay	Picton and Waikawa
Seddon	Starborough Creek	Seddon township
Spring Creek	Wairau River	Spring Creek township properties on the eastern side of the State Highway
Renwick	School and Gibsons Creeks	Renwick township
Riverlands	Riverlands Industrial Estate	Co-op Drain system

STORMWATER

Stormwater systems collect water from houses, driveways, streets and roads, and pipe or channel it to natural waterways. As each town or settlement develops, the piping becomes part of an organised system put in place to deal with flood hazard risk and for human health and wider environmental reasons.

The Council operates urban stormwater disposal systems in Blenheim, Picton, Havelock, Seddon, Spring Creek, Renwick and Riverlands - see Table 6.3 above. The urban stormwater systems consist of 120 kilometres of piped drains, many of which are over 600 millimetres in diameter.

Spring Creek and Renwick have relatively comprehensive stormwater systems consisting of sumps, service connections, manholes, pipework and soak pits. Havelock's and Seddon's stormwater systems consist of kerb and channel and a small amount of piped reticulation, transporting stormwater to open drains and watercourses.

Marlborough's two largest urban stormwater systems are in Picton and Blenheim. The Blenheim system consists of stormwater reticulation laid at very flat grades due to the flat nature of the terrain, draining to a number of open drains and watercourses - see box 'Blenheim stormwater system' for more about this system. Picton's steep terrain enables stormwater to get away quickly through a number of open drains and watercourses. Open drains and watercourses are an integral part of the systems providing significant run off storage.

BLENHEIM STORMWATER SYSTEM

Blenheim has an extensive drainage system that relies on open drains and streams for the disposal of stormwater. The flat topography of Blenheim has meant that much of the reticulation has been installed at very flat grades. The system relies on the storage of stormwater runoff in roads and natural depressions to reduce peak flows. Outlet pumps along the Taylor and Opawa Rivers assist with stormwater disposal when the rivers are in flood.

Many roads in Blenheim operate as secondary flowpaths and store stormwater during flood events and therefore assist in reducing peak flows in the stormwater system. This results in some road flooding after heavy rain until the flood peak has passed and the drains can accommodate the water. This is generally not a problem unless the kerbing is overtopped with footpaths being affected or the water extends into traffic lanes. After intense rain some nuisance flooding of private property can occur.

The major health and environmental risks from Blenheim's stormwater system are considered to be from stormwater discharges contaminating the receiving environment, rather than from the risk to health from major flooding; this risk is considered low. For this reason, the development of a strategy by the Council for the future management of Blenheim's urban stormwater to enhance water quality in the Taylor and Opawa Rivers is currently being prepared. The general approach of the strategy will be that it is more efficient to address stormwater quality issues at source and at catchment level before stormwater enters the receiving environment. The strategy will therefore aim to:

- Identify and confirm actual stormwater outfalls and their respective catchments.
- Carry out catchment surveys to identify likely sources of contaminants.
- Develop and implement programmes to minimise these sources of contaminants.
- Undertake educational initiatives to emphasise the importance of contaminant minimisation.

To date, development of the strategy has involved the Council's Assets and Services and Regulatory Department staff monitoring stormwater quality. Where this monitoring indicates the potential for cross connections with sewer pipes further works have been carried out to identify and eliminate the cross connections.

TRANSPORT INFRASTRUCTURE

People in Marlborough are heavily reliant on private motor vehicle transport and roads. This is because of the district's extensive land area, relatively low population base and a resulting lack of alternative forms of transport. The land area has resulted in an extensive rural road network that has state highways linking other districts, major arterial routes within Marlborough, local sealed roads and many kilometres (some 700) of unsealed gravel roads extending far into the Marlborough Sounds and other rural areas.

The arterial road network involves state highways and arterial roads. Marlborough has four state highways running through it: State Highway 1 (Picton to Christchurch), State Highway 6 (Blenheim to Nelson), State Highway 63 (Renwick to the West Coast) and State Highway 62 (Rapaura Road). The arterial road network also includes primary arterial routes along Queen Charlotte Drive and Kent Street, Picton and 14 secondary arterial roads in the urban Blenheim environs. Highways in Marlborough are managed by the New Zealand Transport Agency and all other roads are managed by the Council, both under contract by Marlborough Roads.

Marlborough enjoys 18% of New Zealand's coastline, much of which is within the Marlborough Sounds. Very important transport links have developed here over many years, including the inter-island ferries operating between Picton and Wellington. The vast navigable waterways of the Sounds are however, also well-used by recreational, private commuter and commercial vessels. These vessels come in all shapes and sizes, ranging from kayaks and sailing dinghies, through to large yachts and launches, to fishing boats and international cruise liners. Many activities, including marine farming, forestry, farming and residential activities are reliant on water transport as being the only way or the easiest way of getting around or moving goods. This is partly because of the limited extent of roads in the Sounds. The link with the inter-island ferry service means that rail has a significant role in freight and passenger transport through Marlborough.

Air travel is also very important. The Royal New Zealand Air Force Base Woodbourne and the civilian Blenheim Airport are located on the outskirts of Blenheim. Regular services are provided to Wellington, Christchurch and Auckland. A second much smaller airport, privately owned and located within the Koromiko Valley approximately 20 kilometres from Blenheim, also provides a regular service to Wellington.

Marlborough's climate is very suitable for walking and cycling activities. In recent years, there has been a very positive trend towards the use of walking and cycling as a method of transport, as well as being a recreational activity. This has occurred mainly in the Blenheim, Renwick and Wairau Plain environs but is much wider in terms of tourist cyclists.

National overview

The management of transport generally is significantly influenced by central government policy. Most forms of transport are governed to a large degree by statute e.g. the Land Transport Act 1998, the Maritime Transport Act 1994, and the Land Transport Management Act 2003 to name just a few.

Other legislation has quite an impact on the Council's ability to actively manage certain activities. The Defence Act 1990 for example, provides for the Royal New Zealand Air Force Base at Woodbourne to be used for the defence and protection of New Zealand, for other international New Zealand contributions (e.g. United Nations work), for civil assistance in times of emergency and for the provision of public service. This Act takes precedence over the Resource Management Act.

A similar situation arises in respect of air transport. Under the Civil Aviation Act 1990, the Civil Aviation Authority is responsible for air safety and has sole responsibility for the regulation of navigable air space in New Zealand. This means that the Council cannot control aircraft once they leave the ground. The Authority also advises on standards, practices, procedures and methods relating to the safe operation of aerodromes, airports, commercial airstrips and heliports.

The Land Transport Act 1998 is quite important as it includes a requirement for the Minister for Transport to prepare a national land transport strategy. It also sets up the framework for local authorities, such as Marlborough, to prepare a regional land transport strategy.

The New Zealand Transport Strategy

The New Zealand Transport Strategy (released in December 2002), sets out the government's vision for transport:

> ***By 2010 New Zealand will have an affordable, integrated, safe, responsive, and sustainable land transport system.***

The strategy recognises different types and users of transport, those who provide transport, and those affected by transport. It also responds directly to the broader social, economic and environmental needs of New Zealand. It is intended to guide decision making by central government, and its various agencies, and also act as a point of reference for local government, business and communities.

