

Managing Competing Demands in Urban and Rural Areas – A Regional TDM Strategy

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1 Introduction

The development of a Regional Travel Demand Management (TDM) Strategy for the Waikato State Highway Network needs to be responsive and seek to manage network optimisation and demand for transport through a package of measures.

Currently economic development and social change are placing unmanageable demands on the transport system in many areas, and there is a need to ensure the region has a well-connected and integrated strategic transport network, ready to cater for anticipated population and freight demands over the next 20 plus years.

Understanding the performance of the strategic road network through its users, their mode of travel and movement is essential to the planning, function and operation of the transport network. The state highways in New Zealand serve multiple often conflicting functions, including residential and commuter movements, heavy vehicle movements, tourism, passenger transport networks and other road network users (i.e. cyclists, pedestrians).

During the development of this TDM Strategy for Transit New Zealand the following tasks were completed:

- Data collection and Literature Review including a review of existing and proposed or planned TDM measures across the Waikato Region;
- Consultation with Transit NZ Regional Office, Environment Waikato;
- Developed a database to identify TDM measures and opportunities applicable to the rural and urban state highway networks for walking and cycling, freight and tourist vehicles and public transport;
- Identification of key stakeholders responsible for TDM measures and governing areas;
- Indicative assessment of the costs associated with each TDM measures identified and agencies responsible; and
- Development of an implementation plan for optimal TDM measures to be implemented over the short (5 -10 years), medium (10 -15 years) or long term (++15 years).

With twenty three State Highway Networks (SHN) in the Waikato Region this paper does not set out why or where all TDM measures were considered appropriate for further development and / or implementation but rather provides guidance on how specific measures were selected for different urban and rural locations.

2 Transit New Zealand and Travel Demand Management

Travel Demand Management (TDM) strategies and measures work to manage and support an integrated land use and transport network by providing improved travel options and choices as to how, when, where or even if we travel. TDM programs should not necessarily be restricted to regional or local territorial boundaries. Hence, for a comprehensive program to be developed, it requires inter-agency coordination, collaborated partnership and a shared vision. The New Zealand (NZ) Transport Strategy (Dec 2002, Ministry of Transport) provides a framework for TDM programs to be considered and developed in a way “*that contributes to an integrated, safe, responsive and sustainable land transport system*”. Under the Land

Transport Management Act (2003) Transit are required to give “*early and full*” consideration to land transport options and alternatives to road building.

For Transit its role in travel demand management is two-fold. Firstly, Transit is required to protect the State Highway Network from inappropriate development thus maintaining its contribution to the country’s social and economic prosperity. This means actively managing the demand for travel on the state highway network. Secondly, in order to manage the state highway network Transit must develop travel demand management initiatives that support and integrate transport and land use objectives. They are currently developing a Travel Demand Management Guide to ensure that TDM is considered in Transit’s professional services contracts for existing and new state highways, and within the scope of strategic studies (Transit New Zealand, 2007).

A comprehensive approach to TDM is new to the Waikato Region. The Regional Land Transport Strategy (Environment Waikato, 2006) identifies the need to develop a TDM Strategy for the region. Environment Waikato is due to start work on a TDM Strategy to meet the requirements of the Regional Land Transport Strategy (RLTS) in mid to late 2007. The Waikato Regional TDM Strategy for Transit needs to be responsive and seek to manage network optimization and demand for transport through a package of measures including;

- Physical mechanisms to help better manage the traffic on the road network;
- Influencing travel behaviour by providing better information to road users so they can make informed choices about how and when to travel; and
- Co-ordinating land-use planning and transport planning to achieve integrated and sustainable transport solutions.

2.1 An International Reference Point: ‘Highways Agency (UK)’

In 2004, the Highways Agency (HA) established a program aimed at reducing congestion on the motorways and major 'A' roads. The aim was to cut congestion through influencing travel behavior, by providing access to information to help people make ‘smarter travel choices’ and introducing demand management measures. ‘Smarter travel choices’ are techniques for influencing people’s travel behavior towards more sustainable options (Highways Agency 2007).

This has led to a number of smarter travel choice initiatives being set up including:

- The implementation of workplace travel plans.
- Contribution to the spatial planning and development control processes through collaborating with local authorities, in order to minimise the impact that new developments may have on the strategic road network.
- Encouragement of tourists to consider changing their travel choices.
- Encouragement of the use of bus and coach services in particular where there are no rail links.
- Improvement of signage to encourage the use of Park and Ride facilities at rail stations.
- Consideration of trials of hard shoulder running for coaches.
- Introduction car-sharing lanes.
- Contribution to improving awareness of public transport (e.g. by providing better signs to public transport operators and taking part in discussions about improving other areas of public transportation).
- Support for the benefits of healthier living (e.g. increasing the use of public transport, walking, cycling, car sharing/clubs, home-working etc by encouraging people to use online journey planning websites).

