

Growth and Development Issues and Principles

Environment Waikato | 7 August 2008

1 Introduction

This report is to support the process of identifying and evaluating options for growth and development in the sub-region and is in response to a strategy development action contained in the project plan.

A key role of Environment Waikato in the Future Proof project is to identify constraints to development in the sub-region, and to identify opportunities for environmental improvement through development planning. The purpose of this report is to support this task by identifying:

Growth and development issues that are of concern to Environment Waikato which may be influenced through the Hamilton Sub-regional Growth Strategy.

Principles to guide option selection and evaluation.

This report focuses on matters that may influence *where* particular kinds of development should occur (locational aspects of development). It does not specifically set out to discuss the nature of development or the manner in which development occurs (such as earthworks and sediment control). These broader matters are dealt with in the document: "Sustainable subdivision development – An Environment Waikato perspective" (which can be downloaded at: <http://www.ew.govt.nz/regionalservices/documents/sustainablesubdivisionreport.pdf>).

The principles suggested are not absolutes but are meant as guidelines to inform development decisions. In some cases principles can conflict with other principles. In applying the principles, there needs to be awareness of the potential for unintended consequences such as redevelopment and intensification of inner city areas resulting in increased air/noise pollution and problems with contaminated sites. These tensions need to be dealt with through the development planning process.

Note that for the purposes of this paper, unless otherwise stated, development refers to urban, rural-residential, commercial, industrial and infrastructural development.

2 Rivers, Lakes and Streams

2.1 Water Quantity

Issues

1) Demand for water is increasing and as a result water availability is decreasing. Although this is particularly so with respect to water for farm irrigation and stock watering, demand is also increasing for water for public water supply. This demand will continue to increase in the Hamilton Sub-region as a result of high population growth rates. Climate change may exacerbate water allocation problems due to expected decreasing rainfall and increasing droughts in the Hamilton basin.



- 2) Urban streams are frequently degraded by urban development which increases peak flood flows (causing scouring of banks and habitat) and decreases low flows (decreasing quality and quantity of stream habitat).
- 3) Stormwater discharges from urban development can cause drainage problems in surrounding rural areas. Due to low lying flat land in the vicinity of Hamilton City, drainage is already an issue for farmers in these areas.

Development Principles

- 1) Encourage wet industries to locate downstream of the confluence of the Waipa and the Waikato River (Ngaruawahia).
- 2) Development planning should at the very least not discourage or prevent reuse and recycling of wastewater. This may be increasingly needed in the future, particularly in the vicinity of Hamilton City. Use of rainwater tanks for non-potable water use should be encouraged.
- 3) Urban development should be near water sources and/or if possible, near existing water supply treatment plants, to minimise potential for water supply pipe leakage.
- 4) Development planning must consider the future stormwater impacts on water bodies and drainage areas. Catchment management plans, which model the potential stormwater implications, must be produced prior to urban development occurring, and should be part of the development planning process.
- 5) Urban development may need to be directed away from small, sensitive, streams and lakes, particularly where habitat quality is currently high. At the very least, large buffer zones should be kept around these water bodies, and riparian vegetation established and protected. Hydrological characteristics should be maintained in the catchments of these sensitive water bodies, such as through low impact stormwater design methodologies. Similar measures are needed where urban development is near poorly flushed harbour areas.
- 6) Low impact stormwater design methodologies should be used in catchments where there are drainage problems (such as poorly drained rural land). Where possible, urban development should be directed away from natural ponding areas and poorly drained land.
- 7) Don't allow future development to prevent hydrological linkages within the floodplain/lake/wetland complex in the lower Waikato River. It may become more important in the future to re-establish such linkages (such as where stopbanks currently prevent them), so future development should be directed away from these areas.
- 8) Urban development should generally not occur on flood plains.