The strategy states that the 'government is determined to see that the transport system supports access and environmental outcomes through improving public transport, reducing congestion, improving safety for all, supporting alternatives to travel (such as teleworking and local provision of services), and providing infrastructure for walking and cycling. Barriers to mobility will need to reduce. Improving the energy efficiency of our transport system, and implementing emissions-related initiatives, are an important part of the government's commitment to reducing greenhouse gases.'

Transport issues for Marlborough

Land use activity affecting the road network

Arguably, Marlborough's road network is the foundation of the Marlborough transport resource. It connects settlements in Marlborough and also between other regions, and links the other

key transport modes of air, rail and water transport. The road network is strategically important, both regionally and nationally, with State Highway 1 running through the district. It is also of absolute importance on a local level.

Over time the way the road network functions or works, especially the arterial road network, can be affected by the cumulative impact of land use activities. An area where pressure on the arterial road network from expanding use and intensive development has been significant is the Blenheim and Wairau Plain area. These pressures have arisen from increasing traffic numbers and subdivision and land use activities. Viticulture expansion within and beyond the Wairau Plain has meant more intensive use of the road network by both heavy and light traffic. Subdivision in this area has also led to increased numbers of vehicles using roads especially for residential development. Land use activity in rural areas, such as that from restaurants, craft and other tourist places, also contributes to overall traffic numbers. On their own, any particular activity is of little consequence, but collectively, the effects can become significant on how well the road network operates.

Because of intensive development in locations like Blenheim and the Wairau Plain, it is extremely difficult, physically, legally and economically to develop new or alternative roads, or even to widen existing road reserves.

Safety and conflicts on Sounds' roads

The Marlborough Sounds are an attractive destination and playground for Marlburians, for other New Zealanders and for overseas visitors. The Sounds are also a place where a considerable amount of primary production occurs, e.g. aquaculture, commercial fishing, commercial forestry, pastoral farming, etc.

There are degrees of incompatibility between some of these primary production activities and other recreational/tourist-related activities in the Sounds. The road network is a key part of this mix. Because of topography and the original choice of alignment, the roads in the Sounds are narrow, tortuous, vulnerable to climatic events and expensive to maintain. This makes significant demands on drivers in order to proceed safely.

Over the past 10 years there has been a lot of conflict between these different road users, especially from a safety perspective. A typical example of the relationship between different users is of resident commuter traffic/tourist traffic and logging trucks. Conflicts can be expected to increase if land in the Sounds is to be further subdivided and developed, tourist numbers increase and harvesting of primary produce continues. The essential element of this issue is traffic safety. Stresses arise from growth pressures, incompatible vehicle types and the demanding conditions of the Sounds' roads. These along with heavy repair and maintenance costs, continue to challenge the Council, the Sounds' community and other road users.

Heavy vehicle use on highways and through urban areas

Heavy vehicle use of highways and through town centres is increasing. Many people would like to see the removal of heavy vehicles out of towns like Blenheim. Some of the problems that arise from the existing and increasing numbers of heavy vehicles on state highways through Marlborough include the following:

- The community having to face the cost of progressively upgrading the existing network both in urban areas and in rural areas. This includes the progressive need for passing lanes.
- Conflicts at locations such as the Spring Creek junction and the railway roundabout in Blenheim.
- Potential sooner-than-later cost of needing to put in a heavy traffic bypass for Blenheim.
- Traffic safety on the open road.
- Traffic incompatibilities in townships, particularly Blenheim, Picton and Seddon.
- Discharges and emissions (including noise, vibration and stock truck effluent).

One of the key pressures driving the investigation of a heavy traffic bypass for Blenheim is the impact of heavy vehicles in Blenheim. The number of heavy vehicles passing through Blenheim is progressively increasing and stressing the urban network in a variety of ways. Additionally, the crash statistics for heavy vehicles on State Highway 1, through Marlborough, are also on the rise.

Lessening the numbers of heavy vehicles using roads would help in reducing the impacts described above. One way of achieving this would be to promote the use of rail transport.

Use of the Marlborough Sounds as part of the transport network

The waters of the Marlborough Sounds are of strategic importance in being part of New Zealand's overall national transportation

network. The link between the North and South Islands of New Zealand is particularly important with large numbers of passengers and freight being transported annually through the Sounds between Picton and Wellington. This interisland route has been described by some as being part of the state highway network, providing access between the North and South Islands in the same way as a bridge does across a river.

The size of boats using the Sounds varies considerably (from large overseas freight ships down to small passenger or tourist boats). Collectively their operation contributes to the social and economic wellbeing of Marlborough, which means they rely on being able to efficiently and safely use the waters of the Sounds. At the same time, there are many hundreds of private boats, yachts, kayaks and other recreational craft which interact with the larger and or commercial ships. Invariably there can be conflicts between the different users.

(While the Council has recognised the overall importance of shipping activity to Marlborough, there have also been issues with the speed and wake generated from larger and faster ships. This issue has been included in the Coastal chapter of this report and is not covered here.)

An important aspect of the Sounds being regarded as a significant transportation route is also the port and marina infrastructure that goes with it. The communities at Havelock and Picton have grown up in and around their respective ports and marinas, with them being a significant component of the landscapes/seascapes of these towns.

The historic closeness between port and town continues today, with much of the economic activity of Picton and Havelock derived from activities arising from the ports' operations, e.g. passenger and freight ferries or activities undertaken at the port itself, e.g. marine related industries. The ports, and associated industrial areas, are vital for the social and economic wellbeing of Marlborough, as well as playing a critical role nationally in the transportation of people, goods and services between the North and South Islands.

The larger marinas at Picton, Waikawa and Havelock are also important bases providing landing, storage, and loading facilities for residents of the Sounds, as well as providing an important access point for many vessel owners who are not Sounds' residents. The marinas provide for a significant number of berths within a relatively small area and can therefore concentrate adverse effects (such as antifouling and sewage discharges) to a single part of the coastal marine area, avoiding the need for such activity and effects throughout the coastal marine area. However like ports, the operation and or expansion of marinas can have adverse effects on the surrounding environment. Therefore, while recognising the significance of the actual infrastructure of the marinas is important, they too need controls to minimise the adverse effects on the environment.

Providing for public access to and from the Marlborough Sounds

The limited road network in the Marlborough Sounds, particularly in the outer Sounds, means that many activities, including marine farming, forestry, farming and residential activities are reliant on water transport. Where road access is available, larger jetties and landing areas have been developed in some areas for commercial and community use. Those at Oyster Bay (Port Underwood), Elaine Bay, Okiwi Bay, Elmslie Bay, Kapowai Bay and Portage are examples of public landing areas. Others are in private ownership but still attract commercial use, for example, the Outward Bound School jetty at Anakiwa is used to provide access to the Queen Charlotte Walking Track.

There has been a general increase in residential and commercial use of the Sounds. Quite a number of Sounds' residents rely on boat only access to the ports of Picton and Havelock. These residents are finding that affordable and convenient access is becoming more difficult. This is especially the case in Picton, and particularly so during the peak summer holiday season. With the ports becoming busier, this issue is likely to become more significant.