The HA believe that road authorities should be essential partners in the delivery of TDM initiatives, particular softer approaches such as workplace/school travel plans, because it can

play a key role in reducing congestion. This currently happens on a scheme by scheme basis with both Councils and the HA taking the lead, but usually on different target sites – these can be developments that access major networks, business parks adjacent to networks or network corridors. The HA is currently developing a national framework which identifies the roles and responsibilities of all involved partners in the delivery of travel behavior change initiatives.

3 The Waikato Region

The Waikato region is the fourth largest region in New Zealand by population, covering an area of approximately 26,000 km². The 2006 Census (Statistics New Zealand, 2006) indicated that the population of the Waikato region is likely to be 417,800 by 2021. Ninety four percent of growth in the Waikato Region is projected to occur in the Hamilton, Waikato and Waipa sub-regions which will have major implications on land use and transport networks. Other growth hotspots within the region are the Thames-Coromandel and Taupo districts due to demands in lifestyle choices, (i.e. retirement, life style blocks and outdoor/coastal living).

The Waikato region is administrated by Environment Waikato, Hamilton City Council and 12 District Councils. All Councils are responsible for various aspects of the roading and transportation network. Environment Waikato is responsible for the provision of passenger transport and mobility services while local councils have the responsibility to provide and maintain local road networks and supporting infrastructure. Transit is responsible for administering the State Highways through all areas, in conjunction with local bodies (refer to Figure 1).

3.1 Waikato Road Network

The Waikato road network is the 3rd largest in the country containing over 10,000km² of roads which accounts for 11% of the total road length in New Zealand. Of this figure, 1,740km includes Transit's state highway network. The state highway network links Auckland, Waikato and Bay of Plenty together to form what is known as a "strategic growth triangle" (Environment Waikato, 2007). The major inter-regional routes in the region include:

- State Highway 1 – the major north-south national arterial that links Auckland with the Waikato region and to regions further south.
- State Highway 2 – links Auckland and Waikato with the Bay of Plenty region through the Karangahake Gorge and connects with State Highway 25 to the Coromandel Peninsula.
- State Highway 3 – this route runs from Hamilton connecting the Waikato with the Taranaki region.
- State Highway 29 – this route links Hamilton with the Bay of Plenty region over the Kaimai Ranges.
- State Highway 27 – this route provides an alternative link for Auckland and the Waikato into the Bay of Plenty via State Highway 24 and State Highway 29 over the Kaimai Ranges.
- State Highways 5 and 30 – links the Waikato region to the southern Bay of Plenty region (Rotorua) and Hawkes Bay.
- State Highways 4, 41, 46 and 47 – links the Waikato region to the Manawatu/Wanganui region.