2.2 Water Quality

Issues

- 1) In general water quality of rivers, lakes and streams is continuing to decline in the Waikato Region. This is mainly due to diffuse contaminant sources rather than point sources (although wastewater discharges to the Waikato River do have a continuing, although generally small, effect on water quality). Urban stormwater discharges can have localised effects on the Waikato River due to runoff of sediment, metals and animal faecal matter. This currently does not result in a major impact on the river, but the issue may increase with increasing urban development.
- 2) Water quality of small urban streams and lakes is often degraded by stormwater discharges and other waste discharges (commercial waste, illegal household waste connections and so on).
- 3) Small urban streams are often degraded due to lower base flows (caused by stormwater running off impervious surfaces rather than being stored in the soil) which decreases stream temperature. Lack of riparian vegetation can also increase stream temperature and reduce organic material in streams needed for food and habitat for aquatic organisms. This is less of a problem in Hamilton where gully areas retain riparian vegetation.
- 4) There are 46 lakes in the Waikato River catchment below Lake Taupo. Twenty eight of these have been surveyed using the LakeSPI health indicator. Of these, 22 are classed as having unsatisfactory quality. The main problems are invasive weed and pest impacts, intensive land use and resulting nutrient inputs, loss of depth due to drainage activities in catchment, and stock impacts on the lakes and their tributaries.

Development Principles

- 1) In general, if low impact stormwater design principles are adopted for future development areas, many of these water quality issues can be avoided.
- 2) As stated above, urban development may need to be directed away from small, sensitive, streams and lakes, particularly where habitat quality is currently high. This would be particularly the case for future commercial and industrial areas.
- 3) Future development should be such that it has a net benefit for currently degraded small streams and lakes. Urban development can benefit degraded water bodies, if stormwater quantity and quality issues are dealt with, by improving buffer zones and riparian vegetation. Where present, small streams and lakes should be actively made valued features of future urban development areas.
- 4) In some cases, to protect existing small urban streams and lakes, it may be appropriate to direct first flush stormwater discharges to the Waikato River, particularly in commercial/industrial areas. In other cases, stormwater treatment devices such as wetlands, swales and other constructed soakage areas may be needed. Where there are high risk facilities in terms of stormwater contaminants, there may be a need for catchpit filtration bags. These matters need to be considered during development planning.



- 5) Urban development should be directed away from particularly steep and erodable areas (including gully margins).
- 6) Urban development should generally be serviced by centralised wastewater services and not on-site wastewater systems.
- 7) Where streams enter urban areas, urban councils could investigate potential for contractual agreements with farmers, whereby farmers as land stewards are funded to undertake works which will improve water quality in the streams, for the benefit of the urban communities.
- 8) Where urban areas are in the vicinity of water bodies, public access to the water bodies should be maximised as this increases the value of the water body to the community and reduces the chance of 'out of site' activities which can reduce water quality.
- 9) In some cases, it may be possible for urban or rural-residential development to result in increased retirement of erosion prone land. Rural-residential development in particular could be established on some steeper land areas (but not too steep) that are currently being farmed, with protection mechanisms (covenants, consent notices) which ensure the most erosion prone land is retired from grazing and planted.
- 10) Development should minimise the need for multiple stream crossings.

2.3 Public Access

Issues

1) Rivers, lakes and streams are often important amenity and recreational features. Development can restrict public access to rivers, lakes and streams.

Development Principles

2) Development should not limit public access to rivers, lakes and streams, and where practicable, should augment the public's ability to access these features.

3 Wetlands

Issues

1) Wetlands contain a diverse range of flora and fauna and offer significant habitat for many rare and threatened species. For example, wetlands in the Waikato are home to 13 threatened plant species and 11 threatened animal species. Wetlands enhance water quality by filtering nutrients, chemicals and sediment. They are important storage areas for flood waters. Much of the Hamilton sub-region was originally wetland, so a key issue is the historic loss of wetland. Wetlands have been drained mainly for farming, but also for urban development.

2) Wetlands are also continuing to be degraded by land drainage activities, plant and animal pests, stock grazing and fragmentation.



