A National Road Hierarchy – Are We Ready?

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Abstract

Functional road classification systems or road hierarchies are widely used in all aspects of traffic planning, traffic operations and road asset management. Considerable effort should be invested to keep them current, relevant and consistently applied within and across jurisdictions. With increasing emphasis being placed in New Zealand on cost-effective and equitable management of transport infrastructure and sustainable transport systems, road hierarchies should be better designed and implemented than is currently the case.

This paper identifies and compares a variety of functional road hierarchies from both the national and local sectors, including those used by Land Transport New Zealand, Transit New Zealand and six metropolitan areas. Many of the systems analysed use traffic volumes as indicators of road class but widely different definitions exist. Besides traffic volumes, the hierarchies have a number of criteria used to classify roads, although these are not explored in any detail in this paper.

The paper makes a case for reviewing New Zealand's various functional road hierarchies to develop a road hierarchy for application across the country. Rational transport planning and traffic engineering decision making will be greatly enhanced by such a move. New Zealand is a small enough country that a national road hierarchy could be developed with relative ease, whereas other, larger countries will have much greater difficulty aligning the systems of many more agencies.

So are we ready for a national road hierarchy? There is no better time than now!

1. Introduction

1.1 Defining Road Hierarchy

A functional road hierarchy is a system of classifying roads for different functions and for managing roads and traffic according to this classification system. The roads carrying (or intended to carry) most traffic are at the top of the hierarchy, while those with least traffic (and which serve primarily to provide property access) are at the bottom.

Every New Zealand territorial local authority (TLA) has a road hierarchy (LTSA 2001). Similarly, national agencies such as Transit New Zealand (Transit), Land Transport New Zealand and others have one or more road hierarchies. A typical hierarchy has road types such as arterial, collector and local. Each road type has associated characteristics defined or described by the hierarchy. For councils, hierarchies are usually defined in the district plan. National agencies such as Transit and Land Transport NZ define their hierarchies in various documents for different purposes.

In practice, most roads have functions for both traffic movement and property access. A properly designed and managed road hierarchy can help ensure that a few roads carry most motor vehicle traffic, and do so efficiently, while most roads carry less traffic and provide opportunities for other uses of the street, especially access to property.

This paper recommends the establishment of a national road hierarchy. The first part of this, the identification of a set of road class names and associated traffic volume ranges is attempted here. Further work is needed to develop other characteristics for each road type in the hierarchy, such as recommended speed limits and geometric standards.

1.2 Austroads Guide to Traffic Engineering Practice

Austroads (1988) identifies road class names as arterials, distributors/collectors and locals but does not define their associated traffic volume ranges. It includes an illustration of the relationship between traffic function and property access (or land service) function for different road types. This is reproduced as Figure 1.

