Rotorua District Council

Rotorua Urban Transportation Study 2003

November 2003

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Summary

Purpose

The purpose of the Rotorua Urban Transportation Study 2003 (the Report) is to ensure that the Rotorua community has effective ways to manage the impact of roads and traffic on adjacent land uses and road users.

Summary of Previous Studies to Determine Future Road Network Needs

The Rotorua Urban Transportation Study summarises a number of previous studies to determine how the District road network is placed to cater for increasing population growth and traffic growth over the next 20 years. A number of major roading projects have been identified as necessary to ensure network efficiency over this planning period.

It has been identified that major upgrading works for road widening are required at:

- Lake Road/Ranolf Street
    - Lake Road (Koutu intersection to Ranolf Street)
    - Ranolf Street/Lake Road signal-controlled intersection
    - Ranolf Street – Lake Road to Arawa Street
    - Ranolf Street – Arawa Street to Victoria Street
- Ngongotaha Road north of SH5
- SH5 northern entrance to the city and Fairy Springs Road
- Victoria Street Arterial – 4-laning, with links to Amohau Street and Te Ngae Road

Rotorua District Council intends to designate these roads.

In addition, a number of major works are required for which the designation process is underway; these works include:

- Old Taupo Road (Pukuatua Street to Malfroy Road) - *Designated*
- Malfroy Road upgrade - *Designated*
- Eastern Arterial - *Designated*

Other projects, including intersection improvements, minor road widening and safety improvements will also require attention over the next 20 years.

Appropriate Planning Mechanisms to Protect the Road Network

Designations

The Rotorua Urban Transportation Study considers the best way to protect the District's roads, to provide for future upgrades and to protect the amenity of adjacent land use. It is considered that the existing Rotorua District Plan provisions are difficult to administer and does not effectively protect the community (adjacent land uses and road users) from possible development of the roading network.

All district roads are currently zoned Road Zone. Whenever the Council needs to construct a new road, alter an alignment where land is required outside of the Road Zone, or a road is to be uplifted because it is no longer needed, Council must prepare a Plan Change and engage in a lengthy and expensive process in order to re-zone land.

The Report proposes to address this problem by:

1. firstly undertaking a Plan Change to delete the Road Zone and then as a later phase

2. as part of the District Plan review process roll over existing designations and modifications to these, plus new designations. This would encompass the entire road network within Rotorua District.

Designation is a planning mechanism under the Resource Management Act that enables land to be put aside for a specific purpose and to be protected from other uses that may compromise the land's intended use. Therefore, the status of roads as designations would provide for roading activities as of right while any roading work outside of the designated road area would need to go through the alteration of designation process. When a designation is uplifted, it automatically takes on the zoning of the adjacent land, so this negates the need for a Plan Change. The public can still be involved in the planning process by making submissions to the Plan.

Road Hierarchy

A road hierarchy is a functional classification system for roads that considers the basic purpose of the road, traffic volume and the nature and types of trip along the road. The purpose of the hierarchy is to describe the desired balance between the different needs of road users.

Rotorua District Council proposes to incorporate a 5 level road hierarchy into the Rotorua District Plan by way of a Plan Change. This proposed hierarchy includes:

- *National Routes*
  (motorways, expressways with highest access control)

- *Major (Regional) Arterials*
  (to provide for major regional movements; strict access control)

- *Minor (District) Arterials*
  (to provide for major regional movements)

- *Collector Roads*
  (to link arterial network to local roads; traffic through movement and access to properties is of equal importance)

- *Local Roads*
  (to provide direct access to abutting properties; traffic through movement is secondary to the need to access adjacent properties)

This hierarchy is largely consistent with that proposed by the LTSA in their National Road Classification System consultation document.

Environmental Effects Area

The Environmental Effects Area would incorporate a buffer area alongside the Road Reserve where adverse effects are identified. It would have its own objectives, policies and performance standards (which would need to be developed) that set out the maximum effects permitted in the Environmental Effects Area. The Environmental Effects Area does not seek to prevent development but rather to ensure there is a reasonable distance between a road and neighbouring land uses so that adverse effects generated from traffic, and adverse effects from land uses that affect the operation of the road, are mitigated.

The performance standards will be designed so that the road and the land use do not compromise each other's function. The objectives, policies and standards of the Environmental Effects Area will vary depending on the nature, or hierarchy of the road.

The Environmental Effects Area is proposed to provide protection for the Rotorua community against the effects of any significant changes to the operation or management of the Rotorua road network, and to manage the impacts of adjacent land uses so that they do not unduly impact upon the safe and efficient operation of roads.

A Summary Report has been produced which describes the interaction between the proposed Environmental Effects Area and Road Hierarchy in detail. The process for incorporating these into the Plan through Plan Changes should be staged as follows:

1. Change Road Zone to Road

2. Include Road Hierarchy with Environmental Effects Area

This staging will ensure the Environmental Effects Area does not cloud the designation process.

It is recommended on cost and time grounds that the Environmental Effects Area be included as part of the Plan review process.

Consultation

It is recognised that consultation with key stakeholders is important to seek their views and feedback on the Rotorua Urban Transportation Study. The consultation process will provide opportunities for the stakeholders to participate in the development and refinement of the proposed draft objectives, policies and performance standards for the Environmental Effects Area and Road Hierarchy as part of the future Plan review process.

It is proposed that this consultation process will be a separate exercise as part of the Plan Change.

Recommendations

It is recommended that Rotorua District Council complete the following actions. These are divided up into the tasks that should be completed in the near future, those that should follow, and the tasks that will be necessary in the future:

Now:

- Seek comment from stakeholders and the community on the proposals
- Amend the Rotorua District Plan by removing the Road Zone (through the Plan Change process)
- Designate District roads (through the provisions in the Resource Management Act (the Act or the RMA)) and land required for major upgrades to 2011 via the Plan review process
- Designate land for the following road improvements:
  - Widening:
    - SH5 Fairy Springs Rd 4-laning
    - Ngongotaha Rd 4-Laning
    - Lake Rd 4-laning
    - Ranolf St 4-laning (Lake Rd to Victoria St)
  - Intersections:
    - Clayton/Lake/Old Taupo/Fairy Springs Rd
    - Devon St/Old Taupo Rd
    - SH30/Te Ngae Rd
    - Old Taupo/Malfroy Rd
  - New Roads:
    - Victoria St Arterial

Next:

- Adopt a 5 level road hierarchy in the Rotorua District Plan (the Plan) and assign all roads to appropriate following hierarchy levels (through the Plan Change Process) as follows:
  - National Routes
  - Major Arterial Routes
  - Minor Arterial Roads
  - Collector Roads
  - Local Roads
- Manage the environmental effects of transportation activities for each road hierarchy level through the implementation of an Environmental Effects Area (through the Plan review process)

Future:

- Review the road hierarchy and road designation requirements every 5 years

Introduction

1

1.1 BACKGROUND

Engagement

Rotorua District Council (RDC) engaged Opus International Consultants Ltd (Opus) to carry out the Rotorua Urban Transportation Study 2001 (Contract 00/123).

Study Objectives: To identify and arrange road designation

The objectives of this study are to:

- summarise previous studies
- propose a road hierarchy
- identify required upgrading and designations
- undertake initial designs for the upgrading works required
- supply draft Requirements Schedules and Applications for the Designations.

Current Documentation was reviewed and supplemented

Opus reviewed the current documentation and produced a Deficiencies Report (February 2001). To complete the information, Opus carried out additional traffic modelling and an investigation of population growth.

1.2 PURPOSE OF THIS REPORT

The purpose of this report (the Report) is to ensure that the Rotorua community has effective ways to manage the impact of roads and traffic on adjacent land uses and road users.

Rotorua District Council are the Road Controlling Authority (RCA) for local roads, and are the delegated RCA for state highways in the district. RDC can therefore take the community's needs into account in their network management.

This Report:

- summarises previous studies
- proposes a road hierarchy based on function
- identifies upgrading required for the road network to 2021
- identifies designations required to meet network needs to 2011 in accordance with RDC Strategic Plan.

The Report prioritises the upgrading works and designation requirements for the various projects. This is intended to ensure that there is sufficient network capacity to cope with predicted traffic growth over the strategic planning horizon. RDC's policy is to designate for roading projects that are programmed within their planning horizon taking into account that the maximum period for which a designation may be applied for, is 10 years. However, Council also takes account of strategic projects within a 20-year horizon and plans towards designation for these projects to comply with the statutory planning horizon.

The existing District Plan Road Zone provisions may not effectively protect the community (adjacent land uses and road users) from possible future development of the network. To manage any future changes to the network, we propose some changes be included in the District Plan. The changes include:

- a road hierarchy to be included within the plan. The surrounding land use rules will be amended to reflect the hierarchy eg access controls or restrictions on use.
- deletion of the Road Zone with an interim reliance on the definition of road in the Plan and the Act.
- rollover existing designations, modify designations and include designations for the entire road network within the District as part of the Plan review process. The designation notation in the District Plan will reflect the level of the road within the hierarchy. An underlying zoning reflecting the surrounding land use will replace the road zone.
- introduction of an Environmental Effects Area to protect adjacent land uses and road users from changes in how the road is used and to manage the effects of roadside development (noise, vibration, glare, signs) as part of the Plan review process.
- standards and guidelines for road-related effects which the Road Controlling Authority cannot exceed without going through the resource consent process
- minimum levels of service and amenity for road users, considering safety and capacity.

The aim is for the arrangements to be performance and effects based, rather than specifying road standards.

Review of Current Documentation

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2.1 EXISTING DOCUMENTATION CONSIDERED

Full copies of the reports are attached as Appendices to this report.

Appendix A: Planning Input (Land Use)

- Rotorua Urban Growth Study – A Projection of Land Use Change (June 1999, CanMap).

