greater WELLINGTON
REGIONAL COUNCIL

Regional Land Transport Strategy

Policy Positions

Friday, 14 July 2006

Report no: WL00047

Hyder
Consulting

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1 Summary

The Wellington Regional Land Transport Committee (RLTC) is currently renewing the Regional Land Transport Strategy (RLTS) for the Wellington region. This report provides background and a policy position for three issues related to the RLTS; Planning Timeframes, Peak Oil, and Climate Change; and reviews central government policy and the policies of regional authorities.

The RLTS is required to plan for a maximum of 10 years in advance yet actions taken under the RLTS often extend far beyond this limit – the impacts of some actions will still be felt in 50 years. To deal with this, the RLTS needs to consider both the short term and the longer term by developing a short term work programme that contributes to the longer term goals and vision for the region.

The term 'peak oil' describes the point at which global oil production reaches a maximum and declines into the future. Combined with increasing global demand for oil, passing the peak of oil production will mean that oil become increasingly more expensive as it becomes more difficult and costly to recover. Central government recognises there is little that New Zealand can actively do and has taken a 'wait and see' stance, while encouraging the efficient use of energy and the use of alternative fuels. It is also keeping up-to-date on new technologies that may be relevant. Regional authorities are supporting these initiatives in addition to the use of active modes and passenger transport, and more energy efficient urban development. The RLTS should reflect these policies.

The transport sector contributes to climate change through the emission of carbon dioxide from vehicles, it is the largest contributing sector after the agricultural sector, and it is the fastest growing. Climate change is likely to impact on the transport sector through increased rain, higher sea levels, and more frequent storms. Central government is committed to reducing greenhouse gas emissions from transport through reducing the need to travel, improving the energy efficiency of vehicles and the provision and uptake of low energy transport options. The most effective measures are taken at a national level. For Greater Wellington Regional Council the best way forward is in supporting these measures at a regional level through such initiatives as promoting active modes and passenger transport, improving the efficiency of the transport network, and efficient land use planning.

Most of the recommended actions are being undertaken at present. There is no strong reason to make large changes to the policy direction or level of activity of the RLTS.

2 Introduction

2.1 Purpose and Objective

This report will review three strategic issues — planning timeframes, peak oil, and climate change — which need to be considered because of their impact on land transport development. The Wellington RLTC has identified a need to have a clear policy position on these three issues. This report will provide the information with which to develop these policy positions and provide the basis for background material to be distributed during the RLTS consultation process. The report:

- Presents a summary of the three issues; planning timeframes, peak oil, and climate change.
- Discusses their impacts on the Wellington Region and their implications for the RLTS.
- Summarises guidance from central government level and presents current practice at a regional council level.
- Recommends the way in which the RLTS should recognise these issues.

2.2 Background

The Land Transport Management Act 2003 (LTMA) requires all regional land transport strategies to be renewed in light of the New Zealand Transport Strategy, and has a focus on sustainability. Specifically, an RLTS must take into account the objectives of the New Zealand Transport Strategy (NZTS) and the National Energy Efficiency and Conservation Strategy (NEECS) as well as take into account the impact of the land transport system on "affected communities"[1], identify desired outcomes and consider a range of options for meeting them. Sustainability comes to the fore with specific requirements to consider the impact of the transport system on our environment, the role of transport demand management, and the level of funding likely to be available to the region within the period covered by the strategy.

To this end, the RLTC is currently reviewing the RLTS for the Wellington Region.

The Land Transport Act 1998 states that regional land transport strategies must be kept current for not less than three, but not more than ten years in

[1] S(5) Land Transport Management Act (2003)
"affected community", in relation to a proposed activity, means a group of people who are affected by the proposed activity because of living, studying, or working in close geographical proximity to the proposed activity.

advance. Many activities contained in the RLTS, particularly those regarding transport infrastructure, deal with timescales of greater than ten years. Consequently, the issue of planning timeframes is an important one. Accepted practice within New Zealand will provide guidance on the direction that the RLTC should take.

Peak oil and climate change are big picture issues that have risen in profile since the completion of the previous RLTS in 1999. The RLTS needs to take into account the potential impacts of peak oil and climate change on land transport in the region. In order to do this, the RLTC needs information on what the impacts are likely to be, and what actions will be effective and feasible at a regional council level.

2.3 Methodology

This is a research based report focussing on understanding the three issues and their implications, and discussing how various agencies have responded to them. Each of the concepts is explained and the likely impacts on New Zealand and the Wellington region are discussed. Planning documents such as transport, growth and energy strategies of various agencies have been included in the research as well as guidance documents provided by central government. The RLTSs included in this research exercise are those that have recently been updated and are from the larger urban areas.

