THE IMPACT OF HEAVY VEHICLES ON RESIDENTS ON ARTERIAL ROADS AND STATE HIGHWAYS

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This paper describes investigations that have been undertaken on the effect of heavy vehicle traffic on residents. The study focused on sixteen roads in four North Island communities. The roads selected were predominantly regional arterial roads and had heavy vehicle volumes ranging from 2.1% to 32% of total traffic volume. The study had two main components, a residents' survey and an environmental analysis of the roads. Results showed that traffic was the main community concern on the roads surveyed. Heavy vehicles were perceived to be a particular problem by residents in Gisborne and Whangarei. Concern about heavy vehicles in these cities appeared to cut across a wide range of people. However, heavy vehicles were most likely to concern women, households with children, and people at home during the day. The level of concern was not related to the actual volume of heavy vehicles but to the perceived volume, especially any perceived change in volume. The main concern about heavy vehicles appeared to be the nuisance that they caused. Heavy vehicles were one of the main contributors to complaints about vehicle noise and vibrations. In addition, comments about exhaust fumes often related to heavy vehicles. They were also the major contributor to perceived negative effects of traffic and roads on property values. The environmental survey revealed few differences in road environment between roads where residents mentioned disliking heavy vehicles and those where they did not. The only differences that emerged were differences in change in noise level when heavy vehicles passed and differences in the noise protection afforded by fencing, trees, and house construction.

Introduction

The number of kilometres driven per year by heavy vehicles is steadily increasing. Between 1998 and 2001 the total distance travelled by heavy vehicles increased by 17% from 2873 million kilometres to 3355 million kilometres (Baas & Bolitho, 2003). It is clear that heavy vehicles are becoming an increasingly prevalent feature in the road environment.

Some studies have focused on how other road users react to heavy vehicles. For example, Charlton, Newman, Luther, Alley, & Baas (2002) found that general road users often have negative perceptions of heavy vehicles. However, in New Zealand, there has been little systematic research into how residents on main truck routes are affected by heavy vehicles. While district and city councils do receive and record resident complaints, those that lay complaints generally represent only a small proportion of the total group exposed to the heavy vehicles. Therefore, this study aimed to conduct a systematic examination of the effects of heavy vehicles on a broad distribution of residents.

While there is little available research that focuses specifically on this issue, the findings of a few studies provide valuable insights into community interactions with the transport system. Dickson, Davey and Henderson (1980) conducted a study to examine the effects of street traffic on residents and to determine the relationship between those effects and traffic volume. Two hundred and thirteen residents of North Shore City (Auckland, NZ) were surveyed. The results of this study showed that over half of respondents spontaneously noted traffic as a dislike. Interestingly though, there was no specific correlation between general dislike of traffic and traffic volume. There was however, a significant correlation between driver-related effects (such as access to property, the need to adjust departure and return times, and the effect of traffic on visitor parking) and volume. Residents reported that traffic affected various aspects of their lives including, walking/crossing the road, visitor parking, use of the front of their property, their health, and opening windows. Dickson et al (1980) also noted several demographic effects. Awareness of traffic was stronger among women, household with families, and younger residents.

Another, more recent, piece of research regarding the effect of traffic on residents was completed by Ludvigson (2002). This study reviewed ten resource consent submissions relating to traffic issues. The results of this review showed that the community response to traffic issues was extremely diverse and multi-faceted. It also clearly demonstrated that responses to traffic issues were often mediated by a change in the traffic environment (e.g. increasing volume). The main perceived effects of traffic included impacts on walking, cycling, or driving in the neighbourhood, health concerns from exhaust fumes, impact on children's play and transport to school, and effects on property condition and value.

Taken together these studies clearly indicate that residents are affected by traffic in general. However, they provide little information about the specific effects of heavy vehicles on resident's lives. Therefore this study conducted a survey to gather detailed information about the effects of heavy vehicles. The survey was conducted with four communities in the North Island of New Zealand. Across these communities roads were chosen that had differing volumes of heavy vehicles, and the responses of residents on these roads were compared. In addition, a full environmental analysis of each road was conducted, recording details such as geometric configuration (number of lanes; width,

presence of islands etc), road lighting, type and condition of the road surface, and the nature of the houses in the area. Finally, suggestions for remedial treatments that might alleviate some of the concerns about heavy vehicles expressed by residents were made.

