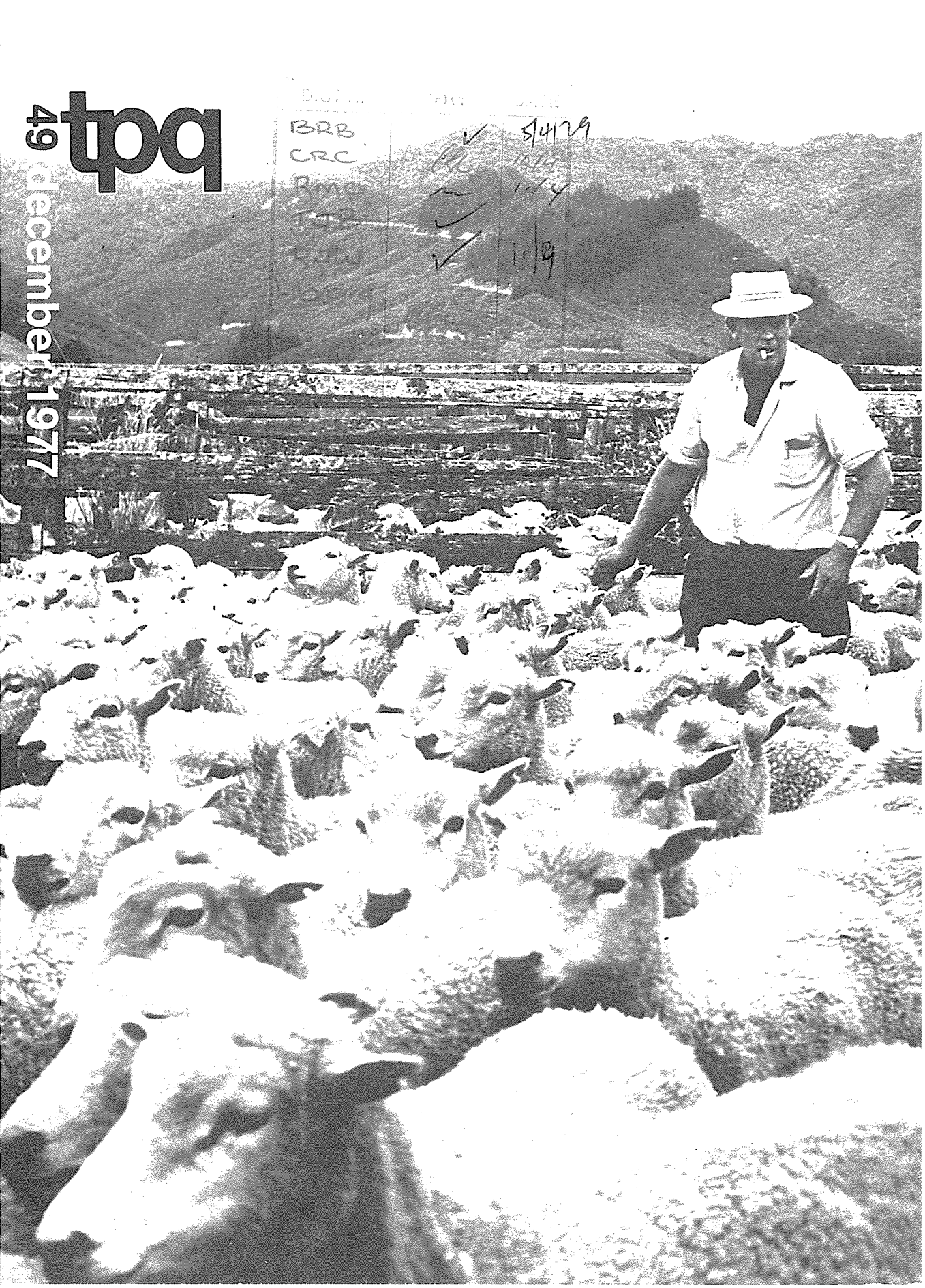
tpq 49

december 1977



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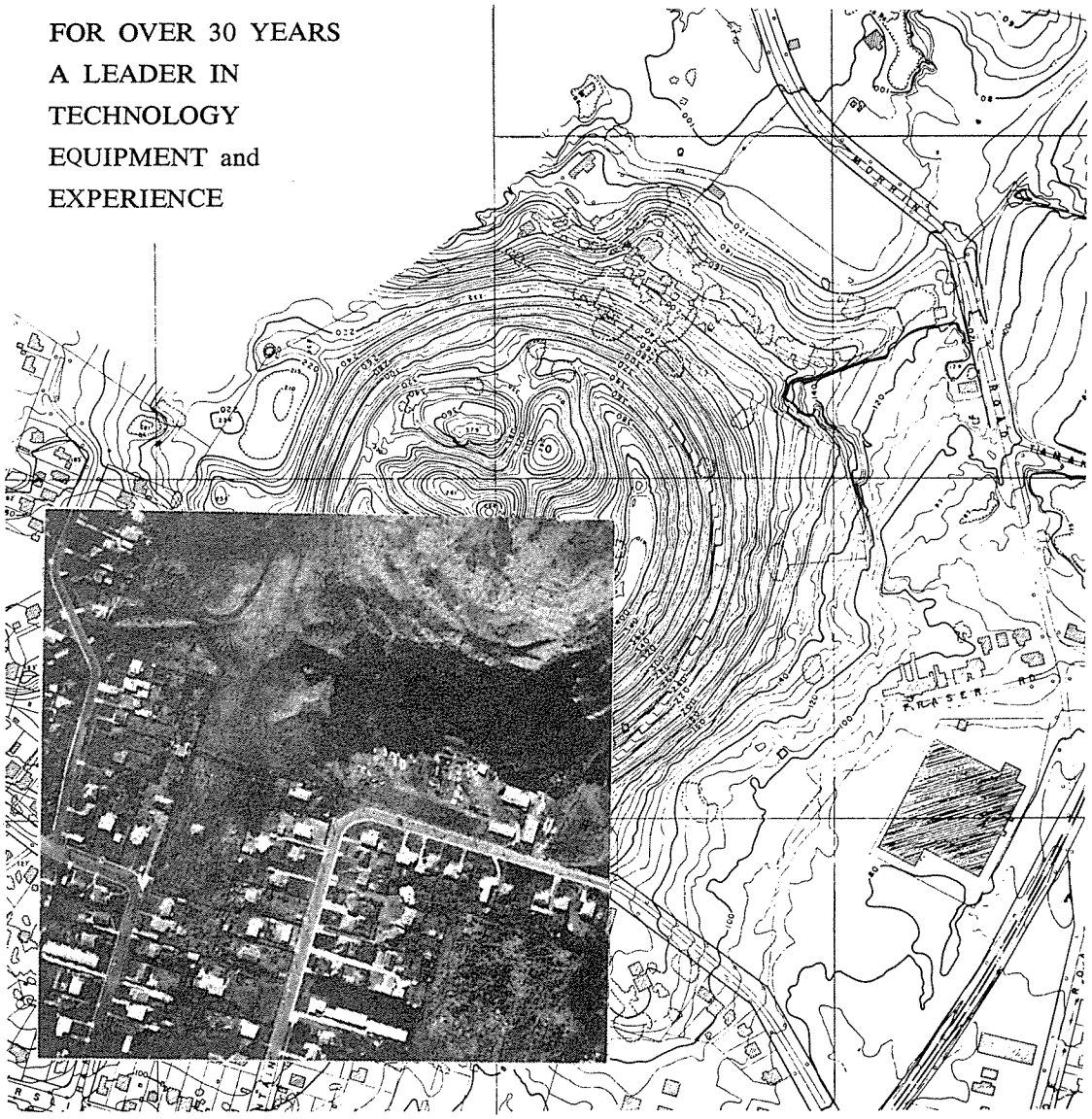