The remainder of this report is structured in four sections; Planning Timeframes, Peak Oil, Climate Change, and Conclusion.

3 Planning Timeframes

The Land Transport Act requires regional land transport strategies to: "at all times, be kept current for a period of not less than 3 years in advance but not more than 10 years".[2] However many of the projects and the issues that an RLTS must address span a far longer timeframe. Transport infrastructure can have an economic life of over 50 years, and many large scale projects take more than 10 years to move from investigation through to construction. Sustainability is an important focus of an RLTS and has a timeframe of generations. Given this, the 10 year timeframe of an RLTS may not adequately give consideration to the longer term issues that need to be addressed if the Wellington region is to develop a sustainable land transport system, and needs to be careful to draw from a longer-term vision for the region.

3.1 Comment

The Wellington Regional Land Transport Strategy is one of many plans and strategies that are developed to lead the direction of the Wellington region. Other important strategic documents include the regional Policy Statement (RPS) and the Wellington Regional Strategy (WRS). The RLTS and the RPS are informed and guided, to a degree, by the direction set out in the WRS.

The Wellington Regional Strategy is a sustainable economic growth strategy for the Wellington Region, with the purpose of ensuring the long-term prosperity of the Wellington Region. The WRS will have a 50-year time horizon.

Whilst the WRS has no statutory effect, the objective of the WRS will be achieved by influencing the region's statutory documents and strategies, and through the member councils' incorporation of it into their District Plans and their Long-Term Council Community Plans. The review of the RLTS has been delayed with the intention that the WRS will be completed before the region finalises decisions on the future of its transport network.[3]

The nine local authorities that make up the Greater Wellington Region[4] are formally working together under a joint committee structure; the Wellington Regional Strategy Forum (the Forum); to develop the WRS. In August 2005, the Forum released its initial thinking on the development of a

[2] S.176(1) Land Transport Act 1998

[3] The review of the Regional Policy Statement has also been delayed to allow for the finalisation of the WRS.

[4] Greater Wellington Regional Council, Wellington City, Porirua City, Hutt City, Upper Hutt City, South Wairarapa District, Carterton District, Masterton District and Kapiti Coast District Councils.

Growth Framework. Along with this, the RLTC released a consultation document canvassing public opinion on strategic options for achieving the region's transport needs over the next 10 years, but including longer term considerations.

It is intended that the development of the WRS and the Wellington RLTS will be kept in alignment. The RLTS will support the land use and transport initiatives that flow from the WRS process. The WRS will also influence the RPS.

The Bay of Plenty region has developed the SmartGrowth Strategy which sets the direction for the region for the next 50 years. Like the WRS the SmartGrowth Strategy has no statutory effect, yet it is providing the blueprint for the long term development of the entire Bay of Plenty – feeding in to the reviews of their RLTS and RPS. Under the LTA, the RLTS may not be inconsistent with the RPS.

For the RLTS to contribute to the ultimate goals and direction of the WRS, the RLTS needs to consider actions beyond its 10 year timeframe while focusing on the short term future. There is some concern that some methods for selecting which projects will go ahead may be biased towards projects which return a greater level of benefit in the shorter term (i.e. less than 10 years). This disadvantages larger scale projects, which may be strategically important to the region, and creates a distorted programme which may, as a result, be less effective in achieving the long term goals and vision for the region.

The Land Transport Act states that regional land transport strategies must "contribute to the overall aim of achieving an integrated, safe, responsive, and sustainable land transport system" and ensure environmental sustainability.[5] Sustainability is a concept that has an inter-generational timeframe which requires decision makers to consider the needs of future generations, in addition to the needs of the present population. If an RLTS is to contribute to sustainability then it needs to be grounded in a vision for the future of the region. Such a direction may be set out in strategic documents, such as in the Vision and Outcomes of the Wellington RLTS and in the WRS.

Land Transport New Zealand (LTNZ) recognises the importance of longer timeframes, particularly with regard to large scale projects that will provide benefits to the community for more than 10 years. In their submission on the Wellington Western Corridor Plan, LTNZ stated:

> *"We acknowledge the difficulty in forecasting future trends for growth, technology change etc. However, given the scale of investment proposed in the Plan and the relatively long useful life of much of these investments we regard the assessment for long term (i.e. 25 years plus) transport needs and alternative responses as being a vital step for a plan of this scale".*

[5] S.175(2a) Land Transport Act 1998

And in their submission on the Wellington RLTS Strategic Options Consultation Document (SOCD) they stated:

> *"We acknowledge that the Land Transport Act constrains the detailed content of the RLTS to a 10 year planning horizon. However given the long term nature of the RGS* [Regional Growth Strategy] *and its implications for transport we consider it would be prudent to ensure the 10 year window of investment in the RLTS takes account of the longer term needs, options and affordability of the three broad options in Section 5 of the SOCD. For example it may be possible to manage the 10 year transport needs by building more road capacity (advanced roading option) but is this a viable option to manage 30 – 50 years projected demand?"*

Both these submissions emphasise the need to be planning for the long term and that actions in the short term must contribute to the long term goals.