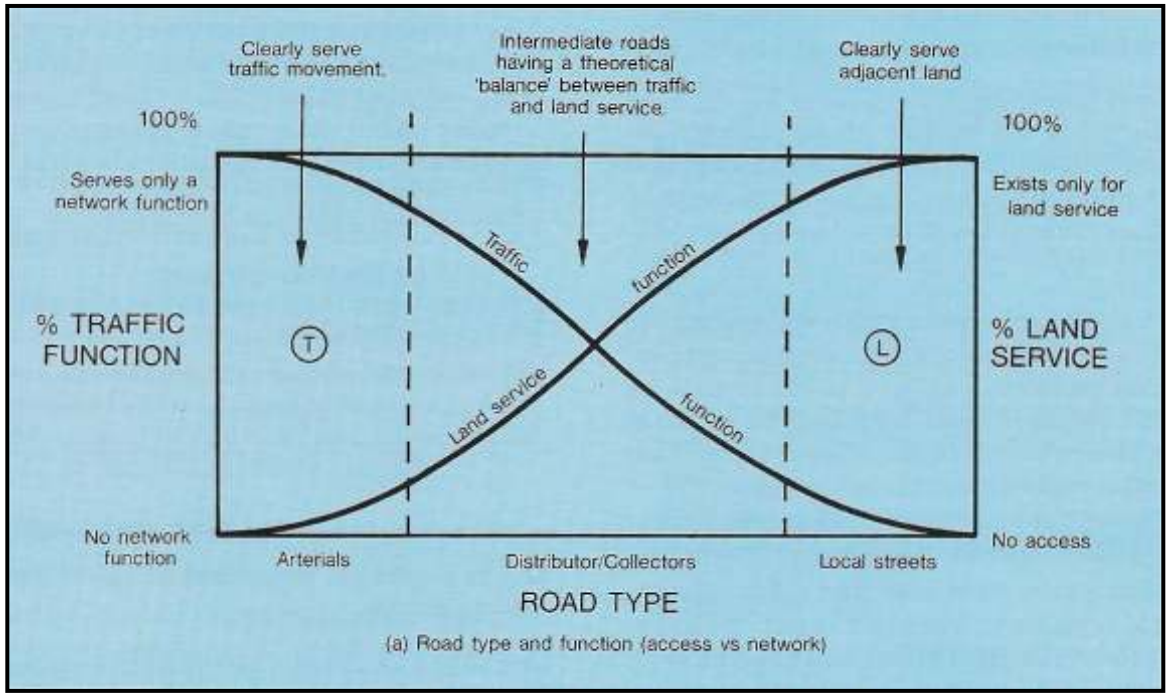

Figure 1: Austroads (1988) Road Types and Functions

1.3 Managing Road Safety and Efficiency under the RMA

In a recent "best practice" road safety report, Land Transport NZ (2007a) observed that: "There should be coordination and consistency of rules between adjacent councils, eg, on access or roading hierarchy." The report also noted that: "The hierarchy minimises delays and accidents, and makes the best use of the substantial investment in the road network. Efficient use of the hierarchy may delay the need for extra road construction or improvement in the district."

Despite being a "best practice" guideline on managing road safety and efficiency, it does not contain specific recommendations or guidance about the names of road classes or associated traffic volume ranges.

There are over 100 different road hierarchies in NZ, yet there are numerous similarities. Consolidation of these into one commonly agreed system would provide a range of benefits both locally and nationally. There is no strong argument for an urban collector in Christchurch, for example, being differently defined to one in Tauranga. There seems to be little merit in having different road class definitions for each of New Zealand's 86 regions, cities and districts. Likewise, why would we define a collector road for the State Highway network differently from a collector for NZS 4404: 2004 (the national land development and subdivision standard) or in RAMM (the national road asset maintenance and management system)?

1.4 The "Quality Planning Project"

The Quality Planning Project is a partnership between the New Zealand Planning Institute, the Resource Management Law Association, Local Government New Zealand, the NZ Institute of Surveyors and the Ministry for the Environment.

A steering group manages the project and an editorial panel of practitioners also reviews content on the project's website, where findings are reported. The project is funded by the Ministry for the Environment, which owns and administers the website. According to Quality Planning Project (2003):

> "Road hierarchies classify roads in the district, and their priority in terms of use. The highest classification is arterial roads like state highways, and the lowest classification is local roads and cul-de-sacs. Each classification has a priority use of either through traffic or local access.
>
> "Road hierarchies are a robust method used commonly in district plans as a good basis for developing provisions in the district plan. As well as a means of managing the district roading infrastructure, road hierarchies can be used as an environmental management tool to assist in controlling effects e.g. noise, amenity protection.
>
> "The graduated hierarchy can help establish policies and rules relating to appropriate:
>
> - Traffic volumes and speeds;
> - Road construction and geometry standards;
> - Traffic generation rates;
> - Access and parking effects of adjacent land use activities;
> - Design and amenity standards;
> - Provision for pedestrian, cyclist and public transport within the hierarchy
> - Consistency of terms is important."

The Quality Planning Project does not recommend a set of road class names or associated traffic volume ranges.

