Transport Impact Guidelines for Site Development

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ABSTRACT

Transport (traffic) impact assessment (TIA) reports are required by most road controlling authorities (RCAs) for site developments of a particular size and potential transport impact. The requirement for, and guidelines around, the preparation of such reports varies significantly around the country. For some site development key transport issues, particularly network effects, are not being addressed. Other countries, including England and Scotland, have developed national guidelines/standards to 1) improve the consistency of assessment around the country, 2) to check that all key issues are being considered in each assessment, and 3) that opportunities for sustainable development are being realised. There is anecdotal evidence that particularly the latter opportunity is not being realised in New Zealand.

Following a review of international literature, particularly from the United Kingdom, but also from Australia and USA a set of guidelines for New Zealand conditions (Land Transport NZ Research Report 327) has been developed. This guideline specifies four levels of transport assessment from a 'basic assessment' through to 'wide area transport impact assessment'. The level of assessment depends on the scale of the site development, with guidance provided on where each level should be considered.

Depending on the level of assessment the guidelines specifies the requirements in terms of the following inputs (some inputs do not apply for lower level assessments); existing site data, existing transport data, committed development, policy, proposed development details, trip generation, sustainable travel initiatives, and capacity testing and mitigation. Guidance is provided on the detail of assessment required for each level, such as whether transport modelling is required. This technical note provides a summary of the new guidelines and a case study example from the South Island for a development where the guidelines have been applied.

INTRODUCTION

The Resource Management Act (RMA) (New Zealand, 1991) sets out the duties of local authorities and other statutory planning authorities to consider the impact of development proposals, including transport impacts. Where the transport impact of a development may impact on effected parties a transport impact assessment (TIA) report is often requested by the local authority. The need for a TIA is normally determined through initial discussions between the developer and the council. It is often dependant on the status of the resource consent (e.g. permitted, discretionary & non-conforming) and whether district plan transport rules are not meet (e.g. insufficient parking provision) or are triggered (e.g. high traffic generator and/or high parking demand).

Unlike other developed countries, there are currently no national guidelines on the preparation of TIA's in New Zealand. Hence there is a significant variation in the assessment of transport impacts of development around the country. With the release over recent years of a lot of central government legislation, national strategies and policy in the transport area there is a greater need for guidance on assessing the transport impacts of developments, particularly with respect to sustainable transport options, favouring walking, cycling and public transport over private motor-vehicles. Many councils have been slow to expand the transport assessment of developments from the impacts of the private motor-vehicle to consider these other modes of transport. Many district plans also lack the policies, procedures and rules that are required to encourage sustainable transport and even high levels of safety and efficiency from new developments.

Other countries, notably Australia, Singapore, USA, England and Scotland, have developed national or state guidelines on TIAs. In Australia the New South Wales Road and Transport Authority (RTA) have a guideline entitled "Guide to Traffic Generating Developments" (RTA, 2002), which is widely used across Australia and to a lesser extent in New Zealand. Of the guidelines for other countries the guide prepared by the Scottish Executive (2005) is considered the most comprehensive and is outlined, along with the other guides, in Collins et. al. (2007b).

The aims of the research study reported in this paper was to understand world's best practice for carrying out assessments and to compile a set of guidelines for New Zealand (see Collins et. al. 2007a) that could be used by transport professionals. The guidelines serve two purposes:

- a guide for those carrying out TIA's that identifies the scope and content of assessments according to development location, type and size;
- A guide for those reviewing such assessments to determine that the content is appropriate to the size, location and type of development being assessed.

SELECTING LEVEL OF ASSESSMENT REQUIRED

The first step in the proposed process is to determine whether a TIA is required. The Council would require the developer, or consultant acting on the developer's behalf to fill out a pre-application questionnaire to submit to the council's planning officer. This questionnaire should provide information on the development in terms of general form, scale and location. The questionnaire should include:

- The type and scale of the development
- The location of the development
- The floor area or number of residential units
- The number of staff working on the site, if relevant
- Peak periods of trip generation
- Parking provision
- The types of vehicles accessing the site

The planning officer would then circulate the application questionnaire within the council for review. The questionnaire is intended to facilitate early discussions regarding the development and not replace contact between the developer and the council.

There are four levels of detail proposed for TIAs, which represent the anticipated level of impact generated by the proposed development. The council will set the required level of assessment following discussions with the developer. The levels of assessments are as follows:

- Basic assessment – the proposed development will have negligible transport impact.
- Neighbourhood transport impact assessment – the proposed development will have a minor transport impact over the local transport network.
- Local area transport impact assessment – the proposed development will have significant transport impact over the local transport network.
- Wide area transport impact assessment – the proposed development will have significant transport impact over the wider transport network.