Appendix B: Transportation Input

- Rotorua Road Network – Development Strategy (March 2003, Gabites Porter).
- Ngongotaha Traffic (November 2000, Gabites Porter).
- Assessment of Traffic Impacts on Tauranga Direct Road (November 2000, Meritec).
- Rotorua Transportation Study – Additional Modelling (March 2001, Gabites Porter).

Appendix C: Road Safety Input

- Rotorua District Road Safety Report, 1994-1998 (July 1999, LTSA).
- Existing Road Safety Audit (1998, Transfund).
- Review Comments on Existing Road Safety Audit (1998, Sigma)
- RDC Crash Reduction Study (July 1997, Sigma).

Appendix D: Planning Input (Environmental Impact)

- Environmental Controls for Rotorua District's Road Network – Access Management (May 2000, Opus).
- Rotorua Roading Network Noise Monitoring and Proposed Noise Performance Standards (January 2001, Marshall Day).
- Road Zone Bylaws – Glare (May 2000, BCHF).

Appendix E: Legal and Statutory Considerations

- Report on Designations and Engineering Provisions in Proposed Rotorua District Plan (June 2000, Harrison Grierson).
- Review of Harrison Grierson Report (August 2000; Cooney, Lees & Morgan).

2.2 SUMMARY OF KEY FINDINGS FROM EXISTING DOCUMENTATION

More detailed comments are included within the RDC 00/123 Current Documentation Deficiencies Report (March 2001, Opus) with extracts attached at the front of each Appendix.

Land Use

- Growth trend is medium for households building and subdivision consents (approx +1% per annum for households).
- Employment patterns are likely to change but without significantly changing land use characteristics.
- By 2021, Northern and Central areas will be at capacity:
  - Western: 55% remaining
  - Eastern: 45% remaining
  - Ngongotaha: 80% remaining

Transportation

- Existing sections of Old Taupo Road and Te Ngae Road present concerns.
- Ngongotaha traffic will increase (made worse by traffic likely to be attracted on to Tauranga Direct Road).
- RDC plan road improvement projects up to 2021 that will cater for most expected traffic growth. These are included in 2006 "do minimum" network:

Completed so far:

- *Te Ngae Road from Iles Road to Tarawera Road widened to provide 2 lanes towards CBD.*
- *Roundabouts constructed at the Te Ngae Rd/Tarawera Rd and Te Ngae Rd/Owhata Rd intersections.*
- *Turning movements at the Te Ngae Rd/Vaughan Rd restricted to left in/left out only.*
- *Traffic signals installed at the Amohau St/Amohia St intersection and a road link developed to the south from the intersection to join Victoria St.*
- *Linking of traffic signals on Amohau St at intersections of Amohau St with Ranolf St, Amohia St, and Tutanekai St.*
- *Old Taupo Rd from Lake Rd to Sunset Rd widened to 4 lanes.*
- *A roundabout constructed at the Old Taupo Rd/Tallyho St intersection with a new link into industrial land east of Old Taupo Rd.*
- *Upgrade of Pukuatua St/Tarewa Rd intersection*

Yet to be built:

- Old Taupo Rd from Pukuatua St to Malfroy Rd widened to four lanes.
- Two approach lanes provided at the roundabout at the Malfroy Rd/Ranolf St intersection.
- Two approach lanes provided at the roundabout at the Ranolf St/Pukuatua St intersection.
- Malfroy Rd extended from Fenton St to Te Ngae Rd on a new alignment parallel to Ti St and Fenton St/Malfroy Rd intersection upgraded.

- included in 2011 and 2021 network
  - Eastern Arterial.
  - SH5 northern approach to city.
  - Victoria St Arterial

Network elements:

- Network elements that Gabites Porter identified for further attention are:
  - Lake Road (Fairy Springs Road – Ranolf Street)
  - Ranolf Street (Lake Road – Arawa Street)
  - Ranolf Street (Arawa Street – Victoria Street)
  - Victoria Street Arterial
  - Te Ngae Road/Amohau Street extension intersection
  - Amohau Street/Pukuatua Street intersection
  - Old Taupo Road/Malfroy Road intersection
  - Old Taupo Road/Lake Road/Clayton Road intersection

2011 traffic modelling

- 2011 supplementary traffic modelling does not highlight any significant differences in concern from previous modelling for 2006 and 2021:
  - Lake Road and Ngongotaha Road link capacity
  - pm peak side road delays at Fairy Springs Road

Planning (Environmental Impact)

- An appropriate draft RDC bylaw to control the impact of glare on road activities is available.
- Draft noise control criteria are available, but may need to be developed further to suit the Environmental Effects Area concept.
- Vibration is an impact that is harder to control using predictive techniques. NZS 2631-2:1989 suggests maximum vibration levels.

Legal and Statutory Considerations

- Road Zone should be removed from District Plan – roads should be considered in the same way as other utilities – S224 certificates could be introduced to control standards.
- Rotorua Civil Engineering Industry Standard may need to be modified – standards either need to be in the District Plan or subject to the same standard of consultation.
- Bylaws suit function and operation of road (prescriptive).
- An Environmental Effects Area concept should be used as part of the District Plan to manage effects of road on adjacent activities and vice versa via the Plan review process.

Road User Needs

3

3.1 GENERAL

Purpose of Roads

The main purposes of roads are to:

- provide for safe and efficient movement of goods and people:
  - through movement
  - local access
- concentrate and mitigate the impact of travel in and around the corridor:
  - access opportunities and constraints
  - safety benefits and adverse effects
  - efficiency of movement
  - noise and vibration
  - glare and visual impact

Road corridors also have secondary purposes including acting as service corridors for utilities. These are not considered as part of this report.

Needs of Road Users

The road users we consider are:

- motor vehicles
- cyclists
- pedestrians (along and across the corridor)

We also consider the needs of adjacent land uses, in terms of:

- different sensitivities to road related effects
- different access needs and effects

The needs of the users vary – they can overlap and conflict with each other.

User	Needs
Traffic (motor vehicles)	• safe and efficient movement • acceptable level of service
Cyclists	• safe and efficient movement (different needs) • acceptable level of service
Pedestrians	• safe and efficient movement (different needs) • amenity • acceptable level of service
Adjacent land use • residential • commercial • industrial • rural	• acceptable amenity (varies) • safe access • efficient access

Table 1: Road user needs

The principal conflicts that arise in road corridors are those between through traffic needs and adjacent land use needs. Section 5 of this report proposes a road hierarchy for Rotorua. The purpose of the proposed road hierarchy is to describe the desired balance between the different needs, providing a network that meets the needs of the community as a whole.

The appropriate standards and guidelines for basic road user needs are considered in the following sections:

- Amenity
- Safety
- Efficiency

3.2 AMENITY

AS 1348.4: 1987 Road and Traffic Engineering – Glossary of Terms, Part 4 Transport Planning, defines amenity as:

"That element in the layout and operation of town and country which makes for a comfortable and pleasant life rather than a mere existence. It relates also to the preservation of such characteristics of a neighbourhood as make it pleasing in appearance to both the passer-by as well as to the resident and those across the road".

While the Resource Management Act 1991 defines amenity as:

"Amenity values means those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes (Qu-18)"

The key environmental effects issues identified in previous investigations by RDC (Environmental Controls for the Rotorua District Road Network, Opus 1999) are:

- Noise
- Vibration
- Glare
- Signs

Air and water quality effects are Regional Council issues and are not controlled by the Rotorua District Council. Performance standards cannot therefore, be incorporated into the Environmental Effects Area. There is still a requirement however, to address these issues if a road is designated. Any proposed road works within designated areas or areas proposed to be designated would be required to comply with the Regional Plan or to obtain a resource consent from the Regional Council. (Qu-19)

The different zones in the Rotorua District Plan have different sensitivities to traffic related environmental effects (or will be affected by adverse effects to differing degrees). (Qu-17). We propose that environmental protection criteria for different zones are introduced as follows:

Zone	Environmental Effects to be controlled to protect amenity			
	Noise	Vibration	Glare (from vehicles)	Signs*
Rural F (spray)	A	A	A	P
Industrial	A	A	A	P
Airport	A	A	A	P
Rural General	A	A	P	P
Reserve	A	A	P	P
Commercial	P	P	P	P
Resort	P	P	P	P
Rural (all "special" habitable zones)	P	P	P	P
Residential	P	P	P	P

Table 2: Environmental protection criteria

Key:
A Able to absorb effects – no special criteria.
P Protection criteria proposed.

(Note: Signs criteria are proposed to protect road user amenity).

The method proposed to manage the effects and protect amenity is described in Section 7 of this Report. Access is considered in Section 5: Road Hierarchy.

3.3 ACCEPTABLE LEVEL OF SERVICE (LOS)

Level of Service is defined as *"a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers" (Austroads, 1988).*

Levels of Service (LOS) are qualitative measures related to:

- flow conditions (free flow, congestion)
- delays (congestion, intersection delay, lack of passing opportunity)

The service flow rate is the maximum hourly traffic flow for a given LOS. We have adopted the Gabites Porter LOS boundaries for links to ensure consistency.

Road Hierarchy	Side Friction	LOS Boundary (veh/hr/lane)			
		C	D	E	F
Local	High	100	200	250	300
Collector	Medium	200	300	400	600
Minor Arterial	Medium	300	395	675	1145
Major Arterial	Low	500	700	1100	1500
Motorway	Low	700	1100	1500	2000

Table 3: Level of Service Boundaries

For intersections, we use the delay (including geometric delay) parameter from the SIDRA 5 manual (ARRB, 1998), in accordance with Gabites Porter practice. The above LOS parameters are used by Gabites Porter to highlight areas for investigation.