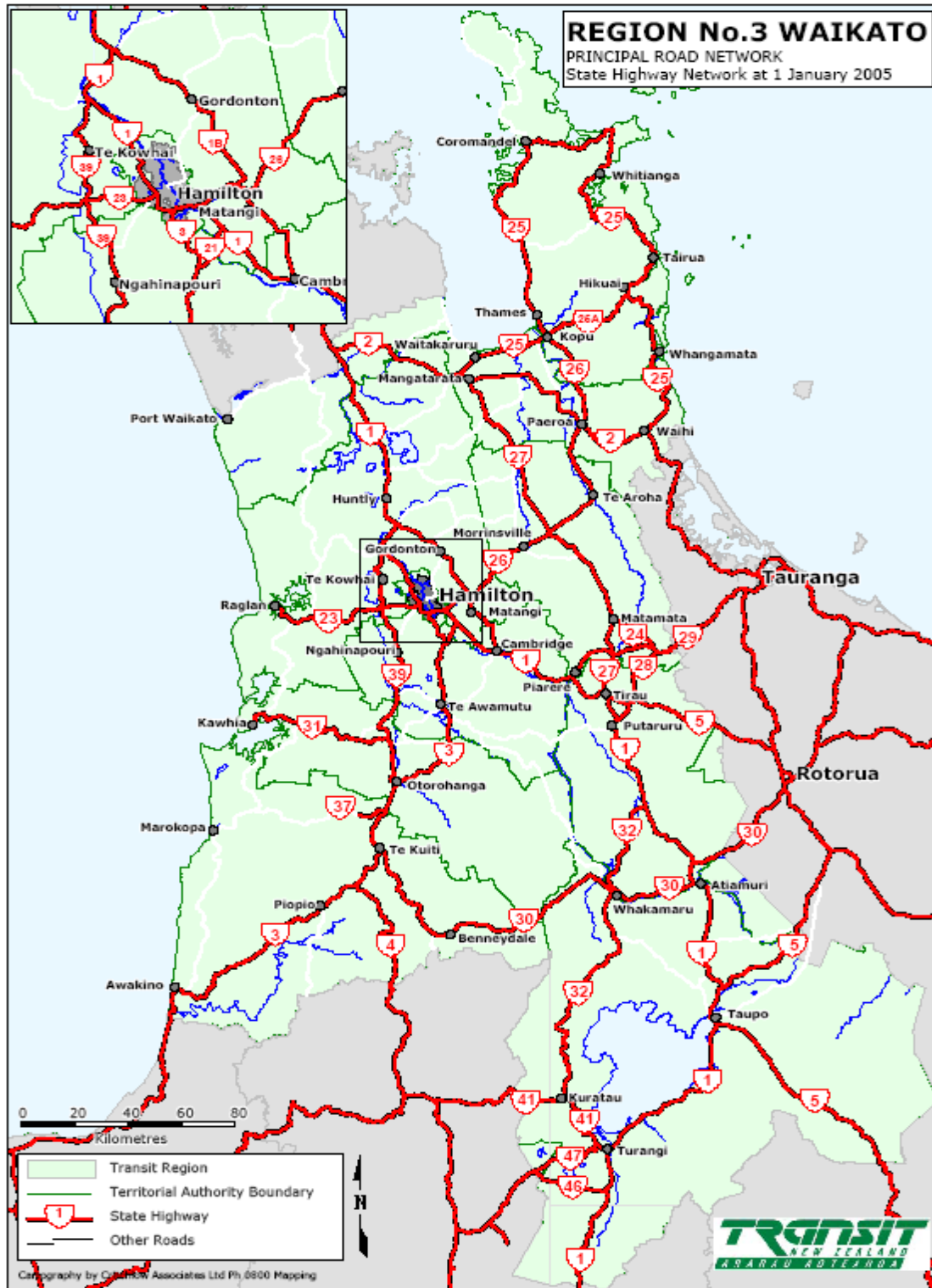


Figure 1 – Waikato Region

4 Understanding the Role of State Highway Networks

In order to identify what type of TDM Measures should be applied to the most suitable locations it was important to understand the role of the Urban and Rural State Highway Network. The National State Highway Network (SHN) and communities are interdependent in

the movement of goods and people. State highways are a major contributor to the economic and social prosperity, forming the backbone of the land transport system. To ensure that the efficiency of the SHN is optimised, a system of categorisation has been identified that recognises the different functions of different highways (Transit New Zealand, 2006). The system applies a three-tier categorisation: National, Regional and Sub-regional state highways, where alternative standards can be applied to be cost effective and meet the intended function of that state highway while continuing to maintain a high level of safety.

4.1 National State Highway Network Function

National state highways connect places of national significance, major cities, international ports and airports, and facilitate long distance inter-regional movement of people, goods and services throughout the country. More specifically, national state highways are between centres of population with:

- More than 30,000 people, or
- Major ports and airports (those handling international trade of more than 500,000 tonnes or over 50,000 passengers per year or regular international flights), or
- Routes with at least 400 Heavy Commercial Vehicles per day, or
- Total traffic of over 10,000 per day, or
- Population of more than 30,000 where the state highway (between the centres of population) generally has traffic as above along more than two thirds its length, or
- Designated motorways in major urban cities, such as Auckland, and Wellington.

4.2 Regional State Highway Network Function

Regional state highways connect territorial regions and places of regional significance, key tourist destinations and regional ports, and serve inter-regional trips. More specifically, regional state highways are between more than two regions with traffic of 100 to 400 HCVs and total traffic of 1000 to 10,000 vehicles per day, or that have a particular strategic function within a region.

4.3 Sub-regional State Highway Network Function

Sub-regional state highways connect territorial districts and places of district importance such as smaller towns, tourist attractions and key primary production areas, and serve as feeder routes to the wider state highway network. They include all state highways that do not fall into the national or regional categories.

4.4 State Highway Environments & Context Sensitive Design

Transit's management of national, regional and sub-regional highways depends also on the environment through which the road passes. Transit is committed to planning for, developing and promoting quality urban design as a signatory to the New Zealand Urban Design Protocol. Highways are defined into urban, peri-urban / semi-rural and rural environments. These classifications are largely based on speed limit and are defined as follows.

4.4.1 Urban State Highway Network

The urban environment covers all urban communities where the speed limit ranges from 50 to 70 km/h. This range includes settlements from small villages through to large cities. The urban classification also includes urban motorways where the speed limit is 100 km/h.