1.5 Progress towards a National Hierarchy

There have been a number of discussions over recent years about the concept of a national road hierarchy. In 2001, the former Land Transport Safety Authority (LTSA) surveyed all road controlling authorities in NZ to ascertain whether they had hierarchies and if so what they were. This work was published as Road Safety Survey 16 (RSS 16) and a summary of findings is reproduced in this paper as Appendix 1. Recommendations of the survey (LTSA 2001) were that:

- "LTSA should ensure that the information obtained in this survey is used to derive a national roading hierarchy and appropriate standards for each class of road in the hierarchy.
- "LTSA should produce guidelines or a policy document on desirable standards for different classes in a road hierarchy.
- "RCAs should implement programmes to systematically upgrade specific aspects of their roading standards (such as road marking and delineation) to provide motorists with a consistent roading environment on each class of road."

In 2003, the LTSA organised a series of five workshops throughout New Zealand on a proposed national road classification system. Most councils attended one of these workshops and most supported the concept of the development of a national hierarchy.

At the end of this process (November 2004), however, Transfund and the LTSA were merged to form Land Transport NZ. This resulted in significant upheaval within both organisations and work on a national hierarchy effectively stopped for two years.

The annual Safety Management System Workshop in July 2007, organised by Land Transport NZ, also included a session on a national road hierarchy in the context of safety management systems. Again there was significant support for the development of a national hierarchy and work is continuing.

However, the recent announcement of the merger of Land Transport NZ and Transit means that it is likely that progress will be slow over the next few years as the reorganisation of two large and different organisations takes place, and other issues will be more urgent. After all, the country has survived without a national hierarchy so far. There is a danger that there will be no obvious "home" for this work for some time, or at least that staff in the new organisation will be busy re-organising or working on other priorities.

2. Existing functional road hierarchies in New Zealand

2.1 National Hierarchies

A number of national documents (described below) provide guidance on road hierarchies, either for internal use by the agencies that developed them, or to assist local councils. These documents are shown in Table 1, with the names of each class and its associated traffic volume range (annual average daily traffic volume – AADT) where they exist. These documents are described below the table. Bibliographic details are contained in the Reference section of this paper.

Table 1: Existing National Road Hierarchies

National Document	Classes (AADT in thousands of vehicles per day)						
NZS 4404: 2004 (Land Development and Subdivision Engineering Standard) (Urban)			Primary (regional) arterials > 7 K	Secondary (district) arterials 3-7 K	Collector 1-3 K	Local distributor 0.2-1 K	Local < 0.75 K
(Rural)			Arterial > 2.5 K	Major collector 1-2.5 K	Minor collector 0.7-1 K	Sub-collector 0.3-0.7 K	Minor local < 0.3 K
Land Transport NZ Economic Evaluation Manual – Vol. 1 (EEM 1) (Urban)			Urban arterial > 7 K		Urban other < 7 K		
(Rural)			Rural strategic > 2.5 K		Rural other < 2.5 K		
Land Transport NZ EEM 1 Worksheet A6 - Accident Cost Savings			Motorway/ 4 lane divided 15-68 K	2 & 4 lane arterial 3-24 K	Collector 2-8 K	Local < 3 K	
Transfund [1] Road Maintenance Hierarchy (Urban)		A > 10 K	B 5-10 K	C 1-5 K	D 0.2-1 K	E < 0.2 K	F
(Rural)			> 5 K	1-5 K	0.2-1 K	0.05-0.2 K	< 0.05 K
Transit State Highway Geometric Design Manual		Motorway > 8 K	Expressway > 8 K	Arterial < 12 K	Collector < 5 K	Local < 1 K	
Transit Planning Policy Manual[2]	Motorway	Expressway	Primary Arterial	Secondary Arterial	Collector	Local	Cul-de-sacs

1. Transfund is now part of Land Transport NZ, but the Transfund maintenance hierarchy is still in use.
2. Transit's Planning Policy Manual (August 2007) notes that: "A number of different road hierarchies are possible and there is no standard version." The list of road classes shown in this table is "A typical road hierarchy supported by Transit".

NZS 4404:2004 *Land Development and Subdivision Engineering*, provides national guidance for councils and developers in the provision of new roads, amongst other things.

