14. The Built Environment and Transportation

14.1 Introduction

The Wellington Region has primarily an urban population. Of the 400,000 people living in the Region, 94 percent live in urban areas containing more than 1,500 people. These settlements range from small towns like Martinborough to cities such as Wellington with a population of 150,000.

Although many of these urban areas may be regarded as physically separate communities, many settlements in the Wellington Region are functionally linked by a complex web of physical, social, cultural and economic interrelationships. Activities or changes in one part of the built environment can often have significant and sometimes unexpected consequences for other areas.

The term "built environment" is used to describe all those structures, facilities and other physical resources built by people. It therefore includes urban and rural settlements, telecommunication and utility networks, transportation systems, sewerage and water systems, dams and flood control structures, and recreational facilities.

However, as use of the word "environment" indicates, the built environment means more than just physical resources. It additionally involves the relationships between people and communities, and physical resources. Five aspects of these relationships are considered in this and in other chapters of the Regional Policy Statement:

- The human values placed on **buildings, structures and facilities**;

- The need for physical resources such as transportation systems and public utilities (**infrastructure**) that connect and service human settlements;

- The **natural systems** (air, water, land and ecosystems) that

are essential for life, but that also contribute to the quality of the built environment;

- The **resources** used (including energy) and the **wastes** produced by activities undertaken by people for their social and economic well-being; and

- The **process of development** by which the built environment changes, and the **urban form** which results from the process.

Buildings provide many of the services and products which enable people and communities to provide for their well-being, safety and health. Buildings provide shelter and warmth, but also meet other human needs. They can help create a sense of history and heritage, meet requirements for recreation and entertainment, provide the physical structures in which to shop or work, and cater for the provision of health and other community services. Collectively, buildings can make important contributions to local identity and to wider landscapes.

The Region's **infrastructure** comprises those structures and facilities that link urban areas, and support the functioning of society. Infrastructure includes the electricity, gas, sewage disposal, water supply, roading and rail networks that service the Region. The Region's infrastructure therefore represents a considerable physical resource.

This chapter provides a particular focus on one part of the Region's infrastructure, its **transportation network**. Debates about transport often begin, and end, with disagreement about the relative advantages and disadvantages of different types (modes) of transport. The current pattern and scale of movement is heavily dependent on motor vehicles that are powered by finite fossil fuels. This dependency has a number of adverse consequences for the long-term viability of transportation and for the environment.

Transport is not an end in itself but a means of undertaking social, economic, cultural, recreational and other activities. The key question relates to the optimum way of meeting regional (and national) needs for the movement of people and goods. The optimum solution is one that provides, now and in the future, good accessibility to many different places for as many people as possible, whilst minimising the risk of damage to the environment and using finite fuel sources wisely.

The healthy functioning of **natural systems** as an integral part of the built environment is an important consideration for the Regional Policy Statement. Access to clean water, unpolluted air, the coast and to a diverse range of natural areas contributes enormously to the quality of urban living. These matters are dealt with in other chapters of the Regional Policy Statement.

However, the day-to-day use of the Region's urban areas and infrastructure **consumes significant volumes** of resources, and can **generate large quantities of waste**. The density and diversity of activities within large urban areas can lead to high concentrations of pollutants and cumulative effects on the natural environment.

Moreover, the repair and upgrading of road and rail infrastructure and the extension of pipes and networks to service new urban development can also consume large quantities of construction materials. Construction, if not properly managed, can also cause adverse effects on the environment.

The **process of urban development**, the shape of settlements (**urban form)** and the distribution of activities and their interrelationships (**density**), are potentially major influences on sustainable resource use. The development of the Region's urban areas and the provision of infrastructure systems represent a major investment of capital and, when built, are significant regional resources.   Though renewable, these resources are costly to provide, maintain and replenish. Decisions about the location of activities and the form and density of urban development can have a major long-term impact, for better or worse, on the achievement of sustainable resource management.

Nonetheless, it is essential to recognise the beneficial value of urban areas in terms of providing for the Region's social, cultural and economic well-being. Indeed, in possessing a capital city, an international seaport and airport, and the centre for significant national and international economic activities, the Region plays a vital national role. This role is acknowledged in the Regional Policy Statement.