Development Principles

- 1) Development should not occur where it would rely on land drainage activities that will adversely impact existing wetlands, even poor quality wetlands.
- 2) If development is to occur in the vicinity of an existing wetland, one of the development objectives should be a net improvement in the quality and/or quantity of the wetland. This can occur by riparian protection, pest control activities and so on. There have been some very good examples recently in Hamilton where wetlands have been enhanced in the vicinity of urban development.
- 3) Even small wetland areas can be important for habitat value and water purification services. Constructed stormwater and wastewater wetlands should be encouraged as they can provide these services as well as being attractive landscape features if well cared for.
- 4) Development should not result in reduced hydrological linkages between wetland areas, lakes and rivers, and where possible, should result in these linkages being improved.
- 5) Development can help the movement of threatened wetland birdlife by increasing biodiversity corridors that link existing wetlands and waterbodies.
- 6) Where development is to occur in the vicinity of a wetland, a development buffer zone should be established around the wetland.

4 Biodiversity and Habitats

Note that some biodiversity and habitat matters have been discussed above.

Issues

- 1) Biodiversity continues to decline in the Waikato Region. This is most obvious from the continuing loss of quality of habitats, particularly due to poorer water quality, sedimentation in water bodies and increasing weed and pest infestations of natural areas. But there is also a continuing loss of habitat quantity in some areas. The only area where there may have been a reversal of development impacts on biodiversity, has been in dune ecosystems due to beach care activities.
- 2) A likely future issue is that climate change will change natural habitat conditions, some of which will be particularly important for rare and endangered species. As temperatures warm, some species of plants and animals will want to move to higher elevations. Development should not prevent this movement, where particularly sensitive species are present.



Development Principles

- 1) Apart from protected Doc areas, areas of highest biodiversity value tend to be habitats in and around rivers, lakes, streams and wetlands. As stated above, development buffer zones and riparian plantings can greatly benefit biodiversity of these wet areas.
- 2) Because many of the sub-region's valued habitats have been fragmented and separated from larger Doc protected areas, development that helps to re-establish habitat linkages can greatly benefit the sub-region's biodiversity and this should be encouraged. At the very least, urban and rural residential development should not be located in a way that prevents the future establishment of biodiversity corridors (for example between wetlands and waterbodies or between other existing significant areas of high biodiversity value).
- 3) In all situations and at all scales, development proposals and plans should always have an objective of a net improvement in biodiversity. This means that active rebuilding of lost biodiversity should be a feature of all development.
- 4) Areas of high biodiversity value in the vicinity of urban or rural-residential development should have some form of formal protection. This may include, in order of preference, public ownership, covenants, and consent notices.
- 5) Development planning should not only seek to protect existing high biodiversity areas; it should also seek to protect areas of degraded biodiversity, particularly where they are near areas of higher biodiversity, or where they represent rare or significant biodiversity, albeit in a damaged state. Low lying swampy pasture and some areas of gorse and scrub could become important future areas for biodiversity.
- 6) Development should not be such that it fragments existing altitudinal sequences, particularly where there are important low lying habitats that may need room to move due to climate change.

5 Productivity of Rural Land

Issues

- 1) Farming in the Waikato Region directly contributes 13.7 percent of the regional GDP. Seventeen percent of the regional workforce is directly dependent on agriculture for its livelihood and 29 percent of people working in other sectors indirectly benefit from revenue generated by agriculture. The value of food production is increasing and will continue to increase internationally as demand from developing countries increases. However, a large proportion of the Waikato region's best farm land is being lost to urban and rural-residential development. Between 1991 and 2001, nearly 3,200 hectares of land changed from a low density rural land use to a more intensive use. Two thirds of this was on land classed as having a high productive capability for pastoral use.
- 2) Urban and rural-residential development can create reverse sensitivity with respect to current rural land uses.