Threshold guidance for the level of detail required within a TIA is yet to be developed in New Zealand. Thresholds will vary depending on the actual land use type of the proposed development. The number of dwelling units is likely to be used for the threshold limits for residential developments. The majority of other developments will be assessed against the GFA of the development. Where a development consists of a number of different land uses, e.g. retail and commercial office, the threshold should be based on either individual land uses or the combined area, or both, to ensure that these developments are assessed properly.

There is considerable variation in transport conditions across New Zealand, with a variety of rural, semi-rural and urban areas and this precludes determining the most appropriate thresholds for use at this time. It is not a matter of one size fits all and hence the development of land-use thresholds will vary in different regions around New Zealand. Further research is required on this matter.

Further research is also required in a number of other areas. For example what are the best measures to assess the impact of a development. Along links and at intersections the most common measures is Level of Service (LOS), but this measures does not consider safety or many other impacts, such as a variety of environmental and social impacts. In the current climate how is sustainable transport initiatives brought into the assessment.

PREPARING A TRANSPORT IMPACT ASSESSMENT

Depending on the level of detailed required in the evaluation, whether basic or wide area, some or all of the following inputs will be required in an assessment:

- Details on the proposed development
- Current site and transport data
- Details of development already committed to in the area
- Policies relevant to the area
- Trip generation data
- Details of sustainable travel initiatives
- Infrastructure capacity testing and mitigation

Figure 1 shows the process for preparing TIAs. The information to be provided in a TIA for the four assessment levels is outlined in Collins et. al. (2007 a) and summarised below.

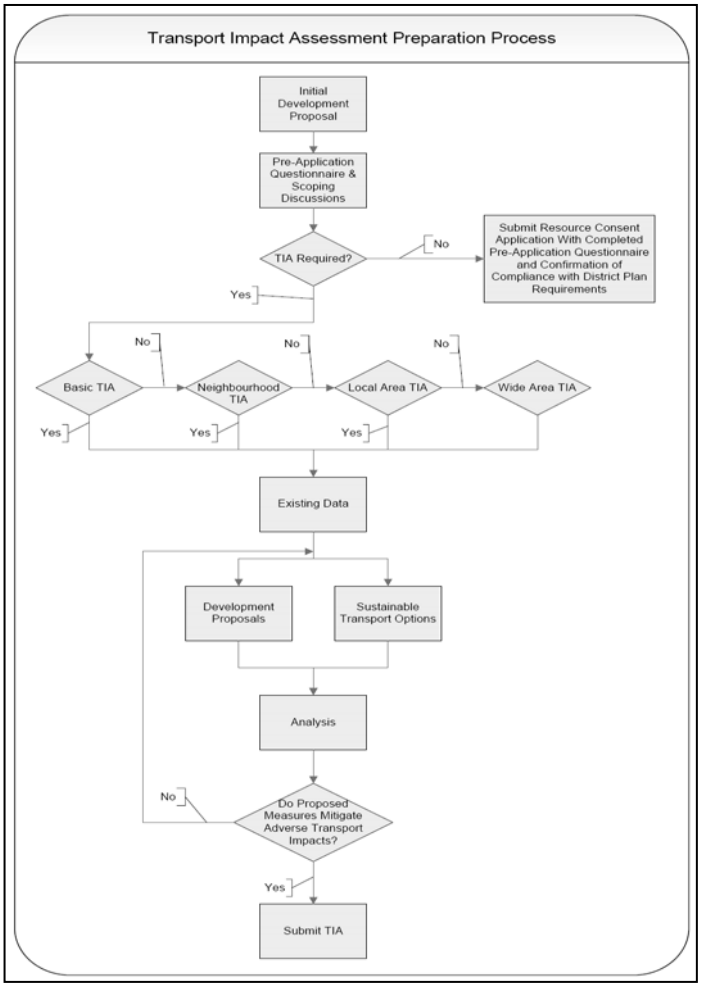

Figure 1 - Transport Impact Assessment Process

A) Basic TIA

Small developments may often have negligible transport impact and, therefore, no TIA will be required to support the resource consent application. In addition, developments complying with the District Plan may also be excluded from the need for a TIA. In this event, a minimum amount of data, such as that required for the resource consent, needs to be submitted (in a letter) as follows:

- a copy of the pre-application questionnaire
- confirmation from the council that a more detailed TIA is not required
- development details confirming that the proposals are within district plan requirements
- confirmation that the development meets all relevant access and parking design standards, including confirmation that site access arrangements meet relevant sight distance criteria
- confirmation that the development will have no significant adverse effects on existing on-site and off-site parking provision.