4.4.2 Peri Urban / Semi Rural State Highway Networks

Peri-urban environments form the hinterland surrounding major towns and cities. Typically there is a mix of land uses, including commercial, residential and agricultural. These areas are often subject to development pressure. This can present significant risks to the functional operation of the state highway, as well as providing positive opportunities for integrating land use and transport objectives. The speed limit is generally between 70 and 100 km/h.

4.4.3 Rural State Highway Networks

The majority of state highways are located in a rural environment. The landscape can vary significantly from mountainous native forest to rolling farmland and flat coastal regions. In some instances they may be the only highway in an area which will perform a wide range of functions. In other areas they may form part of a denser road network. The emphasis placed on access and mobility will vary depending on the category of the road. The speed limit is generally 100 km/h.

4.5 Self Explaining Roads

Self-explaining roads can help with road users' perceptions of road environment, category and function. By encouraging implementation of the self-explaining road concept, benefits to Transit will be accrued not only in terms of reduced speeds and improved safety, but also by further emphasizing different road classifications (Land Transport New Zealand, 2007). This will benefit TDM initiatives such as walking and cycling in urban areas, as reduced speeds and a more inviting road environment are likely to encourage greater use of walking and cycle as modes of transport. Furthermore, where higher speeds are allowed and encouraged, the self-explaining roads concept encourages wider shoulders and provision of adequate clear zones, which is also of benefit to cyclists travelling in high speed, rural areas.

5 Application of TDM Measures to the State Highway Network

This section summarises the approach taken to identify possible TDM improvements for specific sections of the national, regional or sub-regional state highway networks and environments for which they pass through.

Transit's role in developing and implementing TDM measures ranges from facilitation, funding, liaison to active implementation of measures. There are several key players with whom Transit will need to establish strong inter-agency co-ordination, collaboration partnerships to achieve a shared vision of an integrated sustainable transport network. The following parties identified, have key responsibilities and interests in or influences on transport, though it may not be their direct responsibility. It is important that Transit develops and maintains communication forums with these parties to ensure that travel demand management solutions are readily integrated where possible. These agencies include;

- Land Transport New Zealand (Transit and Land Transport NZ to merge in 2008);
- Tourism New Zealand;
- Department of Conservation (DOC);
- Regional Councils (i.e. Environment Waikato);
- District and City Councils (i.e. Hamilton City Council, Waikato District Council);
- Private Developers;
- Airports;
- Coastal Shipping & Ports;
- Rail (ONTRACK); and
- Agriculture and Forestry Industries.

5.1 TDM Database

To assist with the identification of TDM measures appropriate to the local context of the SHN we developed a TDM database to inform and be used alongside the Strategy. Due to the diverse nature of the Waikato Region there was a need to understand the role, function and individual characteristics of each SHN. Information was gathered from literature reviews, Statistics New Zealand and Transits Regional Highway Information Sheets. A summary of the information collated and the structure of the database is outlined in Table 1.

Table 1 – Details of the framework of the TDM database

Heading	Detail
State Highway	State Highway Number
Strategic Function	National, Regional and Sub-Regional
Local Function	Urban, Peri-Urban or Rural
Route (RS)	Route Station on State Highway
Distance	Length of SH network by speed limit
AADT traffic volumes	AADT traffic volumes
Speed	Speed limit (i.e. 50, 80, 100)
Population (2001)	Population of major urban Areas (2001 Census)
District	Local Council (i.e. Taupo District Council)
Town/Route	Major Town Name (i.e. Hamilton)
Primary Activity Function	Freight, Tourism
Other Activity Function	Local Movement
Treatments	Parking Management, Bus Priority, Marketing etc.
Timeframes for Development (Indicative)	<5-10 years 5-10 years 10-15 years 15+ years
Costs (These costs are indicative and subject to further investigation)	0 - \$50,000 \$50,000 - \$250,000 \$250,000 - \$1,000,000 \$1,000,000 +
Stakeholders	Transit NZ, Environment Waikato, Councils

As outlined in section 4, the strategic function of each SHN is classified as National, Regional or Sub-regional. The local function (Urban, Peri-Urban and Rural) is defined by the location and speed allocated to stretches of the SHN. In order to identify the most appropriate TDM measures there was a need to clarify the length of each speed limit zone (some segments are less than 1km in length), the current population and the area through which the SH passed (including geographical features and land use).