Development Principles

- 1) Rural-residential development should be directed away from land with a high capability for pastoral use (such as class one and two land).
- 2) In general, rural-residential development should be concentrated development that minimises encroachment over farm land.
- 3) Urban development will always compete with the best farm land, simply because it is easiest (cheapest) to build on and provide infrastructure on. Urban development planning should recognise the importance of protecting high quality farm land. However, it also needs to be recognised that the best use of high quality land may not be for farming purposes, particularly for example where this land is already well serviced by public transport and other development infrastructure.
- 4) Development planning should seek to avoid, where possible, the potential for reverse sensitivity issues to arise. There should be large buffer zones set up around existing activities such as chicken farms and piggeries, and subdivision should be prevented in these areas.

6 Natural Hazards

Issues

- 1) The value of property in hazard prone areas continues to increase (therefore the hazard is increasing), in part due to continued development in these areas.
- 2) The frequency and intensity of severe weather events is expected to increase in the future due to climate change, which in turn will increase the potential for natural hazards such as flooding and landslide. Sea level rise may also increase flooding potential. The potential for flooding could also be exacerbated due to land clearing in the southern Waikato for forestry to farm conversions.
- 3) Development decisions in areas subject to flood protection works sometimes do not take into account residual flood risk (risk from failure or overtopping of flood defences).
- 4) There are some low risk but high damage potential hazards such as dam breaks, volcanic eruptions and tsunamis that may need to be considered in development planning.
- 5) There is potential for damage from subsidence where development occurs in areas subject to past mining or geothermal activities.
- 6) Some parts of the Waikato River are subject to bank instability problems.



Development Principles

- 1) In general, urban and rural-residential development should be directed away from flood plains, ponding areas, areas subject to coastal flooding or erosion (past or present), areas of past mining or geothermal activities and steep areas where landslide potential is high. Avoiding hazard prone areas should generally be preferable to mitigation (such as increased flood protection).
- 2) In some cases a tiered approach to development in relation to hazards would be appropriate where the kind of development which is allowed, is tied to the level of hazard risk. For example rural residential development (with appropriate building controls) may be appropriate where there is a medium hazard risk (but not a high risk), but more concentrated urban development is only allowed in areas of low hazard risk.
- 3) Where possible, urban development in particular, but also high density rural-residential development, should be directed away from areas subject to flood protection schemes.
- 4) New facilities such as hospitals, old people's homes and schools should not be placed in locations that are, or may in future be, subject to flood or erosion hazards. They should also not be placed in areas subject to a dam break scenario (an event which may be triggered by volcanic activity), on land with high liquefaction potential, or on land which could be subject to a tsunami risk.
- 5) Land use intensification and new urban development should not occur within the Waikato River hazard lines as determined by the Waikato River Bed Degradation Study.

7 Landscape and Heritage Issues

- 1) The value placed on rural areas (particularly farmland) is changing and is not well understood. Where previously rural areas were valued principally for their productive value, they are increasingly valued by an increasingly urban regional population, for purposes such as open space, landscape amenity, and locations for rural-residential lifestyle. Rural areas are also increasingly seen as important for the ecosystem services they provide urban populations such as water supply, food production, flood mitigation, adaptation to climate change, biodiversity, energy services and so on.
- 2) The most attractive parts of the Waikato Region are under increasing pressure for development, including coastal areas and margins of some rivers and lakes. These are also areas that often have high cultural heritage values due to historic settlement.
- 3) Many urban areas have been developed with little thought to the quality of the urban landscape that is being created.
- 4) We do not have good information about the extent to which cultural and natural heritage values are being maintained in the region, but anecdotally at least, there are threats to such values from development.