In addition, there is a significant part of the community, which only requires occasional access to and from the Marlborough Sounds. The existing launching ramps around the Sounds are mostly owned and operated by Port Marlborough New Zealand Limited or by community groups. These facilities can become overloaded at peak times. Sufficient boat trailer parking around the launching ramps can also be a problem. There is a perceived lack of easily accessible and low cost facilities around the Sounds.

By the day there are more tourists visiting the Sounds, more Sounds' residents in residence and more recreational boaties enjoying the Sounds' waters. Access to and from the Sounds, for these user groups, may become more of a problem in future years.

Operation of Marlborough's airports

Blenheim Airport is an important link for air transport (for passengers and freight) between Marlborough and the rest of New Zealand and potentially overseas. Operation of the airport for civilian and military purposes is an important activity in Marlborough. Figure 6.1 shows the figures for current airport landings from the period 2001/2002 through until 2006/2007.

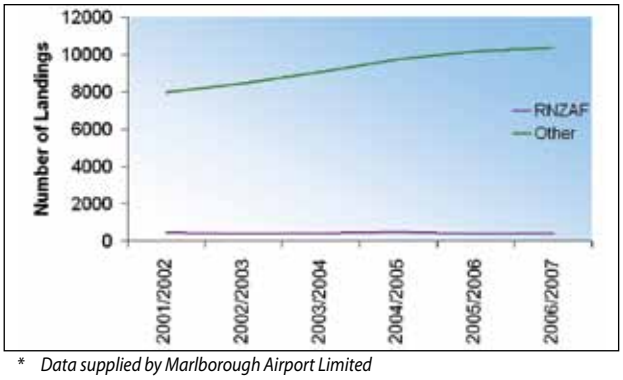
Based on current projections, it is unlikely that the main runway at Blenheim Airport will reach capacity in the foreseeable future and there are no plans by the airport operator, Marlborough Airport Limited, to extend the existing runway. There is capacity within the existing land area to develop a taxiway parallel to the main runway, if congestion becomes a problem.

However, any significant increase in the number of military aircraft movements could trigger a need for an extension of the runway, e.g. if the flying school is transferred to Base Woodbourne. Alternatively, if other industries located at the airport were to expand, then there may be a corresponding need to extend the runway.

Urban encroachment could become a significant threat to the future of Marlborough's airports. Experience elsewhere around New Zealand has shown that increases in population in areas affected by aircraft noise can result in public pressure to modify airport operations, for example by altering flight tracks or introducing curfews. These can have significant adverse effects on the operation and viability of the airport.

Blenheim Airport is currently separated by approximately 4 kilometres of open land from the western boundary of Blenheim. While there are currently no significant proposals to extend Blenheim towards the Airport, it needs to be recognised that there are no significant natural constraints on the expansion of Blenheim in that direction either. It is therefore important that the airport be safeguarded against potential urban encroachment.

FIGURE 6.1: LANDINGS AT BLENHEIM AIRPORT 2001/2002 - 2006/2007*



* *Data supplied by Marlborough Airport Limited*

Omaka airfield and Picton Airport are located in sensitive locations, with some physical and residential constraints on future development. Yet both Omaka and Picton are zoned exactly the same as Blenheim airport, and the wide ranging activities currently being undertaken at Blenheim airport e.g. aircraft engineering and testing, visitor accommodation and restaurants (subject to meeting the conditions in the Wairau/Awatere Plan) are also permitted at Omaka and Picton Airports. This could potentially be an issue for other land use activities occurring in the immediate vicinity of these small airports.

Responding to pressures on transport infrastructure

Regional Land Transport Strategy

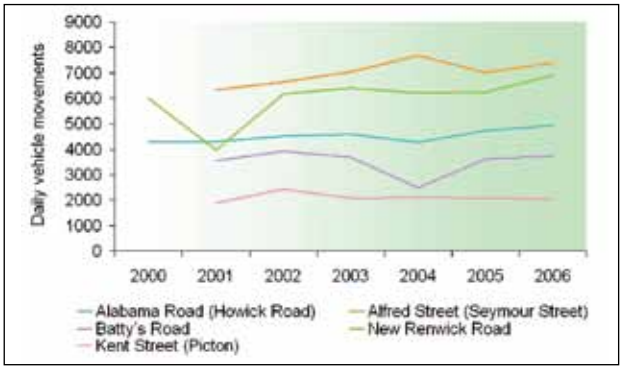
The Regional Land Transport Strategy for Marlborough provides a vision for land transport management in Marlborough. The strategy attempts to identify all of the district's land transport needs, for roads, rail, public transport, cycling, walking, and the movement of freight. Consideration is also given to the interface between port and airport facilities to move people, vehicles and freight. This strategy outlines how these needs will be met in a sustainable manner. (An important aspect of a regional land transport strategy is that it must be consistent with a council's regional policy statement or plans prepared under the Resource Management Act.)

The overall objective or vision for Marlborough's strategy is to "provide a sustainable land transport system that enables social and economic development to occur in balance with environmental and community needs".

A significant focus for the latest strategy (reviewed in 2006) was that the location of some land use activities has not been well thought through, meaning there are implications for the long-term safety and/or sustainability of the land transport system. The strategy recognises there is a need to balance the economic development of Marlborough against the impact on the land transport network. While a good transport network can support and assist economic development, the effectiveness of how well the network operates is often not considered to be of a concern until the effects arise and then these are reacted to, as opposed to being avoided in the first place.

One important aspect of the strategy is the use of a roading hierarchy to help identify the purpose of roads and therefore how they should be managed. This hierarchy is also used in the resource management plans to determine the effects of land use activities on the road network. The hierarchy comprises national routes, primary arterial routes, secondary arterial routes, collector routes and local routes.

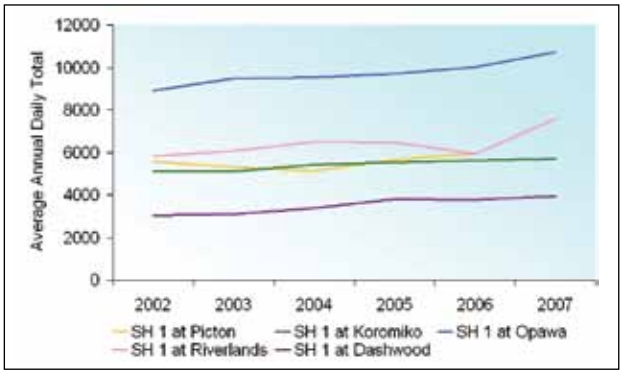
FIGURE 6.2: DAILY VEHICLE MOVEMENTS ON A SELECTION OF LOCAL MARLBOROUGH ROADS 2000 – 2006*



* *Traffic counts all Marlborough roads supplied by Opus on behalf of Marlborough Roads.*

** *For some roads, multiple vehicle counts have been done. Where that occurs, the figure for the year has been calculated as an average of all counts for that year. The effect is to average high summer and lower winter usage on some roads such as Queen Charlotte Drive and Mahakipawa Road which are more heavily trafficked by tourists in summer.*

FIGURE 6.3: AVERAGE ANNUAL VEHICLES ON MARLBOROUGH STATE HIGHWAYS 2002 - 2006*



* *Information provided by New Zealand Transport Agency*

The "higher" the classification the more priority is afforded to the movement of through traffic and, conversely, the "lower" the order the more priority given to access (pedestrian, servicing and parking). The higher order roads can also be expected to cater for higher traffic flows, although this is not a universal rule. Higher intensity use should not impair however, the operational efficiency or safety of the arterial road concerned. To ensure this does not happen, direct access to arterial roads may be controlled. A limited increase in traffic generation may be tolerated without alternative access, provided the number of direct access points to the arterial is reduced.