This information enabled us to identify the primary activity function of the SHN. An example of this is SHN1, alternatively known as the 'Thermal Highway'. This route is marketed by Tourism New Zealand as one of the key tourist driving routes in New Zealand. In addition SHN1 is the major north-south national arterial that links Auckland with the Waikato region and to regions further south and as such is a key freight corridor. Along sections of SHN1 other activity functions were also identified (i.e. local movement in urban areas, employment sites).

Where potential TDM measures were identified (discussed further in section 5.2 and 5.3), the indicative costs and timeframes for developing these measures and the relevant stakeholders that would need to be involved were also recorded. The potential timeframes for implementation have been indicated for the short (5 years), medium (5-10+) and long term (+15). These broad timescales were fixed by Transit. Some initiatives can clearly be developed and need to be (i.e. cycle strategies) within a short time frame in order to ensure the identification of urban and rural specific measures. Some TDM measures need further investigation, development and political will before they can be realised (i.e. HOV lanes).

5.2 Strategic TDM Measures

It was determined early on during the study (whilst conducting the literature review), that although a RLTS had been developed for the region, there were many gaps in both the data available and local strategies which set out how each Council was to develop and implement TDM measures. A number of strategic TDM initiatives were therefore identified in order to ensure a comprehensive and consistent approach was taken to further develop and implement TDM measures across the Waikato Region. A selection of these strategic TDM initiatives is outlined below. These will need to be developed in the short term to inform the development of this Strategy although they should be subject to ongoing review.

5.2.1 Walking and Cycling

Walking and Cycling Strategies – only one Council (Taupo District Council, 2007) has developed a walking and cycling strategy in the Waikato Region. The purpose of any walking and cycling strategy is to provide guidance to the local Council and the community on how best to promote, manage, plan and provide for cycling and walking in the District. In order to ensure walking and cycling measures are developed to their fullest extent it is important that each Council develops a walking and cycling strategy within the short term with support from Transit and other stakeholders.

Develop GIS database of cycle network – Hamilton and Taupo Councils have both developed maps of the cycle networks within the municipalities but there is no GIS database or regional map which shows the extent of the Waikato cycle network. It is important to develop this in order to identify both existing gaps in the cycle network and where networks can be developed to take account of future urban growth. Table 2 provides a snapshot of some of the Strategic and National State Highway TDM Measures identified for Walking and Cycling.

5.2.2 Freight Vehicles

Establishment of a regional freight forum – this would include representation from Transit, Ministry of Transport, Land Transport New Zealand, key stakeholders and agencies involved in all aspects of the freight cycle (i.e. representatives from the manufacturing and bulk product industry). This forum should provide a single vision and voice at a regional or national level. A key priority of this forum would be the development and implementation of a Freight Management Strategy which would identify, develop and support corridors for rail, shipping and road transport.

The movement of freight cannot be underestimated in the Waikato region and in particular its impact on the functioning of the SHN. In managing the movement of freight Transit's aim is to minimise the negative impacts that congestion creates by slow moving traffic. A Freight Forum should be established within the short term to ensure the needs of this industry are clearly identified and so that TDM measures can be developed to ensure the most cost effective and sustainable movement of freight on the SHN.

Table 2 – Snapshot of Strategic and National State Highway TDM Measures (Walking and Cycling)

State Highway	Strategies and Measures	Urban Environment	Peri urban Environment	Rural Environment	Timeframe in Years	Costing	Responsibility
ALL	Highway maintenance	○	○	○	Annual program	\$	Transit
	Walking & Cycling Strategies	○	○	○	< 5-10 years	\$\$	Transit, Local Councils and other key stakeholders
	Monitoring of cyclist numbers	○	○	○	Annual program	\$	Transit, Local Councils
	Develop GIS database of cycle network	○	○	○	< 5-10 years	\$	Transit
National State Highway – Possible TDM Opportunities for Walking and Cycling - SH1 SH3 SH5 SH27 SH29							
1	Improve signage and intersection treatments	○	○		Ongoing program	\$ / year	Transit, Local Councils
	Develop / improve dedicated cycle routes	○	○	○	< 5-10 years	\$\$	Transit, Local Councils, Cycle Groups
	Improved crossing facilities	○			Ongoing program	\$ / year	Transit, Local Councils
	Walking - personal security	○			Ongoing program	\$ / year	Transit, Local Councils
	Walking - Environmental enhancements / streetscape	○			Ongoing program	\$ / year	Transit
	Extend urban footpath network	○			Ongoing program	\$ / year	Transit

\$ 0 - \$50,000
 \$\$ \$50,000 - \$250,000
 \$\$\$ \$250,000 - \$1,000,000
 \$\$\$\$ >\$1,000,000

5.2.3 Passenger Vehicles Improvements

Establishment of a Passenger Transport Forum – this forum should focus on regional issues relating to the establishment of passenger transport corridors and special vehicle lanes, integrated real time information systems and ticketing. Environment Waikato are responsible for managing the bus network but Transit and Councils need a greater say in identifying where there is an existing need for services in rural and urban areas (including extensions), future need due to urban growth, and the appropriate provision of infrastructure required to support these services.