The sustainable management of the Region's built environment

must take all these matters into account. The Regional Policy Statement has a part to play, but the objectives and policies contained in this and in other chapters of the Statement will be complemented by the policies adopted by territorial authorities in their district plans. The district plans are expected to be the documents that spell out the more specific means for promoting sustainable management of the built environment.

14.2   Issues

Issue 1   There is considerable **uncertainty about what sustainable management of the built environment involves**. There are no commonly accepted approaches to addressing the subject, nor agreement about what data might be needed to assess whether sustainability is being achieved.

Built Environment Policy 1.

Issue 2   Despite the severe constraints presented by hilly topography, the Wellington Region's urban areas are generally characterised by **a low density and extended form of development**. While lower density housing may be appropriate in certain areas (for example, because of the physical character of the terrain, limitations of infrastructure or for reasons of amenity) other areas that could accommodate higher densities are not able to do so because of subdivision controls. Low density development is not very efficient for resource use, requires a large and valuable land area and, over the long-term, carries extra costs through the need to maintain an extensive infrastructure.

Built Environment Objective 1.

Issue 3   **Unco-ordinated and sporadic development** around the Region may place pressures on those parts of the environment that are less able to cope. There is presently a risk that policies on urban development within each district may be prepared with little consideration of the wider impacts of such policies on other urban areas or wider resource management issues (e.g., energy use). The implications, for example, of rapid urban growth in the Kapiti Coast area for the remainder of the Region are little understood.

Built Environment Objectives 1 and 2.

Issue 4   The **location of major facilities for public use**, such as major shopping developments or new recreation centres, can also have significant effects beyond the immediate surroundings of the facility. For example, sports stadia can have long-term impacts on the transport system and the use and development of infrastructure, and a large shopping centre can influence the location and density of development and the demand and supply

Built Environment Objective 2.

of other public facilities.

Issue 5

Low density development and growth in areas not serviced by public transport tends to reinforce the **inefficient use of public transport systems**. It is proving difficult and expensive to operate and maintain an efficient urban public transport system in Wellington, yet such a system is important in meeting social and environmental objectives. Despite the extensive network and the significant investment in resources that has been made, the urban passenger rail network, for example, needs large subsidies to be able to operate. There is a need to:

- Ensure that land uses and developments are managed so that, as far as possible, they can be efficiently serviced by public transport;

- Maintain and develop public transport networks which can provide good accessibility, while minimising adverse effects on the environment; and

- Provide a more integrated land use/transportation planning process.

Issue 6

Road, rail, sea and air **transport systems create a range of adverse local and global environmental effects**. In the Region these include the following:

- Air pollution (from "greenhouse" and other gases such as CO_2, CO, NOx, SOx, unburnt hydrocarbons, CFCs and benzene; primary pollutants such as lead and other particulate emissions);

- Noise (from aircraft and from vehicles in congested built-up areas and in the vicinity of major roads);

- Severance of neighbourhoods (from roads that cut through or divide residential areas);

- Water and soil pollution (from pollutants in run-off from road surfaces, running into freshwater and coastal water; potentially, from used or waste liquids such as ethylene glycol, crankcase and gear oil, transmission fluids and grease; and, potentially, from solids such as aluminium, chromium, iron, lead, nickel, zinc, asbestos, paint, rubber dust and soot); and

- Ecological damage (arising from habitat disruption or destruction caused, for example, by oil spills, dredging of sea beds or new route construction).

The various types of transport systems create these effects to a greater or lesser extent. The concerns raised in this Issue relate to identifying the range of effects, preventing them and encouraging transport users to make informed choices which would minimise adverse effects on the environment.

Issue 7

The cost of **maintaining, developing and expanding the Region's infrastructure** is often large, entailing a major investment of resources, and frequently commits future development to a fixed pattern or direction. Decisions concerning infrastructure need to take into account a full consideration of long-term environmental costs and resource efficiency.

Built Environment Objective 2.

Issue 8

The need to **protect major investment in infrastructure** is also an issue. The protection and maintenance of transport networks and of network utility operations, together with the land corridors through which they pass, is essential for their long-term and efficient use.

Built Environment Objectives 1 and 2.