On non-arterial roads, residential density is unlikely to be constrained by capacity, but will be influenced by safety issues and the acceptability of increased flows to existing residents. Safety issues will be influenced mainly by road width, alignment, visibility and traffic speed. Sometimes other methods are used to discourage traffic in areas where it would have adverse environmental effects. These include road closures, narrowing of roads, turn restrictions and one-way roads restrictions.

Monitoring road use trends

Related to growth in Marlborough's economy, and consistent with national trends, vehicle trip movements have continued to grow in recent years. Total vehicle kilometres travelled on local roads is estimated to have increased from 128,260,000 in 2002 to 137,336,000 in 2006 - an increase of 7%.

Although there have been some variations between years, total vehicle movements have increased on the district's local roads over the period 2000 to 2006 as shown in Figure 6.2.

Vehicle movements on state highways have also gradually increased over the period 2002 to 2006 as illustrated in Figure 6.3, which shows the recorded average annual daily trips a number of locations on the state highway network.

Wairau Plain traffic investigations

A lot of the investigations into roading issues have occurred in and around the Wairau Plain. This is not surprising given this area has the highest population density in Marlborough and is also where much of the current primary production activities are based. The start of the investigations initially arose out of a review of the policy framework for subdivision and land use activity on the Wairau Plain, or more specifically, the area known in the Wairau/Awatere Resource Management Plan as the Rural 3 Zone. This took place in 2001. The most recent study had a broader focus, which included arterial routes through Blenheim and the Wairau Plain in 2008.

Wairau traffic study Rural 3 Zone

This study was to provide the Council with a range of traffic related policies to guide decision makers in assessing the cumulative effects of subdivision and land use activities on the road network. Part of the study involved mapping all subdivision and building consents granted between 1998 and 2000. The intention of this was to identify those areas of the Rural 3 Zone and associated roads that were under the most pressure.

What was found was that subdivisions for lots below 8 hectares tended to be found on the periphery of Blenheim and concentrated to the west and northwest of the town. Residential development was also clustered in these areas. Subdivision for lots 8 hectares or larger were scattered across the entire Wairau Plain, although some clustering was evident. Rural industry development was concentrated along Rapaura Road and to the east of Blenheim.

One of the major outcomes from this work was the development of a good practice processing guide for assessing subdivision and land use consent applications in relation to effects on the road network. What was also recommended from the study was a need to identify transport thresholds to act as triggers for refusing to allow subdivision or land use activities.

Rapaura Road safety study

Crash reductions studies are undertaken regularly to identify why crashes occur. This helps to identify whether remedial measures are needed to minimize future crash occurrence and severity. In Marlborough a crash reduction study team investigated Rapaura Road in 2002 given the number of incidents occurring along this 12.75 kilometre stretch of road. There had also been some publicly expressed concern about the number of traffic incidents along this road.

In the period 1996 to 2001 there were 33 crashes recorded. Some of the notable factors from the crash reports include the following:

- 5 (15%) involved alcohol;
- 9 (27%) involved collision with service poles;
- 7 (21%) recorded fatigue or sleep;
- 18 (55%) recorded collision with ditches and fences;
- 9 (27%) occurred at intersections;
- 16 (48%) were single vehicle crashes;
- 6 (18%) occurred at commercial and private accessways; and
- 67% were on week days.

The report recommended a number of short term and long improvements to Rapaura Road. Some of these included improving intersection markings and signage, widening road seal and developing strategies to relocate power poles and for managing the impact of roadside drains on road safety.

Interim Wairau Plains arterial roads strategy study

Following on from the crash reductions studies and the public feedback from them, the Wairau Plain arterial roads strategy provided a framework for implementing the recommendations of the crash studies.

Blenheim and Wairau Plains strategic study

In more recent times and in response to the growth pressures in Marlborough, the Council wanted to assess the effect of long term growth on the transport system, for Blenheim and on the Wairau Plain. (Previous studies had concentrated more on the Wairau Plain and had not included routes through Blenheim.)

Three future land use scenarios were considered based upon existing land use trends. The three scenarios were: intensification within Blenheim; a "satellite town" scenario, based upon new residential growth being developed in areas surrounding Blenheim; and a combination of the two scenarios. The first two scenarios are considered extremes, with either all or none of the new housing centred in Blenheim. The third scenario, a combination of the first two, seemed to be the most preferred.

It was intended that by going through the three scenarios, this would help determine if the existing transport network, particularly arterial roads, is robust and would provide information to the Council to determine the best policies for future growth.

A transport model has been built to enable future traffic flows in the Wairau Plain area to be predicted based on future land use assumptions. The model was developed and validated against the 2006 base year with the land use scenarios then being extrapolated out to 2026.

The report outlined future transportation issues with growth. This indicates that all scenarios create a low level of service through Blenheim in the future. Issues that were considered included:

- Capacity of existing intersections to cope with traffic flows, including the delays being experienced and the possibility of spreading peak flows. For investigations on intersections within Blenheim, it was found the three roundabouts on State Highway 1 (Nelson Street, Alfred Street and Redwood Street) are nearing capacity and will produce additional delays without improvement to traffic flow. Spreading the peak was shown to reduce overall intersection delays with

an additional 7 years of life predicted for State Highway 1 through Blenheim before improvements are required.

- The sensitivity of reducing car use with the potential for a shift to public transport. The report concluded that certain improvements will be required on the road network regardless of an increase in public transport.
- Walking and cycling improvements outlined in the Walking and Cycling Strategy.
- Heavy vehicle movement within Marlborough that indicates aside from intersection issues and the possibility of a bypass, there are no other specific issues relating to freight that need to be addressed before 2026.

Overall the intensification of growth in the Blenheim growth scenario results in the least problems with the satellite town scenario resulting in the most.

In looking at an analysis of the necessity and form of an eastern bypass for Blenheim, a preliminary feasibility report of the following has been modelled and highlighted the following:

- A short bypass, which has a link connected from State Highway 1 south of Grovetown, to State Highway 1 between Alabama Road and Riverlands.
- A long bypass connecting to State Highway 1 north of Grovetown and east of Riverlands.
- Two further options were also assessed in order to provide better access to a bypass and to promote a reduction in traffic on Sinclair Street. These are an alignment based on the short bypass, above, with a connection to Dillons Point Road.
- An internal town centre bypass using Dillons Point Road, Marshall Street and Stuart Street. The report noted this location was chosen because of the shorter distance and that variations on this route could apply.

The preliminary assessment shows that the benefit cost ratio of each of these is low at 2026 but the shorter options should be considered further. Essentially the report recommended that the need for constructing a by-pass was in the long-term i.e. beyond 2020 up to 30 years, assuming that further investigations showed that it is still warranted.