5.2.4 Tourism

Develop a Tourist Network Plan – Tourism generates significant traffic volumes around New Zealand and is central to the country's economy. In 2005, the Ministry of Tourism Flows Model identified international and domestic travellers made over thirteen million trips to Transit Waikato region, including day trips and overnight stays. It would be of mutual benefit to the Regional Tourism Organisations within the Waikato region, and other road controlling authorities, to analyse the flows model further. With a better understanding of current and predicted tourism flows through the region, respective stakeholders can work together to apply travel demand management initiatives more effectively and target them more efficiently along corridors where their impact can be optimised and conflict with other road users can be managed.

Develop Guidance on Event Management Marketing – The Waikato region has seen a growth in major events being planned and hosted (i.e. 2008 V8 Motorsport, 2010 World Championship rowing, Super 14's rugby and Lake Taupo Cycle Challenge). There are also numerous annual events which require specialist event management plans in order to manage and minimise their impact on state highway networks.

5.2.5 Parking and Park & Ride

Parking Management Strategies – the literature review identified that there were no Parking Strategies in the Waikato Region. It is important to understand the current demand for parking especially in urban areas in order to reduce conflict with the function of the urban SHN. It is recommended that these are developed in the short term.

Park and Ride Strategy – The RLTS identifies the need for further investigation into the provision of Park and Ride facilities in Hamilton, Waikato and Waipa sub-regions. The provision of Park and Ride facilities could be located at the urban and peri-urban fringes with ready accessibility to passenger transport networks especially along key growth corridors. The provision of Park and Ride facilities is a tool to manage demand and should be a developed alongside a comprehensive parking management strategy. Park & Ride facilities reduce vehicle kilometres travelled by transferring drivers to passenger transport for part of the journey, where a complete passenger transport journey is currently not possible or desirable.

5.2.6 Marketing and Education

Branded Communication and Education programs – Marketing is a powerful tool in communicating and influencing how, when and where people travel. It is important that Transit plays a leading role in the provision of information at all times to raise awareness/educate travelling public on transport issues and Transit's wider objectives. These need to be developed particularly in conjunction with Councils and can be used to promote a new bus service, or to encourage local cycling and walking trips.

Route choice/advisory information – It is important for state highways users to be informed both in advance and during their journey whether it is a recommended alternative route,

tourist or freight corridor, or just traveler information on conditions (i.e. ice, fog, event management). This could be done via web based technology, radio, or the provision of infrastructure/messaging on the SHN. Variable Message Signing (VMS) can be installed/used to provide general transport messages to assist in reducing congestion and encouraging more sustainable travel (e.g. market rideshare scheme operating in area, advertising traveller information websites).

5.3 State Highway TDM Measures

As discussed in section 5.1 a database was developed to assist with the identification of TDM measures appropriate to the local context of the SHN. Due the diverse nature of the Waikato Region there was a need to understand the role, function and individual characteristics of each SHN. The strategic function of each SHN is classified as National, Regional or Sub-regional. The local function (Urban, Peri-Urban and Rural) is defined by the location and speed allocated to stretches of the SHN.

With twenty three SHN in the Waikato Region this paper cannot detail why or where all TDM measures were considered appropriate for further development and / or implementation. A selection of these and the issues that need to be considered are provided below.

5.3.1 Cycling

Cycling - The basis of planning and provision of cycle facilities on state highways should focus on the removal or mitigation of cycling blackspots, and the provision of suitable shoulders / cycle paths where non-state highway alternatives are available. To facilitate cycling on the urban SHN, routes need to be developed that link main trip generators, and provide crossing facilities and advanced stop lines at intersections. SH1 is the key national and inter-regional north-south route through the Waikato and as such is a key freight corridor which limits the potential to develop safe on-road cycle facilities due the width of the road within the urban highway network. Safe cycling routes need to be developed as part of a cycle strategy especially for urban areas with the respective councils.

Identifying appropriate cycling routes on the rural SHN has been focused on recreational (including sport), and touring cycling. Taupo is becoming a very popular visitor destination for visitor-based activities and cycling related events (i.e. Lake Taupo Cycle Challenge). This results in both local and visitor participation in cycling in and around Taupo being heightened at certain times of the year. SH46, SH47 and SH1 (Taupo) makes an ideal recreation loop circuit for recreation uses using the SH or alternative path/ facilities for cycling. Taupo District Council has identified a cycling recreation and sport cycling route on SH41 which provides the connection to SH47, and will work with Transit to develop this and other routes over the next five years.