Land Transport NZ's *Economic Evaluation Manual Volume 1*, EEM 1, (Land Transport NZ 2006) is widely used to evaluate transport projects for funding approval.

Transfund's Road Maintenance hierarchy is used by councils and Land Transport NZ to manage maintenance issues.

The *State Highway Geometric Design Manual* (Transit 2000) is used by Transit and others for road design and access management.

Transit's *Planning Policy Manual* (Transit 2007) is also used to manage land and access development in relation to the roading network.

2.2 Local Hierarchies

As established by the LTSA survey in 2001, almost all councils have road hierarchies. Hierarchies from six metropolitan areas, including New Zealand's three main urban areas, have been analysed. Auckland, Wellington and Christchurch all have a number of cities within their regions and the potential exists for these hierarchies to be aligned. Hamilton, Palmerston North and Dunedin, however, effectively contain the majority of urban development associated with their cities. The data are summarised in Table 2. Sources of the information are identified in the references section.

Table 2: Road Hierarchies in a Selection of Cities

City/District	Classes (AADT in thousands of vehicles per day)							
Auckland City		Strategic	Regional Arterial ± 40 K	District Arterial 5-25 K	Collector 3-10 K	Local < 5 K	Service Lanes	
Manukau City [1]		National Route	Regional Arterial	District Arterial	Collector	Local		
North Shore City [2]		National Route	Primary Arterial 20-50 K	Secondary Arterial 10-20 K	Collector 3-10 K	Local < 3 K		
Waitakere City		Strategic Arterial > 30 K	Regional Arterial 15-35 K	District Arterial 5-25 K	Collector 2-10 K	Local < 1.5 K		
Hamilton City			Major Arterial	Minor Arterial	Collector	Local		
Palmerston North City			Arterial	Principal 5-20 K	Collector 3-10 K	Local < 3 K	Parking	Pedestrian
Wellington City [3]			Arterial > 7 K	Principal 3-7 K	Collector 0.8-3 K	Sub-collector 0.2-0.8 K	Local < 0.2 K	
Porirua City (Urban) (Rural)	Motorway 10-30 K	Major Arterial 10-25 K 3-10 K	Minor Arterial 7-15 K 1-8 K	Principal 2.5-10 K --	Collector 0.2-3 K 0.5-2 K	Local -- < 0.25		
Lower Hutt City			Primary Distributor	Major District Distributor	Minor District Distributor	Local Distributor	Access Road	Pedestrian Road
Upper Hutt City [1]		National (SH) Route	Primary (Regional) Arterial	Secondary Arterial	Collector	Local Distributor	Local	
Christchurch City (Urban) (Rural)			Major Arterial > 12 K > 10 K	Minor Arterial 3-15 K 2-12 K	Collector 1-6 K 0.1-2.5 K	Local < 0.55 K	Service Lanes	
Waimakariri District			Strategic	Arterial	Collector	Urban Collector	Local	
Selwyn District [1]			Strategic	Arterial	Collector	Local		
Dunedin [1]		National	Regional	District	Collector	Local		

1. Traffic volume ranges for road classes are not defined either in the District Plan or other council documents
2. North Shore City traffic volume ranges from Infrastructure Design Standards Manual
3. From Wellington City Council's Draft Code of Practice for Land Development

The analysis of road hierarchies in these urban areas has been confined to the names of the classes and to the traffic volume ranges assigned to each class, where these data exist.

2.3 Names of Classes

Nationally there is little consistency amongst agencies for the names of road classes For example, the following names are all used for what are effectively major arterial roads: "primary (regional) arterial"; "arterial"; "A" and "primary arterial". Transfund's road maintenance classes have alphabetic characters (A to F) as road class names. Nevertheless, most national agencies use collector and local as the two lowest road classes.

At the local council level, more consistency exists as to road class names, especially within each of the metropolitan areas. While most cities have local and collector road classes, the next class is variously called district arterial, secondary arterial, minor arterial or principal road. The next class up the hierarchy is called regional arterial, primary arterial, primary (regional) arterial, major arterial, primary distributor or strategic road. A more consistent name would be beneficial here!