The investigations also looked at the future rural arterial road network relating to safety and expected traffic volume increases. Based on traffic and accident data gathered for routes on the rural network (for the period 2003 to 2007), the report identified a number of sites that warrant further investigation in the short term, especially those sites ranked with a high priority - see Figure 6.4. The analysis also concluded that the intersections at State Highway 1/Grovetown and State Highway 6/ Godfrey's Road would exceed capacity in 2026. Under the satellite town scenario the intersection of State Highway 1/ State Highway 62 at Spring Creek would also require upgrading.

The project report concluded that the road network in the study area is generally in reasonable condition, both from a safety and capacity perspective.

Marlborough Sounds roading conflicts

During the early period of forestry planting in the Marlborough Sounds, the then Marlborough County Council of the day refused to allow commercial forestry to be established in some areas because of road transport related concerns. However, these decisions were overturned by the former Planning Tribunal, as that body thought there would be improved technology and engineering innovations not apparent at the time of planting, but which might appear within the following 30 years.

FIGURE 6.4: RURAL CRASH BLACK SPOTS (2003 - 2007)

Location	Number of Crashes	Fatal	Serious	Minor	Non-injury	Priority
State Highway 6 - 60 to 200 metres north of Wairau Bridge	10	1	1	1	7	High
State Highway 6/Bells Road/ St Leonards Road	10			2	8	High
State Highway 1/State Highway 62/ Ferry Road	15		1	4	8	High
State Highway 1/ Alabama Road	7	1	1	1	5	High
State Highway 1/ Dazzle corner	9	1	1	4	3	High
Old Renwick Road/ Jacksons Road	7			3	2	High
State Highway 6/ Godfreys Road	8			1	7	Medium
State Highway 6 - 800 to 1000 metres south of Leslies Road	6			3	3	Medium
State Highway 62/ Selmes Road	6			1	5	Medium
State Highway 1/Mills and Ford Road east	4			1	3	Low
State Highway 6/ Jacksons Road	4				4	Low

Over recent years, as these commercial forests have been harvested, transport issues have seen affected communities clashing with forest owners and log transport operators. The main community concerns are road safety, especially the compatibility of logging traffic with other road traffic given the narrow and winding nature of the roads in the Sounds, and pedestrian safety and noise as the logging trucks drive through residential areas. The Council has put a lot of effort into looking for solutions with operators and affected communities, including road widening and improvements, logging truck dedicated haul routes and water transportation - see the box 'Port Underwood logging traffic'.

PORT UNDERWOOD LOGGING TRAFFIC

Waikawa and Picton residents had been increasingly concerned about the number of logging trucks using the Port Underwood Road. Between 30,000 and 50,000 tonnes per annum of logs had been hauled over the Port Underwood Road throughout the 1990s and early 2000s. This figure was expected to increase significantly, to a total of between 100,000 to 200,000 tonnes per annum. The Council identified that this volume of logs would create significant road maintenance and upgrade costs for the ratepayer as well as raising significant concerns for Port Underwood and Waikawa Road residents.

An issues and options paper was prepared for the community and forest owners about concerns the projected increases in forestry traffic would have. In this, the Council noted that although reported accidents involving trucks had been negligible, there were increasing accounts of "close shaves". While independent road engineering studies found the Port Underwood Road safe with existing heavy traffic numbers, the perception of the car driver was different. Large logging trucks are an imposing sight, particularly on narrow, winding Sounds roads. Residents had also complained about the noise and vibration from logging trucks.

Options suggested by the Council to deal with the log cartage problems included: doing nothing more than the normal maintenance on the Port Underwood Road based on 30,000 tonnes of logs per annum being carted over the road; upgrading the road; directing heavy traffic through Rarangi instead of the Waikawa route; provide an alternative logging road through Department of Conservation Estate adjacent to Mount Robertson; and requiring barging from either Tory Channel or Port Underwood.

Nearly 300 submissions were received on these options with a significant majority favouring the use of barging as the best way to get logs to Picton. The Council, with the forestry industry, looked at developing a voluntary agreement that would:

- Restrict log cartage to that being transported to South Island timber mills (average 50,000 tonnes per annum) on the Port Underwood Road network.
- Allow mussel traffic to continue to use Port Underwood Road.
- Barge the balance of logs harvested.
- Upgrade Waikawa and Port Underwood Roads with particular reference to safety involved.
- Work with Underwood Farms Limited on a purpose-built forestry road.

To date a barging site has been developed in Opua Bay in Tory Channel for the forestry company Rayonier to barge export logs from. Upgrading to parts of the Port Underwood Road was also carried out and further upgrading is planned.

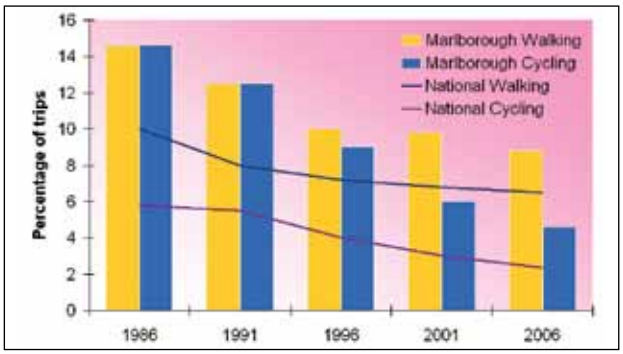
Walking and cycling strategy

Marlborough is a great place for walking and cycling, with an ideal climate, relatively low traffic volumes, and good topography. Significant numbers of people walk and cycle to work and school - and for health, recreation and fitness. Our countryside, including hills and plains, rivers, coasts, farms and vineyards, offers a wide variety of routes and destinations for walking and cycling, for locals and visitors alike.

However, many people currently feel intimidated about walking and cycling, or are reluctant to let their children walk and cycle, since increased motor vehicle traffic volumes and speeds present very real safety issues. In fact, the proportion of people walking and cycling in Marlborough is declining. The overall trend from census statistics is that walking and cycling to work have been steadily declining since 1986. Cycling to work appears to have declined faster than walking, although it must remembered that the census data are based on survey results for a single day. These data are illustrated in Figure 6.5.

In response to this downward trend, a Walking and Cycling Strategy for Marlborough has been prepared. The Council, together with the New Zealand Transport Agency, has developed this strategy with the help of many agencies and interest groups. This strategy aims to ensure that all people feel they have the choice to walk and cycle if they wish, and to reverse this downward trend.

FIGURE 6.5: TRAVEL TO WORK TRENDS BY WALK AND CYCLE 1986 - 2006



Source: Statistics New Zealand

BikeWalk Marlborough is a representative community interest group providing an advocacy and advisory role to the Council in helping to implement the Walking and Cycling Strategy. Group members represent a wide cross-section of interested parties from both the private and public sectors. The group's vision is that *Marlborough people and visitors can walk and cycle safely for travel, health and enjoyment.*

There are two major projects being considered at present and these are:

- Setting up a pathway between Spring Creek and Riverlands along railway designated land, to link the communities in Spring Creek, Grovetown and Blenheim, with the industrial area at Riverlands, free from the safety issues posed by State Highway 1.

Cycling in Marlborough

- The provision of on-road cycle lanes along main routes, initially between southern Blenheim and the central business area, to provide those on bikes with dedicated space on the roads. Cycle lanes improve the real and perceived safety for cyclists, and help all road users to predict each other's travel movements. They are identified by lane markings and on-road cycle symbols.