Issue 9

Developments and extensions to infrastructure can have **adverse environmental effects**. Extensions to the transport network, for example, may have impacts on areas of special value, including the coastal environment, valued landscapes, rare habitats or sites of significance to tangata whenua.

Built Environment Objectives 2 and 3. See also Soil Issue 14.

Issue 10

Urban areas are large consumers of energy and producers of wastes. They are also typically the biggest generators of environmental problems connected with energy use, such as the emission of contaminants. However, historically energy has been one of the least considered aspects of urban development.

Built Environment Objectives 1-3.

Issue 11

The **concentration of activities in urban areas and the cumulative impact of their effects** have the potential to place unsustainable demands or effects on local natural resource systems. Avoiding or minimising such effects on an integrated basis must be a key element in managing development. Different authorities and agencies have different but complementary roles to play, and there needs to be consistent application of environmental policies across the Region's urban systems.

Built Environment Objective 2.

Issue 12	**Levels of amenity** vary widely within the Region at present. A high quality urban environment enhances social and economic well-being for its residents and also central to visitors' feelings about the Region.	
	"Quality" largely depends on having those amenities which the community deem as important elements of the overall urban environment, including visual quality, heritage character, access to parks and recreational facilities, low pollution levels and traffic volumes, and the presence of natural features.	
Issue 13	The **importance of special features** and **the particular character of different urban areas** is often overlooked and needs a better level of protection. Each area has unique qualities that collectively contribute to the regional character — the things that make the Wellington Region distinctive from other parts of New Zealand. The historic character of the suburbs flanking Mount Victoria, for example, and the urban landscape around Porirua Harbour are important elements of the regional character, particularly as they are located on "gateways" into the Region (the airport and major road and rail routes).	

14.3   Objectives

Objective 1	*Urban areas, the built environment and transportation systems are developed so that they, and their associated activities, use resources efficiently and demand for the use of finite resources is moderated.*	
	Sustainable management requires the efficient use of our natural and physical resources. **Objective 1** recognises that scarce resources, such as land for urban development, freshwater, clean air and non-renewable energy, are used in ways that maximise benefits whilst minimising costs, including environmental costs.	
	The objective refers to urban areas, individual structures and the activities that take place in urban areas and buildings. It therefore involves consideration of efficient use of resources in relation to urban form, to the density of development in urban areas, and to the geographical distribution of activities in the Region and the need to provide transport links between them.	
	Objective 1 also seeks to apply efficiency considerations to the use, development and management of transportation networks and	

to the operation and long-term management of the Region's physical infrastructure generally. The Regional Land Transport Strategy will help spell out the policy direction and implications of Objective 1 for the Region's transportation systems. The Objective also points to the need to avoid, as far as possible, duplication of facilities because of the need to manage resource use in an efficient and sustainable manner.

Objective 2   *The adverse environmental effects that result from the use of urban areas, transportation systems and infrastructure are avoided, remedied or mitigated and, in particular, any effects that result from the concentration and scale of activities in urban areas are recognised and provided for.*

Many of the effects of activities in urban areas are essentially the same as the effects of similar activities in non-urban areas. However, **Objective 2** recognises that there are two characteristics of urban areas which give rise to **cumulative** effects that are particular to urban areas. The characteristics are:

(1)   The **concentration** of activities and effects in urban areas (e.g., the number of households and associated volumes of waste, vehicle ownership and concentrations of pollutants);

(2)   The **scale** or geographical extent of activities and effects.

Specific consideration needs to be given to these characteristics when managing the adverse effects of activities in urban areas. Management of the effects may require quite different approaches to those used for managing more localised effects. For instance, managing the effects of transport or sewage discharges from urban areas are usually very different from non-urban situations. Similarly, the scale and concentration of effects of major development projects require a management approach that could involve a range of local authorities.

The principal reason for adopting **Objective 2** is that it recognises that urban areas, transportation systems, and infrastructure are major source of adverse environmental effects. Because of their concentration and scale, the effects may best be addressed on an aggregated basis (city-wide or Region-wide), rather than on a site by site or locality basis.

Objective 3   *The environmental quality of urban areas is maintained and enhanced.*

Objective 3 identifies environmental quality as an important value to recognise and provide for in the management of urban areas and the built environment. Quality is a function of high levels of public amenity, good urban design and the presence and health of natural elements within the urban environment.