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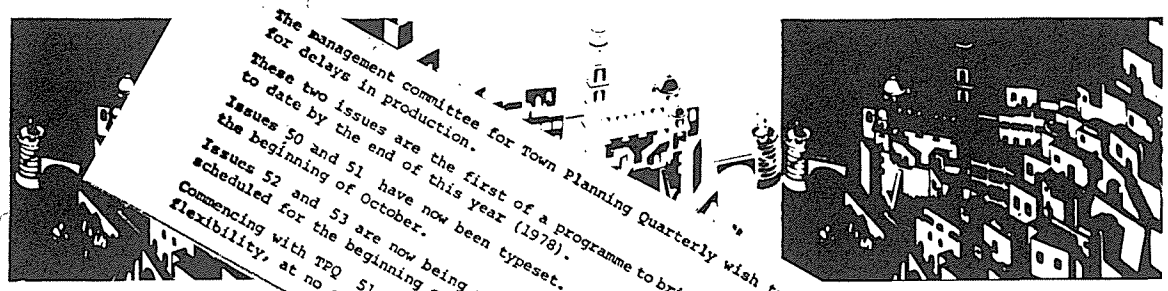
Town Planning Quarterly

Number 49
December 1977



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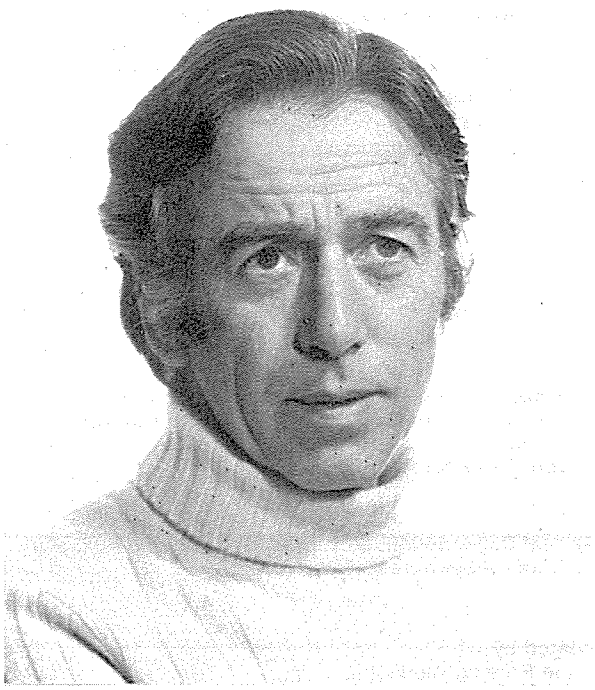
The Editorship

This issue marks a kind of mid-stream handing over of the editorship of the Town Planning Quarterly, from Jim Dart to Dinah Holman. Both have had a hand in this issue.

Jim has been editing the Quarterly for many years, and this editorial page is the rightful place of honour for the following tribute from Professor Robert Kennedy:

Early in 1964 Jim Dart and I discussed the possibilities of the Department of Town Planning at Auckland University producing a modest size journal that would keep ex-students informed on planning matters likely to be of interest to them. The Department had no money for such a venture, the small staff too much engaged in teaching to spare the time and energy to be given to what we thought would be a continuing publication; temporarily the idea was dropped.

Sometime later Jim Dart said he had found a man, Dick Scott, who was apparently prepared to publish a town planning journal as a commercial proposition — provided that he had the Department's help in doing so. I confess that I was sceptical of the proposal, all the technical and professional journals that I knew of were either heavily subsidised or largely dependent on the revenue to be obtained from advertisements. A journal circulating in the then so few, small and scattered planning offices in New Zealand was unlikely to get much support from the advertisers of machinery, plant, equipment or trade materials.



After talks with Dick Scott and Jim Dart I still remained sceptical, the most the Department could do was to find articles and news suitable for publication. Jim Dart said he was prepared to do just this and on that basis Dick Scott said he would go ahead, without financial help, and publish a town planning quarterly with himself as nominal editor of material that could be supplied to him.

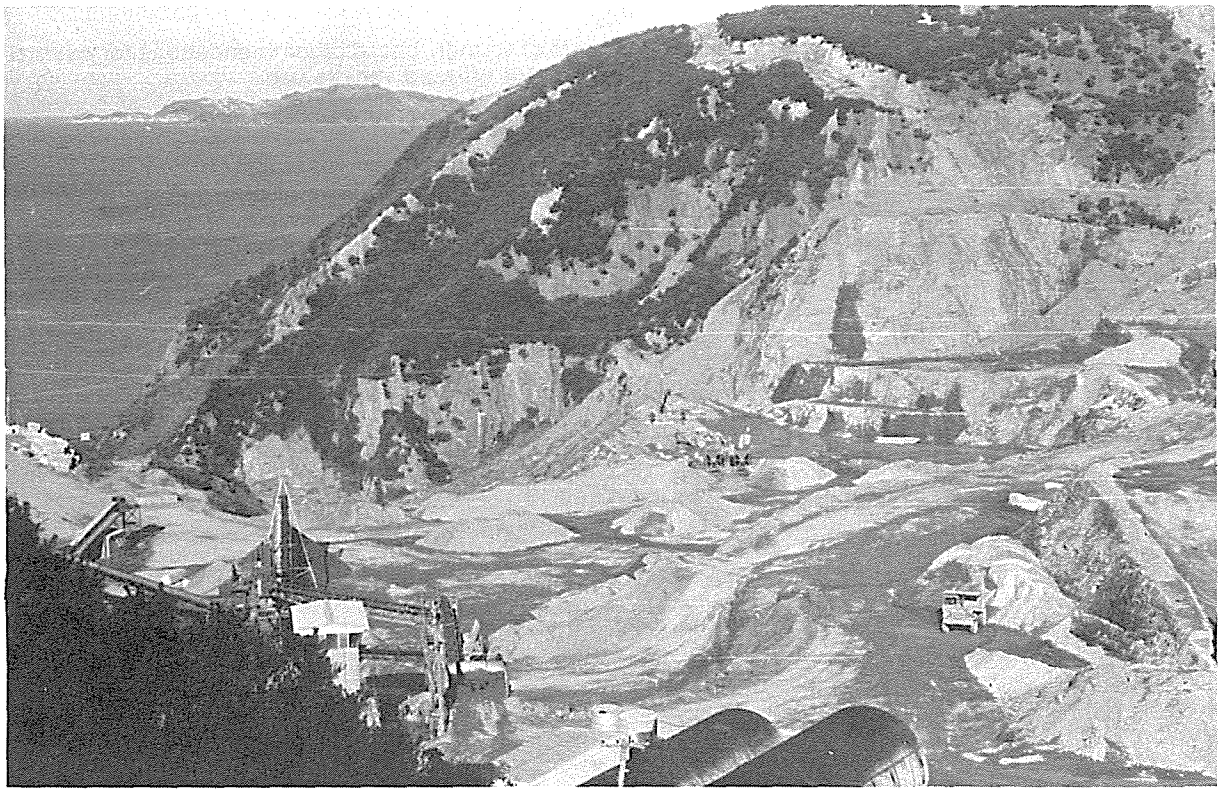
Publishing with printing and distribution is a "business" and a difficult one in itself (I doubt Dick Scott made any profit at all during the seven years he was the publisher of the TPQ). Finding and selecting materials for publication whilst not a 'business' is equally, if not more, difficult and even more troublesome. From the first number of the TPQ dated June 1965 Jim Dart has, through thick and thin — and there has been plenty of the latter — nursed and guided every issue. It has been Jim Dart who from the beginning has been the real editor, the one that decided the standard and contents of forty seven issues of the TPQ.

With ever rising publication costs and severely handicapped by the inability to offer even a modest fee for any published article Jim Dart must have always been conscious that a worthy N.Z. publication "Community Planning" had soon 'flopped' for want of continuing support in the 1930's. The TPQ has not only survived for nineteen years, it has grown in size and format of issue, is well established as the official journal of the New Zealand Planning Institute and now enjoys a circulation no longer confined to erstwhile and qualified town planners.

