Transport Infrastructure Issues

Updated May 2004

Transport Project Team

SmartGrowth

Contents

1. Introduction

This report summarises shows the progress of a range of research and analysis undertaken by the SmartGrowth Transport project team to address transport as a growth management issue.

A range of individual investigations has been undertaken. Assistance and advice has been obtained from a range of New Zealand experts in transportation, including passenger transport, transport technology developments, and future predicted occupancy/use of private motor vehicles. This report consolidates the findings to provide a source document for public consultation in 2003 on growth management alternatives.

2. Background

The SmartGrowth project includes a range of key tasks related to transportation as a component of growth management. Because of the very large social and economic costs of servicing growth, consideration needs to be given to the most efficient use of public resources in order that costs to future citizens and the sub-regional economy are kept as low as possible. Transport is the area of greatest cost and a priority for developing a rigorous approach to long term planning. The provision of Transport Infrastructure early or late can have a major impact on the rate of development of new area's.

For prudent asset management and cost effective long term service provision of infrastructure such as water, wastewater and roads, Councils need to have a comprehensive picture of existing services and likely future demands. The SmartGrowth Inception Report sets out the broad outline of tasks to be completed as part of the project.

In Phase 2: Research Input, identification of the existing and planned capacity of all infrastructural systems was undertaken. For transportation, this included analysis of the already agreed Western Bay of Plenty Subregion Strategic Roading Network (SRN) and the related policy framework. A paper explaining the SRN is attached as Appendix 1.

At the same time, work was commissioned independently by Environment BOP to assess the capacity of existing regional airports to accommodate future air travel demands.

In Phase 3: Option Development, the SRN to 2021 was included as an underlying assumption for all options. This work also identified and confirmed the importance of walking and cycling as a component of the transport system and a core assumption for future planning.

In Phase 4: Option Costing and Evaluation, tasks relating to transportation included:

- Modelling traffic impacts of growth options – to establish network capacity and the case for future infrastructure.
- Infrastructural costing - to provide an overview of the costs of growth and assessment of alternatives

The Project Team determined the need to set up a transportation model based on the existing sub Regional Model to enable the implications of a range of growth alternatives to be assessed.

Careful consideration was given to future impacts and road network requirements due to public transportation. A study was commissioned on public transport viability in the Western Bay of Plenty Subregion.

Further work is planned to refine the work done to date and to improve the validity of assumptions made.. This includes research on the possible effects of changes in car ownership and technology on road infrastructure.

Further work is also needed to get a better feel for long term development issues at the port of Tauranga, and the outlook for the possible relocation of Tauranga Airport.

At this stage, the work has highlighted how important it is to deal with land use and transport issues in an integrated way in order to reduce the kind of traffic congestion that is presently of such great concern to the community.

3. Transport Legislation

Recently there has been a significant change in Central Government's transport philosophy through the new Land Transport Management Act 2003. The planning emphasis now focuses on the western Bay of Plenty achieving an integrated, safe responsive and sustainable land transport system. Central Government funding for the sub-region is dependent on these objectives being met.

Environment Bay of Plenty, which has the overall responsibility for transport planning in the region, is preparing a new Regional Land Transport Strategy (RLTS) by September 2004, which will reflect the philosophy of the new legislation.

The SmartGrowth transport strategy will be a significant sub-regional component of the RLTS. The current SmartGrowth emphasis will be reviewed following the adoption of the RLTS to ensure that there is consistency between the RLTS and the SmartGrowth strategy

4. Land Transport

4.1. Overview

Following initial scoping of issues, the Project Team determined that there were two main issues to be dealt with in determining future land transport infrastructure provisions to meet the predicted 2051 growth. These were:

- Future use of private motor vehicles.
- Prediction of future traffic volumes and the adequacies/inadequacies of the existing and future planned road networks.

The team were concerned to gain a understanding of the long term impacts of public transportation versus private motor vehicle use, the parallel impacts of evolving technology and the general public perceptions/attitudes to the use of private motor vehicles and the subsequent freedom of choice of movement which they currently bring.

To help in addressing these issues the Transport Project Team chose to bring together the knowledge and expertise of four recognised transportation experts (Peter McCombs - Traffic Design Group, Grant Smith - Gabites Porter, Ian Bone - Beca, Ian Wallace - Booz Allen Hamilton).

The high level conclusion of this group was that technological advances in both power sources and efficiencies of private motor vehicles would result in them continuing to be a dominant means of transport for private individuals. The group was of a view that the comparative operating costs of motor vehicles would continue to reduce as has been the case in the past 50 years, and that although there will be a need for improved public passenger transport, best case scenario prediction shows that the greatest modal shift which could be expected clearly represents a potential reduction of an average of 8% across the total region. The quantum of this shift is comparatively small and represents a percentage less than the ability of future traffic modelling accuracy predictions. This 8% shift also only accounts for two years growth at the current average rate's therefore only delaying the infrastructure improvements by two years.

From these initial findings, this group assisted the Project Team in developing the scope of further research and assessments required to meet the needs of the project. This involved:

- Development of a regional scale computer based traffic model
- Research on public transport viability
- Research on car ownership patterns and technology
- Developing detailed land use scenarios for growth alternatives for inclusion in the model
- Identifying network improvements and associated costs

A summary of the Experts Session findings are included in Appendix 2.

4.2. Traffic Network Model

The relationship between land use and transport networks was identified early in the project as an area requiring careful integration.

Beca, Carter, Hollings, and Ferner (BCHF) were commissioned to develop the computer based traffic model to enable long term road network needs to identified. This is also needed to support the financial evaluation of options.

BCHF already supported the **"access"** partnership with a Traffic Model for Tauranga. This traffic model was not suitable for SmartGrowth because it did not cover the entire sub region, provided only 20 year scenarios at most, and required too much detailed land use and network data that could not be provided with any validity out 50 years. For example, the Tauranga model as it stands contains more than 230 land use "zones" that requires individual forecasts of population and employment change.