Development Principles

- 1) It is important that landscape character and heritage values are actively considered during development planning. A range of responses should be considered to these issues, from active prevention of development in some areas, limited controlled development in some, and less restrictive development in others.
- 2) Areas of particularly high landscape character should be actively protected from development. However the issue is not just one of protecting high value landscapes, it is also about maintaining and enhancing other landscapes, so all development decisions need to be based on a clear understanding of the effect of the development on landscape values.
- 3) The use of existing infrastructure, facilities and developed land should be maximised without compromising its efficient functioning. As much as possible, open farm land, forest/bush land should be protected from urban and rural-residential development.
- 4) Where possible (and in general), new infrastructure corridors should not be established on greenfield land, but should occur where there is existing infrastructure. There will be some exceptions to this. For example it may not be appropriate to put a new pylon route alongside a high use roadway. New infrastructure corridors should generally not be placed in areas of high landscape character.
- 5) Development decisions need to consider effects on the natural character of water bodies and coastal margins.
- 6) There should be special consideration of landscape values along high volume traffic routes such as State Highway 1, 2, 3 and 23. Viewing lines from these highways should be considered when planning for development.
- 7) Certain types of development in rural areas can limit landscape effects such as small compact settlements surrounded by open farmland. Farm parks or similar concepts can provide for rural-residential development while keeping farming activities intact and having minor effects on visual impact. Such models for rural-residential development should be considered.
- 8) Planning for rural-residential development should not only consider where it should occur, but also what landscape, heritage and ecological restrictions should apply to the development.
- 9) Landscape issues can be particularly important with respect to development of industrial areas. Use of topography for visual screening should be considered.
- 10) Planning for future urban areas should consider how to create a pleasing urban landscape. One option is to maximise greenspace within future residential developments. Greenspace will not only improve the urban landscape, but can also be useful for recreation, stormwater management, hazard protection,



other ecosystem services. Future greenspace requirements may need to be protected from sporadic development, well in advance of intensive development occurring.

11) Sometimes cultural heritage values are not well understood or known (sometimes as a way of protecting some sites). Development decisions therefore need to be made in consultation with relevant iwi.

12) Development decisions need to take account of potential effects on heritage sites, outstanding natural features, features of scientific interest and other highly valued landscape and heritage features. Such sites should be identified, and the appropriate level of protection determined before development decisions are finalised.

8 Coastal Matters

Many issues identified in the other sections apply equally, and sometimes more particularly, to coastal areas.

Issues

1) Coastal areas are often particularly vulnerable to development pressures. They are usually very highly valued in terms of amenity, recreational, landscape, heritage and cultural values. There will often be important historical and archaeological/cultural features in coastal areas. Through tourism and holiday facilities, coastal areas are often important to the region economically. As important recreational areas, maintaining high coastal water quality is vital. Coastal land is often highly erodable and coastal vegetation can be sensitive to human activities. In general therefore, coastal areas are particularly sensitive to effects from development.

Development Principles

1) In general, highly valued features and values of coastal areas need to be more rigorously protected through planning controls. This is not just a matter of locational controls; the form and nature of development also needs to be carefully controlled.

2) New urban development in coastal areas should be limited to existing areas of development.

3) Rural residential development should generally only be allowed on a case by case basis, with each development individually assessed for its effects on the values and features of the coastal area.

4) In all cases, broad development setbacks from beach areas must be maintained.

5) More stringent requirements on new infrastructure (such as overhead power lines) should be considered for coastal areas.

6) When planning for expansion of development in coastal areas, provision must be made for expansion of public facilities in beach areas (such as car parking, public toilets, retail services and recreational areas).



9 Infrastructure

Issues

- 1) Development can adversely affect the efficient and effective functioning of infrastructure. For example, increasing population density and increasing spread of urban areas increases traffic congestion.
- 2) Development can affect the ability to expand infrastructure, such as roading and electricity transmission.
- 3) Rural residential development results in demands for new infrastructure in new locations.
- 4) Some infrastructure such as stormwater pipes, culverts and sea defences may become inadequate for the task they were designed due to climate change impacts.
- 5) Some transport (and other infrastructure) corridors may also become more frequently subject to flooding, landslide and erosion due to climate change.
- 6) Increasing value of land due to development makes establishing new infrastructure in these areas more expensive.