There have been occasions when some of Jim Dart's editorial comments have, not surprisingly, raised a few eye-brows and sometimes a few hackles but a thoughtful and well-informed editor who does not fear to express his honest opinion is absolutely invaluable, not least in the work of town planning which suffers much from loose and excessive verbiage and far too many platitudes.

Only half an hour before the announcement was made at a planning conference in Christchurch in May 1965 that the TPQ first number was soon to be published I was asked if the Department of Town Planning would help in creating and regularly supporting a proposed section of "Local Government" to be devoted solely to planning matters. The invitation was a tempting one but it had to be declined. I have had no regrets. Under the guidance and firm editorial control of Jim Dart the TPQ is a journal in which NZ town planners can take some pride — it is their own, they should also be deeply grateful for all that Jim Dart did to start off the TPQ and thereafter giving it his long, unpaid and unstinted service.

R.T. Kennedy



Geology and Planning

Martin Ward
Commission for the Environment

A search through back-numbers of this journal revealed what is to me an astonishing lack of material on the role of earth science in planning. Environmental earth science, and more specifically environmental geology, has had great encouragement in the United States and Europe in recent years as local government and their planners have been forced by natural and some quite unnatural events to take greater account of earthquake faults, flood plains, unstable slopes and low value, high bulk density, mineral resources.

A guide to the importance to planners of earth science information can be found in a study from California which estimates that property damage and the dollar equivalent of life loss directly attributable to geologic processes and conditions, and the loss of mineral resources due to urbanisation, will amount to more than $55 billion in California between 1970 and the year 2000 The proportion of loss attributed to various geological problems is given in the following table:

Geological Problems:	Percentage of Total Loss:
Earthquake Shaking	38
Loss of Mineral Res.	30
Landsliding	18
Flooding	12
Erosion Activity	1
Expansive Soils	0.3
Fault Displacement	0.15
Volcanic Hazards	0.1
Tsunami Hazards	0.1
Subsidence	0.05

It is not hard to identify New Zealand urban areas to fit each of these categories. Tahunanui landslips in Nelson City, loss of sand, gravel and peat deposits in the Hamilton region, unstable soils on the Christchurch Port Hills, and flooding in many localities.

Environmental geology is defined by Flawn (1970) as dealing with the consequences of an industrial society's use of the earth — with resource problems, geologic hazards, and earth tolerance for immense volumes of wastes. It is axiomatic that this earth science information is socially orientated; it is for land use planning.

Town and Country Planning Act amendments in 1966 and 1971 introduced this subject to the planner with these inclusions in the schedule of matters to be dealt with in District Schemes;

"Control of development in areas containing earthquake faults or land likely to be affected by

geothermal activity, flooding, erosion, landslip and subsidence and other special areas" and "Areas likely to be used exclusively or principally for the development of mineral resources".

Let me add two "other special areas" that should be spelled out;

"Land likely to be affected by volcanic activity"

"Ground water recharge zones".

For the guidance of planners, Town and Country Planning Bulletins cover these aspects, and land refuse disposal, another subject for which earth science information is essential. That is 30 percent of the Bulletins produced.

My geologist's view of district schemes and their reviews as well as individual large development proposals, suggests that too little account is taken of earth science factors, notwithstanding the wide availability of earth science information. Basic, broad scale geology, soils, and land capability maps are available for most of the country and more detailed information can be collected quickly by trained personnel. Microzoning maps for earthquakes are available for some areas and basic hydrological data for most river systems. Qualitative slope stability and small catchment hydrology studies are not time consuming. Detailed and careful appraisal of special problems related to coastal erosion, volcanic or geothermal areas, protection of groundwater recharge zones and definition of mineral resources, may however require more detailed and lengthy study.

This list of necessary earth science applications may also be used to illustrate some notable instances where earth scientists have worked with planners to good advantage — urban geology studies in Whangarei and Waipawa for instance. A truly innovative study is the Wellington Regional Planning Authority's report on off-road vehicles, where geology and geography skills have produced a set of soundly based recommendations for optimal areas for off-road vehicle use.

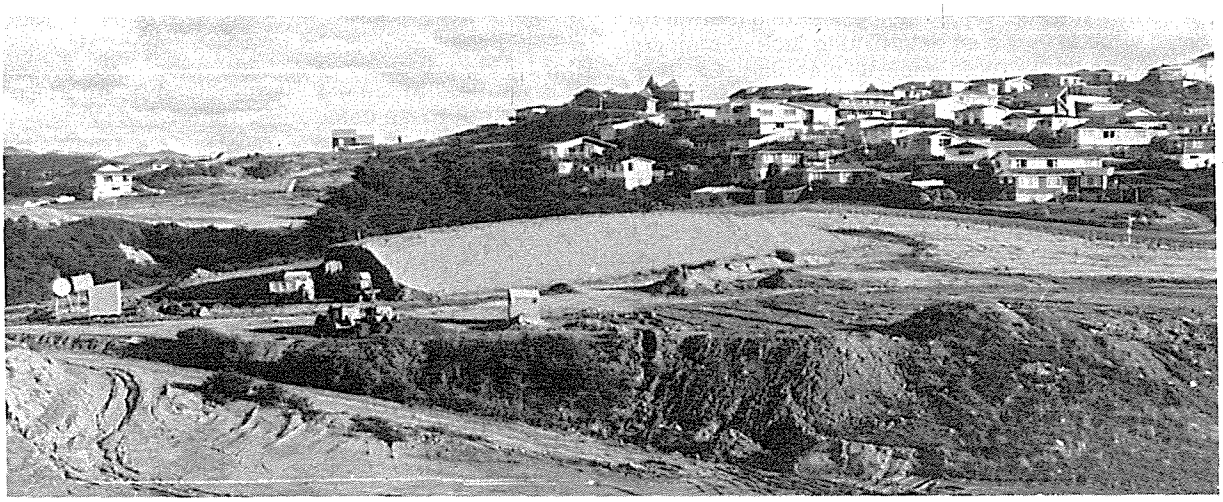
Mineral deposits are a special point of common concern for planners and geologists. The Mining Act does not bind prospecting and mining operations where minerals are privately owned. Thus for the majority of mining operations in this country, local bodies provide the principal, if not the only regulation.

Fast disappearing are the days when land ownership was the principal determinant of quarry sites. That luxury is being replaced in this time of diminishing resources by zoning on the basis of mineral abundance or suitability. Professional advice for this information as well as ordinances and conditions relating to mine lay-out and rehabilitation is required.

If this earth science information is available, why then is it overlooked? Mainly I think because it tends to be scientific. Geologists tend to think that geology is so fundamental to practically any land use that its place in the planning process is assured. However, most geological maps have time classified rock units rather than physical property classifications, for instance.

We do not have enough applied scientists or professional geologists, hydrologists, etc. to bring this information into planning nor planners with earth science background. Few as there are, professional geologists are there, so next time you pull together a multidisciplinary planning group, add the geologist to your geographer and landscape specialist.