BCHF developed a simplified version of this model that covers the entire 50 year planning horizon. Land use and networks have been reduced in complexity to align with available data. The land use zones have been reduced from 230 down to approximately 30.

To enable the Transport Project Team to gain some understanding of the issues involved from a transport infrastructure point of view to accommodate and manage growth to 2051, a one day workshop was held where the base case (business as usual) growth scenario was applied to the traffic model and a high level understanding gained of the impacts on the various roading links of the forecast traffic volumes.

Some key initial findings from this modelling work to date are that:

- The Strategic Road Network as currently planned to a large extent fulfils the future transportation infrastructure requirements.
- There are a number of portions of the local roading network which will require major upgrading to meet the future travel demands.
- In the long term, the balance between place of work and place of residence becomes increasingly important. For example, large scale residential development in central Tauranga without adequate employment will result in large traffic outflows and substantial demands for improvements to connect into the Strategic Road Network. These commuter requirements can least well be served by Public Transport.

On this latter finding, Peter McCombs, an independent expert advisor on the Transportation Project Team, has prepared a paper that provided input to reworking land use assumptions in the model to address employment imbalances.

Refer to the report – "Tauranga Central Area Transport Scenarios"

The traffic model is fully described in BCHF report –" Smart Growth - Refined Transport Modelling"

The model and land use allocations have been applied to the draft strategy. A significant exercise has now been commenced to translate this regional scale information into more finely grained information suitable for traffic predictions over the next 20 years.

4.3. Public Transport

The potential impact of public transport is an important factor in considering future road infrastructure requirements.

Booz Allen Hamilton Consultants were commissioned to undertake an assessment which would identify the "best-case" public transport system as an input to traffic modelling.

The report:

- Reviews public transport experience elsewhere,
- Identifies the key factors affecting public transport demand,
- Reviews the evidence relating to the impact of urban form on public transport demand and
- Estimates likely demand for a high level public transport system in the subregion

The report concludes that public transport service in the subregion will have only a relatively modest impact on road traffic levels, and therefore on the requirements for road infrastructure. However, it notes that substantial increases in public transport usage above current levels are possible, with significant economic and mobility benefits generated from improving public transport services.

Refer to BAH report " Public Transport Viability – Western Bay of Plenty Subregion"

4.4. Car Ownership

Car ownership assumptions are an important component of the traffic model that has been developed.

Initial assumptions were that universal car ownership and individual trips will remain a dominant feature, with developments in technology supporting this pattern.

BCHF were commissioned to carry out work to refine current traffic model assumptions, considering influences of population, household structure, GDP growth, and relative changes in costs of vehicle ownership. The two papers prepared by BCHR produced the following conclusions:

This paper discusses methods for forecasting car ownership and sets out a method for incorporating a car ownership model into the Tauranga Transport Model. Car ownership is the number of registered cars per head of population or, in the context of the Tauranga household model, the number of cars available for use by household members.

The reports opts to stay with a "logistic model" form including time, GDP/capita and car price index. This model gives the best fit to historic data at a saturation level of 0.82, which appears quite high. However, the saturation level used by MOT of 0.65 also appears to be too low. A best estimate, places saturation level of car ownership of 0.75 cars per head, equivalent to about 90% of the driving age population, with sensitivity tests to lower and higher levels of 0.70 and 0.80 cars per head.

The overall effect of the car ownership model is to increase trip productions predicted by the model in future years, particularly for home based work trips. The extent of the increase is about 7% in 2051 if the Tauranga model were to be used for projecting this far ahead.

However, there are caveats on attempting to use the model for very long range planning. These include:

- stability of the category trip rates – these will become less reliable as the time horizon lengthens
- as car ownership increases and approaches saturation, additional cars will have progressively less influence on the total kilometres driven – which implies that the trip production rates will go down

There are alternative approaches to car ownership forecasting that could be considered, but involve significantly more work and are more demanding of data. These involve modelling the car acquisition behaviour of population cohorts. It has been shown in overseas work that patterns of car ownership change from one generation to the next, after all other factors of variation have been accounted for. An interpretation of this is habitual behaviour, which becomes engrained from youth and is conditioned by the transport environment at the time.

A key to changing car ownership over time may lie in influencing attitudes to car ownership and car driving in these formative years of 15 to 25 when young people first enter the car market and become drivers. Models that work with population cohort data may ultimately be more useful tools for understanding and attempting to influence car ownership, than simple aggregate predictions which carry the risk of being labelled as self-fulfilling prophecies.

However, to develop and incorporate such an approach into the Tauranga Transport Model as presently specified would require some wide-ranging change to the modelling structure.

In summary, the approach proposed allows car ownership effects to be incorporated into the Smartgrowth projections in a way that should be sufficient for short to medium range forecasting. However, it should be recognised that for longer term predictions, the time stability of the modelling relationships will become less certain and that, in particular, as the number of cars per households approaches saturation, there is likely to be a reduction in the kilometres of travel per car – that is higher car ownership will not be fully reflected in more car travel.

4.5. Technology

Technology will have a significant influence on transport systems. This is typically thought of in terms of vehicle technology. However, technology is also likely to increase the capacity of road networks into the future for example through more efficient intersection use.

BCHF were commissioned to research the potential implications of emerging technology on network requirements. This preliminary findings (not yet published) from this work are set out below. Contrary to community expectations, part of the future transport solution may lie in *higher* levels of personal vehicle ownership – but with a better matching of the type of vehicle needed with the nature of the trip.

4.5.1. Recent Trends

The present dominant position of powered private motorised transport has resulted first from scientific discovery, then technological exploitation and industrial production methods that have increased scale and lowered prices. Cheap and relatively fast urban transport made it possible to work in the city and live in a semi-rural environment, and encourage low density development of urban land within commuting time of the business centres. Increasing accessibility to private means of transport freed this development from siting along public transport corridors. In turn, this dispersed development pattern has weakened the viability of public passengers services, particularly those that rely on high levels of demand along confined corridors of flow.