5.3.2 Freight Vehicles

Road Freight Tolling – It is in Transit's interests, in its role of managing state highways to consider management of the movement of freight in order to minimize the negative impacts it can have on congestion created by slow moving traffic in both urban and rural areas. Tolling specific corridors or sections of the State Highway may be a viable means to deter unsupported usage of these corridors by freight operators. Potential benefits of tolling a specific route or section of highway are improved safety for road users by reducing the level of conflicts between freight operators and other road users and protection of scenic corridors from further environmental deterioration.

For tolling to be effective, the toll price would need to be higher than the price elasticity for freight transport, therefore the toll price may vary subject to external market forces. An

application of freight tolling on a state highway network may be applied to a seven day week or set periods such as weekends or public holidays only. The operational hours of the toll may either be applied over a 24 hour period or during peak, seasonal or weekend periods only to deter freight movements. Tolling of specific routes to deter freight may negate the need for future upgrades and enable other uses to enjoy the scenic quality of the route. The timeframes for implementing tolling is likely to be long term due to the need to gain wide support from the freight industry to be able to proceed and for supplementary TDM approaches to be developed.

5.3.3 Passenger Vehicles Improvements

Bus Priority Measures – The state highways network particularly in urban and peri-urban areas have an important role to play in facilitating and promoting public transport. Some of the measures available for use enable public transport to bypass congestion, whilst others operate to give a clear message on the priority of public transport allowing benefits of a quicker more reliable journey.

The Hamilton Western Corridor is the existing SH1 through serving the city's commercial and industrial hub, with access to the inland port location in Crawford Street. Due to the level of development experienced along this corridor, the need to protect corridors to the south of Hamilton (i.e. residential community of Peacocke) from similar levels of development and provide alternative options to private vehicle travel has been identified. This will include ensuring bus priority will be provided along the corridor and building these future improvements and opportunities into the planning process. It is recommended that a corridor plan identifying key actions be developed within a 5 year timeframe.

5.3.4 Tourism

Route Upgrades and Accessibility – Regional SHN2 is an inter-regional freight and tourism route connecting Auckland and Waikato to the Bay of Plenty region via the Karangahake Gorge. The freight function of this route will decline as the SH1/SH29 route to Bay of Plenty is developed. By identifying the existing corridor requirements and how upgrades to other corridors will result in a shift in the primary function of the route will enable Transit to develop a hierarchy of routes by function throughout Waikato. The priority for SH2 will be for tourism traffic and to protect its environmental and amenity values. Appropriate tourist TDM measures can be scheduled as the freight function of the route declines.

5.3.5 Parking and Park & Ride Measures

The main consideration for parking on the SHN in urban areas is whether on-street parking is likely to have implications for highway capacity. Will there be the ability to allocate road space for other modes of transport and what potential safety implications could there be. As identified in section 5.2, there are currently no parking strategies in the Waikato region. It is important for these to be undertaken as a first step in order to identify how and where appropriate parking TDM measures can be applied.

Providing for parking (and associated access) on the rural SHN is about providing tourist and rest parking adjacent to the highway. There are already designated rest areas and tourist viewpoints on many state highways through the Waikato (especially through the Coromandel (SH25 and 26). By ensuring adequate provision for parking and improved awareness of these areas, (i.e. traveler information prior to and on route), especially to cater for tourist demand during the summer months, will help to reduce congestion and accidents caused by poor access, illegal parking on the state highway, limited facilities and driver fatigue. An annual program of works will need to be developed to upgrade these locations, identify additional sites and improve traveler awareness.

When considering Park & Ride measures Transits' primary role will be one of supporting and enabling. One location considered for further investigation is the satellite town of Cambridge south of Hamilton on SH1. This town has and will continue to see a rapid population growth which will increase pressure on SH1 for the daily commute run. Key considerations for the location includes the provision of bus priority measures on the state highway to support a Park and Ride facility, available facilities (including land) to park cars, will the scheme complement existing public transport services and is there potential for a Park and Ride facility to remove car trips from the state highway and so reduce congestion. The timeframe for developing suitable P&R sites has been recommended to be 5-10years in order to ensure the appropriate infrastructure can be provided.

5.3.6 Marketing and Education

Road safety education program – as identified in section 5.2.6, raising awareness of the transport issues associated with how and when we travel is central to achieving any kind of success in managing travel demand. 'Soft' TDM measures such as travel plans has always been seen as outside the scope of Transit's role but as the HA have shown (refer to section 2.1), roading authorities should be essential partners in the delivery of TDM initiatives, particular softer approaches, because it can play a key role in reducing congestion.