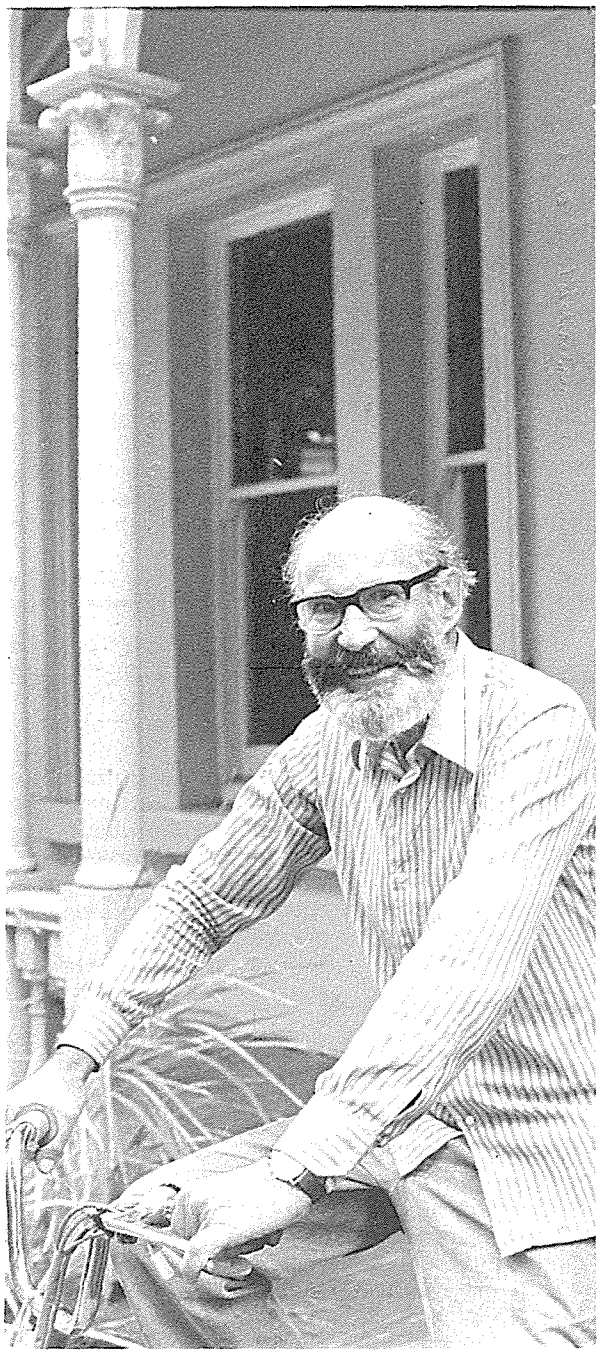
Note: Two professional groups will assist with enquiries concerning applied geologists:
The Australasian Institute of Mining and Metallurgy
Hon Sec. NZ Branch P.O. Box 6342 Wellington
The Geological Society of NZ Inc
Hon Sec. P.O. Box 30-386 Lower Hutt



Gerhard Rosenberg

At the end of 1977, Gerhard Rosenberg retired from the staff of the Department of Town Planning at the University of Auckland.

There is only one Gerhard. He is one of those people whom no one could ever possibly mistake for someone else. To give a rounded view of such rich individuality, it seemed fitting to ask several people who have known him in different situations over the years, to each write a piece to mark his retirement.



When I first met Gerhard Rosenberg in 1963 the Town Planning Department was quite a different place. Staff and students were all in one building, lectures were held in the same building and we all had 'drawing' desks. Except for Gerhard, everyone else was on the same floor — he was a more down to earth being, close to the garden and the library; he was also about half way to the School of Architecture Common Room. When we ,moved down the road to the present building he still remained closely attached in spirit if not body to architecture and urban design. But he brought with him a constant link with the School of Architecture which was increasingly valuable during the 'cultural revolution' when most of us were rubbishing 'civics' and 'urban design'. Gerhard resolutely stuck to his belief that good urban design remained an essential part of the planning process. In spite of enormous good humour Gerhard always seemed to expect things to fail, so whenever he had successes his joyous reaction was spontaneous and very contagious. This was the basis of the 'last planning show' when Gerhard and myself appeared on different sides of the Great Parnell Kindergarten Kase. I was arguing that reserves were not the place for such enterprises and Gerhard argued that it was going to happen anyway so it may as well be better 'planned'. He then set about redesigning his client's proposal. He may be right — if it was going to be done (as it was) it may as well be done properly — a point of view to which we should all pay more attention.

I will remember him not so much for things he taught me, of which the details have now been absorbed into an important general influence, but for something he once said when I was a student. On the way out to redesign the Point Chevalier Shopping Centre (or was it the world) we were all talking about size when Gerhard remarked, apropos women, 'never mind the size think of the flavour'. Now he has retired the Department will miss his flavour.

M.H. Pritchard

I can't remember much of what I was taught in the formal lecture of the Town Planning course but I can remember many of the things that Gerhard said — even if I can't quite reproduce the accent with which he said them. How on earth do you spell "agora" the way Gerhard pronounced it?

Lecturing did not seem to come easily to Gerhard — he had so much knowledge but could not quite work out how to impart it to people who had not had the advantage of a classical education with its emphasis on Latin and Greek.

I admired those students who industriously took notes during his lectures. I never could — his lectures were meant to be listened to as a whole and one had to listen to pick up those gems of wisdom, common sense and humour with which they were sprinkled.

I valued his courtesy and loyalty towards his students and to their ideas and particularly their right to have ideas. His door was always open for discussion and his vast collection of books and papers available for borrowing.

I remember with pleasure his spontaneous anger and language when some bikie roared up Symonds St and interrupted his train of thought, but most of all I treasure his look of delighted amazement when a picture of a naked woman appeared on the screen instead of the Cathedral at Ravenna.

J.F. Graveson

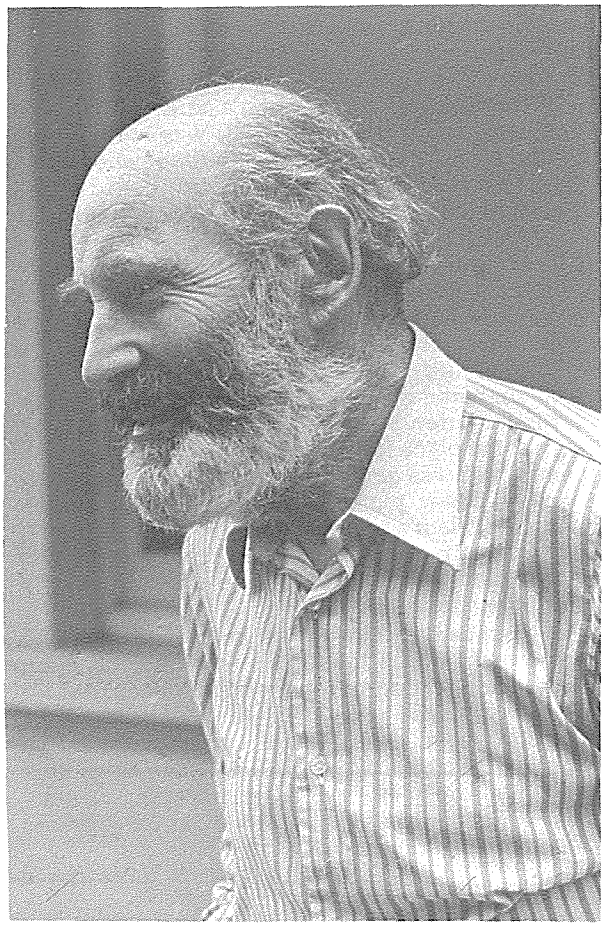
The disciplines of architecture and planning **are** related and it is certainly interesting if not essential for planners to understand and to use architectural concepts and practices. Many a budding planner has sat staring at a seemingly endless supply of colour slides and listening to Gerhard's delightfully accented commentary. They have absorbed, almost by osmosis, a spatial appreciation which probably had never occurred to them before. Gerhard opened our eyes to the built environment all around us, and in helping us to understand its function and effect on Man made us all better planners.

J. Conway Stewart

When Robert Kennedy arrived in New Zealand in 1957 to take up the first Chair of Town Planning at the University of Auckland, Gerhard Rosenberg was already established as a Senior Lecturer with the School of Architecture. They joined forces to conduct the first post-graduate one year diploma courses, but Gerhard always kept **a** foot in both camps. He lectured in civics to students of architecture and in aspects of town design to town planning students. The situation reflected his dilemma; he could never quite reconcile himself to the thought that there was a fundamental difference between urban planning and urban design. It was both his weakness and his strength: his strength because he was always striving to marry the two. He lectured enthusiastically on Geddes, but his heart was with the school of Unwin, Abercrombie and Sharp. He adopted Lynch and his 'city image' concept. He used the phrase "the quality of life" long before it was fashionable so to do. He looked to Jung and introduced students to the world of feng shui. He established a special rapport with Asian and Polynesian students and sought, sincerely and modestly, to understand the tradiitonal culture of the Maori.