The stock of road vehicles in New Zealand represents a very large and widely distributed capital investment by the community in the transport system. Nationally, there are over 2 million cars and half a million other vehicles in the vehicle fleet, with a combined market value of around 35 billion dollars. The average age of vehicles in the fleet is 10 to 12 years, and the average lifetime around 18 to 20 years. This investment commitment and age profile indicate that any radical change in new vehicle technology will take many years to penetrate the market.

Motive power for land transport is dominated by petrol and diesel fuelled internal combustion engines. Diesel fuelling has made steady inroads to the light commercial vehicle market and, to a small extent, the car market.

When considering how new fuels and power systems may penetrate the vehicle fleet in the future, New Zealand's experience with compressed natural gas (CNG) provides an interesting and instructive case study.

- Government, through public policy and incentives, is able to effect changes in consumer purchasing behaviour, particularly if the public can see a good reason to change;
- The time to introduce a new technological innovation into the transport market in substantial numbers is of the order of 5 to 10 years, once the technology is proven andwith industry support;
- It is difficult to support a technology that is not commercially attractive over a long period of time – subsidies and other financial concessions tend to be short lived and subject and subject to changes of Government and policy.

At the time of the 1973 oil shock and through the 1970s, energy efficiency became a concern, and there was a move to smaller engine sizes and lighter vehicles. The average new car engine size came down to 1.7 litres. There was a good selection of very small cars (under 1 litre) on the market.

Through the 1980s and 90s, the situation reversed. Energy prices came down, almost halving in real terms, and consumers started to buy larger vehicles, with features such as air conditioning (almost unheard of pre-1980) and power steering.

In the mid-1990s the sports utility vehicle craze took off, illustrating how a combination of fashion, coupled with the perception of greater safety and heavily supported by supplier advertising can influence a market. Through this period, vehicles have become technologically more complex in regard to their fuel induction, ignition and engine systems, and less amenable to home servicing. The gains made in efficiency of energy conversion have been largely offset by the increased engine capacities, heavier kerb weights and power consuming accessories. There are now very few cars of under 1.3 litres on the market.

The end result has been an improving energy trend from 1974 to 1985, followed by a return almost to the same point by 2001

4.5.2. Future Transport Power Systems

While the world is not 'running out of oil' in the near future, the issue is one of potential price instability and volatility caused by re-adjustments in the international supply-demand balance. With imported oil use in New Zealand projected to continue to grow over the next two decades this further dependence carries certain risks ($EECA_2$, 2000).

New Zealand's transport sector is now responsible for the largest single share of CO_2 emissions derived from fossil fuel combustion. At the end of 2000, this figure stood at 45%, compared to an average of 30% for OECD countries. With the ratification of the Kyoto Protocol, this will pose significant challenges for the transport industry, particularly the role of conventional fuels, in the future.

In short, current trends of fossil fuel usage are unsustainable in the long term, but may be so for the first 25 years of the new century.

The two main technologies competing to become the next step in road vehicle power systems are:

- Hybrid Vehicles – combining internal combustion engine technology with an electric motor and regenerative energy storage, or
- Fuel Cell Vehicles – powered by electricity produced by reverse electrolysis using hydrogen, methane or methanol as the motive fuel

4.5.3. Intelligent Transport Systems

Many of the elements of ITS are in a developmental stage in New Zealand. Some examples are:

- vehicle positioning systems – GPS vehicle positioning is now widely fitted in higher specification cars for on-board navigation and security tracking. Trucks and buses are also being fitted with such systems for fleet management, despatching and as part of passenger information systems[1];
- digital mapping and GIS – there are three or four digital or electronic maps of the state highway system and an increasing level of coverage of the local road network. These include both cadastral boundary maps and road centreline maps;
- automatic vehicle guidance and control – so far has not made any significant entry to the NZ market, although some higher spec vehicles are now being fitted with forward facing proximity warning devices;
- intelligent road networks – Auckland and Wellington are developing ATM Systems on the motorway networks involving closed circuit camera surveillance and variable message signing. Ramp control and linkages with the city SCATS network is the next stage, providing a start to active demand management;
- road access and charging – the Ministry of Transport is actively investigating electronic systems for charging heavy vehicles for road use as a development of the present mechanical/paper based system – such systems would be GPS and electronic map based and eventually could charge for road space by segment, time of day and by other chosen vehicle, traffic or road characteristics; and the metropolitan councils are investigating electronic pricing as a congestion management and/or revenue mechanism

The overall potential effects of ITS can be summarised as:

- higher levels of information available to the traveller or goods consignee on the status of the transport network, on available transport services, and on matching travel requests with services; this should allow vehicles to achieve higher occupancies and load factors, so moving the traffic more efficiently and at a lower requirement for roadspace;
- active management of the network will enable those more heavily used sections to be operated at a higher degree of utilisation than can be achieved with an unmanaged unrestricted access system – the result should be the ability to run close to system capacity without excessive congestion delays; better incident management through advance rerouting and metering;

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- in the short to medium term, intelligent vehicle and highway systems are likely to be aimed primarily at safety improvements such as vehicle control overrides in near crash situations, in-vehicle warning systems and roadside warning systems
- if automatic vehicle guidance and control systems eventually become a reality, probably a longer term prospect, these hold the promise of increasing high volume highway flow capacities (two to threefold in a fully-fledged system) for parts of the network.

4.5.4. Future Transport Modes

When looking forward 50 years, the conditions under which future transport planning and investment will occur will not necessarily be the same as those that prevailed in the past 50 years. New Zealand starts from a position of a high level of motorization. There will be limits on the total investment that can be made in transport infrastructure, which in turn will be governed by national economic performance and growth in population. High growth combined with a high level of available investment provides the conditions under which bold decisions can be made in physical transport planning and investment. Low growth and poor economic performance would obviously constrain the level of investment and allow only gradual change.