3.2 Recommendations

There is no strong formal guidance on the desirability of a longer or shorter timeframe for regional transport planning, however, it makes sense to plan for, and work towards, a stated vision of a desired future. Even though the RLTS has a rolling ten year timeframe, it needs to look beyond this. An RLTS should focus on the coming ten years while keeping an eye to the future (the Vision) and the direction of the region. An outlook of 20 to 30 years will signal the construction of many larger projects, while an outlook of 50 years or more will facilitate the consideration of future generations.

The Wellington RLTS should:

- Reflect the long term goals (20 to 30 years) of the region in the Vision of the RLTS.
- Ensure the Vision is consistent with the direction of the WRS.
- Demonstrate the way in which short and medium term goals in the RLTS contribute to the longer term direction. This could be achieved through ensuring that the project prioritisation process is aligned to the Vision and Objectives of the RLTS.

4 'Peak oil'

The term 'peak oil' is used to describe the point at which world oil production reaches a maximum and begins to decline. From this point onwards the price of oil is expected to continue to increase as the cost to recover the remaining oil increases, exacerbated by increasing demand, particularly in the short-medium term.

Global oil production has continually increased over the last century as new oilfields have been discovered, however, as each individual oilfield peaks and begins to decline, new fields must be discovered and brought into production to meet the steadily increasing demand for oil. Oilfield discovery is already considered to have peaked and it is thought unlikely that additional significant reserves, with the capacity to meet expected future demand, will be located.

The peaking of global oil production does not necessarily mean that the world is running out of oil, as the peak in oil production is usually reached when half of the recoverable oil in the field has been produced. It does, however, mean that the rate of oil production will decrease from this peak point onwards as it is increasingly more costly and difficult to extract the oil.

According to the United States Energy Information Administration (EIA), international demand for oil is expected to increase by 1.4 percent annually between 2003 and 2030[6]. The peaking of global oil production will mean that, at some point in the future, oil supply will not be enough to meet predicted demand. After production peaks, the price of oil is expected to increase due to the greater costs of recovery, and New Zealand will need to reduce its demand for oil or supplement its use of oil with alternative fuels.

While most commentators agree that global oil production will eventually peak, there is a great deal of disagreement on the timeframe over which this will occur. Due to a large number of uncertainties in the variables used to calculate when oil will peak, estimates range from now, through to the end of the century.

There is also disagreement over the need for action. Some economists maintain that although oil is a finite resource, new technologies will mean it will be possible to discover more oil fields and extract oil from places where it is currently impossible or uneconomic to do so. Economic theory suggests that the market will cope with the rise in oil prices, and that as the price increases the demand for oil will fall. However, current Government policy is to support a transition to alternatives.

The implications of peak oil, for the Wellington RLTS, will be that the cost of transportation becomes increasingly higher. Personal transport will

[6]United States Energy Information Administration (2006) *International Energy Outlook 2006.* Report #:DOE/EIA-0484(2006), Table A2: World Total Energy Consumption by Region and Fuel, Reference Case, 1990-2030. http://www.eia.doe.gov/oiaf/ieo/pdf/ieoreftab_2.pdf

become more expensive and this will have flow-on effects on the public transport system. The cost of operating passenger transport services will increase, but may be offset by increases in passenger numbers. Additional routes may require subsidies from local government to continue, but increased passenger numbers may also mean that some routes may no longer require assistance. Any increased demand is likely to be experienced during peak periods, requiring expensive investment in assets which may be under-utilised outside of peak times.

Freight transport may move away from road use to other modes that are more fuel efficient such as rail and coastal shipping. The rise in fuel prices will be accommodated by the market, as freight companies seek alternatives to road vehicles and pass the increased costs on to consumers. There are few ways the RLTS can directly impact on commercial freight activities, but through influencing land use planning it may be able to reduce the costs to the industry. The rising cost of transport may increase the demand for commercial land and warehousing facilities nearer to markets, or port and rail services. The RLTS will need to ensure that industry has access to major transport nodes.