The aim for the Rotorua network is to maintain levels of service at or above D for peak times and above C for normal traffic conditions (all day flow). For intersections, where the through traffic volume is well above the side road volumes, it may not be economically justified to improve the level of service for side roads, because of the level of delay introduced to main road traffic.

The above figures (Table 3) are not absolutely fixed, but depend on intersections, access and traffic characteristics. The potential variation is illustrated in the figure below, prepared for an evaluation of Ngongotaha Road traffic.

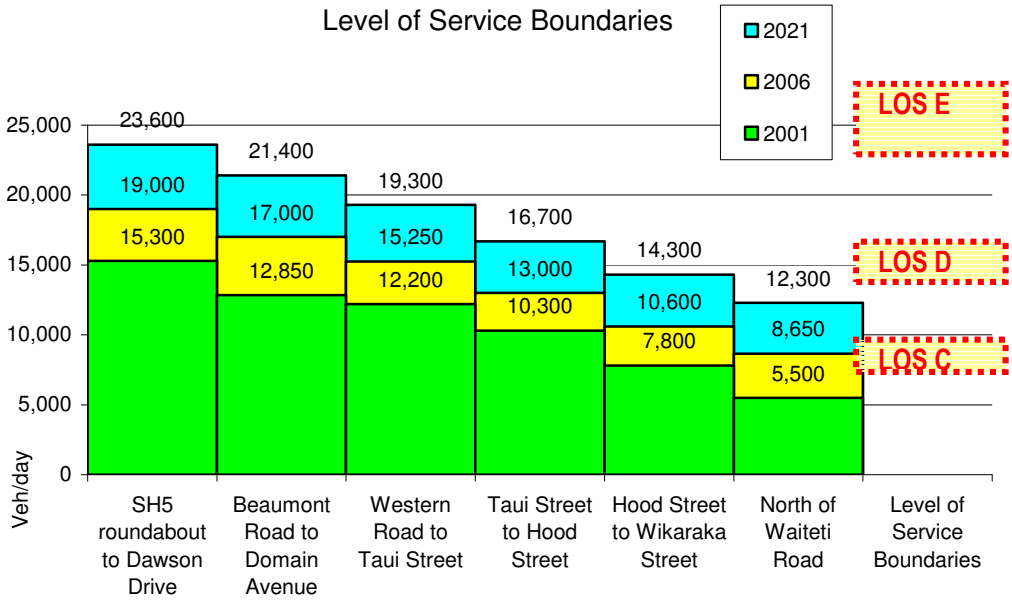


Figure 1: Projected Traffic volumes and LOS for Ngongotaha

LOS D is close to the limit of stable flow and approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and manoeuvre within the traffic stream. The general level of comfort and convenience is poor and small increases in traffic flow will generally cause operational problems.

LOS D is acceptable for short periods of high demand, such as peak commuting periods but is unlikely to be acceptable for long periods.

LOS C is in the zone of stable flow but most drivers are restricted to some extent in their freedom to select their desired speed and manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.

Targeting higher levels of service as minima is unlikely to be economical, however improvements such as adding lanes result in significant steps in increased capacity and can improve the LOS well above the minima.

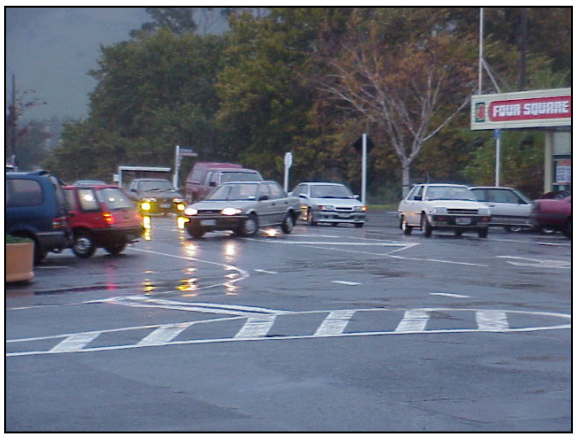
The following photographs illustrate the LOS for locations within Rotorua District with comments on the level of service.

Ngongotaha Road in township at evening peak – LOS D

Parking manoeuvres causing disruption to traffic flows

Traffic volumes approximately 600 veh/hr/lane at peak time

Daily traffic approximately 12,200 vehicles/day



Malfroy Road adjacent to Rotorua Intermediate (mid afternoon) – LOS A

Generally free flow

Daily Traffic approximately 5,000 vehicles/day

Noise level 61dBA at 18m from traffic lane

Malfroy Road West east of Whitworth Road (mid-afternoon)

Level of Service A

Generally free flow

Noise level 59dBA at 15m from traffic lane

Old Taupo Road north of Sunset Road (mid afternoon)

Approximately 32,000 vehicles/day

Level of Service A

63 dBA at 17m

Old Taupo Road adjacent to Boys' High (Mid-afternoon)

Approximately 14,000 vehicles/day

Level of Service B – Generally free flow with some slight delays

64 dBA at 19m from traffic lane

Fairy Springs Road south of Old Quarry Road (mid-afternoon)

Approximately 24,000 vehicles/day

Level of Service A

60dBA at 18m from traffic lane

3.4 SAFETY

Road safety is addressed in 2 ways:

- Crash Reduction – using historical crash data to identify locations for safety investigations (blackspots, crash reduction studies).
- Crash Prevention – identifying hazards and network deficiencies and seeking to manage risks before crashes take place.

Both methods rely on subjective assessments. There are no hard targets for road safety. Programmes are developed by comparing crash records to "typical" levels and evaluating the risk of network deficiencies leading to crashes.

The LTSA Road Safety Report provides an effective overview.

Transfund are developing Safety Performance Indicators that could be used to identify minimum standards or allow a comparison with existing conditions.

Rotorua District Council are implementing a Safety Management System.

Until these are available, we propose that the existing systems are continued. The road designation should include standards relating to safety, requiring that the road controlling authority manage safety through the following:

- All crash blackspots should be investigated for treatment and the conclusions recorded.
- Existing road safety audits should be used to ensure consistency.
- Network standards should comply with the Transfund Standards and Guidelines, and local policies.

The network standards include:

- Rotorua Civil Engineering Industry Standard
- Rotorua Cycle Policy
- TR11 for pedestrian crossings

Growth of Population and Traffic

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4.1 POPULATION

Statistics NZ estimate that Rotorua's population will grow steadily at approximately 0.2% to 0.5% each year (Table 2; Statistics NZ medium projection).

Year	Population	Average Annual Rate	Households
1986	48,655	1.0%	
1991	50,771	0.8%	
1996	54,300	1.4%	18,097
2001	54,900	0.2%	18,663
2006	56,400	0.5%	19,756
2011	57,500	0.4%	20,582
2016	58,400	0.3%	21,389
2021	59,300	0.3%	22,051

Table 4: Population Growth (Stats NZ Medium Projection)

The population growth from 2001 to 2011 and 2021 is 2600 (5% = 0.6% per annum) and 4400 (8% = 0.4% per annum) respectively.

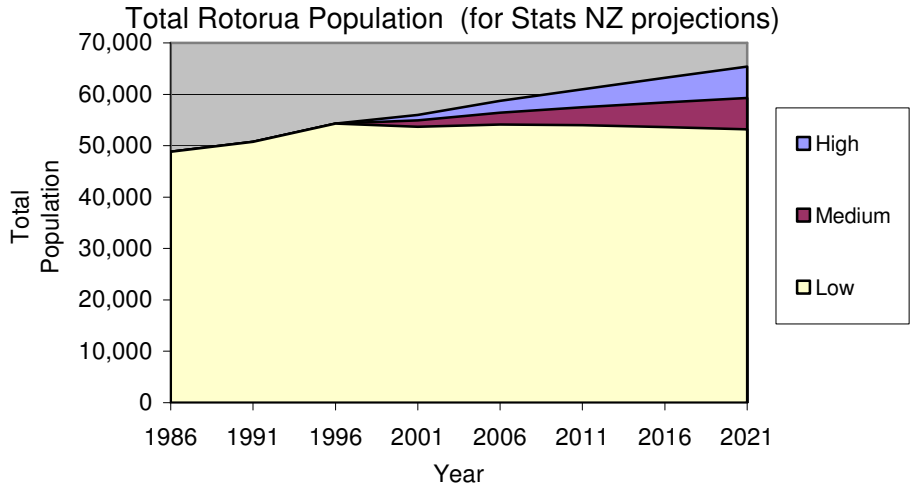


Figure 2: Total Rotorua Population (for Stats NZ projections)

4.2 HOUSEHOLDS

The number of households increases by 1919 (10%) and 3388 (18%) for 2001 to 2011 and 2021 respectively.

4.3 JOBS

The Gabites Porter deficiencies report states the number of jobs in Rotorua as follows:

Year	Jobs
2001	20,296
2006	20,984
2021	23,612

Table 5: Number of Jobs

4.4 AGE DISTRIBUTION

Age distribution will change between 2001 and 2021 with:

- more elderly people (>65 years – 10.9% increasing to 15.9%)
- fewer young people (<15 years – 26.6% decreasing to 21.2%)
- the middle group of 15 – 64 years remains relatively constant at around 62% to 64%.