The Wellington Region is given a special character by the distribution and mix of sizes of its settlements, its city precincts and its individual buildings. This character ranges from the "downtown" setting of Wellington's central city to the semi-rural quality of rural-residential areas in Ohariu Valley and around Masterton. In other parts of the Region, such as the coastal suburbs of Oriental Bay, Eastbourne and Raumati, it is the interaction with the natural environment that creates a distinctive environment.

Objective 3 recognises that maintaining acceptable levels of urban environmental quality is essential, not only for the majority of the Region's residents, but also for the image and attractiveness of the Region.

14.4   Policies

Policy 1

To improve understanding of sustainable management in relation to urban areas and the built environment, and to develop means by which it can be implemented.

Built Environment Method 1.

Policy 1 seeks to provide more informed understanding of how urban areas can be managed in a sustainable way, given the importance of such areas in terms of their use of resources and their role in generating social and economic wealth.

The policy recognises that, because of the complexity of the systems involved and their dynamic nature, such understanding is unlikely to be completed — current understanding can only be improved upon.

The wording of the policy also acts as a reminder that knowledge of what constitutes sustainable management of urban areas is insufficient in itself. Understanding needs to find expression in practical application.

The principal reason for adopting **Policy 1** is that, without such

knowledge, the management of the Region's urban areas and its built environment may overlook those issues and processes which would direct urban development onto a more sustainable path.

Policy 2

To use natural and physical resources efficiently in the development of urban areas and in use of the built environment by:

(1) Encouraging forms of urban development that reflect efficient use of resources; and

(2) Avoiding, where practicable, the use of new resources, particularly non-renewable resources.

Policy 2 seeks greater efficiency in the use of resources in urban development, within urban areas and in the construction and operation of individual buildings. The policy is also concerned with the relationship between land uses, and the potential for particular distributions of land uses to generate inefficient or additional demands on transportation networks and transport services.

Policy 2 does not seek to direct particular urban forms, but it does require consideration of different forms of development in achieving efficient resource use.

Policy 2 also acknowledges that one of the fundamental precepts of sustainable management is that new resources, particularly non-renewable resources, should be used wisely.

Policy 3

To promote the development of transportation systems in the Region that:

(1) Meet community needs for accessibility;

(2) Use modes of transport that are powered by renewable energy fuels;

(3) Help moderate demand for energy and use energy efficiently;

(4) Discourage dispersed development; and

(5) Avoid or reduce adverse effects on human health, public amenity and water, soil, air and ecosystems.

Policy 3 seeks to address the resource consumption and

environmental problems generated by current patterns of transport. The policy seeks to provide guidance on the efficient use of resources whilst meeting community needs for accessibility and avoiding the local and global environmental problems associated with current transport modes. Recognition is given by the Policy, for example, to the contribution that transport can make to meeting targets which have been set through international agreements and protocols to reduce net CO_2 emissions.

Policy 4   *To provide for the accessibility needs of the Region by protecting existing transport corridors.*

The topography of much of the Region severely limits the corridors available for transportation networks to meet community needs for accessibility. Decisions or actions that would lead to the removal or blockage of such corridors would inevitably lead to lower levels of accessibility and economic inefficiencies.

Policy 4 seeks to safeguard transport corridors, on land and water, for the efficient provision of accessibility for the regional community.

Policy 5   *To recognise that the services provided by network utility operations and infrastructure make an important contribution to the social and economic well-being of the Region.*

Policy 6   *To promote the provision and efficient use of infrastructure in the Region, and the reduction of adverse environmental effects from its use.*

Policies 5 and 6 recognise the importance of, and the large costs associated with, providing and using infrastructure. Network utility operations and infrastructure generally represent a considerable physical resource in the Wellington Region. The financial costs of provision and the environmental costs that can arise from use together mean that the investment in network utility operations and infrastructure should be efficiently used.

Policy 6 also acknowledges that a balance needs to be struck between using infrastructure to achieve a good return on the initial investment and avoiding adverse environmental effects from use of pipes or reticulation systems that are old, damaged or overused. In certain circumstances the replacement of old systems and the

development of new infrastructure may be an "efficient" use because of environmental benefits to be gained.

Policy 7

To take account of regionally significant effects on the environment of any new use or development, the size, function or location of which is likely to give rise to those effects.