In addition to peak oil, the volatility of oil prices is also relevant to the development of the RLTS. Short term fluctuations in oil prices may obscure the long term trend of increasing oil prices brought about by the peak in global oil production. Oil price volatility can obscure the price signals of the market and influence longer term planning of organisations and individuals. The long term trend may go unnoticed as 'normal' fluctuations in the price of oil are more obvious to consumers. This may mean delayed investment in measures to transition away from fossil fuels, resulting in reduced competitiveness and higher costs to transition. However, taking steps to transition to alternatives too early will also reduce competitiveness and impose additional costs.

4.1 Guidance

4.1.1 National Level Guidance

Central Government

The Government has taken the United States EIA's estimates as a base from which to start thinking about New Zealand's response to peak oil. This estimate places peak oil between 2021 and 2067, with the greatest likelihood around 2037[7]. Based on these estimates, peak oil is not 'just around the corner', but neither is it far enough away to be disregarded.

The actions that the Government is taking in response to peak oil are centred around improving energy efficiency, and increasing the use of renewables and alternatives to oil. The introduction of the NEECS set out

[7] Hon Harry Duynhoven (8 April 2006) Speech - *How is the Government Preparing for Peak Oil?*

targets for energy efficiency (20% improvement by 2012) and use of renewables (an additional 30 PJ by 2012). Particular objectives for the transport sector are to reduce energy use through reducing the need to travel, improving the energy performance of the vehicle fleet, and improving the provision and uptake of low energy transport options[8].

The Government is developing a National Energy Strategy which will help guide the transition away from oil, and is also working to introduce biofuels to the market and encourage their uptake through mandatory sales targets. The Government is also providing information to allow more informed choices by consumers on the fuel efficiency of cars imported into New Zealand through the fuelsaver website.

In addition to promoting energy efficiency and use of renewables, the government is watching the development of alternative technologies overseas and has taken the position of being a "fast follower"[9].

4.1.2 Regional level organisations

Environment Canterbury

Environment Canterbury's Regional Energy Strategy, released in 2004, has some discussion about the implications of peak oil and dates the peak as occurring between 2005 and 2020. The strategy also discusses security of energy supply, and that oil supply is under threat from terrorism and political unrest. The strategy sets out a number of goals for energy including "*adverse impacts of transport energy use are understood and are addressed*"[10]. Under this goal the strategy discusses increased use of public transport, walking and cycling, improved fuel efficiency of the vehicle fleet and the establishment of biofuels. Several strategies are also proposed that include elements relating to the transport sector:

- Transport Options - developing and supporting energy efficient transport initiatives for the region. This includes such actions as developing public transport services, a regional cycling plan, Walking School Bus initiatives, and designing of junctions to minimise congestion.
- Energy Efficiency in Regional Planning. This includes the actions 'making efficient use of infrastructure by supporting all means of making best use of infrastructure, electricity, roads, water/drainage through land use management planning', and 'introducing or

[8] Energy Efficiency and Conservation Authority (2001) *National Energy Efficiency and Conservation Strate*gy

[9] Hon Harry Duynhoven (8 April 2006) Speech - *How is the Government Preparing for Peak Oil?*

[10] Environment Canterbury (2004) *Regional Energy Strategy*

supporting land use management that results in reduced energy use'.

- Reduce Dependence on Fossil Fuels - support and develop initiatives to reduce or replace use of fossil fuels. This includes supporting fuel substitution, and fostering development of sustainable energy technologies through funding, endorsement or use, where possible.
- Demand Management - develop and support initiatives to withstand disruptions to current sources of energy. This strategy includes an action to raise the awareness of the risks to supply, particularly for oil.[11]

Auckland Regional Council

The Auckland RLTS does not specifically discuss peak oil, but, under the objective of ensuring environmental sustainability, one of the outcomes sought is *reduced non-renewable energy use and consumption of non-renewable resources in construction, by the transport system.*

The Auckland RPS discusses both transport and energy. It states that "because of high dependence on non-renewable fuels, the present use of energy is not sustainable"[12] and notes that it will be necessary to transition to renewable energy sources in the long term. The RPS also discusses the relationship between land use, transport and energy, and states that the existing urban form is not sustainable in terms of energy use, and that the transport system has negative impacts on the environment. Relevant policies in the RPS include:

- Promoting the application of energy efficiency in design and operation of transport vehicles.
- Promoting alternatives to the use of non-renewable fossil fuels.
- Land use and transport planning will be integrated in a way which reduces the need for vehicle travel.
- Promoting reduction of motor vehicle use and the encouragement of fuel efficient modes.

The RPS does however note that central government intervention will be required to encourage the use of renewable fuels.