Above this level, some councils have another level of arterial road. Some have state highways in a separate road class called national or strategic routes, at the top of the hierarchy. Most hierarchies include motorways in their highest class, such as national route or major arterial, along with other kinds of major roads, but some put motorways in their own class.

Distributor and collector are sometimes used interchangeably (as in Austroads) or signify different classes (as in the Wellington region, where some councils use both names and others do not). It could be argued that a road that "collects" vehicles in the morning peak from local roads and connects them to the arterial system, "distributes" the same vehicles from the arterial system to the local system in the afternoon.

2.4 Traffic Volume Ranges

Most of the national hierarchies have traffic volume ranges associated with each class, while only about half of the local hierarchies do. Of those hierarchies that do have traffic volume ranges, some use overlapping traffic volume ranges (where a road with a particular traffic volume may be in two or more road classes).

There is little consistency amongst the existing hierarchies for traffic volumes, with none of the hierarchies reviewed for this paper having the same definitions as any other. It would be beneficial to develop a common set of traffic volume ranges to match the agreed road class names, and it should not be beyond the traffic engineering and transportation planning community to do this.

Many urban roads classified as local by councils in New Zealand carry more than 750 vehicles per day (vpd), the upper limit for urban local roads in NZS 4404: 2004. This was confirmed by GIS analysis of roads in 12 district councils around NZ (covering 20% of the country's road length) as part of a project for the former LTSA in 2003 and 2004 (MWH 2004).

Similarly, most of the hierarchies classify urban roads with between 3,000 and 7,000 vpd as collectors, rather than secondary (district) arterials, as in NZS 4404: 2004. In general, the national hierarchies have lower volume ranges than the local authorities for a given class.

Transit's State Highway Geometric Design Manual (SHGDM) does not distinguish between urban and rural. As most of Transit's roads are rural, the ranges in the SHGDM can be thought of as rural ranges. They are significantly different from other urban classifications. Most territorial local authorities that set traffic volume ranges for their road classes distinguish between urban and rural. Hamilton does not distinguish between urban and rural, but almost all its roads are urban.

Of the seven cities that do have traffic volume ranges associated with each class, three (North Shore, Palmerston North and Wellington) have "non-overlapping" volume ranges. It is probable that some individual roads are classified differently from that suggested by traffic volume, as traffic volume is but one characteristic used to classify roads.

North Shore and Wellington have local roads defined as carrying fewer than 3,000 and 200 vpd respectively. Collector roads in North Shore (and a number of other cities) have between 3,000 and 10,000 vpd. Wellington defines collectors as having between 800 and 3,000 vpd. So a collector in Wellington would be a local road in North Shore.

Four cities have overlapping ranges. For example, Auckland defines a local road as having fewer than 5,000 vpd while collectors can carry between 3,000 and 10,000 vpd and district arterials carry between 5,000 and 25,000 vpd. So it is possible for an Auckland road with 5,000 vpd to be classified as a local, collector or district arterial.

It is argued that non-overlapping traffic volume ranges provide a more rigorous road hierarchy. There will be some roads which are classified differently from that suggested by the traffic volume, but experience in Toronto (Macbeth, A.G. 2001) and the initial GIS analysis undertaken in New Zealand for Land Transport NZ (MWH 2004) suggests that the majority of roads will be able to be classified correctly simply by using well-constructed non-overlapping traffic volume ranges.

Some towns may try to include a full range of road types in their hierarchies, but there is no solid traffic or planning argument for this. If small towns have no urban roads with over 20,000 vehicles per day, then it is suggested that they have no need for a major arterial road class. Major arterial roads should generally have a divided carriageway, with four or six lanes of traffic. Most towns will not need roads of this class.