Methodology

A range of New Zealand communities were surveyed. Roads were selected in Auckland, Mount Maunganui, Whangarei, and Gisborne. These cities were chosen because the traffic issues they face are representative of those experienced by many New Zealand communities. They also represented a range of community types with both large and small population bases. Whangarei was of particular interest because of the relatively large number of logging trucks that use its roads. Gisborne was of interest because of increases in the number of heavy vehicles using its roads during the picking season for horticultural industries and the number of logging trucks.

The roads selected for surveying were classified as either regional arterial or state highway, except for Crawford Rd in Gisborne, which is used as a shortcut to the Gisborne Port. The roads were selected to reflect a range of percentages of heavy vehicle traffic, ranging from 2.08% to 32% of total traffic.

Residents Survey

The residents survey was developed to provide information on the following issues:

- Perceptions of heavy vehicles in relation to other community issues (e.g. amenities or schools)
- Perceptions of heavy vehicles in comparison to other traffic issues (e.g. traffic volume, extended traffic peaks, or speed)
- Specific effects of heavy vehicles on lifestyle and behaviour

The questionnaire was structured around the findings of Ludvigson (2002) who showed that the effects of traffic on communities could be grouped into four main categories; danger, nuisance, environmental, and social effects. The findings of Ludvigson (2002) and Dickson et al (1980), outlined in the introduction, also provided the basis from which response categories were developed.

Respondents were deemed eligible to participate in the survey if they were over 16 years old and were residents of the house. They were not required to own the home, to be one of the main caregivers, or to hold a drivers licence. Interviewers approached every second house on both sides each road until they had collected approximately 20 surveys. The questionnaire took approximately 25 minutes to complete.

Environmental Survey

The aim of the Environmental Survey was to create a record of observations and measurements of the physical attributes of roads. The survey was intended to aid researchers in assessing whether road attributes had any impact on residents responses to the residents survey. The environmental survey form was based on one created for the Auckland Car Crash Injury Study (ACCIS), a research project undertaken by the Injury Prevention Research Centre at the University of Auckland. For this study, additional features were added including noise measurements, recording of the type of house construction, and separation between the road and dwellings fronting that road.

The survey included questions about the type of road surface, street lighting, physical features of the road (geometry, gradient, lane markings, widths, and footpath and verge), details of the surrounding area (type of house construction, distance and elevation of dwellings from the road boundary), and general residential ambience and amenity. Traffic speed, noise readings, and photographs were all taken. Data for the environmental survey was collected in off-peak traffic hours.

Noise readings were taken using a Quest 2400 Sound Level Meter. Readings were taken at kerbside and property boundaries on both sides of the road. Readings were taken every 10 seconds for 8-10 minutes. In addition, each time a truck passed a separate reading was also taken. Readings were taken from a hand held position approximately 1 metre above the ground, with the meter directed at right angles to the kerbline. In windy conditions, a foam filter was used. The methodology employed was not intended to give absolute estimates of noise levels in the areas surveyed. Rather, it was intended to provide researchers with a general impression of the background level of noise and also a measure of the level of noise the heavy vehicles generated.

Traffic speed-readings were taken using a Marksman LTI 20.20 laser speed gun. Each road was surveyed for approximately 10 minutes in each direction. Again, the speed measurements were not intended to provide a comprehensive outline of speeds, but aimed to identify the range of speeds that vehicles were travelling at in the area.

Results

Residents Survey Results

The response rate for the residents survey across all centres was 67.48% (a total of 255 surveys were completed). The sample was approximately evenly divided between males and females. Respondent age ranged from 16 to over 60 years. However, only seven respondents in the 16–20 age group completed the survey so it is possible that the concerns of this group may not be adequately reflected in the results.

Perceptions of Heavy Vehicles in Relation to Other Community Issues

The first objective of this survey was to examine how concerns about heavy vehicles fitted into the broader picture of general community concerns. Figure 1 (below), shows that many respondents were concerned about traffic in their communities. It is notable that 177 respondents (69.4%) stated that they disliked at least one issue related to traffic. Eighty four respondents mentioned disliking the traffic in general (33% respondents). This was followed by heavy vehicles (20%), traffic noise (18%), and traffic volume (11%). The highest ranked non-traffic issue (lack of facilities) was mentioned by less than ten respondents (3%).