B) Neighbourhood TIA

A neighbourhood TIA should discuss the transport issues relating to the area within the immediate vicinity of the site. The existing conditions and predicted effects of the proposed development should be set out and compared. A neighbourhood TIA is likely to be required when predicted trips generated by the development exceed a threshold determined by the council or when the detail contained within a basic TIA is considered insufficient, such as when an intersection capacity analysis is needed. The geographical scope of a neighbourhood TIA is unlikely to extend further than a few hundred metres from the development site. The

information required for the neighbourhood TIA will include, but is not restricted to, the following:

- Existing Site Data (site location plan, existing uses, trip generation, access arrangements, existing consents and adjacent land uses)
- Existing Transport Data (walking and cycling, public transport, roading network, traffic flows and crash statistics)
- Transport Polices (from the district plan)
- Proposed development details (site layout drawings, schedule of land uses, operating hours, car parking, cycle parking, travel plan provision for developments, access, servicing and construction impacts)
- Trip Generation, Impact and Mitigation (existing, predicted and net trip generation, trip assignment, site access capacity, drop-off area, off-site network analysis and mitigation measures)
- Model data (any model outputs - likely to be intersection model output)

C) Local Area TIA

A local area TIA should discuss the transport issues relating to the local area surrounding the site. The existing conditions and predicted effects of the proposed development should be set out and compared. A local area TIA is likely to be required when predicted trips generated by the development exceed a threshold determined by the council or when the detail contained within a basic or neighbourhood TIA is considered insufficient. As a guide, the scope of a local area TIA may extend up to a kilometre from the development site. The information required for the local area TIA includes that provided for a neighbourhood TIA, but with the following additions:

- Person trip generation, rather than vehicle trip generation, considering the mode share of existing journeys to and from the site and what changes could be made to increase mode split to alternatives to the private motor vehicle.
- Outline any walking, cycling and public transport improvements that will benefit the development, including details on opening years, key destinations, frequency and journey time improvements.
- Identify sustainable transport initiatives to reduce single occupancy car travel, such as work-place travel plans.
- Consider various trip types, including new trips, linked trips, transfer trips, pass-by trip and diverted trips in assessing increase in traffic volumes on the road network.
- Capacity testing, using models, of site access, drop-off areas and off-site roading network. Development of mitigation measures.
- Peer review and safety auditing of schemes

D) Wide Area TIA

A wide area TIA should discuss the transport issues relating to the wider area surrounding the site. The existing conditions and predicted effects of the proposed development should be set out and compared. The majority of councils will have a traffic model of the main urban areas. This model may be a useful tool to determine the operation of the existing roading network and the impact of the proposed development. A wide area TIA may be required when the transport impact of a proposed development is expected to cover an extensive area. As the TIA with the largest scope, a wide area TIA is likely to be required for large mixed-use or retail developments. The information required for the wide area TIA includes all the requirements of the Local Area TIAs, but over a wider area and to a greater detail, and with the following additions:

- Break down flows into peak and non-peak periods, as well as daily traffic, and assess effects.
- Provide details on special events, where relevant, including frequency, timing during week and anticipated visitor numbers. Provide details on event planning and mitigation measures, e.g. special bus services.
- Outline phasing of the development and consider effects from each stage and what mitigation measures will be required as development progresses.
- Assess mid-block capacity and level of service for key links in addition to the assessment of key intersections.
- Possibly the preparation of a longer-term growth strategy for the area, if the development is part of what will eventually be a much larger development.

CASE STUDY – BUNNINGS (DUNEDIN)

Beca was commissioned in 2007 by Bunnings Ltd to complete a TIA (Durdin & See, 2007) for a proposed new development in Strathallan Street, Dunedin (see Figure 2). The proposed development consisted of a new Warehouse with a total retail area of 12,012m^2 GFA on a 2.2 Ha site, with 269 parking spaces. Three site accesses to the parking area are to be provided, with a separate one-directional driveway for service vehicles at the rear of the store.