The Auckland RLTC is examining the impacts of peak oil in its work for the next update of the RLTS. It is considering a range of possible dates but concludes that "oil is likely to peak in the next 20 years, and possibly much

[11] Environment Canterbury (2004) *Regional Energy Strategy*

[12] Auckland Regional Council (1999) *Auckland Regional Policy Statement*

earlier".[13] It notes that large investments will be required to introduce alternative fuels, and that the key actions needed to reduce consumption will be improving public transport networks and the efficiency of the vehicle fleet. It also comments on the time that would be required to switch the global energy system to an alternative to oil, and estimates it would take approximately 20 years.

Environment Bay of Plenty

The Bay of Plenty Regional Land Transport Strategy does not mention peak oil specifically but like the Auckland RLTS discusses measures to deal with fuel efficiency and sustainability which will also have positive benefits when oil production peaks.

One of the actions under the RLTS's outcome; Sustainability; is "apply the concept of live work and play in the Western Bay Sub-Region". Locating employment, recreation and retailing opportunities near residential areas will reduce the need to travel. Two actions that contribute to the outcome of energy efficiency are to "consider options to reduce the need to travel" and to "promote the use of renewable fuels". These actions also apply to the issue of peak oil as much as to the intended energy efficiency and sustainability objectives.

Greater Wellington Regional Council

The Wellington Regional Policy Statement (1995) is currently being reviewed. It discusses the finite nature of fossil fuels under the chapter on energy, but does not specifically mention peak oil, and also discusses energy efficiency and managing demand. The Statement notes that fossil fuels are the major source of energy for transport and that continuing the use of these resources is not sustainable. Depleting these resources will also reduce the options for future generations. Objective 2 aims to reduce dependence on fossil fuels and help "sustain social and economic well-being by helping to prepare for the time when fossil fuels are in short supply".[14]

Two policies are particularly relevant to the issue of peak oil:

- Policy 4: To promote a movement away from the use of non-renewable fossil fuels as the primary source of motive power for transport in the Region.
- Policy 5: To promote efficient and effective use and management of all energy resources in the short-term, and the adoption and use of appropriate renewable energy resources for industry, commerce and domestic energy services in the longer-term.

[13] Auckland Regional Council (2006) *Regional Land Transport Committee meeting agenda Tuesday 21 February 2006*. Section C. pp 52.

[14] Greater Wellington Regional Council (1995) *Regional Policy Statement*, ch 12.3.

4.2 Comment

While peak oil is an issue that has recently come to general attention, there are few effective actions that can be taken solely at Regional Council level to actively deal with it. There are uncertainties in many aspects of the issue, and it is an issue that would benefit from nationwide initiatives that can only be set by central government.

Central government has so far acknowledged the issue, but has decided to watch for developments as they occur, because it believes there is no immediate threat posed by peak oil. The actions that have been taken, such as developing a National Energy Strategy and sales targets for biofuels, are actions that also contribute to other goals set by the government, particularly with regards to environmental sustainability, energy efficiency and travel demand management.

Environment Canterbury has taken a more active position. They are working to a tighter timeframe, and have set in place policies that are addressing the issue more directly. The Auckland and Bay of Plenty RLTSs have not directly addressed the issue of peak oil, but have in place several policies under the goals of energy efficiency and sustainability that also contribute to resolving the issues created by peak oil. Ongoing work by the Auckland Regional Council and the current Canterbury RLTS are based on earlier peaking dates than that endorsed by central government.

The main concern with peak oil is that the trend in oil prices will consistently rise. However, oil price volatility may be just as large a problem in the short term. Global political affairs, war, terrorism and natural disasters will continue to have a major effect on the price of oil. The short term price fluctuations that these events cause will be the changes that are most noticeable over the period of the RLTS. Security of oil supply will be affected by both peak oil and volatile prices and in the long term the solution to both these issues will be a transition to alternative energy sources.

The exact date of peak oil will only be evident in retrospect. The immediate effects of peak oil will simply be a sustained rise in oil prices. Peak oil will not involve a distinct devastating event that must be 'solved' through action, but rather the gradual transition away from oil-dependent transportation.

Petrol and diesel are recognised as being relatively inelastic commodities, and therefore it is difficult for council policies to significantly reduce the use of these fuels. However there is anecdotal evidence that public behaviour is already being influenced by the increased price of petrol and diesel, and that travellers are willing to move to public transport in response to the price rises. [15] [16] The council will be able to build on a strong base of public

[15] New Zealand Herald. NZPA (5 July 2006) *Motorbike Sales Soar on High Fuel Prices*

[16] NZPA (3 May 2006) *Car Registrations Plunged in April*. Viewed 27 June 2006. http://www.stuff.co.nz/stuff/0,2106,3656302a13,00.html

transport patronage already active in the region and the RLTS should continue to encourage travellers to use alternative modes to the private car as well as improving the capacity and efficiency of the public transport system.