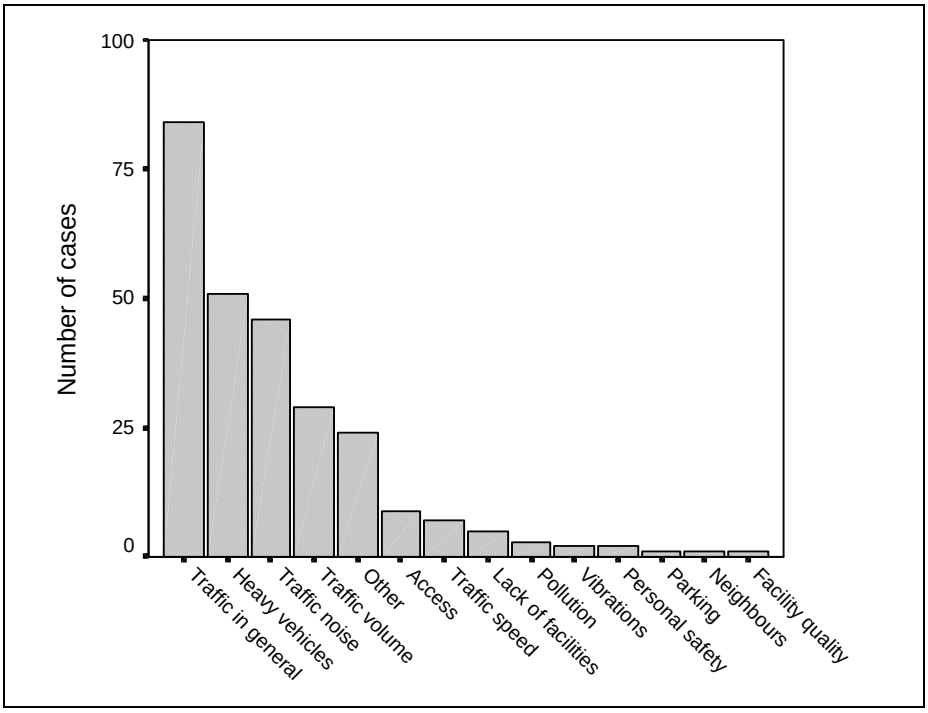

Figure 1. Dislikes/Concerns about Living in Community

Residents in Gisborne (50%) and Whangarei (30.2%) were significantly more likely to mention heavy vehicles as a dislike than those from Auckland (2.5%) and Mt Maunganui (4.2%) ($\chi^2 = 67.793$, df = 3, $p < 0.01$). This response did not follow traffic count data which showed that roads in Auckland and Mt Maunganui had substantially higher heavy vehicle volumes than those in Gisborne and Whangarei. Within the communities of Gisborne and Whangarei, respondents who were home during the day, were female, or had children living in the household were most likely to mention that they disliked heavy vehicles.

Perceptions of Heavy Vehicles in Comparison to Other Traffic Issues

The second objective of this research was to assess the impact of heavy vehicles in relation to other traffic issues. Respondents were asked to rate the danger and nuisance of the traffic and roads in their area and list the perceived causes. In addition, they were asked about the effects of the traffic and roads on their property and environment.

The analyses of perceptions of traffic danger showed that Aucklanders rated the danger of their roads as significantly lower than other communities (Kruskal Wallis = 8.099, df = 3, $p < 0.05$). Therefore these groups were separated for further analyses. The aspects of traffic that Aucklanders rated as most dangerous were traffic speed (68%), access (39%), and traffic congestion (36%). The aspects of traffic that non-Aucklanders rated as most dangerous were traffic speed (87%), busy intersections (59%), and trucks (56%), access and congestion were also frequently mentioned (see Figure 2). Comments from non-Aucklanders showed that concerns about traffic speed and access were often related to the speed of heavy vehicles.