Data suggests approximately 18% of school/college students cycle and 20% walk to school, with 6% of the workforce cycling and 10% walking to work in Marlborough (2005 survey figures). On-road commuter routes are therefore proposed to initially connect southern Blenheim to the colleges and the central business area. Commuter cycle routes work best if they are safe, direct and consistent. Cycle lanes on Maxwell Road and Redwood Street from Alabama Road to Blenheim's central business zone have been proposed on both sides of these roads.

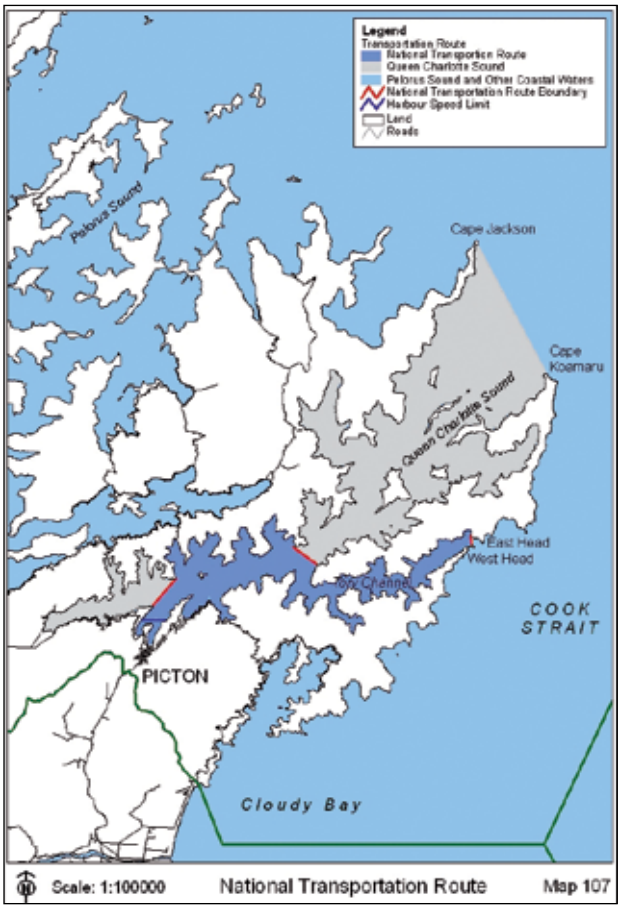
Traffic design engineers were requested to incorporate cycle lanes on these roads and to minimise the loss of parking. Due to limited road widths, the draft design plans would require the loss of many on-road parks, particularly on Redwood Street. Therefore several options are being considered and the Council intends to work with the local community to find the best practical solution.

When designing new roads cycle lanes are included as standard practice and the new 'Taylor on Boulevard' road design on Taylor Pass Road does include cycle lanes. However for existing roads, retro-fitting is the only practical and cost effective approach.

The significance of water transportation

The Council recognises that shipping activity in the Marlborough Sounds contributes to the social and economic wellbeing of Marlborough, especially in terms of the transport link between the North and South Islands. One of the ways in which it has made this explicit is by identifying the actual route followed by the inter-island ferries through the Sounds in the Marlborough Sounds Resource Management Plan. This route is identified in the Marlborough Sounds Plan as a 'National Transportation Route' and is located in Tory Channel and extends into inner Queen Charlotte Sound (between West Head, Ruakaka Bay, and a point southwest of Kaitapeha Bay) to the Port of Picton (excluding Grove Arm) - see Figure 6.6. Queen Charlotte Sound (excluding the National Transportation Route) has also been defined as being part of an established shipping route.

FIGURE 6.6: NATIONAL TRANSPORTATION ROUTE AS IDENTIFIED IN MARLBOROUGH SOUNDS RESOURCE MANAGEMENT PLAN



Associated rules in the Marlborough Sounds Plan enable ships over 500 gross registered tonnes to travel in the National Transportation Route and Queen Charlotte Sound subject to controls on speed and ship-generated wave energy. The methods do not restrict the use of surface water by ships elsewhere in the Sounds or smaller boats. Ships are able to exceed the permitted activity speed limit provided a resource consent is obtained for either a controlled activity or discretionary activity, depending on whether or not the vessel's wave energy exceeds the maximum wave energy standard. Existing conventional ships that were in operation at the time the rules were first included in the Marlborough Sounds Plan (being 14 November 2002) are allowed to continue to travel in the National Transportation Route up to a maximum speed of 20 knots.

The Marlborough Sounds Plan also makes provision for ports and marinas through two specific zones for each of these activities. This recognises the importance of their contribution to the infrastructure and economy of Marlborough. The Port

Zone has rules for both the land and water activities at ports. This is because land and water activities at ports give rise to a number of effects, some of which are potentially undesirable (including noise, discharges to water and air, disturbance of the foreshore, impacts on vehicle and pedestrian circulation, and landscape impacts). Performance conditions and standards in the Marlborough Sounds Plan have been included to make sure any adverse effects are appropriately managed.

The creation of the Port Zone limits the effects of port and harbour activities to specified and established areas of the coastal marine area, which are suited to this type of activity. It is important to ensure that land within the Port Zone is not occupied by activities which do not rely on location at a port or close to water transport. For this reason activities that rely on a location at a port are allowed as permitted activities, while those that do not, are considered to be non-complying activities. The same sort of rules have been applied to the Marina Zone.

Airport infrastructure

A study was commissioned by the Council in 2005 to identify issues and options in planning for the future use, development and protection of air transport facilities. The first stage of the study has been completed with the following matters being looked at:

- The direct and indirect contribution of air transport to Marlborough's economy and employment.
- The land use and infrastructural needs for the future development of air transport and the constraints on the development of new facilities.
- Clarifying issues about safety.
- Identifying and evaluating potential land use changes that might affect the sustainability of existing air transport facilities.
- Identifying and evaluating the effects (including potential effects) of air transport facility operations on surrounding land uses and the environment, which could result in public pressure to modify future operations.

The main threats to the continued use of Blenheim Airport (including the air force base), Omaka Aerodrome and Picton Airport in the long term were identified as arising from:

- The closeness of Woodbourne/Blenheim Airport and Omaka Aerodrome to one another. Operational requirements currently in place do reduce the potential for conflict between the two. Nevertheless, the potential for conflict is likely to be a constraint on future intensification of operations at Omaka Aerodrome.
- Safety in the take-off and landing areas. Care is needed in allowing development at either end of the runways as tall structures (and trees) can affect the ability of planes to take-off and land safely.
- Encroachment of urban and rural-residential development. Urban encroachment and the intensification of rural-residential development near airports can result in public pressure to modify airport operations, and thereby have an adverse effect on the future safe and efficient operation of the airport.

The study identified a need for projected noise levels from airport operations to be revised and updated for Woodbourne, and to be prepared for Omaka and Picton. This was so effects on residential and other noise sensitive activities from airport operations can be anticipated. In turn this would mean the encroachment of urban and rural-residential activities into areas likely to be subject to airport noise in the future, could be avoided. Work is currently in progress on assessing noise levels from airports. This will then enable noise contours to be set up around the airports to help establish compatible land uses near airports and to set limits for the management of aircraft noise at airports.