3. A Proposed National Road Hierarchy for New Zealand

3.1 Names of Road Classes

Land Transport NZ (2007b), in recommending "self-explaining roads", notes that: "Self-explaining road designs make it clear for drivers what type of road they are on. If used consistently, drivers will recognise and understand the designs, and adjust their driving behaviour (and speeds) accordingly." Self-explaining roads should be of a limited number of types so that road users can recognise these and behave accordingly. A national road hierarchy (with fewer rather than more road classes) is the logical place to establish these road types.

State highways and other main roads in the hierarchy owned and operated by the local authority should look and feel similar and therefore should use the same class name. What matters for a driver is how to drive the road, not the ownership of it. They should move seamlessly from roads owned by Transit to roads owned by the local authority without necessarily being aware of the ownership difference. A number of existing hierarchies distinguish between state highways and other arterials, but it is felt that this difference is not necessary (or helpful). Adding road classes just to cover ownership is counter-productive to the principle of self-explaining roads.

Another reason supporting a common road hierarchy for Transit and territorial local authority (TLA) roads is that many roads change ownership between Transit and the local authority over the life of a road (often 50 or more years). So a road designed by one authority to geometric standards appropriate for its class may not comply with the standards of the new owner. A common national road hierarchy with agreed design standards would resolve this.

The road class name "national route" is considered inaccurate as almost all traffic on any given road, even motorways, is relatively local. Similarly, use of the term "regional arterial" is probably not advisable. If the Auckland TLAs were amalgamated into one large city, then the concept of a regional route would be unnecessary. Dunedin is already amalgamated and thus has no need for such a road class name. The more generic "major arterial" is considered to be more useful. This could include expressways.

Motorways probably warrant their own class, as they have no direct property access, have stringent restrictions on use by utility service providers and have special requirements for pedestrians and cyclists. Their speed limits are usually higher than for other urban arterials.

Some hierarchies (including NZS 4404: 2004) distinguish between different types of local or collector roads by considering adjacent land use, such as residential or industrial. This breaks down when a road has different land uses on each side or at different stages along its length. Pedestrian streets and service lanes are recommended as special kinds of local streets, but should not have their own classes.

Typically the travel speeds, road geometry and frequency of property accesses (amongst many other things) are much different for urban and rural roads. Consequently separate road hierarchies will be needed for urban and rural roads. In establishing road classes, care needs to be taken to anticipate (or manage) urban expansion into rural areas. These issues require input from planners as well as traffic engineers.

As simple a road hierarchy as possible, consistent with achieving differentiation by road users, is recommended. Accordingly, the following class names (for both urban and rural roads) are proposed:

- Motorway
- Major arterial
- Minor arterial
- Collector
- Local

Not all councils will have motorways or major arterial roads, and not all councils will have rural roads.

3.2 Traffic Volume Ranges

One of the most useful aspects of road hierarchies is the establishment of traffic volume ranges for each class of road. Yet this is not easy. The existing hierarchies (both national and local) analysed here have come to quite different conclusions in attempting to define traffic volumes for each road class. Some of the hierarchies define traffic volume ranges for each class, while others do not. For those that do define traffic volume ranges for each class, some use overlapping ranges and some use non-overlapping ranges.

The uncoordinated nature of New Zealand's road hierarchies not only complicates the lives of drivers and land developers, but council and national agency staff all have different systems to use and understand. A standard system developed through an inclusive and consultative process would seem to be of significant national benefit.

Standardising the traffic volume ranges for each class is likely to have a number of benefits. There is currently the potential for councils to classify roads as national routes in an attempt to have the roads identified as state highways, whereby maintenance is funded by Transit.

This is more likely to occur in rural areas where road maintenance costs are a very large proportion of all district council costs. But standardisation of traffic volume ranges will ensure that a rural road with a traffic volume of 5,000 vpd is just as likely to be considered a State Highway whether it is in Southland or the Waikato. More important than whether it becomes a state highway or not are the geometric design standards used to design or upgrade the road, and the maintenance regime it is subjected to through its life, which should also be heavily influenced by road class.