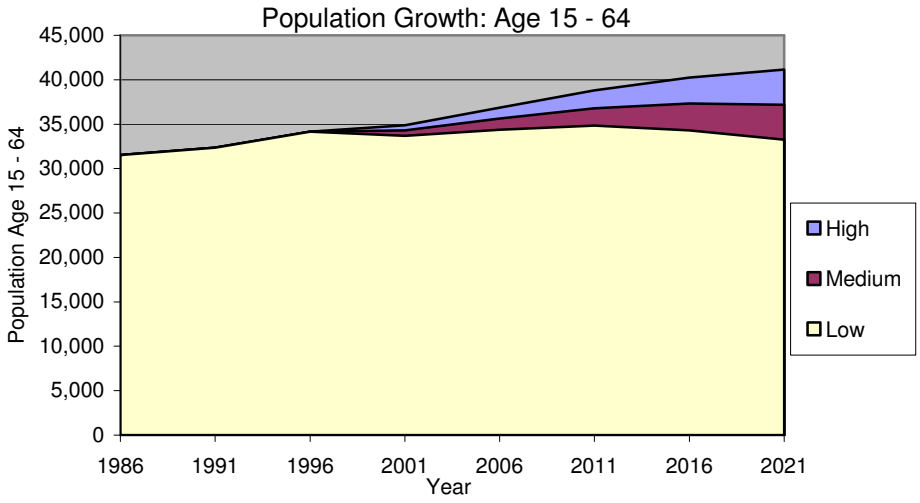


Figure 3: Population Growth: Age 15 – 64 (for Stats NZ projections)

4.5 TRAVEL TRENDS

There is unlikely to be any significant change in travel trends in Rotorua over the next 20 years:

- the car will remain the dominant mode
- the number of single purpose and leisure trips will increase
- car ownership levels will tend to increase (from 1.49/household in 2001 to 1.59/household on 2021).

4.6 TRAFFIC GROWTH

Total network travel was modelled by Gabites Porter and is tabulated below:

Year	Trips (No.)	Rate/ Year	Travel Distance (veh-km)	Rate/ Year	Travel Time (veh min)	Rate/ Year
2006	254,543	1%	1,139,146	1.6%	1,517,489	1.7%
2011	267,980	1%	1,231,984	1.5%	1,642,353	1.8%
2021	294,895		1,417,920		1,936,219	

Table 6: Network Travel Daily

The annual traffic growth rate is approximately 1 – 2%. This compares to 2 – 4% nationally.

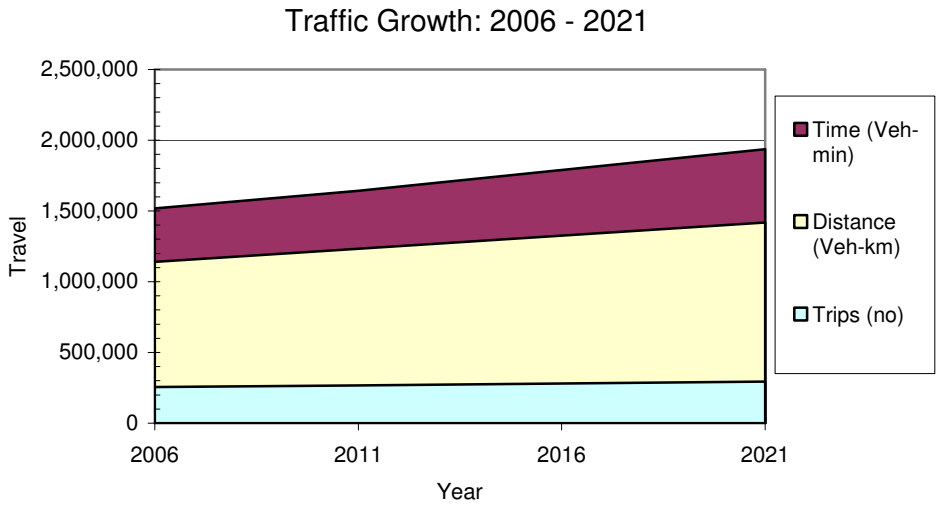


Figure 4: Rotorua Traffic Growth: 2006 – 2021 (from Gabites Porter modelling)

This growth is not spread evenly across the network. Selected locations are tabulated below.

Road	Location	Traffic Volume (vpd) 2001	2006	2021
Fairy Springs Rd	North of Koutu I/S	24,300	25,700	32,300
Old Taupo Rd	North of Pukuatua St	25,500	26,800	32,700
Lake Rd	At Railway Overbridge	20,100	21,100	22,900
Amohau St Ext	East of Fenton St	23,700	25,200	29,500
Te Ngae Rd	At Puarenga Stream	37,200	41,200	50,600
Ngongotaha Rd	SH5 Roundabout	15,300	19,000	23,600

Table 7: Traffic Growth at Selected Locations

Table 7 shows traffic growth rates of 1% to 2.5% per annum over 25 years.

4.7 SUMMARY

The above statistics illustrate that growth in Rotorua is expected to remain relatively stable at less than 1% per year. There are no significant land use or traffic pattern changes anticipated as a result of these findings.

Road Hierarchy

5

The purpose of a road hierarchy is to act as a framework for:

- engineering standards for construction, maintenance and other activities, to ensure adequacy and consistency at each hierarchical level
- regulatory planning mechanisms to:
  - protect the road function
  - control the impact of the road on adjacent activities

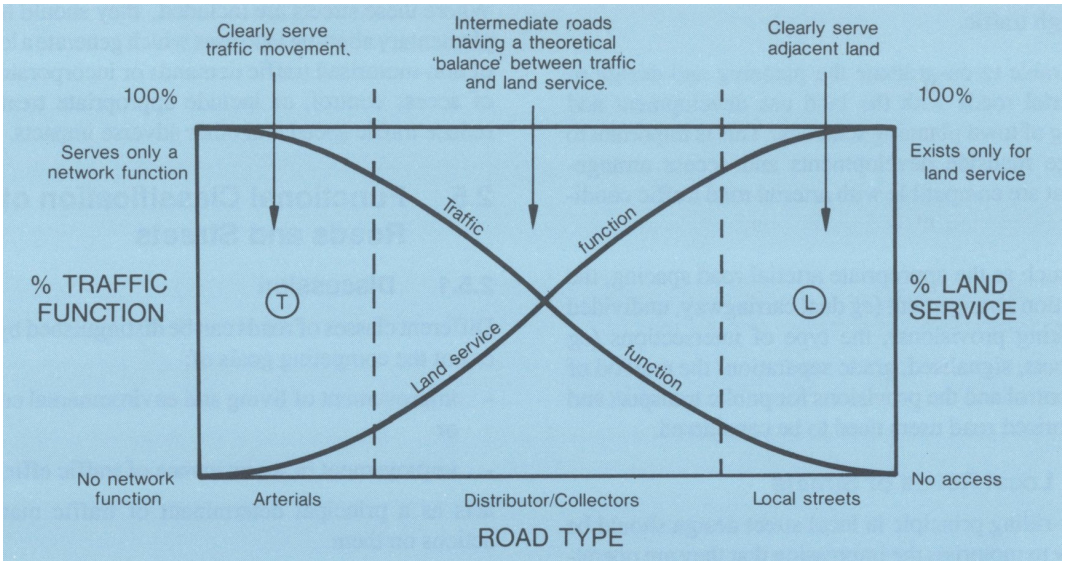
A road hierarchy is a functional classification system for roads which considers parameters including:

- nature and types of trip
- basic purpose of road
- traffic volume

Although the existing hierarchy is determined to an extent by historical development, the assignment of roads to hierarchy levels is a community decision that should be based on local access needs, though traffic needs and environmental protection. Identifying some routes as major arterials, for example, can allow the community to focus and better manage traffic effects in a single corridor. Without a hierarchy to recognise the differences in function for different roads there cannot be planning to ensure appropriate development and control of the roading network; traffic will seek the most convenient routes, which may not suit the community's land use needs.

The hierarchy level assigned to each road has implications for the conditions within a designation, such as access control, construction and capacity standards. It also determines the standards and guidelines associated with the Environmental Effects Area proposed in Section 7. The Environmental Effects Area identifies an area where controls on land use development to protect road safety, access and efficiency are balanced with controls on the road effects to protect the adjacent land owner. This would be introduced via the Plan Review process.

The main difference between hierarchy levels is the change of emphasis between access and freedom of movement, illustrated in Figure 5 below. The character of a road changes as traffic volumes change; an increase in volume desirably involves an increase in traffic function and consequently a decrease in land service.



Arterials	Collectors	Locals
• Higher mobility • Low degree of access	• Balance between mobility and access	• Lower mobility • High degree of access

Figure 5: Relationship between access and movement functions of roads (from Austroads (1988))

5.1 OPTIONS FOR A ROAD HIERARCHY

In determining an appropriate road hierarchy for the Rotorua District, a number of different hierarchy options were considered. These are summarised below, with more detailed descriptions included in Appendix F.

Gabites Porter Recommended 4 Level Hierarchy

- Major arterials
- Principal roads (Minor arterials)
- Collector roads
- Local roads

Existing RDC District Plan

- High density (urban area only)
- Rural arterial routes
- Major arterial routes (urban)
- Collector
- Local

Rotorua Civil Engineering Industry Standard

- Urban
  - Primary arterial
  - Primary principal
  - Secondary distributor
  - Secondary local

- Rural
  - Zones A, B, D, E
  - Cul-de-sac

TNZ Draft Geometric Manual System

- National routes
- Primary (Regional) arterials
- Secondary (District) arterials
- Collector routes
- Local roads

Planning Policy Manual Systems

- State highways
- District arterials
- Collectors
- Local roads

Australian Standard Definitions

- Arterial roads
- Sub-arterial roads
- Collector roads (distributor roads)
- Local roads

NAASRA Functional Road Classification

	Rural	Urban
Arterial	CLASS 1: Those roads which form the principal avenue for communications between major regions of Australia, including direct connections between capital cities.	
	CLASS 2: Those roads, not being Class 1, whose main function is to form the principal avenue of communication for movements between: • a capital city and adjoining states and their capital cities; or • a capital city and key towns; or • key towns.	CLASS 6: Those roads whose main function is to perform the principal avenue of communication for massive traffic movements.
	CLASS 3: Those roads, not being Class1 or 2, whose main function is to form an avenue of communication for movements: • between important centres and the Class 1 and Class 2 roads and/or key towns; or • between important centres; or • of an arterial nature within a town in a rural area.	CLASS 7: Those roads, not being Class 6, whose main function is to supplement the Class 6 roads in providing for traffic movements or which distribute traffic to local street systems.
Local	CLASS 4: Those roads, not being Class 1, 2 or 3, whose main function is to provide access to abutting property (including property within a town in a rural area).	CLASS 8: Those roads not being Class 6 or 7, whose main function is to provide access to abutting property.