As a colleague, I shall remember Gerhard for many things: the constant sound of his prolific typewriter across the passageway; his frequent great bursts of laughter; his way of being always the first to laugh at his own mistakes and misfortunes; his willingness always to help students and friends in distress; the hiar-raising rides in his motor car as he drove with nonchalant disregard for other vehicles on the road; the many discussions on planning practice and planning philosophy. May he live long and well in retirement.

J.R. Dart



Rural Subdivision Controls in Franklin County

K.D. George
Town Planning Officer
Franklin County Council

Paper prepared for NZPI Workshop on Rural Planning, 17-19 November, 1977.

Introduction:

Like many counties, the Franklin County in its District Scheme (recommended in December 1960) specified the normal subdivision requirements in the Rural A Zone as 10 acres (4.0469 ha) with a 5 chain (100.58 m) frontage to a public road. This of course stemmed from the fact that under the Land Subdidivison in Counties Act 1946 and subsequently Part II of the Counties Amendment Act 1961, lots created with an area of over 10 acres (4.0469 ha) did not require approval of county councils.

It wasn't until the passing of the 1966 Amendment to the Town and Country Planning Act 1953, which inserted Section 33(4) into the Act, that the Council was able to consider increasing the minimum subdivision requirements in rural areas. Because of the large number of 10 acre (4.0469 ha) subdivisions coming before Council for a certificate under Section 33(4) and resulting in the creation of rural lots with long mutual rights-of-way for legal access, the Council increased the minimum subdivision requirements from 10 acres (4.0469 ha) to 50 acres (20.2343 ha) as from 1st January 1970. Like most schemes, there was no policy on subdivision expressed in the Scheme Statement.

The 1971 Reviewed District Scheme

The First Reviewed District Scheme advertised on October 1971 retained the 50 acre (20.2343 ha), later amended to 20 hectare, minimum section size, with a 10 chain (201.17 m) road frontage, later reduced to 200 metres. Reference was made to "economic farming units" but this technique was not successful. A few 20 hectare subdivisions were approved and the dispensation provisions as contained in most schemes, were administered freely and subdivision of rural lands continued. Provision was also made for Joint Family Home subdivisions, subdivisions for rural workers (following conditional use approval for dwellings) and for conditional use approvals. Policies and statements about subdivision in all zones were incorporated into the Scheme Statement.

To give authority to dispensations granted for retirement purposes, Change No. 5 to the District Scheme introduced retirement subdivisions for farmers who had farmed the subject property for a minimum period of 10 years. The ordinance specified several provisos which Council chose to ignore, except the one relating to a normal maximum permitted size of 7500m².

Change 27:

This change, introduced in September 1976, revised the policies and ordinances for subdivision in the Rural A Zone. The basic philosophy behind the change is that in the Rural A zone a wide range of uses are stated as predominant uses. Each of these have their own land area requirements and an examination of such uses as dairy farming, sheep farming, forestry, market gardens, orchards and glass houses shows this situation. Basic policies provide for subdivisions to create an independent farming unit defined as

> "a separate parcel of land which is capable, when farmed to its fulll capacity, of continually producing sufficient income to provide a reasonable standard of living for an average family without the use of other land, while taking into account the type of farming proposed and the soil types of the land concerned."

Subdivision policies are also provided in the Scheme Statement for residential uses, including sites for dwellings for rural workers (conditional use), joint family homes, and retirement homes. For other predominant and conditional uses the area and frontage requirements are to be appropriate to the use proposed. Provision is also made for subdivisions for runoffs. These policies are set out in Part IV of the Scheme Statement.

The provisions in the Code of Ordinances set out the requirements for the various use categories and also indicate that dispensation and waiver provisions (See 21(1A)) do not apply to subdivision for rural purposes in the Rural A Zone. For farming subdivisions the purchaser of each lot is required to be named and the intended use of the lot specified, together with information to show that the land will be used as an independent farming unit.

Administrative problems:

The major problem in administering Change No. 27 is that people purchasing the new lots specify their intentions to use land for a stated purpose and then once the subdivision has been approved, build a dwelling and graze the land. The Council is however looking at the question of requiring the proposed purchaser to enter into a "bond" for say $1000 requiring the establishment of the use proposed within two years of the date of approval of the subdivision.

Other problems have arisen by the District Land Registrar issuing title to underlying Crown Grant Allotments and hence "subdividing" land in the Rural A Zone contrary to the provisions of the District Scheme. To overcome this situation, the Council has recently advertised Change 42 to its district scheme, which restates policies for dwellings in the Rural A Zone and amends the provisions in the Code of Ordinances.

Conclusions:

No method of rural subdivision control is perfect. The techniques outlined in Change 27 are seen to have their problems but relate more to permitted uses of land rather than the arbitrary standards imposed previously. Stating policy on all subdivision in the Scheme Statement is seen as a vast improvement, and does make administration of the subdivision controls more effective. In conclusion no matter how good the techniques of rural subdivision control are, they are only as good as the politicians wish them to be.

Land Quality Assessment for Town and Country Planning

T.H. Warburton

Paper prepared for NZPI Workshop on Rural Planning 17-19 November 1977.

Country planning

Recent legislative changes and others which are pending highlight the very limited expertise in country planning in New Zealand. Developments are likely to be so rapid that for some time town planners will be required to fill the gap. In doing so it is imperative that an essential difference between rural and urban land assessment must be recognised. By this I mean that agreement must be reached on an acceptable land grading formula incorporating (a) land quality grading (b) water availability grading (c) environmental feature grading.

The 4 percent of the New Zealand land mass which we loosely call 'first class land' is year by year becoming a more precious national asset, but strangely there has been no real effort to define this land in terms of its real productive potential. Rather we have relied upon maps of soil types, which have so often left the door open to legal squabbles between people with theoretical rather than practical knowledge of the productive capacity of the soil.

Clearly New Zealand's agricultural production, and this includes horticulture, has just left the crossroads, and is inching its way along a path where pastoral farming and traditional horticulture is being supplemented by — in some cases taken over by — newer and more intensive forms of arable and horticultural production.

Parallel to this recognisable change has come the issue of energy farming. Two short years ago the mention of this term conjured a picture of off-beat dreamers, but today it is emerging as practical in economic terms, and probably necessary in terms of mobile energy supply. The answer being currently sought is which types of energy farming are going to be the most economically sound and environmentally desirable.

Whatever may be our individual opinions on the direction and pace of our general development, the one inescapable fact is that the pressure for increased production will be far greater on the 4 percent first class land than the land of lesser productive capacity.

In both the Town and Country Planning Act 1953 and the new Town and Country planning legislation the objective of preserving the first class land is quite clear. Unfortunately the new legislation leaves the door wide open for legal advocates to (a) influence planning committees and appeal boards that land is of lesser quality than is claimed and (b) that particular demands in specific areas are such that the land preservation objective be temporarily set aside. Further, in the main, the final decision-making on the value of the land to the nation will be in the hands of committees, the personnel of which are in many cases neither trained in land quality evaluation nor qualified to make decisions which are really of national rather than of local interest — be they from regional councils or whatever.

Town planning has become a very skilled and specialised profession. Now, clearly, a new dimension has been added, that of rural or country planning. This will no doubt become the task of the current qualified town planner but frankly it is an area where very few people have adequate qualifications. It is essential therefore that our town and country planners — and I mean all of them — agree upon and apply standardised techniques. The pending changes in local body structure mean that urgency must be accorded planning expansion. It is doubtful whether the New Zealand Planning Institute can expect re-vamping courses to be laid on. Rather, I believe, it is an internal responsibility for the Institute itself. But in doing so the Institute should not underrate the importance of consulting people knowledgable in the various facets of rural planning.

Much of this country's first class land is on the fringe of the urban areas, and is often in the line of desired expansion. Naturally home builders prefer to build upon good land, so that the acquisition of this land rather than poor land continues. The objective of a land grading formula is to ensure that, planners and decision makers will have at their disposal a procedure which will give practical effect to the immediately clear directive in the new legislation on land conservation and the water and soil classification.