It is recommended that a national hierarchy be developed, which, while using traffic volumes and urban or rural characteristics as prime determinants of road class, relies on other qualitative characteristics to determine the class of any individual road. Examples of these characteristics include the relative significance of the traffic function versus the land access function for a particular road, and desirable operating speeds.

The recommended hierarchy would have both descriptive and prescriptive aspects. Roads should generally be classified based on how they currently operate, but consideration should also be given as to how they are expected or desired to function in the future, in terms of not only their traffic volumes but also other characteristics. Thus roads servicing planned growth areas might be classified higher than their current traffic volume would suggest.

Traffic volumes are a very important indicator of road class and are essential to provide a common yardstick from one road to another both within and between jurisdictions. Other characteristics, however, must be considered in determining the classification of an individual road, especially when roads have traffic volumes near the thresholds.

Often different sections of a route exhibit different traffic volumes. When some portions of a route appear to be in one class and others appear to be in another, a judgement call is required based on network continuity, planning needs and overall network functionality.

The use of non-overlapping traffic volume ranges is seen as a way of ensuring that adequate rigour is given to the classification of each road. Overlapping ranges encourage less scrutiny of the classifications of individual roads. There may well be cases where individual roads are classified differently from that suggested by their traffic volumes, but these cases will be the exception rather than the rule, and will ideally be documented in each case.

The principle, however, is that traffic volume is the best indicator of the significance of a road for either the movement of traffic (at one end of the hierarchy) or the provision of access to property (at the other end). Accordingly, non-overlapping traffic volumes are recommended for the national road hierarchy. The traffic volume ranges in Table 3 are suggested for discussion:

Table 3: Recommended Traffic Volume Ranges

Class	Motorway	Major Arterial	Minor Arterial	Collector	Local
Urban	> 30,000	> 20,000	8,000 – 20,000	2,000 – 8,000	< 2,000
Rural	> 8,000	> 5,000	1,000 – 5,000	200 – 1,000	< 200

There is some room for debate about the ideal thresholds between road classes. It could be argued that an urban road carrying more than 1,500 vpd (rather than the 2,000 suggested here) should be a collector, or that the threshold between collectors and minor arterials should be 5,000 or 10,000 vpd (not 8,000 vpd). But the ranges shown in Table 3 are based on analysis of 12 councils representing 20% of the country's roads and are considered to be a good fit. These values are proposed for consultation nationally.

4. Conclusions

While there is widespread support for, and use of, road hierarchies for a wide range of transportation purposes in New Zealand, there is little consistency on road hierarchies. The potential for significant improvements in road safety, asset management, traffic engineering and transport planning exists by developing, adopting and implementing a nationally-consistent road hierarchy and associated design standards and guidelines for all roads.

This paper hopes to build on steady work by Land Transport NZ over recent years by focusing discussion and assisting in reaching consensus on the need for a national road hierarchy for all national and local agencies. It also proposes a set of road class names for urban and rural roads and associated traffic volume ranges.

The proposed merger of Land Transport NZ and Transit provides an ideal opportunity to establish a national hierarchy that will be the envy of the overseas traffic engineering and transport planning world. While the merger of these organisations is underway (and will take some time to be implemented), an industry group could be established to develop this project through the IPENZ Transportation Group, perhaps reporting back through the Road Controlling Authorities Forum or the 2008 IPENZ Transportation Conference.

New Zealand is a small enough country that a national road hierarchy could be developed with relative ease, whereas other, larger countries will have much greater difficulty aligning the systems of many more agencies.

When should we do this? Now is good!

Acknowledgments and Disclaimer
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The views and conclusions in the paper are the author's alone, however, and do not necessarily represent the views of any other parties.