Investigations are also to occur on how helicopter landing areas and water aerodromes in the Marlborough Sounds should be provided for especially in terms of the impacts of noise and on amenity values. Looking at the use of farm airstrips and commercial airstrips on amenity values will also be considered.

No need was identified at this stage in the report for any extension of the runway at Woodbourne/Blenheim Airport to meet the present or likely future needs of either civilian or military use. However, the study identified an extension of the runway may be needed if circumstances change and that this option should be safeguarded.

Any changes proposed out of the investigations work to protect the operation of Marlborough's airports, including future development and expansion, will occur through public consultation and submission processes of the Resource Management Act. The current review of the Marlborough Regional Policy Statement will set the policy framework for future airport operations along with the subsequent review of the two resource management plans.

Energy

In depth ....

The use of Marlborough's energy resources is essential to maintaining the quality of life that humans have created and are used to. We rely on energy for things like warmth, light, transport, food, fresh water and recreation and the social and economic wellbeing of our district will continue to rely on the use of our energy resources.

Energy is provided by a variety of means and current energy supply resources and methods have enhanced, rather than replaced primitive resources. For instance, wood burners continue to be used for some home heating, despite electricity and gas being a modern substitute for what was once a totally fire-reliant society. Relatively modern technology has brought solar heating as an option. In recent times mounting pressures on existing resources have given rise to newer technologies such as wind-farming for electricity production. In fact, the Council has recently received its very first resource consent application to install a small wind-farm. Both providers and consumers alike are exploring renewable energy options as they rise to meet the challenge of coping with ever increasing future energy demands.

Like the challenges faced with the use of other resources, stresses on existing energy resources are challenging communities to respond in new and innovative ways. Whether these stresses are real or artificial, as is the immediate situation with the cost of fossil fuels, they continue to challenge us, so we can meet our environmental, social, cultural and economic needs. The TrustPower proposal to harness the Wairau River for hydro-electricity is a good example of this challenge - see box 'TrustPower Scheme'. Here the community's values are being aired and tested in how Marlborough's natural and physical resources are managed.

The supply of viable energy resources is not unlimited and it is certainly not completely understood. There are tangible limits to growth and expansion and these need to be considered. Marlborough may well have limits to its capacity and this could be a limiting factor in terms of future growth and development.

NATIONAL OVERVIEW

The energy situation in Marlborough is significantly influenced by central government policy and initiatives. For example, the Electricity Commission is a Crown entity that operates under the Electricity Act to oversee electricity markets and industry. The Commission's main objective is to ensure that electricity is produced and delivered to all classes of consumers in an efficient, fair, reliable and environmentally sustainable manner. It also has to promote the efficient use of energy.

The Commerce Commission also has a role through the Electricity Reform Act 1998. This Act provided for the separation of electricity generation and retailing and promoting competition within the electricity industry.

The Energy Efficiency and Conservation Authority has a role to promote energy efficiency, energy conservation and renewable energy across all sectors of the economy. It prepared a National Energy Efficiency and Conservation Strategy in 2010 and this is

TRUSTPOWER SCHEME

In 2003, TrustPower Ltd announced an intention to construct and operate a 72 megawatt hydro-electric power scheme on the Wairau River. The proposal involved diverting water up to 40 cubic metres per second from the Wairau River near the Wash Bridge in the upper Wairau Valley. The water is to be run through a canal to be constructed on the south bank of the Wairau River, before returning to the river at the Narrows, some 46 kilometres downstream of the intake. Electricity would be generated in 5 power stations located along the length of the canal. The power to be generated would be sufficient to supply up to 50,000 homes in the top of the South Island.

TrustPower, which already operates the Branch and Waihopai hydro electric power schemes in Marlborough, applied for the necessary resource consents for the scheme in July 2005. The application, publicly notified in September 2005, became the largest and most controversial resource consent application ever processed by the Marlborough District Council. Over 200 individual resource consents were applied for and the applications received 1,442 submissions. 290 submitters went on to present evidence at the hearing. An interim decision granting resource consent to the proposed scheme was released by the planning commissioners in June 2007 and confirmed in a final decision in July 2008.

Whether the proposed scheme is constructed will now depend on the outcome of appeals to the Environment Court on the Council's decision.

presently being reviewed. The current strategy set two specific targets, being a 20% increase in energy efficiency by 2012 and increasing the supply of renewable energy by a further 22% by 2012.

So far only modest improvements in energy efficiency have been achieved. To reach the existing national target would require an improvement of 2.5% per year, which is greater than international best practice at 2%. New Zealand is currently tracking at a rate of improvement of between 0.5% and 1% per year.

The Energy Efficiency and Conservation Authority also undertook a study to assess the renewable energy potential of Marlborough. This study found that there was considerable hydro, marine and solar electrical energy potential and also the potential to produce ethanol from grain for transport fuel. However, the study did not take into account environmental and cultural considerations in tapping this potential - see the box 'Renewable Energy Assessment: Marlborough District'.

One of the most significant changes occurring at a national level is through the Department of Building and Housing in terms of changes to the Building Act. This will change the way in which homes are heated, water is heated and commercial buildings are lit. The changes include:

- Tougher insulation requirements (including double glazing in most climates) that will result in new homes using about 30% less energy to achieve healthy average indoor air temperatures.
- A new compliance document making it easier to install solar water heating systems across New Zealand, cutting the price of installation by as much as $500.
- New requirements for energy efficient lighting in new and refitted commercial buildings, a move expected to save building owners around $8 million a year in energy costs nationally.

Central government's eventual approach, to its climate change obligations will also have implications for energy efficiency and generation. One other feature that will affect some of Marlborough's more remote areas is a current requirement in the Electricity Act 1992 to continue providing line services to all places currently provided with such lines until March 2013. After this date the requirement no longer applies, so some of Marlborough's more remote locations currently serviced by a reticulated electrical supply, may lose their supply after 2013.

ENERGY ISSUES FACING MARLBOROUGH

Marlborough is totally reliant on existing energy supply resources that include natural and physical resources; raw materials such as wind, wood, coal and water, along with fossil fuels, whilst the physical resources also include large and small installations, along with infrastructure. The reliance on out-of-district energy sources does make Marlborough vulnerable. A fault in the national grid or a road closure can prevent the delivery of energy causing power cuts or fuel shortages.

Fossil fuels are a non-renewable energy resource. However, it is realistic to assume the continued supply of affordable fossil fuels, for a while to come. Non-renewable fossil fuels can be expected to supply much of our transport and some of our commercial, industrial, domestic and institutional needs, in the short to medium term, at least.

If fossil fuels are taken out of the stock-take of energy sources, the following sources of renewable supply are left: water, wind, solar, bio-mass and marine. (Note that wood is included under bio-mass.) Water-based resources are currently the most widely used, followed by biomass, solar and then wind. It is of note that there have recently been public forums in Marlborough, exploring the benefits of the marine option. All of these resources might be considered as renewable but it is the way they are applied that determines whether they can be said to be sustainable.