Much of this fringe land on urban perimeters has already been well classified into soil types by the Soils Bureau, but in many cases some of the lighter soils have, in my view, been rather written down. The lighter soil, providing adequate water is available, can be the best of all for winter horticultural production. If we look at this land in terms of the formula it may be classified, soil 6, water 1 (or 2). This, I believe, is of considerably more value to the nation than soil 3 and water 4 or 5. The point is that it is the combination of water and soil grading, rather than soil alone, which would influence a highly qualified horticulturalist or arable farmer to judge the potential productivity of the land.

If there is a shortcoming in the formula it is the failure to take into account the rainfall pattern of the district. In areas where a consistent twelve month rainfall pattern (about 165 mm) exists there may be a

case for playing down water availability.

And who would be responsible for doing the grading? I would say no more than 'people best qualified to do the job', but I would hope that as years go by some type of formal qualification would be mandatory.

Land grading formula

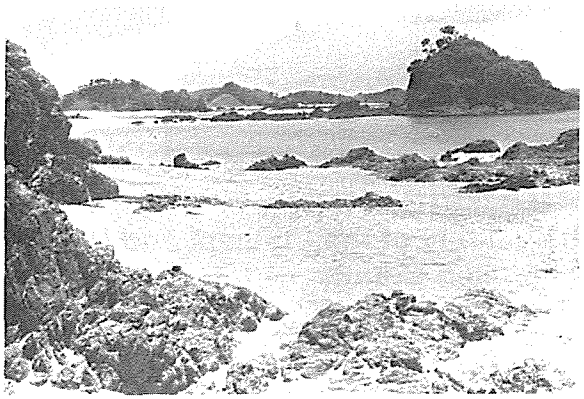
A land quality grading system could be introduced, similar to that operating overseas but instead of the 1 to 5 spectrum it could be spread to have a 1 to 20 spectrum. Under this grading, I would expect land of the finest type that we find at Pukekohe and on the Heretaunga Plains to be classified as 1 or 2. Moderate arable land would probably be graded about 7. Associated with the land grading system would be a water resource grading and environmental feature grading.

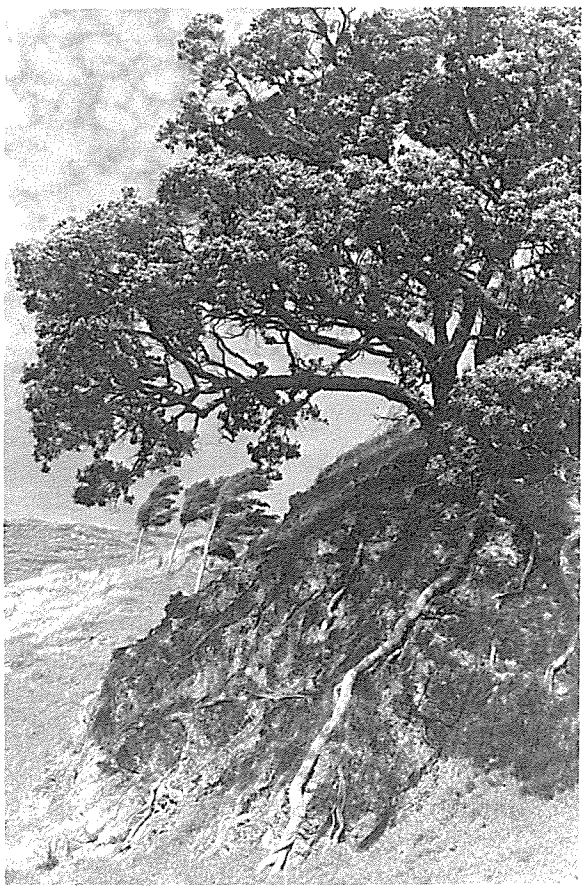
The water resource grading could be based on a spectrum of 1 to 5, with a grading 1 having ample surface water continually available for irrigation. Grade 2 would have ample, near the surface, underground water available. Grade 3 would have deep level water available. Grade 4 would have no water available, but may at some time in the future be incorporated in a man-made irrigation scheme. Grade 5 would have no water and little prospect of it. Within this water grading would have to be recognition of the higher rainfall areas where only at exceptional times would growth suffer through lack of rain.

The third grading would be on an environmental basis. For example, if some rural land were being considered for urban subdivision, and on it were pockets of good native bush or other desirable environmental features, they would be documented for consideration and preservation. In other words, when a town and country planning committee or the planning tribunal is considering an application for change of zoning or specified departure, it would have before it details, prepared by experts, of land quality classification, of water availability, and of environmental features.

I expect this classification, done at the applicant's expense, would be in the hands of either a regional authority, a regional land use council or a catchment board, and done by qualified officers. Under our present system, land quality is left to argument between elected councillors, legal representatives, and appeal boards ; and in most cases no person really qualified to speak on land quality is there with a say in the decision-making.

The advantages of the grading system would be, firstly, recognition of all features of the land; secondly, a much more complete list of evidence before the planning committee, and the cutting down of the area for argument; thirdly, the saving of expenses by reason that far fewer applications would be likely to go to appeal.





Rural — Residential Zoning and Large Lot Subdivisions:

The Validity of the Concept and Usage in Franklin County

C.J. Pearce
Town planning assistant
Franklin County Council

Paper prepared for NZPI Workshop on Rural Planning, 17-19 November, 1977.

Introduction:

In the recently released Town and Country Planning Bill the following are listed as "Matters of National Importance" in the preparation, implementation and administration of regional, district and maritime schemes:

"(a) The protection and enhancement of the physical and social environment.
(b) The conservation and wise use of New Zealand's resources.
(c) The preservation of the natural character of the coastal environment and the margins of lakes and rivers and the protection of them from unnecessary subdivision and development.
(d) The protection of productive land and of land of substantial productive potential, and the prevention of unnecessary encroachment of urban development on such land.
(e) The prevention of sporadic urban and subdivision development in rural areas.
(f) The avoidance of unnecessary expansion of urban areas in or adjoining cities.
(g) The relationship of the Maori people and their culture and traditions with their ancestral land."[1]

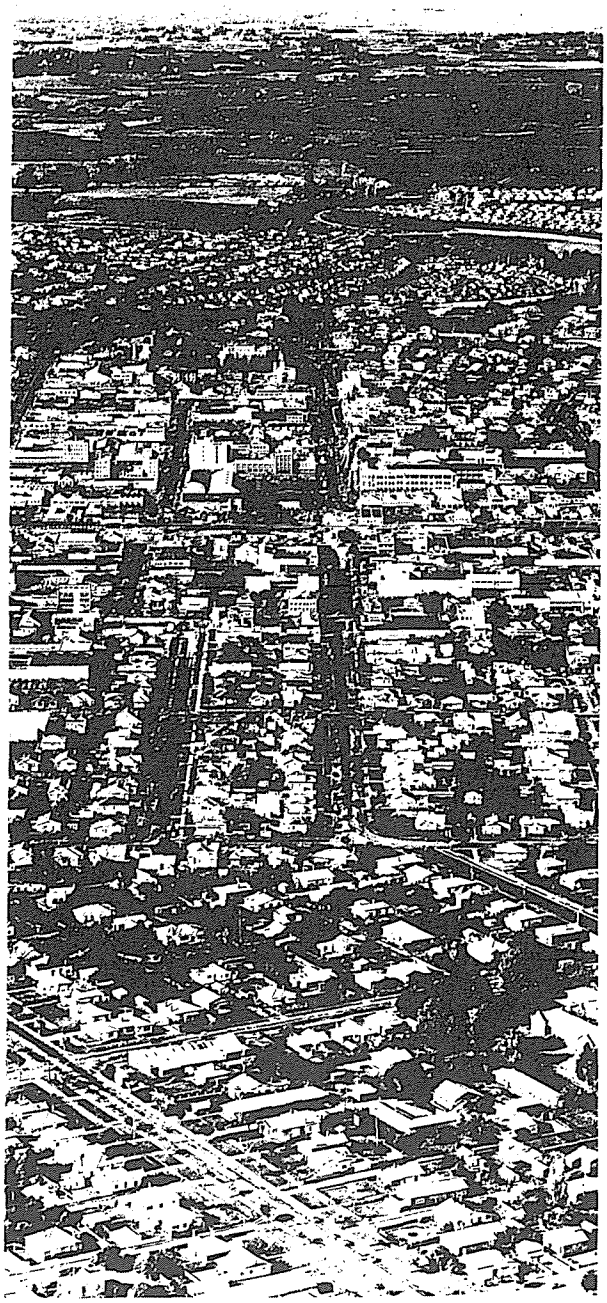
Despite this clear statement of intention in regard to the preservation and wise use of New Zealand's productive land, the technique of zoning for rural-residential living is likely to gain wider acceptance than it presently enjoys. At the moment rural-residential zones are regarded fairly much as an experimental regulatory mechanism.