The RLTS should also consider promoting the use of measures such as improving public awareness and understanding of the issue, supporting innovation in related fields, and making the energy efficiency of land use and infrastructure design a consideration when planning for the future. Measures to improve the efficiency of the transport network and reduce congestion will also contribute to managing the issues surrounding peak oil. The RLTS should also support central government initiatives on the supply and uptake of biofuels, and increasing the fuel efficiency of the national fleet.

4.3 Recommendations

Peak oil needs to be taken into account when considering the future direction of transport in the region, but the issue is not enough on its own to warrant major changes in expenditure or policy direction. It must be noted that many of these issues are already being dealt with through actions towards other goals such as energy efficiency, sustainability, public health and climate change. There is at present no reason to suggest significant changes in the planning process or the outcomes sought.

The Wellington RLTS should:

- Support Central Government policies on energy efficiency and biofuels.
- Continue its current stance on supporting and encouraging alternatives to the use of the private motor vehicle through increasing the capacity of the passenger transport network and increasing the uptake of active modes.
- Set a “watching brief” to:
  - Keep informed as to whether the level of action by the council is appropriate
  - Keep up-to-date on new technologies regarding fuel efficiency and biofuels and their application to the region.

5 Climate Change

It is now generally accepted that human induced climate change is occurring, and that it will cause global temperatures to rise, altering weather and climate patterns around the world. New Zealand can expect more extreme weather events, e.g. floods and droughts, and warmer temperatures especially in winter[17]. The effects of climate change may have significant impacts on communities, infrastructure, biodiversity and the economy.

The majority of New Zealand's emissions profile is made up of carbon dioxide (CO_2) 46% and methane (CH_4) 35.4%[18]. Emissions from the transport sector make up approximately 40% of CO_2 emissions[19] and approximately 18% of our total greenhouse gas emissions.[20] In addition, transport sector emissions are growing quickly, at about four percent a year. [21] Therefore any reductions in the emissions from the transport sector will have a significant impact in our overall reduction of greenhouse gases.

It is difficult to say what the impacts of climate change will be on a local scale, but estimates for the Wellington region suggest an increase in temperatures during the period 1990 to 2030 of between -0.2℃ to 1.2℃ in summer and 0.4℃ to 1.7℃ in winter, increasing to 0.1℃ to 3.7℃ and 0.8℃ to 4.0℃ by 2080.[22] Perhaps more important is the predicted change in annual rainfall of -8% to +2% in Masterton by the 2030s and -13% to +4% by the 2080s, and in Paraparaumu a change of -4% to +10% by 2003 and +1% to +26% by 2080. In general it is expected to be wetter on the west coast and drier on the east coast.[23]

Nationally, sea levels are projected to increase by 30 to 50 centimetres between 1990 and 2100.[24] This will increase the rate of erosion in retreating areas along the coast, while the rate of accretion may increase in

[17]Ministry for the Environment (2004) *Preparing for Climate Change: A Guide for Local Government in New Zealand.*

[18] Ministry for the Environment (2005) *National Inventory Report: 1990 – 2003*, ch 2.

[19] New Zealand Climate Change Office website. Business Councils and Other Sectors: Transport. Viewed 23 June 2006. http://www.climatechange.govt.nz/sectors/transport.html

[20]*Climate Change Solutions: Whole of Government Climate Change Work Programmes* (2006)

[21] *Climate Change Solutions: Whole of Government Climate Change Work Programmes* (2006)

[22] New Zealand Climate Change Office (2004) *Preparing for Climate Change: A Guide for Local Government in New Zealand.* pp 9

[23] New Zealand Climate Change Office (2004) *Preparing for Climate Change: A Guide for Local Government in New Zealand.* pp 10

[24] Ministry for the Environment (2004) *Coastal Hazards and Climate Change: A Guide for Local Government in New Zealand.* pp 12

some areas due to increased rainfall and sediment supply. Higher mean sea levels, in addition to the temporary increase in sea level caused by low barometric pressure during storm conditions, will also increase the risk of inundation during storms. Coastal areas are often the location of transport corridors and are therefore at risk from the impacts of higher seal levels.

5.1 Guidance

5.1.1 Central Government Guidance

The Government has integrated its commitments under the Kyoto Protocol into a number of strategies including the New Zealand Transport Strategy and the National Energy Efficiency and Conservation Strategy which must be taken into account in the development of an RLTS. However, the Government is currently reviewing its climate change policy.