When resources are scarce or progressively come under pressure, their value tends to increase, and, quite suddenly, ways are found to stretch the limits of a particular resource much further. In recent years, irrigation water for local viticulture has experienced this process, where careful management, research and practice has reduced the amount of water previously thought necessary to irrigate grape vines. Energy supplies have also reached this pressure threshold. Events such as low levels in the southern hydro-lakes, diminishing natural gas reserves and the incapacities of infrastructure to deliver adequate power to parts of Auckland, all come to mind.

At the same time growth throughout Marlborough is driving a need for increased energy supplies. This can be seen by the increase in consumption for Marlborough since 1998 - see Figure 6.7.

Our quality of life in Marlborough will depend upon our securing a sustainable supply of energy. This will mean in the long term, relying on renewable energy resources, supported and enhanced by advances in technology.

RENEWABLE ENERGY ASSESSMENT: MARLBOROUGH

In 2006, as part of evaluating eight New Zealand regions, the Energy Efficiency and Conservation Authority undertook a study to assess the renewable energy potential of Marlborough. This study found that there was significant potential to be realised from hydro, marine and solar electrical energy sources.

This study sought to help the Council identify where it could play a role in realising the potential of renewable energy, using both regulatory and non-regulatory approaches. In general terms the study noted that the uptake of renewable energy is constrained by a wide range of barriers. These barriers not only include the technical challenges and costs of developing such resources, but also the cultural and environmental concerns surrounding the use of natural resources. Often the potential effects on areas of high cultural, ecological and landscape value mean that there are limitations as to where renewable projects may be acceptable. Most projects attract opposition from some sectors and face long consenting and development times. For example, wind-farms in other areas of New Zealand have drawn a lot of opposition from local communities who are concerned about visual and noise impacts.

The report highlighted that a greater uptake of renewable energy could see national benefits such as enhanced security of supply and reduced climate change effects. In addition, a greater uptake of renewable energy would allow regions, districts and cities to deal with issues such as:

- High liquid fuel and electricity costs that could contribute to a significant economic downturn.
- Transmission / distribution constraints leading to supply disruptions and loss of economic activity.
- Uncertainties associated with other conventional energy sources such as gas reserves and coal fired power plants, which may lead to local supply shortfalls.
- The economic opportunities presented by cost effective renewable energy technologies in the short-term and the development/commercialisation of emerging technologies in the medium-term.

An initial assessment of the renewable energy development potential for Marlborough identified major resources that are available and provided an indication of their relative magnitude. The assessment has not accounted for how environmental and cultural issues will affect renewable energy potential. Rather, what has been estimated is the amount of renewable energy that could be realised in terms of the resource available outside national parks and Department of Conservation lands, using technologies that are already economic, or are likely to become economic, over the course of the next 10 years.

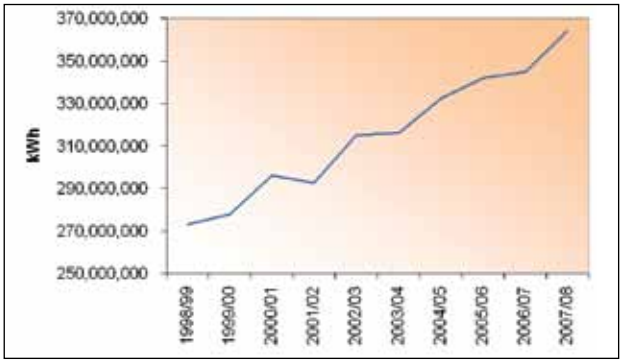
The report concluded that for the Marlborough, the renewable energy potential consists of:

- Hydro potential of about 125 mega watts in mini, small, medium and large scale projects outside Department of Conservation lands and native forest areas, compared to the existing installed capacity of 13.5 mega watts.
- Wave energy in the 1,000 megawatt range, ignoring environmental constraints and conflicts with other maritime users.
- About 2 million litres of ethanol per year for transport fuel from grain crops currently grown in Marlborough.
- About 30 million litres per year of ethanol or 125 gigawatt hours per year of electrical energy from woody biomass from low-grade forestry.
- Significant potential for solar thermal hot water systems, but considerably less so for solar photovoltaic systems.

The Energy Efficiency and Conservation Authority report also provided general advice that developing renewable potential could be helped by things such as developing an energy plan/ strategy, implementing economic instruments at a national level, and working with energy generators, tangata whenua and other interested bodies to develop industry codes of practice for renewable energy production.

Solar panels - Mistletoe Bay Trust

FIGURE 6.7: ENERGY CONSUMPTION (KWH INTO NETWORK)



(Data from Marlborough Lines)

MAXIMISING MARLBOROUGH'S SOLAR ENERGY

Blenheim consistently has high sunshine hours in comparison to other centres throughout New Zealand and the remainder of Marlborough also enjoys a sunny climate. Solar radiation is therefore an obvious and abundant source of renewable energy. Solar radiation can be used to heat hot water, instead of using electricity or gas, or can be converted into electricity by using photovoltaic (PV) technology. The electricity generated in photovoltaic systems is used directly or is stored in batteries where it can be used when the photovoltaic system is not producing electricity.

Solar energy can also be used to passively heat homes, although this relies on the right orientation of buildings relative to the sun. The effect of orientation is enhanced through the design of the building and the construction materials used. Using the passive heat from the sun can help in heating homes and reducing the reliance of alternative forms of heating during the winter months. Using photovoltaic systems, solar water heating and passive heating, will reduce the reliance of households and businesses on the local distribution network for electricity and other sources of energy.

A local example of where solar radiation has been used is in the design and construction of a worker accommodation dwelling in Seddon. The building in Seymour Street, Seddon won the 'Innovation/Efficiency' category at the Marlborough Environment Awards in 2006/2007.

Gary Smith (of Gary Smith Construction) designed and built the worker accommodation. The building requires very little maintenance and is energy efficient with the aim of saving up to 75% in energy use. Increased construction costs are to be balanced by reduced maintenance and operating costs.

A lot of research was done to identify existing energy efficient materials and technologies, bringing them together in a house which is extremely innovative for Marlborough. The building is 100% heated using the sun's energy.

Features of the dwelling include:

- Plastered autoclaved aerated concrete clads the exterior. Similar to Hebel blocks, the "Thermostone" product includes a vented cavity which reduces the risk of leaks.
- A concrete floor slab with polystyrene below reduces heat loss through the floor.
- Tiles are used on the floors and walls to absorb and retain heat, released when it gets colder. The floor is kept at around 16 degrees Celsius.
- A geo-exchange unit extracts heat from 1 to 2 metres below the ground to warm the heat pump's refrigerant to between 10 to 14 degrees Celsius, which significantly increases the efficiency of the heat pump.
- Three solar water heating systems are installed on the roof: one for the building's heating system; and the other two for hot water supply.
- Radiant heat from the underfloor heating and radiators is more efficient than a heat pump. With radiant heat, a room can be 2 to 3 degrees Celsius colder than with a heat pump and still feel as warm (as there is no draft).

The building is sited on the property in such a way that passive heat from the sun is maximised with large windows and doors on the northern side and bathrooms and service areas on the southern side.

A range of other features such as the installation of pink batts in the timber framing and ceiling cavity, use of energy efficient mini fluorescent tubes, which use 20% of the power of conventional bulbs, double gazing and high levels of insulation, all contribute to this dwelling being very energy efficient.