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Road Hierarchies from District Plans

Auckland City	http://www.aucklandcity.govt.nz/council/documents/district/text12.asp
Christchurch City	http://www.cityplan.ccc.govt.nz/NXT/gateway.dll/Christchurch%20City%20Plan/779/2070/2352?f=templates$fn=document-frameset.htm$q=%5Brank%3A%5Bsum%3A%5Bstem%3Aroad%5D%5Bstem%3Ahierarchy%5D%5D%5D$x=server$3.0#LPHit1
Dunedin	http://www.cityofdunedin.com/city/?MIvalObj=dp_chap20&MItypeObj=application/pdf&ext=.pdf
Hamilton City	Pers. Comm. Roger Ward 10 Sept 07
Lower Hutt City	http://www.huttcity.govt.nz/upload/documents/district-plan/pdfs/Chapter-14A1-30.pdf
Manukau City	http://www.manukau.govt.nz/tec/district/dpchapters/chapter8.pdf
North Shore City	http://www.northshorecity.govt.nz/IDSM/IDSM2006/1516.htm
Palmerston North City	http://www.pncc.govt.nz/NR/rdonlyres/1389B7B1-3D60-41E7-B343-43C2AC9AD513/42043/20Transport1.pdf
Porirua City	http://www.pcc.govt.nz/GetImage.aspx?ImageID=8cce73e0-2a5e-4086-bd5f-897ebf0d5be9
Selwyn District	Pers. Comm. Andrew Mazey 6 Aug 07
Upper Hutt City	Pers. Comm. Lachlan Wallach 6 Aug 07
Waimakariri District	Pers. Comm. Ken Stevenson 8 Aug 07
Waitakere City	http://www.waitakere.govt.nz/AbtCnl/pp/districtplan/pdf/policy/appendixm.pdf
Wellington City	http://wellington.govt.nz/services/urban/codeofpractice/pdfs/12appc.pdf

Appendix 1: RSS 16 Road Hierarchies (2001)

During 2001, the Land Transport Safety Authority (LTSA) conducted surveys of all road controlling authorities in New Zealand and published results in November 2001 as Road Safety Survey 16 (RSS 16). The survey report noted:

Survey Results

- All 67 RCAs responding to this survey reported that they had a road hierarchy in one form or another. Fifty nine (88%) had at least one formal road hierarchy and the others had informal hierarchies used by staff (typically to define maintenance levels or design standards).
- Forty nine (73%) had the hierarchy documented in their district plan. Twenty eight of these also had their hierarchy documented in one or more other documents, commonly a RAMM database, asset management plan or engineering standards document.
- The most common purposes cited for hierarchies were for town planning, defining priorities or levels of service for maintenance, and setting road design or construction standards.
- Most of the reported hierarchies (urban and rural) were based on one of two "standard" hierarchies:
    - "State Highway, Arterial, Collector, Local," favoured by smaller authorities, or
    - "National Route, Regional Arterial, District Arterial, Collector, Local," favoured by larger authorities or those near a metropolitan area.
- Most authorities reported they had design standards for the different classes of urban street (75%) and rural road (72%) but reported that they were flexible in the way they applied their standards.
- While nearly all authorities reported an inspection system that identified whether roads were up to the desired standard for their classification, few had inspection programmes specifically for this purpose.
- Similarly, few authorities had specific programmes to upgrade roads to their defined standards or had set aside funds for the purpose.
- The estimated proportion of roads meeting the RCAs' desired standards showed about three quarters considered more than 70% of their urban network met their desired standards.
- Conversely, only 45% thought more than 70% of their rural network met their desired standards.
- About half of RCAs responding to the questionnaire said they had consulted with neighbouring authorities when formulating their hierarchy.
- Only one third of responding authorities said that the regional council had any involvement in formulating their hierarchy.
- About half said they reviewed their hierarchy every five years (to coincide with district plan reviews) or more frequently.
- There was some support for LTSA to produce guidelines on how to classify roads in a hierarchy and for a national road hierarchy.

Recommendations

- LTSA should ensure that the information obtained in this survey is used to derive a national roading hierarchy and appropriate standards for each class of road in the hierarchy.
- LTSA should produce guidelines or a policy document on desirable standards for different classes in a road hierarchy.
- RCAs should implement programmes to systematically upgrade specific aspects of their roading standards (such as road marking and delineation) to provide motorists with a consistent roading environment on each class of road.

http://www.transfund.govt.nz/roads/rss/rss-16.pdf