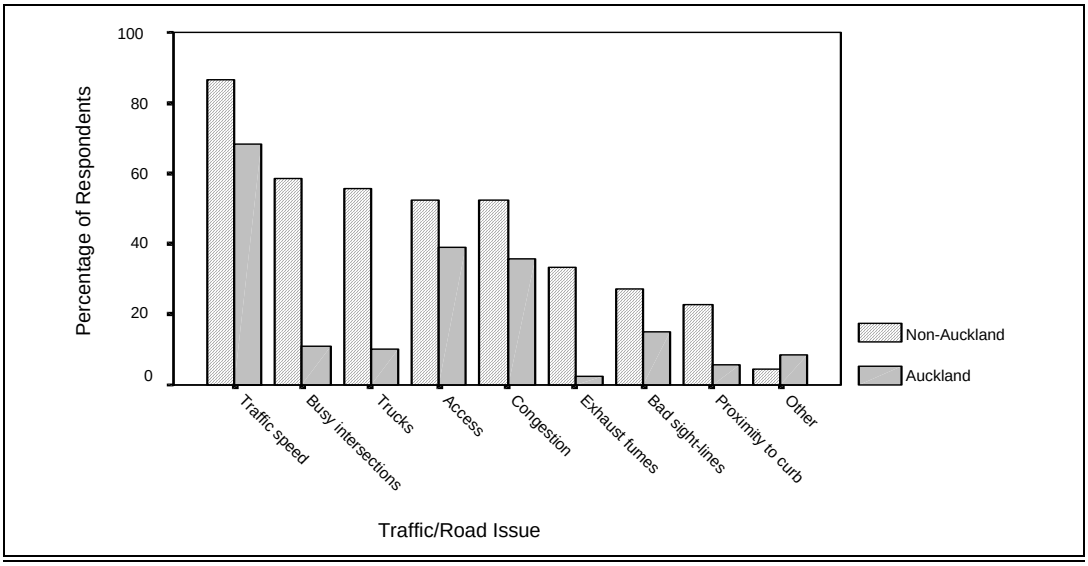

Figure 2. Perceived Danger of Traffic

Perceived Nuisance of Traffic

Analyses of ratings of nuisance showed that households with children were significantly more likely to rate the traffic as a nuisance than those without children (Mann-Whitney U = 6282.500, z = -2.402, $p < 0.05$). Therefore, these groups were separated for further analysis. As Figure 3 shows, the perceived causes of traffic nuisance were similar for both groups. The most commonly mentioned nuisance factor was traffic noise, often noted as truck noise (71.7% of households with children and 56.1% of those without). Households with children were significantly more likely to state that traffic noise was a nuisance ($\chi^2 = 6.604$, df = 1, $p < 0.05$). Traffic vibrations were also a commonly noted nuisance factor (particularly truck vibrations), and congestion was also often mentioned (51% of households with children and 43% of those without).