At least one of the Town and Country Planning Appeal Boards, however, has adjudged that the concept is worthy of incorporation into district schemes. Indeed Mr Treadwell and his No. 2 Board have gone further than this in the case of Transport (Nelson) Holdings Ltd and the Minister of Works and Development v Waimea County Council, saying that the provision of a rural-residential zone in any rural or urban fringe areas is essential for the proper administration of all other rural zones.[2] In the course of this paper then I will endeavour to gauge the validity of the concept particularly in the context of urban fringe areas.

Before taking the discussion further it may be useful to identify the "type" of rural-residential demand pressures which exist in New Zealand, if there are in fact such demands. There appear to be varying levels of use, including:

(a) Genuine rural-residential dwellers seeking isolation from urban influences who are unlikely to demand urban services or compromise foreseeable urban development.
Ohus could probably be included in this category of prospective rural-residential dwellers and it appears that they are having great difficulty in establishing their validity before the Appeal Board. For example in the case of Croixilles Ohu Ltd v Marlborough County Mr Stephens held that a cluster of nine cottages in a commune formation on 20 hectares of Rural A land in Marlborough, would promote sporadic residential development in a rural zone.

(b) Urban orientated commuters who desire large lot living. Accessibility factors constrain the degree of isolation they can accept and thus structures the actual location of the areas to which they will direct demand pressures. In the Auckland region urban orientated commuters have directed their demand pressures to the rural areas of Takapuna City (Albany Ward), Waitemata City (especially in the north-west), Rodney County, Manukau City and Franklin County. In these particular cases both the accessibility factor and comparative seclusion must be highly ranked. As far as the broad categories of rural-residential dwellers are concerned however, it is obvious that there will be variations of type, but it would be equally fair to say that it is the urban orientated users who are likely to cause most planning problems. Existing rural communities may be disrupted by an influx of new (urban) inhabitants, services are ultimately required (usually at a high cost), scenic qualities and the character



of rural areas may be detrimentally affected and adjoining rural land values can be grossly inflated.[3]

While the "types" of demand pressures for rural-residential living are varied so too are the end results or the objectives sought in the use of the technique in planning practice (i.e. zoning for rural-residential living). Indeed large lot residential development can function both as an end product and an interim stage in the urban development process. These different functions are identified in the Rangiora County District Scheme. The Scheme distinguishes between Rural R^1 (Permanent) and Rural R^2 (transitional) zones. The latter is usually referred to as a "shell" type zoning. Rural R^1 is intended to provide permanent, small rural lots for rural-residential use without the possibility of subdivision at some later stage. The Rangiora Council required R^2 development to be serviced with a sewerage system and reticulated water supply and as a result a smaller average lot size is permitted than in the R^1 zone (8,000m^2 average as opposed to the 1 hectare average). It appears that the R^2 areas have been identified as future growth nodes although located at some distance from the main urban area. There can be no doubt that the large lot residential development concept could fit somewhere within a continuum between conventional suburbia and true rural uses. It would certainly be applicable in an area like the Albany Basin, the urbanisation of which has been widely discussed in the Auckland regional context. In the latter instance large lot rural-residential zones could have been introduced as a first stage of urban development leading hopefully to a more desirable residential environment than may be achieved if the land to be converted suddenly from rural to conventional suburbia. The immediate problem of inadequacies in the provision of utilities and services would also be alleviated if such an approach were adopted in this North Shore example.

Rural-Residential Zones in Regional Context: Obviously the provision and location of rural-residential zones could be of regional significance. This may be especially so where the regional scheme seeks to regulate the urban development form of its major centres and to protect productive agricultural lands from urban encroachments. In the New Zealand context, despite the fact that it appears to have been the territorial local authorities in the Canterbury region who have introduced and experimented with such zonings in their district schemes, it is arguably the Auckland region which houses the most pronounced rural-residential demand pressures. Up until recent times (appeals deleting the provisions have only just been resolved) semi rural-residential zoning has been provided for in the Auckland Regional Authority's approved Regional Planning Scheme. Firstly under Section 3 "Resources of the Region":

"**Proposal 3.5.2** Semi-rural housing areas relating to various sectors or the urban area should be considered in appropriate circumstances to assist in the provision of variety in housing type and some variation in the urban environment."

"**Basis 3.6.3** Low-density semi-rural areas would be complementing to the multi-linear form and would serve the following purposes depending on the particular location. They would:

(i) Provide maximum choice of living environment;
(ii) Encourage the retention of intensive agricultural uses;
(iii) Preserve the natural amenities of the area;
(iv) Facilitate the conservation of resources;
(v) Provide contacts to the intensively built-up urban areas."[4]

It can be seen from the above that those who framed the Auckland Regional Planning Scheme regarded the rural-residential concept as a valid one. Once such developments began to compromise the preferred urban growth strategy for Auckland, however, the Auckland Regional Authority decided to delete policy 3.6.3 quoted above and to replace it with policy 3.4.1 which states.:

"Until this Scheme is modified to incorporate a regional growth strategy, urban growth within the region shall be accommodated within those areas already zoned for urban use and in areas defined for development sequences contiguous with the main urban area and in which drainage and water supply services can be provided.

Provided that the above policy shall not prevent extensions to the land zoned for urban purposes in rural service towns and villages where such extensions:

(i) Are of limited scale and will not prejudice or conflict with regional growth strategies.
(ii) Can be serviced by economically practical and environmentally acceptable means.
(iii) Will not conflict with the provisions of Section 2B of the Town and Country Planning Act 1953"[5]

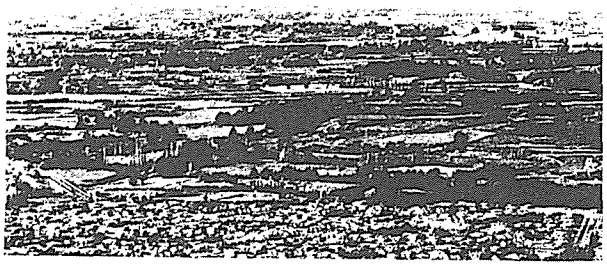
It is perhaps significant that no territorial local authority sought to appeal against Change No. 1 to the Regional Scheme which aimed at deleting the reference to low density semi-rural areas. The Franklin County Council had appealed against the Change solely to ensure that it did not preclude the residential development of the Drury Triangle. Regional thinking now seems to stress caution in taking more rural land for urban uses and clearly such reservations must extend to the provision of rural-residential zones.