Development Principles

- 1) Major transport routes, both rural and urban, need to be well buffered so that there is room for expansion of road width in the future (such as for additional lanes and passing lanes) and to minimise conflicts with residential and other land uses.
- 2) Future potential infrastructure corridors (such as for energy transmission, road and rail) need to be determined and development needs to be buffered from these corridors.
- 3) Rural residential development should focus on locations of existing infrastructure where possible. It should at least be located near existing public transport routes. Planning for new rural-residential development and coastal development must also consider potential future needs for water and wastewater servicing.
- 4) Walking and cycling infrastructure needs to be provided for all new urban development, and should be considered for areas of rural-residential development.
- 5) The settlement pattern should maintain access to work and essential services for non-car owners. In some cases, it may be appropriate to direct services and employment to existing areas of high population.
- 6) Compact settlements should be encouraged. New urban development, where possible, should mostly occur within the existing footprints of urban centres.



7) Existing rural towns should become centres of growth in the Waikato by increasing their attractiveness for residential, commercial, industrial and service development.

8) Ribbon development along main highways should be discouraged, but nodal development along main highways in some cases will be appropriate.

9) Disused rail routes should be protected from development which would prevent them from being reopened in the future.

10) Industrial development should occur in the vicinity of existing rail and/or air links and public transport routes.

10 Energy

Issue

1) The increasing cost of energy is increasing the cost of transport, and the cost of energy use in homes and business.

2) Use of fossil fuels is a major cause of global warming.

3) The increasing cost and availability of fossil fuels is increasing the need for non-renewable energy production. The New Zealand Energy Strategy has a target of generating 90 percent of New Zealand's electricity from renewable energy sources by 2025. Wind farm energy projects are expected to increase in the sub-region.

4) The sub-region is an important route for electricity transmission to Auckland from the south. Increasing development limits options for new and upgraded transmission. There will also need to be new transmission lines from windfarms.

5) Development has the potential to prevent the use of energy resources which may be required in the future such as coal, coal-seam-gas, biofuel, wind and wave energy.

Development Principles

1) Many of the 'solutions' discussed in relation to Infrastructure above will also have important benefits for conservation of energy (particularly transport energy) such as compact urban areas, measures to retain efficient movement of vehicles, measures to promote walking and cycling, limiting urban and rural-residential sprawl, and promoting of multiuse centres with a mix of housing, services and employment opportunities.



- 2) Urban and rural-residential development must be amenable to servicing by public transport. New development should be near existing public transport routes, and preference should also be made for urban development that can be serviced by existing rail facilities.
- 3) Urban and rural-residential development should be directed away from potential wind and marine electricity generation sites, and coal fields (which can also contain coal seam gas reserves).
- 4) Electricity transmission corridors which may be needed over the next 50 years should be identified and protected from urban or rural-residential development.
- 5) Urban and rural-residential development should be designed to make the best use of north facing hill slopes.

11 Mineral Resources

Issues

- 1) The sub-region has significant mineral resources including coal, aggregate, sand, and lime. The ability to extract mineral resources can be compromised through land uses or developments above or in close proximity to mineral deposits.

Development Principles

- 1) Ensure that expansion of existing mineral extraction activities is not prevented by subdivision activities in their vicinity.
- 2) Identify key mineral resources in the sub-region which are likely to be needed in the future, and direct further urban and rural-residential development away from them.
- 3) Where possible, direct urban and rural-residential development away from key transportation routes for mineral resources. This is particularly important where territorial authority roads are used, or are likely to be used in the future, for transporting mineral resources.

12 Contaminated Sites

Issues

- 1) The risk of health effects from contaminated sites can be increased if development occurs in their vicinity.
- 2) Many contaminated sites are not known or documented, such as historic sheep dip sites and orchards.

Development Principles

- 1) Known and potential locations of contaminated sites should be considered during the development planning process to ensure that development of such sites is avoided if appropriate. In most cases, contaminated sites can be remediated and this can be dealt with during subdivision consent processes.