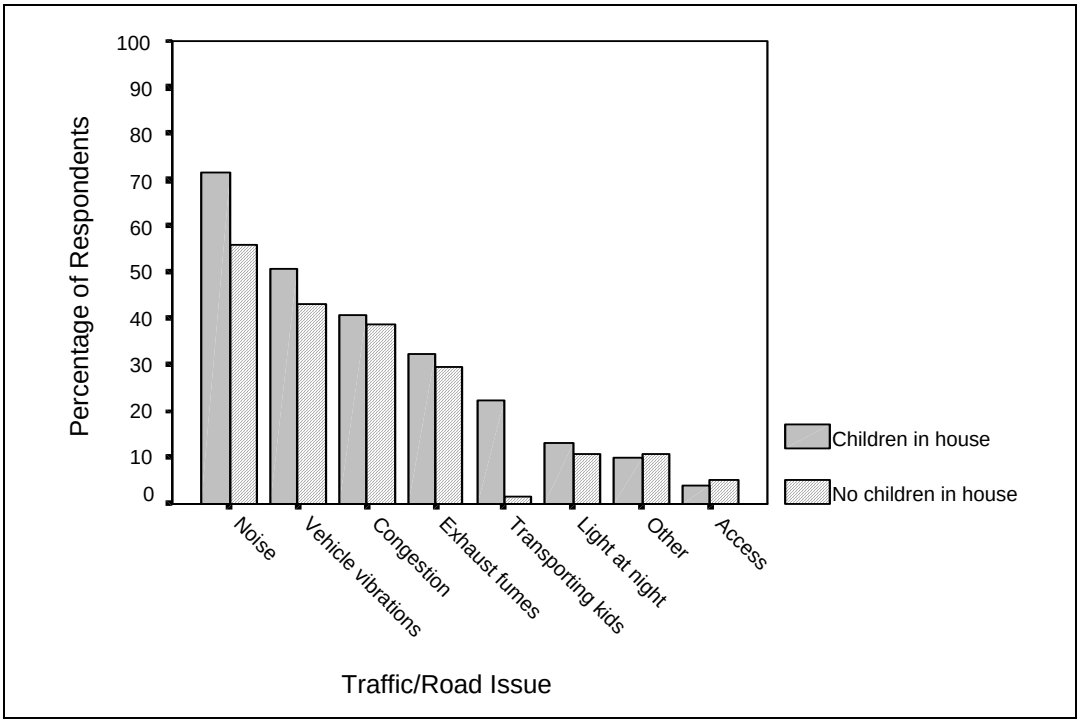

Figure 3. Perceived Causes of Traffic Nuisance

Perceived Effect of Traffic on Property

Homeowners were asked to rate how much the traffic and roads in their area affected their property. Analyses showed that Aucklanders rated the effect of traffic on their property as significantly lower than other cities (Kruskal Wallis = 8.059, df = 3, $p < 0.05$). In addition, for older respondents (over 60 years) the effect of traffic was significantly lower than for younger respondents (Kruskal Wallis = 17.540, df = 3, $p < 0.05$). Overall, the most commonly mentioned issues were loss of property value (59.35% of those who owned their own home) and loss of access (42.58% of those who owned their own home). Aucklanders were more likely to mention access as an issue and residents of other cities were more likely to mention property value as an issue. Few people planned any changes to their property as a result of these concerns.

Perceived Effect of Traffic on the Environment

Nearly half of the residents surveyed indicated that they had some concern about the effect of the traffic in their area on the environment. Aucklanders appeared to be slightly more concerned about fumes than residents of other cities. Gisborne residents seemed more concerned about noise than residents of other cities. A total of 27.9% of those living in Gisborne stated that noise was an environmental concern for them, compared to 14.2% of those living in Auckland, 16.7% of those living in Mt Maunganui, and 9.3% of those living in Whangarei. This result was statistically significant ($\chi^2 = 8.151$, df = 3, $p < 0.05$).

Effects of Heavy Vehicles on Lifestyle and Behaviour

The third objective of this research was to investigate the specific effects of heavy vehicles on residents' lifestyle. Residents were asked questions about the effects of heavy vehicles on their transport choices, recreational activities and use of their home.

Figure 4 (below) provides an outline of responses to these questions by city. As the figure shows, responses for all cities were fairly similar, with the biggest concern for all groups being the effects of heavy vehicles on family activities. However, there were some notable differences between cities. Aucklanders tended to be slightly more concerned than other groups about the effects of heavy vehicles on road based activities (cycling, driving, transport choice). In addition, Aucklanders, (27.4%) and Mt Maunganui residents (22.7%) were significantly much more likely to indicate that heavy vehicles affected their choice of transportation ($\chi^2 = 7.987$, df = 3, $p < 0.05$). By comparison, residents of Gisborne and Whangarei were significantly more likely to be concerned about the effects of heavy vehicles on their family activities, and property use. In terms of family activities, 68.7% of Gisborne residents and 58.5% of Whangarei residents felt that heavy vehicles affected their family activities (compared to 45.8% of Mt Maunganui residents and 35.1% of Auckland residents. This result was significant ($\chi^2 = 22.206$, df = 3, $p < 0.01$). In addition, respondents living in Gisborne (43.3%) and Whangarei (41.5%) were significantly more likely than those living in Auckland (24.7%) or Mt Maunganui (20.8%) to indicate that heavy vehicles have an effect on their use of property ($\chi^2 = 8.315$, df = 3, $p < 0.05$).