Kyoto Commitments

The aim of the Kyoto Protocol is to delay climate change by reducing greenhouse gas emissions. New Zealand ratified the Kyoto Protocol which came in to force in 2005, and must now reduce its emissions to 1990 levels during the period 2008 to 2012, or take responsibility for emissions above this level.

New Zealand Transport Strategy

The New Zealand Transport Strategy discusses the effects of transport on the environment under the Sustainability objective. Here it notes that reducing transport-related energy consumption will be a key contributor to reducing emissions from the transport sector, and that the NEECS already has a number of objectives to reduce emissions.

National Energy Efficiency and Conservation Strategy

One of the major goals of the NEECS is to reduce CO_2 emissions. To contribute to this, the Strategy has several objectives under the transport sector programme:

- Reduce energy use through reducing the need for travel.
- Progressively improve the energy performance of the transport fleet.
- Improve the provision and uptake of low energy transport options.

By reducing the need for travel and the amount of fuel consumed by vehicles the greenhouse gas emissions from transport will be reduced. The Strategy also discusses the support of measures to increase higher vehicle occupancy, walking, cycling and the use of public transport.

Preparing for Climate Change: A Guide for Local Government in New Zealand

The New Zealand Climate Change Office has also published a document that guides local authorities on how to prepare for climate change. It gives guidance on how to incorporate climate change into regional plans and policy statements.

It does not specifically discuss regional land transport strategies, but does make the point that the location of activities, communities and infrastructure will be affected by climate change and as the practical lifetimes of some infrastructure can be up to 100 years, the location of new projects needs to take into account the possible impacts of climate change over the next century. For example, the proximity of roadways and rail corridors to areas at high risk of flooding, storm surges, or landslides.

The document also notes it is the extreme event which has the greatest impact on the landscape and that the frequency of extreme events is likely to increase. Climate change brings an increased risk of heavy rainfall and resulting flood events which will have implications for regional authorities.[25] In relation to transport, this may involve the relocation of roads and infrastructure to areas less flood prone, or increasing capacity to deal with road runoff and storm water. As well as flood risk, changes in wind, rain and temperature may have an effect on the maintenance needs of public transport and transport infrastructure and extreme winds may have an effect on heavy vehicles.[26]

5.1.2 Regional Level Organisations

Environment Canterbury

The RLTS for the Canterbury region addresses CO_2 emissions from the transport sector under several of its key result areas. It encourages walking, cycling and the use of public transport, which will reduce fuel consumption and therefore CO_2 emissions.

The Strategy discusses the impacts of transport on the environment including the "production of pollutants with a global effect, such as carbon dioxide"[27]. To address these issues the Strategy promotes assessment and monitoring of environmental effects in order to avoid, mitigate or minimise them. The policy also intends to meet national and regional

[25] Ministry for the Environment (2004) *Preparing for Climate Change: A Guide for Local Government in New Zealand*, pp 11.

[26] Ministry for the Environment (2004) *Preparing for Climate Change: A Guide for Local Government in New Zealand*, pp 24.

[27] Environment Canterbury (2005) *Regional Land Transport* Strategy, pp 29.

environmental standards and notes the need for the Government to provide appropriate national standards and funding and pricing mechanisms.

In the Demand Management and Land Use key result areas the Strategy also discusses measures to improve the efficiency of the transport network and how land use can impact upon the distance and mode of travel. Again, these policies contribute to reduction in CO_2 emissions through reducing fuel consumption.

Auckland Regional Council

The Auckland RLTS specifically deals with CO_2 emissions under the objective Ensuring Environmental Sustainability. One of the specific outcomes for this objective is to "reduce carbon dioxide emissions from the transport system"[28]. The Strategy also notes that if Auckland is to meet its share of the national targets for the Kyoto Protocol then the region needs to reduce congestion, improve the vehicle fleet, and provide viable alternative transport options.

However, when the expected outcomes of these objectives are discussed the Strategy notes that CO_2 emissions are expected to *increase* between 2005 and 2016 by 21% and that "the expected outcomes for environmental sustainability will not offer improvements over 2001, nor will the option achieve the Kyoto target for CO_2 emissions. Any improvements in environmental sustainability require significant changes that are not within the control of the Regional Land Transport Strategy"[29].

Environment Bay of Plenty

The Bay of Plenty RLTS discusses CO_2 emissions under the strategic outcome Energy Efficiency. It notes that one purpose of the RLTS is to implement the policies of the SmartGrowth Strategy and the Regional Policy Statement related to energy efficiency and greenhouse gas minimisation. The actions of the RLTS include measures to reduce the need for travel and promoting the use of renewable fuels.