13 Air Quality

Issues

- 1) Air quality is degraded in a number of urban areas in the Waikato. The main problem is home heating fires, but in some parts of Hamilton, the main issue is transport emissions.
- 2) Urban intensification can result in increased noise pollution issues.

Development Principles

- 1) In general, new major transport routes should be directed away from existing urban areas, or at least have reasonable buffer zones.
- 2) Industrial zones where 'dirty' industries may develop should be well buffered from residential areas.
- 3) Any planning initiatives that reduce reliance on private motorcars will help to reduce air pollution issues (particularly in Hamilton).
- 4) Planning for urban intensification needs to consider methods to minimise noise pollution.

14 Waste and Wastewater

Issues

- 1) Development results in greater volumes of waste and wastewater to manage. Although we are generally getting better at reducing, reusing and recycling waste and wastewater, increased volumes generally result in increased need for waste disposal.
- 2) Iwi are generally opposed to new discharges of wastewater to surface water bodies.

Development Principles

- 1) Development should be located so as to make the best use of existing waste and wastewater recycling and disposal facilities.
- 2) Rural residential development should, where possible, be associated with currently developed locations, particularly where there is existing waste and wastewater infrastructure.
- 3) Some locations are better suited to land disposal of wastewater effluent than others. When investigating locations for urban development, the potential for land disposal of effluent should be considered.



15 Summary and Conclusions

This report has identified a number of issues and principles which should be considered when developing and evaluating options for the Hamilton Sub-regional Growth Strategy. It is recommended that final growth options are evaluated against each of the subject areas in this paper. Effects of each option therefore need to be evaluated with respect to:

- Rivers, lakes and streams
- Wetlands
- Biodiversity and habitats
- Productivity of rural land
- Natural hazards
- Coastal effects
- Landscape and heritage
- Infrastructure
- Energy
- Mineral resources
- Contaminated sites
- Air quality
- Waste and wastewater

There are some important general principles for development options that arise from this paper. These are that:

- 1) Open landscapes largely free of urban and rural-residential development and infrastructure corridors should be protected so that they remain that way.
- 2) In general it is best to focus development on areas where it already occurs. For example, future urban development should centre on existing key urban areas.
- 3) Urban and rural residential development should aim to be compact and located in a defined and designated area.
- 4) Development decisions should be precautionary with respect to potential future development needs. There should be a broad view about where it could be appropriate to establish various kinds of infrastructure during the next 50 years (including biodiversity corridors, energy transmission and transport corridors, renewable energy sites and quarries), and development should generally be directed away from these areas.
- 5) All development should be planned with the needs of non-car owners in mind.



- 6) There should be special consideration of landscape values along high volume traffic routes such as State Highway 1, 2, 3 and 23.
- 7) New urban and rural-residential development should aim to maximise the use of existing infrastructure (including rail).
- 8) Closed rail lines should be protected from development which may prevent their use in the future.
- 9) Rural residential development zones need to be identified. In general these should focus near existing areas of rural residential development, which are near existing public transport routes, and which do not result in fragmentation of the best farm land.
- 10) Development should not result in reduced hydrological linkages between wetland areas, lakes and rivers, and where possible, should result in these linkages being improved
- 11) In general, urban and rural residential development should be directed away from:
- a) Flood plains, natural ponding areas, poorly drained areas, including areas subject to flood protection schemes
 - b) High quality unfragmented farmland, and existing factory farms
 - c) Potential renewable energy generation sites (such as potential wind and marine energy sites)
 - d) Key mineral locations (such as coal and aggregate), current quarries and areas of current and previous mining activity
 - e) Small, sensitive streams and lakes, particularly where habitat quality is currently high
 - f) Particularly steep and erodable areas (including gully margins)
 - g) Areas subject to coastal flooding and erosion
 - h) Unspoilt/undeveloped areas of high landscape character

16 Recommendations

1. That the report be received
2. That the matters outlined in the report be considered as part of the option development and evaluation process