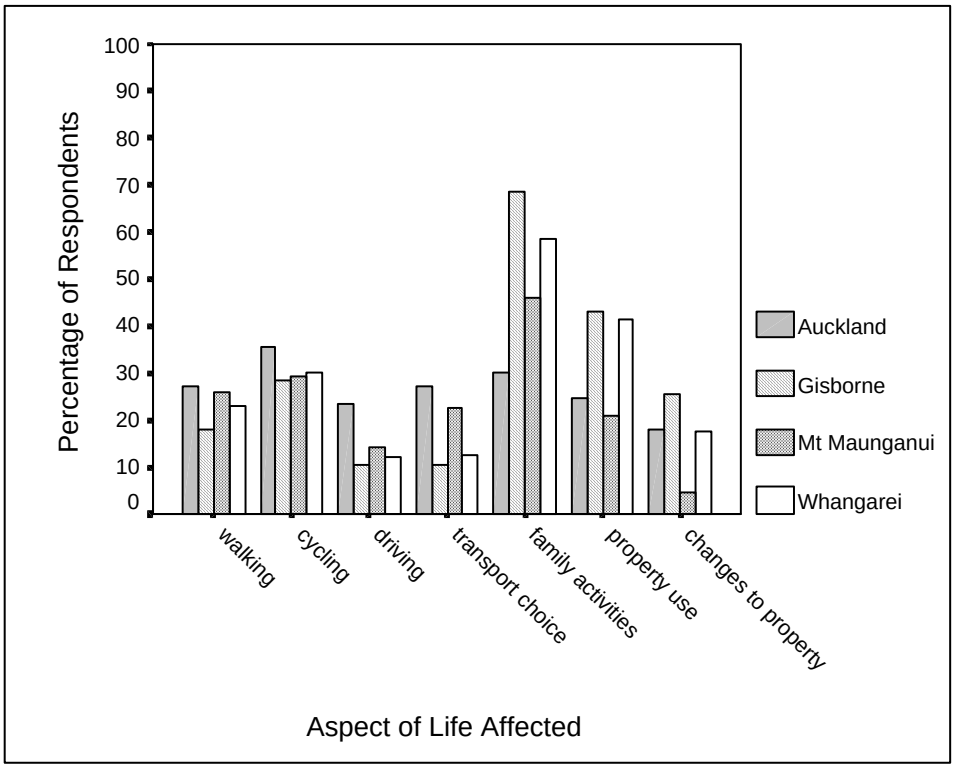

Figure 4. Specific effects of heavy vehicles on residents' lives by city

Finally, respondents were also asked what time of day they were most affected by heavy vehicles. Respondents in all cities except Mt Maunganui most frequently mentioned being affected by heavy vehicles at night and in the early hours of the morning (Auckland 24%; Gisborne 36.8%, Whangarei 37.21%, compared to 0% in Mt Maunganui). Most respondents in Mt Maunganui stated that the heavy vehicles did not affect them at any particular time of day.

Environmental survey results

The results of the environmental survey were collated and divided into the two groups based on the results of the residents survey. The groups were: roads where the majority of residents spontaneously mentioned disliking heavy vehicles, and those where the majority of residents did not mention disliking heavy vehicles. In effect, this meant that roads were divided by community because residents in Auckland and Mt Maunganui generally did not mention disliking heavy vehicles, whereas those in Whangarei and Gisborne typically did.

A comparison of road geometry and vehicle speed between the two groups showed very few differences. The average speeds were similar (and generally within 5kph of the speed limit). There was no notable difference due to the type of road surface where residents mentioned that they disliked heavy vehicles and those that did not. In addition, there were also few geometric differences between the roads. In particular, the distances between resident's houses and the traffic were similar on all roads.

However differences between groups were observed in relation to recorded noise levels and house construction types. Comparisons of noise levels showed that on roads where residents mentioned disliking heavy vehicles the average change in noise level from general background noise to when a truck passed was, on average, 21 db at the kerbside. For roads that did not mention disliking heavy vehicles the change was, on average, 16 db

at the kerbside. At the boundary the average noise level change for roads that mentioned disliking heavy vehicles was 20 db. For those that did not, the average noise level change was 17 db. Therefore it seems that on roads where residents mentioned that they disliked heavy vehicles there was generally a greater change in the noise level when a heavy vehicle passed. The distance of a dwelling to the traffic lane did not appear to be related to residents' likelihood to indicate that they disliked heavy vehicles, however the level of the dwelling in relationship to the road level may have had some influence. The group that disliked heavy vehicles had dwellings that were mostly level or near level to the road.

House construction can impact on the level of noise and vibrations from vehicles that might be felt within the building. As part of the environmental survey, details about the type of noise protection (fencing, trees etc) around properties in the roads surveyed was recorded, as was the type of house construction. Most areas surveyed had minimal to moderate noise protection. However, on roads where residents mentioned disliking heavy vehicles the noise protection was consistently rated as minimal. In addition, on the roads where residents mentioned that they disliked heavy vehicles, house construction was almost always characterised as light weight/low cost construction. By comparison, on the roads where residents did not mention disliking heavy vehicles, the houses were often described as timber and brick/moderate cost or solid construction/high cost.

Conclusions and suggested remedial treatments

The objectives of the resident survey were threefold: 1) to assess how much of a concern traffic and heavy vehicles are in comparison to other community concerns; 2) to assess how much of a concern heavy vehicles are in comparison to other traffic concerns, and; 3) to establish the specific effects of heavy vehicles on residents' lives and activities. In addition, the environmental survey aimed to record any differences in road geometry and driver behaviour between the roads surveyed.