Due to the size of the development and expected peak traffic generation (anticipated to be in the order of 260 veh/h (weekday) and 780 veh/h (weekend)) we anticipated that this development would have transport impacts most appropriately addressed with a Local Area Transport Impact Assessment. This decision was based on the expectation at the start of the analysis that the extent of transport impacts will extend to a number of key intersections in the surrounding area.

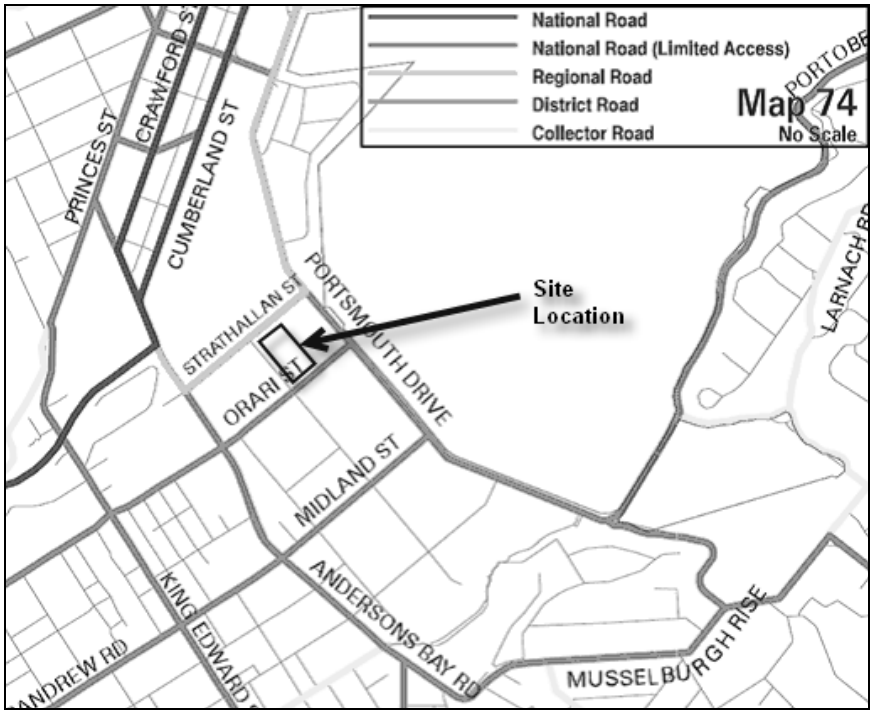

Figure 2: Location of Bunnings Store in Dunedin

A summary of the detail provided in the TIA is provided below:

- Existing Site Environment – site location, roading network, traffic flows, flow patterns, existing intersection performance (six surrounding intersections were modelled using traffic

count and signal data), existing walking and cycling routes, public transport routes, and crashes;

- Future Changes – future roading changes were considered in the TIA due to the sites locality to the proposed Harbour Arterial route, which was anticipated to impact on traffic flow levels on the network surrounding the proposed site;
- The Proposed Development – details of the proposed development (as detailed above) and including site layout drawing;
- Traffic Generation and Distribution – the existing traffic generation from the site was considered, detailed analysis of the predicted traffic generation and distribution was undertaken taking into account the future proposed roading changes in the area;
- Intersection Performance Assessment – the six intersections modelled in the existing site environment section were re-modelled with the new traffic flows and analysed to determine the extent of impact at these intersections due to the new Bunnings Warehouse;
- Parking and Access Assessment – number of parking spaces required and expected parking demand was determined, along with various checks of access layout, location and the like versus the requirements of the District Plan and parking demand at other Bunnings stores in New Zealand. It was found that the District Plan parking requirements were well above observed parking demands at other Bunning stores;
- Conclusion – detailed the expected impacts of the proposed development, and mitigation measures to reduce the impact on the local area.

The Dunedin City Council were happy with the level of detail and assessment completed in the TIA This reinforces that the correct assessment level was chosen at the beginning of the process.

CONCLUSION

The Transport Impacts Guidelines for Site development produced in this Land Transport NZ research project provide advice on the level of detail required for four different levels of development, including; a basic assessment (e.g. one or two residential units), a neighbourhood assessment (e.g. preschool or new shop), a local area assessment (e.g. new school, supermarket or DIY warehouse), and a wide area assessment (e.g. shopping centre or stadium).

As the assessment level increases the amount of information and the level of detail required should increase. Further research is required to define the threshold levels for each assessment level, and this may vary around New Zealand. However, even if threshold levels are set for each assessment level, there should continue to be discretion on the type of assessment required for each development, based on discussions between the developer and the road controlling authority.

REFERENCES

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