	Rural	Urban
Other	CLASS 5: Those roads which provide almost exclusively for one activity or function which cannot be assigned to Classes 1 to 4.	CLASS 9: Those roads which provide almost exclusively for one activity or function and which cannot be assigned to Classes 6, 7 or 8.

Table 8. NAASRA Functional Road Classification

LTSA Proposed National Road Classification System

Urban	Rural
Motorway	Motorway
Expressway	Expressway
Major Arterial	Arterial
Minor Arterial	
Collector	Collector
Local	Local

Table 9. LTSA Proposed National Road Classification System

5.2 PROPOSED ROAD HIERARCHY SYSTEM

We propose the following 5-level hierarchy as set out in the draft TNZ Geometrics Manual.

This arrangement is consistent with the Gabites Porter recommendation and the inferred Australian Standard, but with an additional layer available – "National Routes" – to recognise the special nature and access controls for motorways and expressways not present in Rotorua.

This is also consistent with the recently proposed National Road Classification System being promoted by the LTSA, with the difference that "Motorways" and "Expressways" in the LTSA hierarchy are included in the "National Routes" layer.

- National routes
  - motorways, expressways etc with highest access control
- Major (regional) arterials
  - to provide for major regional movements
  - strict access control
- Minor (district) arterials
  - to provide for major district movements
  - some access control
- Collector roads
  - to link arterial network to local roads
  - movement and land access equal
- Local roads
  - to provide direct access to abutting properties
  - traffic movement secondary to access

Table 9 below describes the proposed hierarchy in more detail. We have identified no "National Routes" so the Rotorua hierarchy uses only 4 levels.

The technical requirements for each hierarchy level will be set out based on performance criteria such as design life and minimum levels of service, based on the existing engineering standards.

Hierarchy Level	Purpose/Description	Engineering Aims	Planning Aims
National Route	• Nationally important. • Motorway, expressway. • >20,000 vehicles/day.*	• Limited Access Road. • No interruptions to flow. • High speed. • 4-lane road with flush or solid medians.	• No access other than intersections. • Limited Access Road.
Major Arterial Route	• To provide for major regional, inter-regional and intra-urban traffic movements. • >14,000 vehicles/day.*	• Limited Access Road. • High geometric standards. • Minimum interruption to flow (accesses, inter-sections). • High capacity. • 2-lane road with flush median, OR 4 lane road with flush or solid median.	• Strict access control. • Non-sensitive adjacent land use. • Minimise land impact on road.
Minor Arterial Road	• To provide for major district movements. • Strategically important. • <14,000 vehicles/day.*	• High geometric standards. • Property accesses controlled. • 2-lane road with or without flush median.	• Managed access. • Minimise land impact on road.
Collector Road	• To link arterial network to local roads.	• Side friction accepted - Access accepted - Parking. • Sufficient capacity. • 2-lane road.	• Few controls on access. • Balance between land use needs and movement needs.
Local Road	• To provide direct access to adjacent properties.	• Designed to avoid inappropriate speeds, traffic, or traffic behaviour. • Minimum standards to avoid safety and maintenance liability.	• Minimise road impact on land. • Traffic movement secondary to access.

Table 10: Proposed 5 Level Road Hierarchy for Rotorua

* Indicative volumes.

Note: We have not identified any roads within Rotorua as “National Routes”

Gabites Porter suggest cross sectional standards relating to volume:

- <14,000 vehicles/day — 2 lane road
- 14,000 – 20,000 vehicles/day — 2 lane road with flush median
- >20,000 vehicles/day — 4 lane road with flush or solid median

The traffic volumes for the cross sections are indicative, inferred from the Level of Service Boundaries (Table 3), service flow rates and inferred intersection right turn manoeuvring requirements.

Roads in the CBD and other commercial and industrial areas have special access requirements, and in spite of some of the roads having high traffic volumes, their access and amenity functions must be recognised. This could be achieved through a geographical CBD classification or within the proposed road hierarchy list. We propose to apply two sub-levels of hierarchy to the

"Local Roads" level similar to that described by the Transport Association of Canada (1995) as quoted by Ogden and Taylor (1996). These are:

- Residential
  - traffic volume <1000
- Commercial/Industrial
  - traffic volume <3000

These two levels incorporate the essence of traffic and land access functions for local roads outlined above, while recognising the different roles local roads fill in terms of traffic volumes. This sub-classification may also be used in defining different pavement standards in commercial/industrial areas, with their higher proportion of heavy vehicles.

The proposed assignment of roads in Rotorua to this proposed hierarchy is included in Appendix F. Roads not listed are deemed to be "Local Roads".

Also, some CBD roads are recognised as having unique amenity to Rotorua City. In particular these are:

- Hinemoa St – from Fenton St to Amohia St
- Tutanekai St – from Pukuatua St to Eruera St

These special roads could be recognised through an additional level in the proposed hierarchy, or with special identification in the District Plan.

Some arterial roads have existing access functions well above that desirable for their hierarchy level. This needs to be addressed when planning controls and rules for the hierarchy levels are developed in detail. Because the accesses already exist, rationalisation may only be possible on major redevelopment.

Network Physical Requirements

6

6.1 MODELLING

The scenarios modelled were a combination of:

- time period (all day, pm peak)
- year (2006, 2011, 2021 matrices)
- network [2006 (2011 same as 2006), 2021]

The all day traffic model provides the appropriate guide for the capacity of the network links, while the pm peak is appropriate for considering intersections. The network conditions modelled are illustrated by means of Level of Service diagrams showing links and intersections at a level of service below D.

6.2 NETWORK DEFICIENCIES - CAPACITY

The Gabites Porter report reviews the LOS diagrams and concludes:

"These figures indicate the following capacity concerns:

- *The State Highway 5 northern approach to the City*
- *Lake Road and its intersections from the Koutu intersection to Ranolf St*
- *Ranolf St from Lake Rd to Arawa St*
- *The Amohau St/Fenton St intersection*
- *Te Ngae Rd (SH30) east from Sala St*

The deficiency analysis has highlighted a number of network elements where capacity will become limited. Of these, there are two which have previously been considered that are not evaluated as part of this study but still need to be considered in the roading strategy. These projects are:

Network Element	Comment
SH5 northern entrance and Fairy Springs Rd	*The 4-lane extension of Fairy Springs Rd will overcome the predicted deterioration in the LOS. Some rationalisation and closure of intersections with specific control at other (intersections) may be required for traffic to access the corridor efficiently.*
Eastern Arterial	*Previous analysis indicates that this route will need to be developed to two lanes by 2008 to provide relief for Te Ngae Rd. By 2021 there will be a need to widen part of it to 4 lanes.*

Table 11: Previously considered network elements

The network review outlines some pending roading concerns indicating a continuing need to review the system and develop proposals for improvements.

The roading strategy proposed is based on the current projected growth rate for the land use variables of households and employment. These have not changed over the last five years. However, should this rate and the distribution of growth change the strategy will need to be reviewed. The most likely scenario is that if the growth rate is greater than now the expected timeframe to complete the roading works will decrease.

Given the development of the projects contained in the proposed strategy the roading network will operate efficiently and safely for the next twenty years or so."

6.3 NETWORK DEFICIENCIES – SAFETY

Crash Reduction Study, 1996

The 1996 Crash Reduction Study (Sigma) identified 11 minor site improvements to address road crashes, and 3 route treatments. The improvements were within the road reserve. All improvements and treatments that were recommended have been completed.

Existing Road Safety Audit Report (& Sigma Response), 1998

The existing road safety audit identified high, medium and low crash risk sites. The contributing factors for high and medium sites are listed below. These relate to matters that can be addressed within the existing road reserve. They are mainly in the rural environment in the District

- High Crash Risk Sites
  - Urban/Rural interface- definition and lighting (Including Mamaku, Ngongotaha, Broadlands and Reporoa)
  - Curve warning signage on rural roads
  - Street lighting at intersections and in general
  - Guard and sight rails

- Medium Crash Risk Sites
  - Standard of rural chevrons
  - Rural property access
  - Advanced lane arrow markings
  - Visibility of roundabout central islands
  - Detritus on rural intersections

LTSA Road Safety Report 1994-1998

The LTSA produces road safety reports for road controlling authorities, which highlight crash trends. The 1994 –1998 report summary comments that are relevant to the urban area stated:

- Cost to society of crashes in Rotorua District is $33.5 million for urban crashes and $20.8 million for rural crashes
- Number of reported injury crashes in 1998 was lowest in 10 years
- Urban speed-related, and urban serious and fatal injury crashes have increased disturbingly
- Parked vehicles as objects struck are below comparison groups

Observations From Network

The following sites are nominated for investigation based on potential safety concerns after observation of the network in operation:

- Old Taupo Road/Devon Street intersection
- Ranolf Street/Amohau Street intersection in CBD (signals)

6.4 NETWORK PHYSICAL REQUIREMENTS

The network physical requirements identified in the Gabites Porter report are sufficient to maintain all day levels of service no worse than D. The identified projects are:

Project	Timing
Ranolf St/Pukuatua St roundabout upgrade	2003
Old Taupo Rd – 4 lanes – Pukuatua St to Malfroy Rd	2004
Malfroy Rd/Ranolf St roundabout upgrade	2005
Malfroy Rd upgrade with an extension to Te Ngae Rd parallel to Ti St and a roundabout at the Fenton St/Malfroy Rd intersection	2006
SH30/Te Ngae Rd intersection – construct a roundabout as part of the Ti St deviation project	2006
SH 5 Fairy Springs Rd northern entrance to the City – widen to 4 lanes	2006-2011
Lake Rd – widening to 4 lanes from Koutu intersection to Ranolf St. Upgrade the two end intersections to provide additional capacity	2007
Eastern Arterial – construct 2 lane road on new alignment	2008
Ranolf St – 4 lanes – Arawa St to Victoria St	2011-2021
Ranolf St – 4 lanes – Lake Rd to Arawa St	2016-2021
Victoria Arterial	2016-2021

Table 12: Road/Intersection Capacity Projects

Victoria St Arterial

The proposed Victoria Street arterial has been identified as a key future arterial route to ease congestion on the network near the CBD, in particular at the existing Amohau St/Fenton St intersection.