The Strategy also promotes walking, cycling and public transport as a way to reduce fuel consumption which will also result in reduced CO_2 emissions. The strategic location of employment, education, recreation and residential areas will reduce the need for travel, implemented in the Strategy through the concepts of *live work and play*.

Greater Wellington Regional Council

Similar to Auckland, analysis of the Wellington Regional Transport Programme suggests that compared to 2001, 23% more CO2 will be produced by the transport system in 2016.

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[28] Auckland Regional Council (2005) *Regional Land Transport Strategy*, pp 42.

[29] Auckland Regional Council (2005) *Regional Land Transport Strategy*, pp 115.

The Wellington RPS considers the impacts of energy production, transportation, and use on the environment and, as a part of this, emissions of carbon dioxide. The aim of policy 7 in the chapter on energy is "to avoid, remedy or mitigate effects on the atmosphere, including emissions of greenhouse gases, that result from energy production, transportation, transmission, conversion and end use, consistent with national standards and international protocols".

The RPS discussion document, *Our Region – Their Future*, covers the issue of climate change and notes that emissions from transport are the largest and fastest growing in the region. It notes that the location of infrastructure in relation to areas at risk from the effects of climate change will need to be a consideration for local authorities, and that "no development" zones could be an option for dealing with this. While this is the responsibility of the local councils, the Regional Council needs to provide a strategic overview of the transport network and guidance to local authorities through an overarching strategy.

5.2 Comment

Climate change is an important and pervasive issue, the effects of which will become more noticeable over the next century. New Zealand and the Wellington region need to work to reduce the transport sector's carbon dioxide emissions, and prepare for and adapt to the effects that changes in the climate will have on the transport network.

The effects of transport on climate change are currently dealt with through policies on energy efficiency, use of alternative modes, travel demand management, and land use, which aim to reduce CO_2 emissions through reducing the need to travel, improving the fuel efficiency of the vehicle fleet, and the efficiency of the transport network. Further actions to reduce emissions, such as pricing, vehicle fuel efficiency standards, and alternative fuels, are most effectively undertaken at a national level.

The impact climate change and its associated increase in extreme events will have on the transport network must also be taken into account in the RLTS. The risks posed to the existing transport network need to be considered and measures put in place to mitigate the undesirable impacts. For the construction of new transport links and infrastructure, decision makers will need to consider the future impacts of climate change throughout the lifespan of the assets. The strong relationship between transport and development also needs to be recognised. For example, construction of transport infrastructure that encourages development in coastal areas which are at risk from storm surges and erosion, may need to be reconsidered or require development restrictions to be put in place. While district councils have control over land use, the regional council will need to provide guidance as to the location of growth.

5.3 Recommendations

The regional council is currently taking action to reduce CO_2 emissions through promoting walking and cycling, and expanding and encouraging the use of public transport. Measures to reduce congestion and improve the effectiveness of the strategic road network are also in place and the council is addressing the need to travel, through policies on land use and land use guidelines which seek the integration of land use and transportation. These initiatives cover the major methods of reducing CO_2 available to regional authorities, represents good practice and should be continued.

In relation to the issue of climate change the RLTS should:

- Continue with measures to seek reductions in emissions of carbon dioxide through:
  - Improving the efficiency of the transport network through reducing congestion, improving intersection design and facilitating usage by pedestrians and cyclists.
  - Encouraging use of alternatives to the private motor vehicle.
  - Continuing development of the passenger transport network; ensuring it attractiveness, convenience, safety and security.
- Promote awareness, and implementation where possible and appropriate, of Central Government policies.

6 Conclusion

The three issues discussed in this report, planning timeframes, peak oil and climate change, are all issues with a long term focus.

While the RLTS is restricted in its planning horizon, the future direction of the region must still be taken into account when considering activities within the 10 year timeframe. The RLTS can indicate this future direction through its stated Vision and Objectives.

Peak Oil is a global issue and while New Zealand and the Wellington Region have very little control over the supply of oil there are actions the region can take to influence demand and provide alternatives to oil. However, the actions that will be most effective at smoothing the transition away from the transport sector's dependence on oil must be undertaken at the central government level. The council can keep a watching brief on this issue, particularly to inform its passenger transport plans, and to a limited extent, to inform its policies on use of transport planning as the price of oil rises and alternative methods of transporting people and goods begin to further develop.

Climate change is also a global issue that is best tackled by central government. The RLTS can support these initiatives by ensuring the provision of alternatives to the private car and improving the efficiency of the transport network – actions the council is already taking.

At present, given the high level of uncertainty and the limited range of actions available to the Regional Council, the current policy direction and level of activity is considered appropriate to address these issues.