For communities on arterial roads and state highways, the traffic is one of the main community concerns. Heavy vehicles were perceived as a particular problem by residents in Gisborne and Whangarei. Concern about heavy vehicles in these cities appeared to cut across a wide range of people. However, heavy vehicles were of particular concern to women, households with children, and people at home during the day.

It is interesting to note that residents of Gisborne and Whangarei were much more likely to state that they were affected by heavy vehicles, despite the comparatively low numbers of heavy vehicles on their roads. Therefore, it appeared there was no direct link between the number of heavy vehicles on the road and how residents felt about them. This result concurs with the findings of Dickson et al (1980). It is also notable that perceived, rather than actual, heavy vehicle volume was significantly related to respondents' ratings of overall traffic danger, nuisance, and heavy vehicle safety. This indicates that perceptions about heavy vehicles did have a notable impact on the way respondents felt about their environment generally.

In terms of general traffic concerns, heavy vehicles were not perceived as particularly dangerous with traffic speed being perceived as the biggest danger. However, if residents felt that the heavy vehicles were speeding through their area then they tended to consider them very dangerous. Heavy vehicles were perhaps the biggest nuisance factor mentioned by residents. They were the biggest contributor to complaints about vehicle noise and vibrations. In addition, comments about exhaust fumes often related to heavy

vehicles. They were also the major contributor to perceived negative effects of traffic and roads on property values. It is clear that heavy vehicles were a significant nuisance factor for the communities surveyed.

The environmental survey revealed few differences in road environment between roads where residents mentioned disliking heavy vehicles (Gisborne and Whangarei) and those where residents, generally, did not (Auckland and Mt Maunganui). The only differences that emerged were differences in change in noise level when heavy vehicles passed and differences in the noise protection afforded by fencing, trees, and house construction.

It is therefore interesting to speculate about why Gisborne and Whangarei might be particularly affected by trucks. It is possible that the size and nature of the heavy vehicles that use the roads in these communities may be the cause. Residents in both communities commented about logging trucks. Anecdotally, residents considered logging trucks to be a bit more dangerous and intimidating than other trucks. It is also possible that more trucks use the roads in these communities at night, however, the traffic count data available to the research group did not have the level of detail necessary to confirm this hypothesis. It is also possible that the increase in heavy vehicle kilometres driven per year noted by Bass and Arnold (1999) has affected these communities more than Auckland and Mt Maunganui. As Ludvigson (2002) notes, community responses to traffic issues are often mediated by a change in the traffic (e.g. increasing volume). What is clear is that there are no 'quick fixes' to help the communities particularly affected by heavy vehicles (e.g. changing seal types). Therefore, more detailed remedial treatments must be examined. Phase three of this study (outlined below) involved developing possible remedial treatments for residential areas affected by heavy vehicles.

Suggested Remedial Treatments

The main concerns these residents tended to mention in relation to heavy vehicles were traffic noise and vibrations (particularly at night), exhaust fumes, and vehicle speed. The effects of these issues on residents lifestyles tended to be related to household activities (talking on the phone, watching television), children's activities (riding bikes on the road, transporting children), using the front of the property, cycling and property values. Therefore, the remedial treatments suggested below aimed to specifically address these issues.

Many of these issues are inter-related and may therefore be addressed by an integrated approach to road design. For example, design that encourages heavy vehicles to slow down may not only alleviate residents concerns about vehicle speed but may also help to reduce their concern about noise and vibrations. In addition, speed reduction measures that contain lane narrowing may also serve to create a 'soft barrier' between residents and heavy vehicles.

Suggested remedial and mitigation treatments

Perceived problem	Objective of treatment	Possible remedial or mitigation treatment	Benefits	Disbenefits	Recommendations
1. Speed	Slow speed of trucks down	1.1 Narrow road	Perceived to be safer	May impact on cycle lanes	Suggested