Options considered for the Victoria St Arterial are outlined in detail in Appendix H. These options consider a range of alignment, cross section and intersection configurations. The preferred option is Option 8 (see Appendix H for option drawings). The basis of this preferred option is to minimise property impacts of the arterial within the identified alignment constraints, and to provide a balance between access control and safety in the chosen intersection layouts and controls.

Features of this option include:

- Noise bund along southwestern side of the alignment from Pukuatua St through to Ranolf St
- Cyclist and pedestrian facilities on the bund
- A continuous 1.2m-wide median from Ranolf St intersection to Fenton St intersection, with left turn in and left turn out (LTILTO) intersections at Herewini St, Eason St, and both accesses to Rotorua Central.

With the Victoria St Arterial in place it may be appropriate to change the designation of the land to the north of the route and allow this to become part of the CBD, extending the area of land available for commercial development.

Planning Controls Required for Road Improvements

7

7.1 CURRENT PLANNING PROTECTION

This section outlines how the District Plan currently provides for roads and outlines other ways roads could be provided for within the District Plan.

The management of roads has been under review for a number of years. In anticipation of the possible changes, RDC wants to put in place controls to ensure that the construction, operation and maintenance of the road network meets minimum environmental standards. Council wants to ensure that the future management of the road network and the environment is undertaken in an integrated manner. This will protect community interests and expectations for an acceptable level of amenity and service.

Existing and New Roads

Part 12 of the District Plan provides for roads and roading activities such as those undertaken by Council and Transit New Zealand. Within the District Plan roads can be zoned or designated.

Road Zone

The Plan creates a "Road Zone" which applies to all land used for reserves for roading purposes within the District. The Road Zone provides for a range of activities as permitted activities including "any relevant activity provided by the Transit New Zealand Act 1989 or the Local Government Act 1974"

Rule R12.1.1 of the District Plan states:

"In situations where the boundary of a road reserve is realigned, or a road is stopped, any part of the land no longer needed for road reserve… shall be given the same zoning as the land immediately adjacent to the road reserve boundary"

This Rule within the plan cannot automatically deem land to be rezoned as of right.

Council has found this Rule to be difficult to administer and impractical. For example, when a road is realigned or stopped, the redundant section of road retains its original "Road Zone" status and cannot automatically take on the adjacent land zoning (i.e. Residential, Reserve, Commercial, Industrial) as implied by this rule. Zones can only be amended by way of a plan change. Therefore, redundant land would need to go through a publicly notified Plan Change process to uplift the existing Road Zone and re-zone the land consistent with the zoning of the adjacent land.

The existing Road Zone mechanism has been described by Harrison Grierson as being "inflexible" as it requires Council to undertake Plan Changes every time it wants to re-zone land in the Road Zone to that of an adjacent zone, or vice versa.

Options

A number of options have been examined including:

- Designation
- Bylaws

- Plan changes to delete the road zone

These options are discussed in further detail below:

Designation

It is possible to designate all existing public roads within the District as "Roads" in the District Plan. The Notice of Requirement for the designation of the roads will cover the planning, design, supervision, construction, operation and maintenance of the roads in accordance with the Local Government Act 2002 and amendments. The underlying zoning for all district roads is currently Road Zone (Appendix B1.10.1 of the Rotorua District Plan).

A Notice of Requirement for a designation under Section 168 or an alteration to designation under Section 181 of the Resource Management Act 1991, is required to be lodged with the Council to have land designated as "Roads".

Notices of Requirement must be publicly notified for new designations. An alteration to an existing designation can be processed as non-notified if the alteration meets the following criteria:

- It involves minor change to the effects,
- It results in minor changes or adjustments to the boundaries,
- The written approval has been obtained from all the directly affected landowners or occupiers, and
- Both the territorial authority and the requiring authority agree with the alteration.

Existing road-widening provisions within the Plan are not designations, they are Rules and as such, if acted upon, an alteration of designation would be required.

Reasons for Removing the Road Zone

The difficulty in the Road Zone provision is the need to undergo Plan Changes either to uplift the road zone where land is no longer required for road or re-zone new areas of land required for road. To minimise the time consuming and costly procedures involved in drafting a Plan Change, along with the associated notification and submissions period and any hearings, Council aims to adopt a more cost effective management tool that is efficient, easier to implement, and avoids the costly process associated with Plan Changes.

Furthermore, the advantage of designations over the Road Zone is that designations have an underlying zone that takes effect when the designation over the land is altered or removed which avoids the necessity to undertake Plan Changes to rezone land.

Plan Changes

An option other Councils have relied upon is not to zone the roads but to allow for roading activities as permitted activities in all zones. Interpretation is then reliant on the definition of road defined in S2, RMA that refers back to the definition of road in the Local Government Act.

The definition is:

*"**Road"** means the whole of any land which is within a district, and which*

(a) Immediately before the commencement of this Part of this Act was a road or street or public highway; or
(b) Immediately before the inclusion of any area in the district was a public highway within that area; or
(c) Is laid out by the council as a road or street after the commencement of this Part of this Act; or
(d) Is vested in the council for the purpose of a road as shown on a deposited survey plan; or
(e) Is vested in the council as a road or street pursuant to any other enactment;—

and includes—

*(f) Except where elsewhere provided in this Part of this Act, any access way or service lane which before the commencement of this Part of this Act was under the control of any council **[[**or is laid out or constructed by or vested in any council as an access way or service lane**]]** or is declared . . . by the Minister of Works and Development as an access way or service lane after the commencement of this Part of this Act **[[**or is declared by the Minister of Lands as an access way or service lane on or after the 1st day of April 1988**]]**:*

(g) Every square or place intended for use of the public generally, and every bridge, culvert, drain, ford, gate, building, or other thing belonging thereto or lying upon the line or within the limits thereof;—

It is possible to undertake a Plan Change to delete the Road Zone from the Plan and rely solely on the RMA/LGA definition of roads. Roads and specified activities related to the road could be included as permitted activities in all zones.

Other Councils, to cover the road stopping option, have included general clauses along the lines of

"where a road is surrounded by one zone, the zone of the road shall be that of the surrounding zone. Where a road is adjacent to two or more zones, the zone shall be that of the highest adjoining zone ranked in a priority order"

7.2 PLANNING PROTECTION OPTIONS

Designations

Section 175 of the RMA specifies that, once confirmed, a designation is to be included in the district plan as if the activity were a rule specifying the activity to be a permitted activity. Section 176(1)(a) of the RMA states that: *"the requiring authority responsible for the designation may do anything that is in accordance with the designation"*. A description of the activities authorised by the designation and any conditions should be included in the District Plan. Section 176A(1) states that an "outline plan" of public works to be undertaken

on designated land must be submitted by the requiring authority to the territorial authority to allow any changes to be sought before the work is commenced. Outline plans are not required where details were incorporated into the original requirement for designation or the territorial authority waives the requirement for an outline plan. There is no provision for outline plans to be publicly notified or for written approvals of affected parties to be obtained.

Designations have an underlying zone that takes effect when the designation over the land is altered or removed.

Bylaws

Bylaws can be made under the Local Government Act 2002. It appears that the content of a bylaw is concerned mainly with the function and operation of roads and less with environmental effects of roading as is the subject of the Report. Therefore it may be possible to make bylaws based on the engineering standards. However, these may not provide for the environmental protection sought by Council.

Any development of bylaws are required to be valid and in order to be valid must not be ultra vires or unreasonable.

The process of creating a Bylaw is undertaken under the Local Government Act. Bylaws are publicly notified giving the community time to lodge submissions on the proposed bylaw but there is no statutory right of appeal if the Bylaw is adopted as initially proposed.

It appears that in the assessment of effects for applications there is a tendency for Council staff to give more weight to the District Plan provisions, rather than Council Bylaws. However, it needs to be recognized that roading is still considered under the Local Government Act 1974.

Environmental Effects Area

The concept of an Environmental Effects Area (EEA) would provide a buffer along minor or major arterial or national routes where there was an identifiable adverse effect. The area would be identified on the planning maps within the District Plan and include objectives, policies and performance standards that would define levels of permitted activities within the buffer area so as to protect landowners/occupiers from the potential environmental effects associated with the function of the adjoining road. Non-compliance with the permitted activity Rules would be dealt with through the resource consent process.

This concept is not new, and it is being used by a number of local authorities to manage environmental effects. For example, the Hamilton City Proposed District Plan has an Environmental Protection Overlay that is designed to manage the environmental effects of adjacent landuse activities on the gully ecosystems including habitats and wildlife. Waitakere City Council use overlays to distinguish between the natural physical environment, and the built environment (eg residential zone with a biodiversity overlay).

The boundary of the buffer area will not coincide with land ownership boundaries or the boundaries of other land use zones. It is tempting to apply a blanket strip along all roads on roads on the upper end of the hierarchy. This approach is likely to fail if the overlay area does not accurately reflect the scale of effect.