The essential features that are sought from modes of transport are:

- door-to-door service - every person trip has a start and an end that involves walking. This may be to the carport, the bus stop, to the bicycle park, but is required nonetheless;
- personal safety and security – are an important consideration, and one of the reasons why some modes of transport are not better used; safety and security of travelling companions, particularly dependents is also important;
- ease of use, comfort, weather protection and pleasant travel conditions;
- ease of carrying goods, luggage, shopping – a major reason why public transport is little used for shopping trips
- flexible scheduling, reliability in journey start and end time, and an acceptable trip duration;
- ability to make use of in-travel time;

For the transport of goods, the required features have some similar parallels:

- door-to-door service: the goods have to be loaded and unloaded and there must be facilities and space to do so for the type of vehicle used; at the end consumer end there is the question of how the goods get to the household and, for the waste stream how refuse and recyclables are collected;
- goods must be protected against damage, theft and loss, the extent of the protection depending on the goods' value, fragility, perishability and hazardous nature;
- with more reliance on just-in-time delivery to minimise inventories and storage, freight customers are looking for reliability and regularity of service, while transport operators look to minimise the vehicle fleet size and maximise load factors to keep costs low.

Private transport faces the dilemma of an ever increasing demand for car ownership in conflict with limits on the continual expansion of highway and street networks. In the future, the access to roadspace is likely to be managed by a combination of regulation and pricing.

At present though, most private vehicle travel in New Zealand is by car and, for commuting journeys, in cars with very low occupancy. Part of the reason for this is that cars still tend to be multi-use – purchased with a view to being weekend campervans, shopping baskets and weekday commuter transport all in one. Also

there has been a tendency to fortify the car against intrusion and impact rather than to render the external travelling environment safer and more pleasant.

Small cars, which used to be prolific, are now seldom seen. The urban traffic environment, by and large, has become more hostile to less or unprotected road users in or riding small vehicles. Those using motor scooters and cycles are at much higher risk of accident than car users. Larger trucks are being used which are intimidating and create side draft, traffic lanes have been narrowed to increase capacity where widening is difficult to achieve, and footpaths have been reduced to create more roadspace.

Some cities have managed to provide a wide range of transport modes, including various forms of public transport, and private cars while still providing protected and environmentally pleasant routes for cyclists and pedestrians – Stockholm is a good example. However, this has come through many years of conscious physical planning. Other cities are trying to retrofit facilities that promote walking and cycling over short to medium distances in urban fabrics that have been largely taken over by motorised traffic.

In future, advanced materials and propulsion technology will already allow new forms of non-motorised transport and low-impact motor assisted transport to substitute for some of these low occupancy commuter trips that are currently made by general-purpose cars. This will include safe low speed transport infrastructure for the young cyclist and the old person's mobility scooter. However, the networks to support individual low impact transport intermediate between walking and motoring are largely absent. Apart from being more environmentally acceptable, healthy and low cost, these intermediate single-person transport vehicles give the free-routing on-demand benefits that public transport struggles to provide. Contrary to expectations, part of the future transport solution may lie in *higher* levels of personal vehicle ownership – but with a better matching of the type of vehicle needed with the nature of the trip.

4.6. Network Development and Costs

Project Team members have developed a spreadsheet model that identifies network links, capacity issues and related costs of road network improvements based on traffic model results.

This spreadsheet model has been used to assess the initial cost of growth. Assessment of the costs for capacity improvements to the sub Regional or Local Arterial network are particularly difficult to determine without engaging in a high level of detailed design. These costs therefore will be only an indication or order of magnitude rather than an accurate requirement. The work will continue to be updated as the traffic model work is further refined and improved understanding of the constraints is gained.

Particular attention will have to be given to the funding mechanisms for the required Road infrastructure . Current indications are that there will for many years be insufficient fund in the National Roads Fund to meet the upcoming requirements and levels of congestion will worsen unless alternative funding sources are found. This will be particularly important if good transportation linkages are to be provided as a 'Lead' to encourage growth on a particular area.

5. Air Transport

5.1. Overview

Air transport is a significant issue for Smart/growth for a number of reasons.

As a land use, it is influential on the pattern of development due to its large land area, environmental effects, and need for linkage to transport routes.

In addition to the land use issues there is the need within approximately 15 – 20 years to identify an alternative corridor for the SRN through the Hewletts Rd segment. The work currently being planned for Hewletts Rd will only have a life of between 15 and 20 years. Other options were investigated but all had significant cultural and ecological issues associated with crossing the Matipihi Peninsula and Tidal areas of Waipu Bay. There is a possibility that the existing Airport land could in part be used for a by pass of Hewletts Rd and therefore the future of the Airport in this location has wide importance.

5.2. Tauranga Airport

The location of the existing Tauranga Airport has been the subject of community debate for many years. Sensible long term planning creates a need to settle the long-term issue of airport location.

In parallel with the SmartGrowth project, Environment Bay of Plenty has separately commissioned an initial study on the regions air transport services.

The report concludes that the three airports in the Bay of Plenty have capability and capacity to cater for future regional and national needs. The report also concludes that the economic benefit of relocating Tauranga Airport as a domestic airport to Tauranga and the Western Bay of Plenty are alone sufficient to warrant the airport being relocated.

Environment Bay of Plenty are in the process of taking the investigation work to a further stage, that may include work in determining a potential new airport site.

However, on the basis of the findings of the report and transportation and land use needs the assumption of a relocated airport has been included as an assumption in the Draft Strategy

6. Sea Transport

6.1. Overview

No work has been separately commissioned to review long-term sea transport issues. However, a number of issues have arisen in conjunction with other SmartGrowth work including:

- long term airspace conflicts between port cranes and aircraft using Tauranga Airport
- the importance of protecting shipping lanes
- road access to the port
- provision of additional business land to support port activities

The current assumption is that the Port will continue to develop within the Port Development Zone defined in the Regional Coastal Plan.