Policy 7 acknowledges that, because of the scale and concentration of effects that can arise in urban areas and as a result of urban development, a wider view may need to be taken. The policy also recognises that the effects arising from major development proposals (e.g., for new shopping centres or for sports stadia) may also require a regional view. The policy aims to encourage the co-ordinated formulation and implementation of policies by all relevant authorities.

Policy 7 has been adopted because the scale and concentration of effects arising from urban development can have significant cumulative and cross boundary effects on the environment. Criteria for assessing "regionally significant effects" of the use of land are set out in section 3.2.11 of the Regional Policy Statement.

Policy 8

To promote a high level of environmental quality in urban areas by:

(1)   Encouraging good urban design;

(2)   Enhancing and protecting amenity values; and

(3)   Maintaining and enhancing natural areas and protecting those places, features or buildings with significant heritage, ecological, cultural or landscape values.

Policy 8 identifies good urban design and the protection of amenity values as key elements in achieving environmental quality in urban areas. Good urban design involves an approach to managing development that incorporates physical design elements with the needs and aspirations of people for health and a feeling of well-being, and with the needs of natural systems.

The policy also acknowledges, that for Maori residents of the Region, achieving high standards of amenity, urban design and environmental quality includes making provision for the development of marae, papakainga housing, kohanga reo and

other cultural institutions within urban settings.

14.5   Methods

Method for Improving Understanding of Sustainable Management of the Built Environment

Method 1

The Wellington Regional Council will review relevant information sources on sustainability and urban and rural systems, and will consider undertaking research or policy analysis to further understanding.

Built Environment Policy 1.

At present there is confusion about the application of sustainable management to urban areas and the built environment. Further investigation may help establish better understanding.

Method for Efficient Use of Resources and Minimising the Use of New Resources

Method 2

District plans would be an appropriate means of implementing Built Environment and Transportation Policy 2.

Built Environment Policies 2 and 3.

District plans are a major way in which the efficient use of resources for urban development could be achieved.

For example, in relation to resource efficiency, transportation systems and urban development, district plans can begin to have an effect. Whilst plans may not achieve substantial improvements in the short-term, provisions in the plan could place a priority on the consolidation of existing or partly developed areas before opening up new areas to urban development. District plans can be an important means by which, for example, higher density development can be encouraged and facilitated in areas with convenient access to public transport or urban expansion directed to areas that are serviced or programmed to be serviced by public transport.

Such provisions would not mean that existing urban areas need to be fully developed before any new green fields development is permitted. Rather, the relative costs and benefits (in their widest sense) should be considered.

At a small scale, district plans can be effective means of addressing resource efficiency considerations for new urban uses and development. Site layout, building design and consideration of energy efficiency in the development of policies for settlements and transport needs are all matters where district plans could help implement Built Environment and Transportation Policy 2.

Methods for Promoting a Sustainable Transport System and the Efficient Use of Infrastructure

Method 3

The Wellington Regional Council will prepare and review the Regional Land Transport Strategy and through the Strategy and its other transport responsibilities:

(1) Promote public awareness about the full social, economic and environmental costs of using different modes of transport;

(2) Promote the use of urban transport modes which use renewable energy resources and that are efficient in the use of energy generally;

(3) Promote policies that encourage the provision and use of alternatives to individual vehicles as a means of meeting needs for accessibility;

(4) Promote fuel efficient driving practices; and

(5) Provide, where appropriate, funding for the investigation, planning and provision of public transport services.

Method 4

To achieve integrated management, other means which could be used to implement Built Environment and Transportation Policies 3-6 include:

(1) Encouraging the introduction, monitoring and enforcement of emissions standards for all land transport vehicles;

(2) Encouraging relevant authorities, in their plans and decisions, to make adequate and appropriate provision for the development, maintenance and upgrading of network utility operations and infrastructure, and for the protection of existing transportation corridors;

(3) Encouraging the owners and operators of existing infrastructure to ensure that such infrastructure, where

practicable and reasonable, is used to capacity before additional infrastructure is programmed and provided; and

(4)   Ensuring that all infrastructure is developed and used in ways that reduce, as far as practicable, any adverse environmental effects.