The purpose of the Environmental Effects Area is to encourage protection and enhancement of the amenity value of the environment (i.e. noise, vibration, spill lighting, glare and signage) while ensuring that the function of the road within the hierarchy is not compromised. The potential for adjacent development and activities to adversely impact on the current or future operation of the road will also be managed through the EEA.

The method of provision of an Environmental Effects Area is considered an appropriate management tool that Council can use to address the potential competing demands in resource management terms and in traffic management terms for Rotorua's urban roading hierarchy. The Environmental Effects Area should be developed to provide standards to protect the community from the potential adverse effects from the operational performance of the road; the zone provisions will be used to manage the potential effects of the adjacent land uses on the road.

The proposed Environmental Effects Area needs to be defined in the District Plan with Objectives, Policies and Rules to address the potential effects of roads on the adjacent land use. The overlay areas and their extent should be shown on the planning maps. It is recommended that the Environmental Effects Area be included as part of the District Plan Review process.

7.3 PROPOSED PLANNING PROTECTION METHOD

To address the environmental effects generated by changing level of service along Council Roads' over time, it is recommended that, as part of the Plan review process, Council roll over existing designations, modify others and designate all other public roads within its District and introduce an Environmental Effects Area where there are identified effects. This will provide certainty to the community of the minimum environmental standards for each road hierarchy and ensure that these standards are maintained regardless of how the road network is managed in the future.

Council should include in the Transportation section of the District Plan, future rules requiring that all new roads within the District be designated and that requirements for designations or alterations of designation will be assessed against specified criteria that will relate to the different levels of the hierarchy. In addition, RDC should include a rule specifying the underlying zoning of the road is the same as the adjoining zone where the boundary of the underlying zone will be the road centreline.

The proposed format is shown in Figure 6 below:

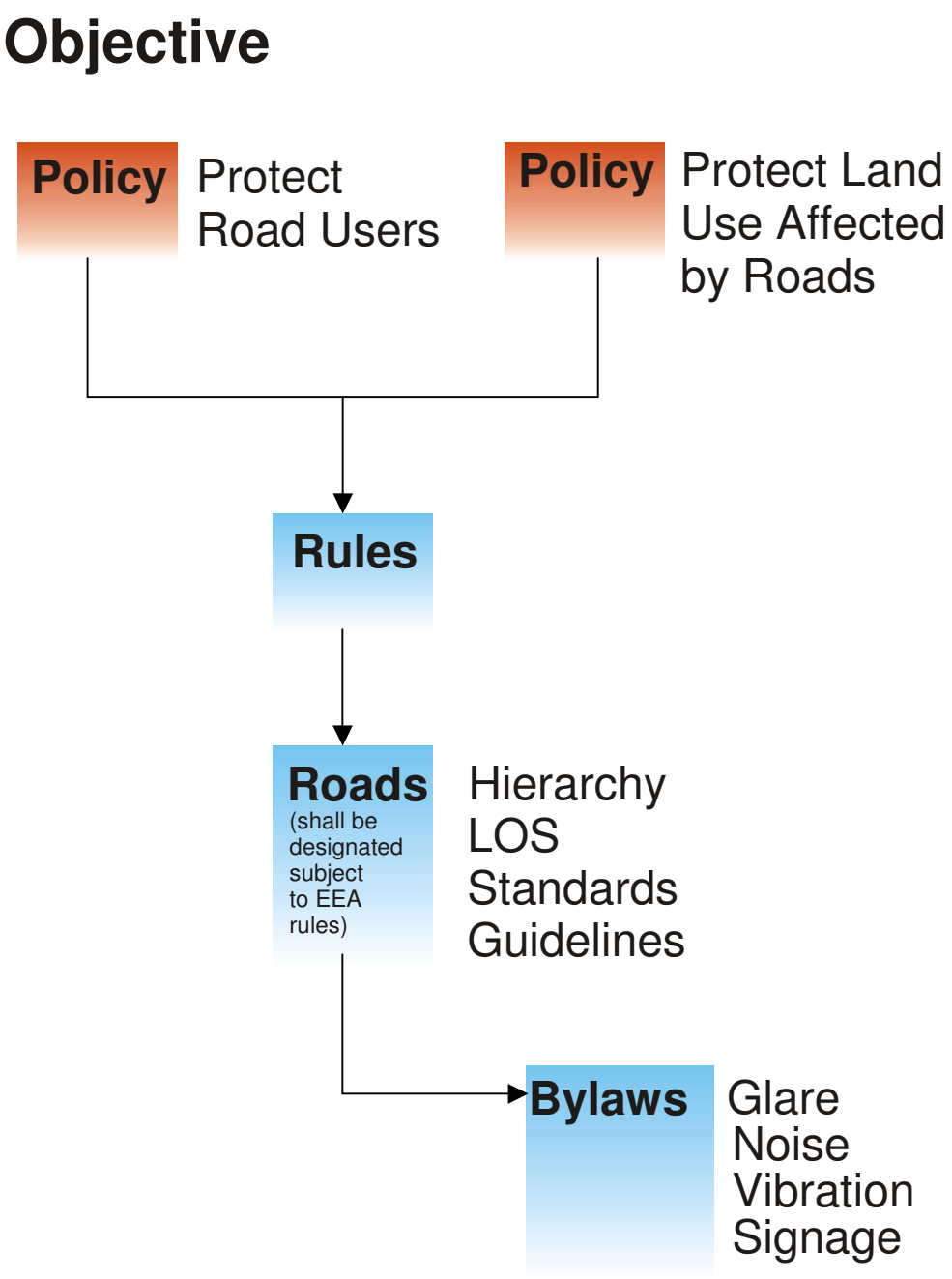


Figure 6: Proposed Planning Protection Method

In the interim the Council may wish to uplift the Road Zone through the Plan change process, include roads as permitted activities in all zones and include a statement about underlying zoning.

A flowchart outlining the proposed process to achieve designation and Plan change goals for Road Controlling Authority activities and TLA Planning/Regulatory activities is shown in Figure 7.

Planning Controls for the Roading Hierarchy

The proposed planning controls via the Plan Review will require the development of Objectives, Policies and Performance Standards for the issues identified (noise, vibration, glare, signage).

Some examples of policy and draft standards are included in Appendix J of this Report to illustrate a framework for improved environmental management. These are based on previous research reports commissioned by Rotorua District Council.

To advance the development of further Objectives, Policies and Performance Standards it is essential and appropriate that the concept be fully considered by the key stakeholders and the Rotorua community.

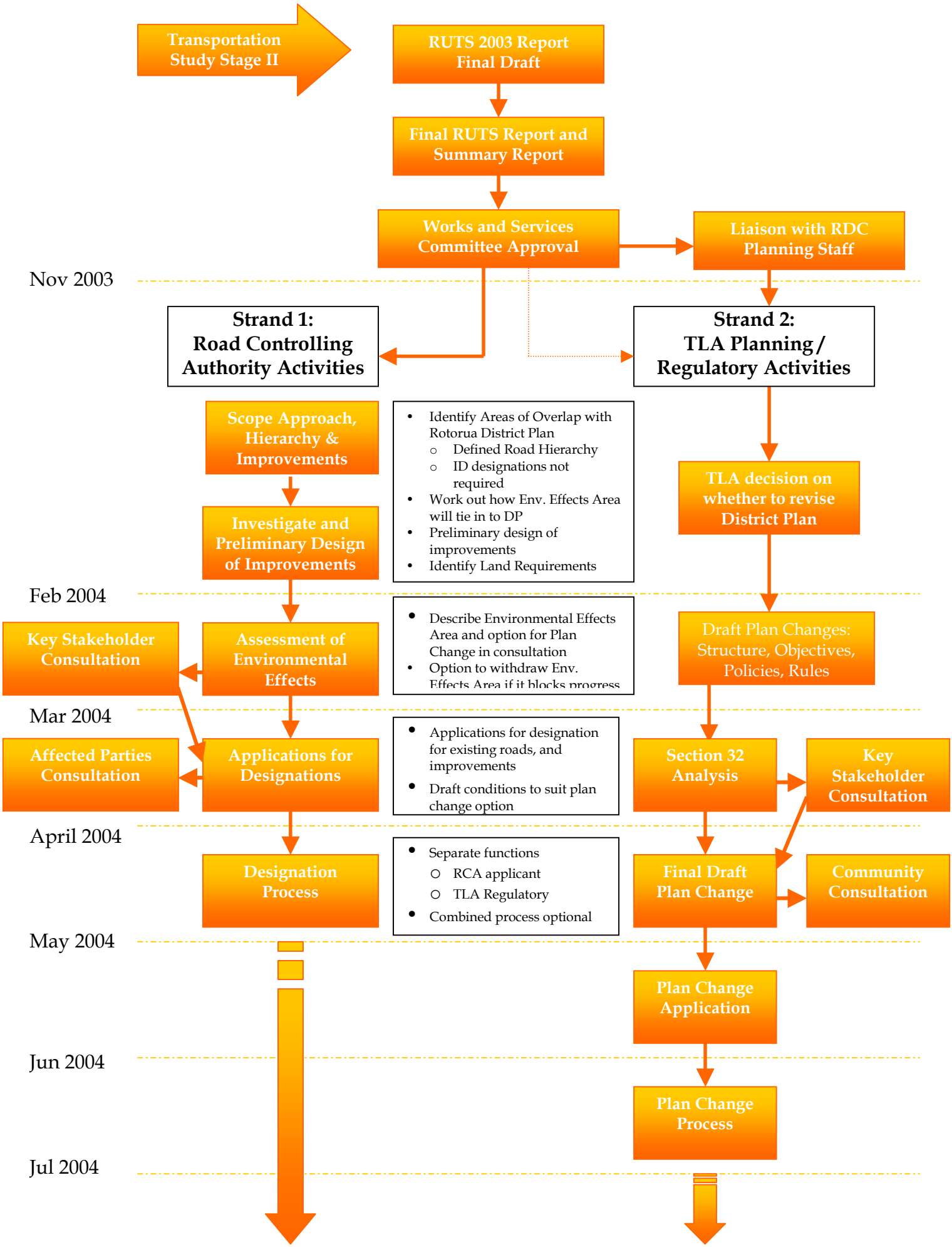


Figure 7. RUTS Flowchart Illustrating Stage 2 Process

Designations Required

8

8.1 DESIGNATIONS NEEDED FOR MAJOR ROAD IMPROVEMENTS

Gabites Porter (2003) identifies improvements required to ensure network efficiency until 2021.