The long term outlook for the Port is important to the SmartGrowth project and further work will be done to better understand the issues and implications for growth in the long term.

7. Conclusion

An efficient transport network is vitally important to the future prosperity of the subregion.

Transport is an issue of particular current public interest due to present road congestion. Congestion is one of the very direct and obvious effects of growth.

Work to date has highlighted the importance of viewing land use and transport networks in an integrated manner, also the value of taking a long horizon to identify the consequences of decision making.

There are high expectations in some quarters that public transport can address many of the long-term issues relating to the road network. However, work to date does not support this assumption. The strong drivers for continued high use of private modes of transport seem likely to remain dominant for many years to come. This is an important are, and further research is being done to improve the information needed for decision making.

Work on traffic modelling has provided a tool for testing alternative ways of developing the region, and also to test the likely impact of changes in the way people choose to travel. This puts SmartGrowth in a good position to form some useful conclusions in relation to traffic issues at the time a preferred strategy is being developed.

Other modes of travel are also important, and there is a constant need to maintain a wider view of growth management issues arsing from modes other than simply road traffic.

8. Appendices

8.1. Appendix 1 – Tauranga Strategic Road Network Definition

Tauranga Strategic Roading Network Definition

Purpose

The purpose of this brief paper is to outline the background to the development of Tauranga's Strategic Roading Network and the alternatives which have been considered, along with the processes which have been used to agree upon a network as currently stated.

In 1997 Tauranga District Council, Western Bay of Plenty District Council and Transit NZ entered into a Heads of Agreement in respect to strategic roading issues in the Tauranga region.

Within that Heads of Agreement there was a stated outline of the strategic roading network, which was generally in accordance with that defined in Tauranga District Council's Vision 2020 transportation statement (copy attached, Appendix 1).

The adoption of this strategic network has some considerable history, and the following attempts to set out some of that background knowledge to provide adequate understanding and explanation as to how the present situation has been reached.

1976 Transportation Study

In 1976 a Tauranga area transportation study was undertaken and included parties from Tauranga City, Mt Maunganui Borough, Tauranga County Council, National Roads Board, Ministry of Works, Ministry of Transport and liaison members from New Zealand Railways and the Tauranga Harbour Board. As part of this study various alternative networks were considered for the Tauranga subregion, and in particular in and around Tauranga itself.

The study identified various major routes such as the various alternatives to what is now Takitimu Drive and Route J. Generally the network defined by that study agreed upon the construction of what is now Route J, Takitimu Drive, 15th Avenue, Turret Road and SH29 to Te Maunga, plus Maunganui Road and SH2 to the south to Domain Road. As part of this study in 1976, consideration was given to alternative harbour crossing routes to provide an additional link to the 15th Avenue/Turret Road harbour crossing. The routes that were considered were Sulphur Point Bridge (approximately the current Tauranga Harbour Bridge), Brown Street Bridge which was slightly further south from the Harbour Bridge and linked from Brown Street across to the Tauranga Airport. The third alternative was a road bridge to the south of the existing Matapihi rail bridge.

Following is a quotation from that report of the summary of the conclusions reached as a result of that study:

"5.2.5 Summary

Of the three options considered, only the Sulphur Point and Brown Street crossings present satisfactory solutions with respect to traffic considerations, and the Matapihi option was therefore deleted from further consideration. The Sulphur Point and Brown Street options were considered at some length by the Technical Advisory Committee which decided that while Sulphur Point was the preferred crossing, either Sulphur Point or Brown Street were acceptable as traffic alignments. The Ministry of Works and Development undertook another study of the economic viability of a harbour crossing in view of the marked increase in the construction and operating costs of such a bridge since the previous study four years before. Using the cost estimates from the Murray North Partners Report (Reference D), and utilising a modified traffic assignment technique, they concluded that the costs of a bridge had risen to a level whereby the economic viability of the scheme was in serious doubt, and they recommended to the Technical Advisory Committee that a harbour link be deleted from the traffic network (see Item 3, Appendix). This recommendation was adopted, and a revision of the remaining network was undertaken."

Whilst this report concluded that an alternative harbour crossing would not be required, history has shown that the demand for this became a reality and Tauranga District Council, Mt Maunganui Borough, in conjunction with the Port of Tauranga, and with some Government assistance undertook the construction of the Tauranga Harbour Bridge in its existing location.

1993 Tauranga Transportation Study

In 1993 a further Tauranga District Transportation Study was undertaken. This involved input from Tauranga District Council, Transit NZ and the Bay of Plenty Regional Council. The recommended network strategies from that study are as follows:

*"**9.3.4 Recommended Network Strategy***
It is concluded that the 'around the Harbour' network strategy is superior to the 'across the Harbour' network strategy for the following reasons:

- *it will attract vehicular traffic away from using the Waikareao Expressway/Harbour Bridge link whose prime function is to provide a connection to the CBD and the Port and not act as a regional through route,*
- *it will provide future increase capacity and access in close proximity to the expanding urban development,*
- *the capital cost of upgrading the network is significantly less,*
- *it will provide a higher level of network efficiency, namely, increased capacity, reduced travel time and reduced vehicle operating costs."*

The report further went on to identify issues and potential options beyond 2011 as follows:

*"**12.3 Tauranga Harbour Bridge Duplication***
For all the reasons summarised in 9.3.4, the 1993 Transportation Plan is based on increasing the capacity on the links 'around the Harbour' in preference to those which are 'across the Harbour'. By adopting this road network strategy, there is no need or expectation to duplicate the Harbour Bridge within the planning period of 20 years - the reasons for this are outlined below.

Under the empowering conditions of the Tauranga Harbour Bridge Act, the tolls must be removed when the loans are paid off. With the anticipated traffic volumes and toll levels this is scheduled to be in about 14 years, well beyond the middle of the planning period.