		1.2 Speed humps	Speeds slower	Increase noise level	Not Suggested
		1.3 Reflectorised raised pavement markers	Provides a visual perception of narrowing the road, thereby reducing speeds	May increase noise if trucks and vehicles drive over them	May be appropriate in situations where the travel path of vehicles is kept within the lane.
2. Noise	Reduce noise for residents	2.1 Double glazing	Reduce noise in the inside of the dwelling	Residents may object. Costly	Suggested
		2.2 Reclad exterior	Reduce the noise attenuation properties of the dwelling	Residents may object. Costly	May be appropriate for dwellings with a light weight construction
		2.3 Provide landscaping on road verge or within properties	Provides a visual interruption of the traffic	May impact on visibility from driveways or to pedestrians.	Suggested
		2.4 Noise attenuation fence	If constructed appropriately may reduce noise level in front yard and dwelling	Severs communities, and isolates residents	Not Suggested
		2.5 Resurface with “quiet” road surface material.	Reduce road tyre / road surface noise*	Costly	Suggested for roads with high volumes of traffic, or where heavy vehicles traffic is expected to increase significantly
		2.6 Increase the level of monitoring and maintenance of road surface	Reduces noise by reducing the possibility of an uneven road surface. Reduces vibrations		Suggested
3. Vibrations	Reduce perceived level of vibration	3.1 Slow speed by road narrowings as in 1.1 above			Suggested
		3.2 Reseal road with quieter surfacing material	Reduces noise. Smooths surface	Costly	Suggested
		3.3 As in 2.			Suggested
4. Sleeping / resting	Provide basic quiet period each night	4.1 Adopt a by-law prohibiting nighttime HV traffic (possibly between hours 10pm – 6am)	Ensures there is a quiet period each night	Requires Local Govt Act. Transport and commercial operators may object to any	Suggested on roads that are predominantly residential, with lower volumes of general traffic; and as a mitigation measure

		daily.		restrictions to working hours.	where heavy vehicle volumes are expected to increase significantly
5. Family activities	Provide "safer" environment	5.1 As in 1.1, 2.1 and 2.3 above			Suggested
6. Walking / Cycling	Provide "safer" environment with good cross connections over roads	6.1 Introduce pedestrian / cyclist central refuge islands at regular intervals	Increases residents' ability to walk or cycle. Improves sense of community. Slows traffic speeds	Introduces no stopping parking restrictions outside residential houses.	Suggested
		6.2 Install signalised pedestrian crossings to cater for vulnerable road users such as young and elderly pedestrians.	Increases residents' ability to walk or cycle. Improves sense of community.		Suggested where appropriate
7. Exhaust	Reduce the level of exhaust fumes	7.1 As in 2.3 and 4.1			Suggested

**To further reduce the tyre / road noise, restrictions on the type of tyres used would assist. This requires legislation that is beyond a Local Government by-law; and is therefore not considered a practical option for these case studies.*

The full report is available from the TERNZ website www.ternz.co.nz

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Appendix A – Roads Identified for Surveying

City	Road Name	Location	Road Classification	AVERAGE VEHICLES PER DAY (7 DAYS)	AVERAGE HEAVY VEHICLES PER DAY (7 DAYS)	% HEAVY VEHICLES PER DAY (7 DAYS)
Auckland	Mangere Rd	North of Hospital Rd	Regional Arterial	42000	13440	32.0
Auckland	Greenlane West Rd	West of St Andrews Rd	Regional Arterial	10656	3908	26.83
Auckland	Hillsborough Rd	West of Cape Horn Rd	Regional Arterial	13200	1710	13.0
Auckland	Remuera Rd	West of Waiatarua Rd	Regional Arterial	12200	1590	13.0
Auckland	Donovan St	West of McFadzean Drive	Regional Arterial	18500	1480	8.0
Auckland	Kepa Rd	East of Patterson Ave	Regional Arterial	23400	1400	6.0
Auckland	West End Rd	East of Fife St	Regional Arterial	17000	510	3.0
Auckland	Manukau Rd	North of Turama Rd	Regional Arterial	12992	276	2.1
Tauranga	Maunganui Rd	East of Hewletts Rd	State Highway	35247	2081	5.9
Gisborne	Awapuni Rd	East of Stanley Rd	State Highway	5400	500	9.0
Gisborne	Lytton Rd	South of Gladstone Rd	Regional Arterial	6900	350	5.0
Gisborne	Wainui Rd	South of Rutene Rd	State Highway	10800	330	3.0
Gisborne	Crawford Rd	Full length	Minor Road	900	160	18.0
Whangarei	Manu Rd	West of Western Hills Dr	State Highway	18184	927	5.37
Whangarei	Hatea Dr	South of Nixon St	Regional Arterial	16673	906	5.75
Whangarei	Mill Rd	North of Nixon St	Regional Arterial	14429	488	3.5