Rotorua District Council operates a 10-year strategic financial plan that sets out the Council's intention for future projects. RDC's policy is to designate land required for projects within a 10-year planning horizon, taking into account the maximum period for which a designation may be applied is 10 years. RDC also takes account of strategic projects within a 20-year horizon and plans towards designation for these projects to comply with the statutory planning horizon.

Table 13 below identifies the major road improvement projects required to ensure network efficiency for Rotorua up to 2021, and identifies where designations are required for projects. Appendix G of this Report includes a diagram of locations of identified proposed upgrades, and preliminary plans of the proposed upgrades where these are available.

Network Description	Proposed Roading Upgrades & Improvements	Pro-posed Timing	Current Status	Action
Ranolf St/ Pukuatua St Intersection	Additional approach lanes at roundabout.	2003	Single approach and circulating lane.	Designation may be required depending on design.
Old Taupo Rd	4 lanes from Pukuatua St to Malfroy Rd.	2004	Designated.	Nil.
Devon St/Old Taupo Rd Roundabout	Additional lanes at roundabout.	2005	Single approach and circulating lane.	Requires designation.
Malfroy Rd/ Ranolf St Intersection	Additional approach lanes at roundabout.	2005	Single approach lanes.	Designation may be required depending on design.
Clayton Rd/ Lake Rd/Old Taupo Rd/Fairy Springs Rd	Intersection upgrade.	By 2006	4 lanes with auxiliary lanes at signals.	Designation may be required depending on intersection design.
Malfroy Rd Extension	Extension of Malfroy Rd parallel to Ti St and roundabout at Fenton St/Malfroy Rd intersection.	2006	RDC Malfroy Road Designation.	Nil.
SH30/ Te Ngae Rd Intersection	Construct roundabout as part of Malfroy Rd extension project.	2006	Subject to review depending on connection point to Victoria Arterial.	Designation may be required depending on design.
Ngongotaha Rd	4 Laning from SH5 to railway crossing.	2006-2011		Requires designation.
SH5 Fairy Springs Rd northern entrance to city	Extension of 4-laning on Fairy Springs Rd.	2006-2011	Currently 20m width. Road to be widened 30m (5m on each side as per Planning Map 16).	Requires designation.

Network Description	Proposed Roading Upgrades & Improvements	Pro-posed Timing	Current Status	Action
Lake Rd	Widening to 4 lanes from Koutu intersection to Ranolf St, and upgrade the two end intersections.	2007	Currently 20m width. Road to be widened to 30m (5m on both sides) Planning Maps 19, 20 & 26 show 2.5m each side to 25m width.	Requires designation. Rail approval will be required for changes to the rail bridge on Lake Rd.
Eastern Arterial	Construct new 2 lane road.	2008	TNZ Designation (refer Appendix B.10 District Plan or Appendix C of this Report).	Nil.
Old Taupo Rd/Malfroy Rd intersection	Intersection upgrade.	2010		Requires designation.
Ranolf St – Arawa St to Victoria St	Road widening to provide 4 laning.	2011-2021	Currently 2 lanes, 20m width. Road to be widened 30m (5m on each side).	Requires designation.
Ranolf St – Lake Rd to Arawa St	Road widening to provide 4 laning.	2016-2021	Currently 2 lanes, 20m width. Road to be widened 30m (5m on each side).	Requires designation.
Victoria St Arterial	Widen to 4 lanes and construct new links from Amohau St to Victoria St, and from Victoria St to Te Ngae Rd.	2016-2021	Currently 2 lanes, 20m width. Road to be widened to 30m.	Requires designation.

Table 13: Major Road Improvements Needed for Rotorua

Note: *Refer to Appendix G for copies of District Plan Designations*

8.2 ROADS TO BE WIDENED

Roads to be widened have been identified in Appendix D of the Rotorua District Plan (Refer to Appendix G of this report). The Planning Maps show lines that are indicative of the "roads to be widened' and the area of land potentially affected. The major arterials identified as roads to be widened are included in Table 13. For the remaining roads consideration has been given to the need to retain the 'road to be widened' status. The reason to justify their retention or removal is given in Table 14 below.

There is no clear need for the roads to be widened within 10 years. We do not recommend that RDC seek designation for the widenings.

Road	Hierarchy Level	Reason	Action
Clayton Road	Minor Arterial	Traffic volume in 2021 is estimated at 15,000	Retain road widening and possibly extend the area westward to Mountain Road
Hamurana Road between Ngongotaha Road and the Intersection with Tauranga Direct Road	To be classified as State Highway 36		Full strategic study of the route to be completed. Retain pending strategy study.
Old Taupo Road south of Malfroy Road	Major Arterial		Not required
Te Ngae Road SH30 (from Puarenga Stream to junction of SH33	Major Arterial	Traffic volumes	Not required
Koutu Road	Collector	15m original width	Not required
Devon Street	Minor Arterial	Investigate widening	Not required
Kawaha Point Road	Collector		Not required
Vaughan Road	Collector	20m to 22m on planning maps	Not required
Malfroy Road	Minor Arterial		Not required
Otonga Road	Collector	Investigate widening	Not required
Ranolf Street	Major Arterial/ Minor Arterial/ Collector	Investigate widening	Not required
Springfield Road	Minor Arterial	Investigate widening	Not required
Sunset Road	Minor arterial	Investigate widening	Not required

Table 14: Road Widening Designations Identified in District Plan

Conclusions

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9.1 CITY GROWTH, NETWORK DEFICIENCIES AND PHYSICAL REQUIREMENTS

We expect growth in Rotorua to remain relatively stable at less than 1% each year. There are no significant land use or traffic pattern changes anticipated. The Rotorua road network is reasonably placed to provide an adequate level of service until 2021, as long as some capacity improvements are carried out. Problems are already evident during peak periods at most of the locations requiring significant long-term attention.

9.2 ROAD HIERARCHY

The classification of the Rotorua road network into a 5 level system based on Transit standards should ensure there will be no issues with gaining inter-regional and intra-regional consistency in terms of hierarchy classifications. In order to recognise and accommodate the unique amenity to the City of certain CBD roads a special classification could be applied to these.

9.3 UPGRADING WORKS AND DESIGNATIONS REQUIRED

We have identified the following major upgrading works that require designation for widening or intersection improvements:

- Lake Road/Ranolf Street
  - Lake Rd (Koutu intersection to Ranolf St)
  - Ranolf St/Lake Rd signal-controlled intersection
  - Ranolf St – Lake Rd to Arawa St
  - Ranolf St – Arawa St to Victoria St
- Devon Street/Old Taupo Road intersection
- Old Taupo Road/Malfroy Road intersection
- Ngongotaha Rd north of SH5
- SH5 northern entrance to the city and Fairy Springs Road
- Victoria Street Arterial

The following proposed major works are required but have designations:

- Old Taupo Rd (Pukuatua St to Malfroy Rd)- *Designated*
- Malfroy Rd upgrade- *Designated*
  - Extension of Malfroy Rd parallel to Ti St
  - Fenton St/Malfroy Rd intersection
- Eastern Arterial- *Designated*

Other projects, including intersection improvements, minor road widening and safety improvements, may also require attention.

9.4 CHANGES REQUIRED FOR DISTRICT PLAN

The following Plan Changes/District Plan review process will be required to amend the provisions within the District Plan:

- Removal of Road Zone.
- Provision to establish road hierarchy within the District.
- Provisions to insert Objectives, Policies and Performance Standards and methods for designation of public roads within the District.
- Provisions to insert Objectives, Policies and Performance Standards and methods for an Environmental Effects Area within Rotorua urban area.

9.5 CONSULTATION

RDC should consult with key stakeholders to seek their views and feedback on this Report. The consultation process will provide opportunities for the stakeholders to participate in the development and refinement of the proposed draft Objectives, Policies and Performance Standards.

It is also an opportunity for Council to gauge the initial level of support for the proposed designation process and plan change to remove the road zone. It would also be an opportune time to discuss the introduction of the Environmental Effects Area with its potential Objectives, Policies and Performance Standards.

Effective consultation will ensure that robust and workable standards are adopted and are able to be endorsed by the Rotorua District Council prior to wider community consultation.

Recommendations

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Opus recommends that Rotorua District Council:

- Adopts a 5 level functional hierarchy in the District Plan
- Assigns all roads to appropriate hierarchy levels
- Amends the District Plan to delete the Road Zone in the interim
- Rollover existing designations and modifications of designations, and designate all other public roads within the District via the Plan review process
- Manages environmental effects using the Environmental Effects Area approach.
- Designates land required for major upgrades to 2011 (listed in Table 13)
- Reviews the road hierarchy and road designation requirements every 5 years.

References

11

In addition to the documents listed in the Appendices, the following documents have been referred to in preparing the Report.

- Austroads, 1998, *Guide to Traffic Engineering Practice: Part 9: Arterial Road Traffic Management,* Austroads, Sydney, Australia
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- Gabites Porter, 2003, *Rotorua District Council Roading Network – Development Strategy (Unpublished)*, Gabites Porter, Hamilton, New Zealand
- NZ Government, 1991, Resource Management Act, NZ Government, Wellington, New Zealand
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