The transportation model tests indicate that the removal of the tolls could be expected to shift about 5,000 to 10,000 per day from 'around' the Harbour links (Motorway to 15th Avenue) to 'across' the Harbour links (Waikareao Expressway to Hewletts Road). The nett result of removing the tolls will:

- *increase vehicle flows on the Tauranga Harbour Bridge and on the routes approaching, particularly, Waikareao Expressway and Hewletts Road - this may required the proposed grade separation with Chapel Street/Waikareao Expressway to be constructed earlier than 'late in the planning period' as expected and possibly requiring the construction of a service road on Hewletts Road.*
- *decrease vehicle flows on 15th Avenue/Turret Road/Hairini/Te Maunga - this may enable some of the projects programmed for construction to be delayed, for example, the 6-laning of 15th Avenue and its service road, the duplication of the Hairini Bridge.*

Whilst the traffic flows on the Tauranga Harbour Bridge can be expected to increase in the proportions stated above if the tolls are removed by about 2011, the resulting critical sections on the network are expected to be on the intersections approaching, and not on the Bridge. Hence, duplication of the Harbour Bridge is not expected to be required within the planning period of 20 years.

If the Tauranga District continues to expand as rapidly as it has in recent years, then a duplication or another bridge crossing of the Harbour could be warranted a short time after the planning period.
Attracting extra through traffic to the CBD and to the Port is most undesirable. Hence, by adopting 'around the Harbour' network strategy, attracting this additional through traffic is obviated."

Whilst this transportation study was adopted by Transit NZ, Tauranga District Council did not. This was because of their concerns for the major environmental and detrimental community impacts a major roading corridor would have on 15th Avenue. 15th Avenue traverses the main Tauranga residential and commercial isthmus, and 15th Avenue crosses about midway along its length. For these reasons the Tauranga District Council never adopted the recommendations of the Technical Committee, and no further progress was made in the definition of a future transportation strategy until 1997. Many of the projects identified in the strategy have been implemented as they were also part of the later strategy developed as part of ' Vision 2020'.

Tauranga District's 'Vision 2020'

In 1997 Tauranga District Council undertook the preparation of a range of vision statements as part of their Tauranga District Strategic Plan "Vision 2020". Within this document, under Section 6.3.1, the following two staged approach was proposed and subsequently agreed to by Tauranga District Council:

*"**Stage One***
This stage involves the Tauranga District and Western Bay of Plenty District Councils and Transit New Zealand working in accord with the "Heads of Agreement" and through a "Project Control Group" structure to manage the implementation of the strategic roading network and to develop the entity concepts.

Stage Two
This stage sees a move to a formal Tauranga regional structure and definition of the 'Integrated Network Plan". This entity will create the policy and regulatory framework as "owners" for the Integrated Plan. The policy will be in accord with the strategic outcomes of the Tauranga Region Transportation Study".

Within this Vision 2020 document, which was subsequently adopted in principle by Tauranga District Council, the transportation networks as shown on Appendix 1 attached were outlined. This drawing was included within the Vision 2020 document as Appendix 2.

'access' Partnership

In October 1997 Transit NZ, Tauranga District Council and the Western Bay of Plenty District Council entered into and signed a Heads of Agreement in respect to strategic roading issues. This partnership was subsequently called 'access'. As part of this Heads of Agreement, they adopted the proposed strategic roading network (as per Appendix 1), but within that protocol included a schedule of indicative strategic roading projects. These strategic projects included the duplication of the existing Harbour Bridge and the necessity for consideration of an alternative harbour crossing via Matapihi.

In 1998 the strategic roading partnership commissioned a pre-feasibility report in respect to resource management issues associated with a possible transportation corridor through Matapihi. This report was presented to Tauranga District Council and adopted by them in December 1998.

The following is a quotation from the recommendations of that report:

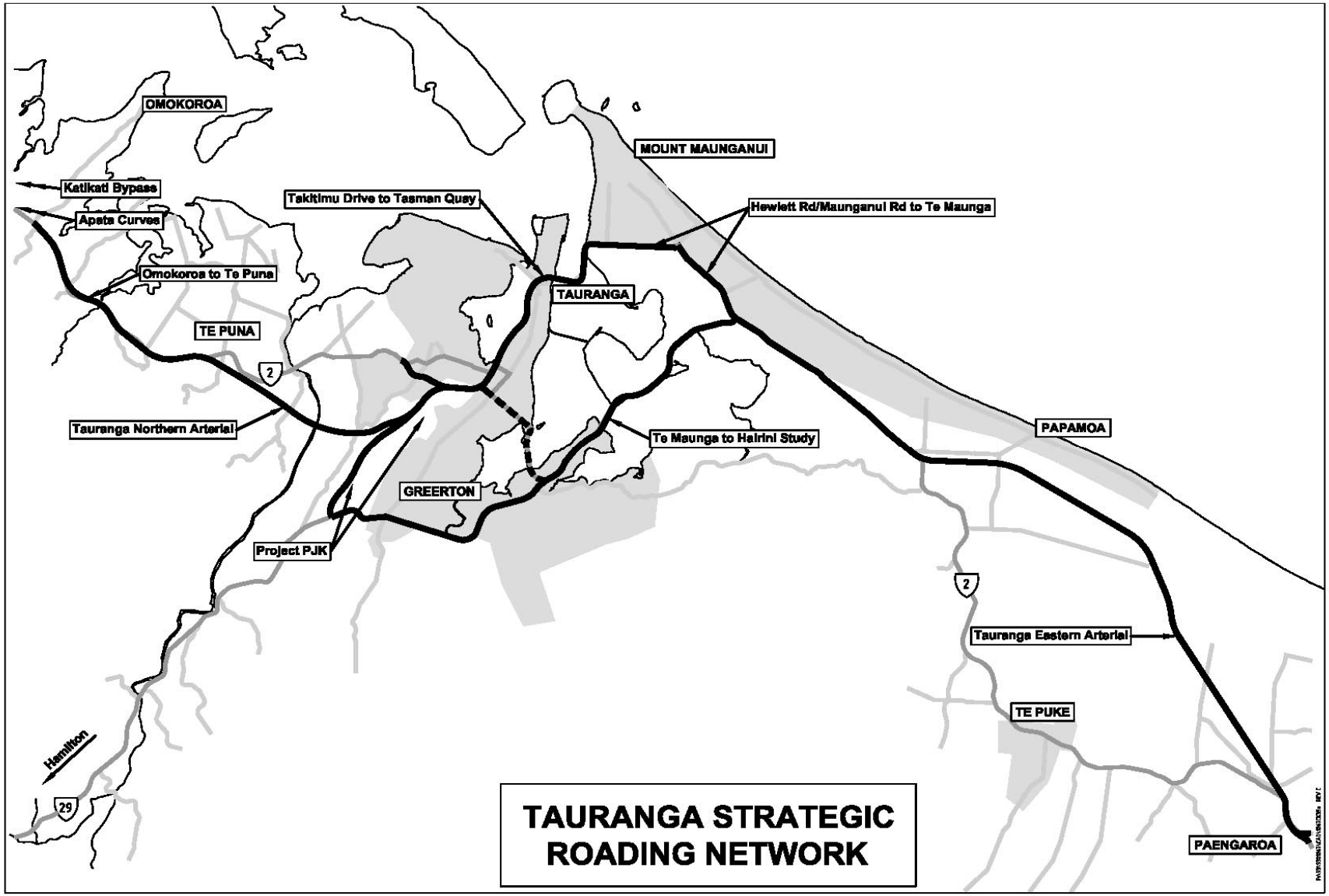
"With so many Section 6 matters likely to be issues the concept of an alternative transportation corridor through the Matapihi peninsular is a doubtful proposition. We do not consider that all of these matters could be dealt with by mitigation measures. The impact on the Maori community and the coastal landscape policy area would be significant and not justifiable in terms of the benefits to the local roading network. There are likely to be other options that would have less adverse effect."