This is particularly the case with schools as road safety initiatives and education is an essential component of travel plans. Whilst reviewing the Highway Information Sheets it was identified that there are a number of schools in rural areas set back from the SHN (the speed zones reduce from 100km/hr to 70km/hr and sometimes to 50km/hr for a short distance). An annual road education program should be developed to work with rural schools to identify suitable road safety, walking and cycling initiatives and provide road safety education to children.

5.4 Monitoring and Review

The Waikato TDM Strategy should be reviewed every three years to ensure that it keeps pace with changing circumstances, travel needs and policy. An Implementation Team should be established to monitor and facilitate the implementation of the Waikato TDM Strategy. The Implementation Team will need to be made up of senior staff from a wide range of organisations to ensure that its policies are installed across the region and that its further development and implementation are informed by all stakeholders. It is also important that the roles and responsibilities of the various stakeholders are established and that the group provides guidance and direction particularly where constraints and opportunities arise with regard to the timing and funding of TDM measures.

Further work is required with stakeholders to both develop and endorse the strategy, and this will include developing a plan to monitor and evaluate the implementation of TDM measures. It is essential that this is reviewed each year, and annual updates are prepared to report on the progress of the Waikato TDM Strategy.

6 Conclusion

Currently economic development and social change are placing unmanageable demands on the transport system in many areas, and there is a need to ensure the Waikato region has a well-connected and integrated strategic transport network, ready to cater for anticipated population and freight demands over the next 20 plus years.

A comprehensive approach to TDM is new to the Waikato Region. For Transit NZ its role in travel demand management is two-fold. Firstly, Transit is required to protect the State

Highway Network from inappropriate development thus maintaining its contribution to the country's social and economic prosperity. This means actively managing the demand for travel on the state highway network. Secondly, in order to manage the state highway network Transit must develop travel demand management initiatives that support and integrate transport and land use objectives.

There are several other key players with whom Transit will need to establish strong inter-agency co-ordination and partnership to achieve a shared vision of an integrated sustainable transport network including Land Transport New Zealand, Councils, Environment Waikato and industry.

Understanding the performance of the strategic road network through its users, their mode of travel and movement is essential to the planning, function and operation of the transport network. The state highways in New Zealand serve multiple often conflicting functions, including residential and commuter movements, heavy vehicle movements, tourism, passenger transport networks and other road network users (i.e. cyclists, pedestrians).

To assist with the identification of TDM measures appropriate to the local context of the SHN a TDM database was developed to inform and be used alongside the Strategy. Due to the diverse nature of the Waikato Region there was a need to understand the role, function and individual characteristics of each SHN. This included the strategic function of each SHN (National, Regional or Sub-regional), and the local function (Urban, Peri-Urban and Rural as defined by location and speed). Other characteristics used to identify the most appropriate TDM measures included, the primary and secondary activities on the highway (i.e. freight, tourism, local movement), population, and the area through which the SH passed (including geographical features and land use).

It was determined early on during the study that there were a number of gaps in both the data available and local strategies which set out how each Council was to develop and implement TDM measures. In order to identify location specific TDM measures on the state highways the needs and constraints of different modes have to be clearly understood. A number of strategic TDM initiatives were therefore identified for development and implementation including, local strategies (i.e. parking, cycling, walking, and tourism management), and forums (especially public transport and freight).

With twenty three SHN in the Waikato Region this paper does not set out why or where all TDM measures were considered appropriate for further development and / or implementation but rather provides a snapshot of how certain measures were selected for different urban and rural locations. Specific measures identified include, a rural road safety education program for schools adjoining the SHN, route upgrade based on change in the primary function of a corridor from freight to tourism, peri-urban P&R site in Cambridge, protection of urban residential growth corridor to ensure provision of bus priority measures, and a rural recreational cycle loop in Taupo. The indicative costs and timeframes for developing these measures and the relevant stakeholders that would need to be involved were also identified.

Although detailed stakeholder consultation did not form part of the brief to develop this strategy it will be an essential component to ensure the strategy is developed and implemented to its fullest extent. The Waikato Travel Demand Management Strategy for Transit New Zealand is the first step to ensuring that appropriate TDM measures are considered in Transit's professional services contracts for existing and new state highways and within the scope of strategic studies according to the specific function of the highway. The challenge now is to establish inter-agency co-ordination, and partnerships to achieve a shared vision of an integrated sustainable transport network by developing, implementing, monitoring and evaluating the measures and initiatives identified in the Waikato Travel Demand Management Strategy.

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