Method 3 identifies a number of means by which the Regional Council can help put Built Environment and Transportation Policy 3 into effect.

The Regional Land Transport Strategy is prepared by the Regional Council. It has a time horizon of five years and must be reviewed biennially. It identifies future transport needs of the Region and proposes ways in which accessibility can be met in safe and cost effective ways, while having regard to environmental effects.

The Regional Council also has responsibilities for public transport funding, planning, co-ordination and service provision. These responsibilities, together with the Regional Land Transport Strategy, are therefore likely to be important means of implementing Policy 3.

Method 4 identifies some other means by which Built Environment and Transportation Policy 3 and, in particular, Policies 4-6 may be implemented. Clause (1) deals with vehicle emission and the introduction of standards. Clause (2) seeks that relevant authorities address requirements for the provision of network utility operations and infrastructure, and for protecting corridors that enable accessibility to and through the Region (including land and coastal water "corridors").   "Relevant authorities" are principally territorial authorities, but also include the Regional Council and other public sector bodies and agencies.

A principle of efficient resource use is that existing investments are used at an optimal level. Clauses (3) and (4) reflect this principle by seeking a balance between maximising the capacity of existing infrastructure (Clause (3)), while recognising that avoiding adverse effects is also an important element of efficient resource use (Clause (4)).

Method for Providing an Integrated Management Framework for Considering Regional Effects of Urban Development and Major Development Proposals

Method 5   *The Wellington Regional Council will:*

*(1)   Carry out a review to determine how the integrated
        management of the Region's urban areas can be best
        achieved;*

*(2)   Promote the assessment, where appropriate, of regionally
        significant effects, including transportation effects, of
        proposals for significant public and commercial
        developments and facilities;*

*(3)   Liaise with territorial authorities, Government departments
        and agencies, and other relevant organisations on issues of
        infrastructure and urban development that are of regional
        significance; and*

*(4)   Consider the preparation of a Regional Urban Development
        Strategy as a means of providing guidance and direction for
        matters relating to infrastructure, urban areas and urban
        development that are of regional significance.*

Method 5 identifies actions that the Regional Council will take in
relation to the regional effects that may arise from urban
development and major proposals for new facilities in the Region.

Clause (2) seeks that consent authorities, in determining resource
consents for major developments, make an assessment of the
regionally significant effects that may arise from the proposals.
The clause is not intended to imply that the Regional Council will
make a judgement on regionally significant effects; only that the
Council will "promote" such an assessment by relevant
authorities.

Clause (4) identifies an Urban Development Strategy as one
means of providing a co-ordinated approach to regional
considerations that may arise from urban development. Whilst
such strategies have been used elsewhere in the country and can
be an effective means of ensuring an integrated management
framework, they should only be developed if there is a common
acceptance of their purpose and benefits.

It is not yet clear whether such a strategy is needed. Therefore, the
Regional Council will consider the suitability of a development
strategy at an appropriate opportunity.

Method for Promoting Environmental Quality

Method 6   *District plans would be an appropriate means of implementing Built Environment and Transportation Policy 8.*

Method 6 recognises that territorial authorities can include objectives, policies or criteria in district plans which promote:

- The maintenance and restoration of environmental quality in urban areas;

- The protection of significant features; and

- The protection of sites within or around urban areas which will buffer, link and preserve ecosystems.

Examples of means that could be included in a district plan are:

(1)   Criteria for the identification and prioritisation of significant areas of poor visual amenity.

(2)   Provisions for the protection of the heritage values of significant buildings.

(3)   Provisions for the protection of places of special significance to the tangata whenua, including features that are likely to be affected by development pressures.

Methods identified elsewhere in the Regional Policy Statement are also of relevance to the implementation of Policy 8.

14.6   Anticipated Environmental Results

(1)   The use of finite resources in urban areas is moderated and those finite resources and renewable resources which need to be used are used more efficiently.

(2)   Urban infrastructure and transportation systems are used efficiently and, as far as practicable, adverse effects of their use are avoided.

(3)   Urban systems are more energy efficient, and have a high

level of renewable energy use per capita.

(4)   The urban environment is healthy and provides a high standard of urban amenity for its residents and visitors.

(5)   Buildings, urban areas and features with significant heritage, ecological, landscape or cultural values are protected.