In adopting these recommendations, the Tauranga District Council confirmed and the 'access' partnership ratified the recommendation that the strategic roading network be continued to be developed in keeping with the strategic network plan in Appendix 1.

All of the members of the 'access' partnership are continuing to develop projects in keeping with this strategic network and are committed to its conclusion.

It is accepted that as time progresses it will be necessary to give consideration to medium to long term alternative routes, particularly in the vicinity of Hewletts Road. The immediate task of the partners is to address the current unacceptable levels of congestion within Tauranga's strategic roading network, and then to give consideration to medium to long term planning requirements.

Stuart Crosby
Chairman 'access' Partnership


OMOKOROA
MOUNT MAUNGANUI
Katikati Bypass
Takitimu Drive to Tasman Quay
Hewlett Rd/Maunganui Rd to Te Maunga
Apata Curves
Omokoroa to Te Puna
TAURANGA
TE PUNA
2
Tauranga Northern Arterial
Te Maunga to Hairini Study
PAPAMOA
GREERTON
Project PJK
2
Tauranga Eastern Arterial
TE PUKE
Hamilton
29
PAENGAROA
TAURANGA STRATEGIC ROADING NETWORK

8.2. Appendix 2 – Transport Experts Session

Report From Workshop on Long Term Transport Issues – the "Transport Experts Session"

SmartGrowth has a planning horizon which takes the subregion forward 50 years. There is acknowledgement that significant social, cultural and technological change that will affect transport systems is inevitable during this period. Some of these changes are predictable, particularly those related to an expanding, but aging population. Others are less predictable, but nonetheless, consideration of trends of change, particularly in other areas which have passed through similar growth phases, can give insight into future possibilities.

Public Transport

For transport, many of the debates centre around the likely future balance between private and public private transport. Common questions of the future are:

- Can public transport can reduce roading requirements?.
- What needs to be done to achieve this?
- Can it be done?
- Are there growth patterns that support public transport?

Even at 2051, the forecast population of 300,000 is not a big city by world standards. At best you might assume that a 15% usage of public transport with the right support and encouragement.

There has been no significant public transport (buses) in Tauranga for much of the past 15 years. From March 1981 to December 1986, bus kilometres operated fell from 24,600 per quarter to 11,200, while passenger numbers dropped from 139,000 per quarter to 20,700 per quarter". Public bus transport was discontinued in 1986.

A new bus service has been in place for 18 months. There are now 10 routes, with a service between 7am and 6pm. 30,000 users per month. Most usage is off peak. It is not taking commuter away from cars and that is not the intention – the current system targets transport disadvantaged.

There are currently few incentives that will push commuters to use buses. There are very cheap parking rates in the Tauranga CBD and other locations. Traffic congestion is viewed as one of the most serious local issues. However, there is also an ongoing programme to improve arterials roads to relieve congestion, and with this an expectation that a more efficient road network for private vehicles will ultimately be provided. In this context, congestion is currently not providing any push to consider public transport.

The subregion currently has a strong commuter culture driven by the historical situation. This culture is likely be strengthened to a degree by growth based on migration, particularly where migrants are escaping larger centres such as Auckland where congestion has become intolerable. One of the reasons for migrating to a

provincial city is to have greater freedom of access to community facilities and work. A change to "commuter style" may be a counter to attractiveness. People come here to get away from this type of lifestyle.

In considering prospects for public transport, it is important to make comparisons with cities that have grown in the same period as the western Bay of Plenty i.e. those that haven't inherited a public transport system. Public transport would have a marginal effect and put off projects for 3 years maybe.

Many as a potentially valuable resource see rail for the future. It has a locational advantage, already linking most of the main settlements in the subregion providing potential for future commuter use (Omokoroa through to Paengaroa). "Park and ride" is seen as a likely component of any commuter rail system. It is generally understood that the current use of the rail line for bulk freight, much of which is related to the Port, is not compatible with commuter schedules and patronage, and significant investment in further lines and other patron facilities would be needed to enable commuter use.

Current rail lines are profitable, due to heavy freight traffic. Commuter use would not be, given the investment required and low patronage levels. The present owners of the network are not likely to have any interest in investment for commuter rail. These costs would fall on the local community or central government.

The rail corridor is an asset that is conveniently placed, and not a current cost on the community. Profitability means it wont be closed in the foreseeable future, and the community may ultimately derive benefit from this.

There is support in the community for removing rail from the Tauranga CBD waterfront to eliminate its adverse environmental impact and provide greater access to the harbour for recreation. Any relocation should have regard to the effect this may have on potential future use for commuter rail linked to the CBD.

The consensus of the meeting is that at best a small impact (maybe a one year deferral on investment).

Present use 1%
Current effort <3%
Optimistic outlook <5%
Planning target 8%
Massive public Investment 15%

Even with massive investment, a deferral of 5 years in roading investment.

Private Car Use

The pattern of private car use has been a steady increase in car ownership. Looking back over the last 50 years the following observations can be made:

- Cars are still cars – the basic concept of design is the same but cars are generally cheaper, and better.
- Trip rates haven't changed much over the period
- The biggest change is that most now own a car. The number of car-less households has been relatively constant, but the number of households with 2 or more cars has increased.
- Cars are the major factors that have influenced land use.
- Cars are now universal, and indispensable,.

The inertia of the car and the culture that surrounds it is a potent influence on the future.

Looking forward the following indicators…:

- There will be more elderly people. – Tauranga stands out but is not alone in this. There may be more non-drivers, but not this will not be major effect.
- In future there will be more part time work, and a spread of work over a wider age range. More active retirement.
- There will be more diversity in lifestyles and housing stock –urban villages, apartments, medical and security focussed environments.
- Demographic and economic change will see relatively less work trips, more recreation, shopping and school trips, less peak traffic, more spread in demand, more diverse origins/destinations.
- Fixed systems, like rail, may not serve this pattern well.
- Cars will continue to dominate for a considerable time: Cars are hard to beat. They are cheap, flexible, and convenient. They may look or operate differently for example different fuel, better fuel economy. Likely use of hybrid and fuel cell vehicles
- Car purchase price may drop, but running costs may go up (maintenance, user and environmental charges), but peoples behaviour is very insensitive to price.
- Road pricing will involve electronic charging - carbon tax and congestion pricing. This wont have a huge effect on mode choice. International trends suggest that road pricing probably inevitable. In 10 years London will have a complete demand system. Singapore has a road pricing system. South Africa has a toll tunnel system where there is a separate lane that operates on congestion pricing.
- Road technology increasing the capacity of the road network –For example, reducing following distances at higher speeds. This will require a shift in the whole fleet, and greater use of grade separation, so may have a long introduction. Increased flow rates from intersections are also significant.
- More rental cars may be a feature, but on a more flexible basis – an hour or two at a time.
- There will likely be modest increase in more environmentally friendly modes – walk, cycle, hi tech scooters, etc.
- There may be policy changes in vehicle imports and safety testing, but this will have a small influence

Public transport will not have a major role or substitute for road investment. Unless car ownership has a very high price, it will provide a social alternative primarily. It will serve mainly children and the elderly, and others captive to the system. It will be mostly road based – bus or taxi, and but likely to be more personalised – 5 to 50 passengers. It wont be rail. Smart roads and automatic roads may do more for road capacity than public transport.

Tauranga needs to look at other cities of around 300,000. Tauranga wont be much different. It is essential not to equate Tauranga issues with those of a city of one million.

Christchurch has a 300,000 population, with growing public transport, but also growing congestion, particularly on wet days.Christchurch has always had a public transport system – a hub and spoke design.

Urban Form

25 years out it is hard to change urban form – you are really playing on the edges. Massive intensification in the centre may make a difference. 25-50 years out a considerable difference can be made. A high growth rate as in the sub region may alter this time horizon.

High growth presents opportunity others don't have. High rates of growth present an opportunity to develop and redevelop at higher intensity.

There are appeared to be no real strategic vision for the commercial heart, and how big it may become, and there may weel nbe inadequacies in network connections to the CBD in the long term..

Purposeful long range planning is refreshing. Planning has been a dirty word – letting things unfold, and managing things. A strategic approach requires sustained effort and cooperation between players – this has been difficult in NZ traditionally.

National economic conditions are important. Capital investment in WB is higher than other parts of NZ. Sweden has small cities with measurable higher levels of infrastructure. How rich the country is will determine investment. NZ has become used to "making do" and "shoehorning things in.

Private/public roading ventures may free up investment capital. High investment may well draw different sorts of people than in the past. When Sulphur Point was established it was criticised as overcapitalisation. However, it has now become a magnet for investment.

Large Commercial Centres

There is likely to be a need for 5 more of these for the future population

Commercial Vehicles

Heavy goods vehicles will get larger. There may be a super heavy route to the port. 60 tonne trucks. Also development of other minor modes – motorised buggy used by retired population. This may lead to the need for greater segregation.

Airport

A 300,000 plus city will need a national sized airport (if not international). This would have:

- Support infrastructure.
- Business park.
- Links to city and rest of region.
- Rail link to the City

The Port is currently under pressure to extend its berthage. There is a direct conflict with airport.

Choices are limited, therefore early action is needed.

Road Network

The lack of sub-arterials alongside the Mount Papamoa Arterial. The sub-arterial tier is missing from the network. Sub-arterial would normally be no more than 800m distant from the arterial. There is already noticeable pressure on existing intersections – special design solutions may be needed. Intersections to the arterial are crucial for access and amenity. The road beside the beach may become extremely busy.

Structure plans do not have sufficient grunt behind them. The sub-arterials that are planned are compromised by adjacent residential development and road design (many roundabouts).

It is clear that SmartGrowth will need to go to a level of detail below external traffic on arterials.

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