My own particular interest in this topic does in fact stem from the application of the Rural-residential zoning technique in the Auckland region and specifically in Franklin County. There is in fact an interesting Appeal Board case against the Franklin County Council in respect of the incorporation of a Rural B^1 rural-residential Zone into that local authority's district scheme. This appeal actually dates back to the Franklin County Council's First Reviewed District Scheme as proposed in September 1971, and even though an interim decision by Mr Treadwell was delivered on May 14th 1973, the appeal was not finally resolved until 22 September 1977. Apart from the rural-residential debate this appeal does in fact provide a good illustration of several problems which confront planning today. For example, the cumbersome nature and practice of town planning procedures in respect of public participation under the existing planning legislation and the reality of political pressures in land use management techniques. The Council's proposal in this particular instance was to zone about 40 hectares of land on Kaipara and Ohiwa Roads situated east of Papakura and adjoining Manukau City's southern boundary. The land itself is in rolling pasture (90%) with some scrub (10%) and faces north with good views over the greater Auckland area. As parties to the appeal the Ministry of Works and Development and the Auckland Regional Authority felt that such zone was premature, pending the formation of a regional growth strategy.

The Franklin County Example. In the particular case of Franklin County with its easy access to the Southern Motorway and thus urban areas, the existence of demand pressures must be considered in terms of basic separation of the County into two parts: that is, land to the west of the motorway which is mainly high class agricultural land and land to the east of the motorway which is of lesser value overall for food production. When speaking of the general applicability of rural-residential zones in the Franklin County area it should also be rembered that we are talking primarily of the permanent type zone. It could conceivably be, however, that the Keri Hills area the subject of the appeal mentioned earlier could be incorporated into the urban area of Papakura at some future date. In New Zealand as in most capitalist countries, demand for rural-residential lots bears little relation to traditional markets economics for rural land. The increasing affluence within certain sectors of our society allied with the non-determinative nature of current zoning means that speculative values of land have become increasingly dominant. It would seem that if we are in fact genuine in our desire to protect agricultural land and thus the farming sector of the nation then planning as an intervening process must act to reduce the effect of market economics. The latter, at present, through valuation and rating structures tend to force much agricultural land out of production through a speculative concept of land having potential for urban development. One has to be very wary of this fact when consider-

ing the establishment of a rural-residential zone. Here it may be relevant to consider some of the findings resulting from the recent Ministry of Works and Development survey on small holdings between 2-25 acres[6]. Of these holdings some 15,000 may be classified as rural-residential. For the purpose of the survey a rural-residential holding was defined as "a rurally zoned holding of between 2 and 25 acres in area, which is used by a person or householder as a full time home. In addition, the male head of such a household, or if there is none, the female head, must be either retired or engaged in the full time work away from the property." Approximately 5/6th of the rural-residential properties have some use other than residential and of those less than half are used as a source of income. Of those deriving some income from the property, less than one quarter of the total household income is obtained from the use of the land. Clearly then, there does seem to be substance to the suggestion that a large proportion of rural-residential owners gain little income from the use of their land. Thus we return to our urban orientated commuters. Within the Auckland Regional approximately 4.25% of the land is in small holdings between 2-25 acres; (the next highest is Christchurch with 2.45%). The most common use of the small lots is residential, followed by grazing — even though many other uses occur.

Franklin County had 21% of the Auckland Region's rural-residential holdings (i.e. approximately 500 as at December 1974). As an actual number, subdivision over the time since this survey occurred may have increased this number. Rural-residential holdings as a proportion of the total number of small lots in Franklin (i.e. 750) was found to be 77% — a very high proportion given that the figure for the Auckland Region is only 57%[7]. This is a higher proportion than any any other area in the Auckland Region overall and would tend to suggest that the existing situation in the Franklin County is such that Section 2B (b) and (c) of the Town and Country Planning Act 1953 may already be compromised and that any further fragmentation of rural land in Franklin County would be premature prior to a thorough land use survey of the County in order to establish an acceptable planning base. The Appeal Board, in the appeal referred to earlier, adjudges that this was not the case although I myself felt that the zoning is somewhat premature. Map No. 1 shows that rural-residential holdings are generally clustered in the Franklin County and seem to be centred on Pukekohe and to the south east of Papakura. This indicates that the greatest pressure is likely to arise on those areas, which in the Ministry of Agriculture and Fisheries Report on soil in the Auckland Regional Authority Growth Alternatives Study identified as areas which should be preserved for agricultural uses. A recent Auckland Regional Authority proposal to set up a **Rural Planning Service**



which will,among other things, undertake large lot subdivision studiesand consider the role of rural service towns and their expansion problems, rural depopulation, the effect of valuation changes on farming and the impact of new semi-rural housing areas, is encouraging in this respect. The implications and implementation of Section 2B certainly need to be looked at and as planning in rural local authorities tends to be characterised by the technical administration of a district scheme it is correct that the Regional Planning Authority should undertake at least part of this forward planning. It is doubtful, however, given our present socio-economic system and lack of political will to change that system, whether any startling or effective revelations will come out of such a study. It will show planners nonetheless the most immediate needs in this field of planning. Indeed for my own part I wonder whether in catering for rural-residential living we as planners are endorsing the class society by legitimising in effect a new landed gentry? Certainly it will be the more affluent members of society who gain access to such rural-residential estates.

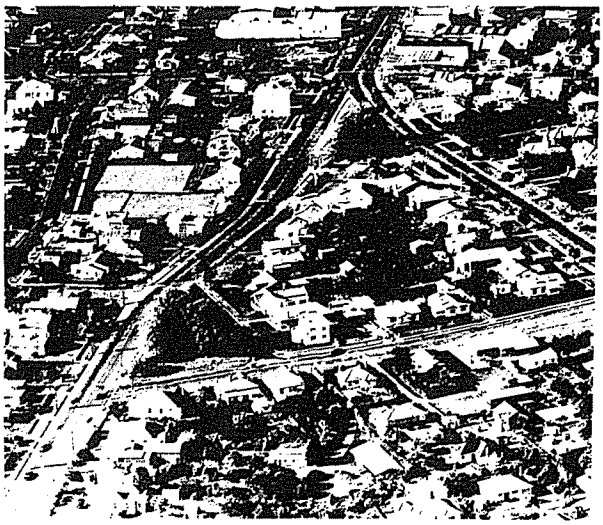
Conclusions: In the test case on rural-residenial zoning Mr Treadwell in his decision relied heavily on the evidence presented by the appellant's planning witness, Mr W.H. Barker, a planning consultant. The latter argued for the validity of large lot subdivisions in rural areas and maintained among other things, that:

> ". . . if one was to administer the district scheme responsibly and preserve rural areas for appropriate economic uses, alternative provision must be made for valid rural living demands by selecting appropriate areas. It should be an area of poorer soil; removed from the urban areas but not too far, perhaps up to ten miles; provision should be made for the suitable disposal of sewage and rubbish; and certain utility services would be required. By providing selected areas the pressure would be taken off other areas more suited to rural activity and the codes of ordinances relating to true rural zones could be considerably strengthened to prevent sporadic residential development".[8]

There can be probably no doubt, that the rural-residential zoning technique is valid in some contexts. In terms of landscape architect William

Whyte's views for example such a zoning may be a means of preserving elements of natural beauty — for example areas of native bush (his 'use it' or 'lose it' catch phrase). Rural-residential zoning can form an integral part of both the urban and rural planning processes. With respect to the former it can be regarded as the first stage of urban development leading hopefully to a more desirable residential environment than has been achieved when land is converted suddenly from its rural state to conventional suburbia. Such a course is being entertained by the Takapuna City Council in relation to the regionally significant urbanisation of the Albany Basin. A transitional residential zone could certainly provide the infra-structure for higher density urban development at a later stage. As a component of rural planning a large lot residential development zone could serve to reduce the demand for such uses elsewhere in that particular rural area. It could certainly provide Council's with some backbone on which to base a hard line attitude against sporadic subdivision in rural areas. Zoning for rural-residential living then may be deemed to be an acceptable technique but it is important that the areas that are to be zoned in such a way are carefully selected. In the main the areas should be small and subdivision should pay attention to topography and to the preservation of natural landscape features. The land should not be prime agricultural land and prospective residents should not be provided with an urban level of services. The "good country life" may not be the panacea which many retreat dwellers think it will be, but it will be even less so if its character is merely a larger scale suburban imitation.

It does in fact seem that rural planning authorities are now being pressured to introduce rural-residential zonings into their district schemes because in an unfavourable economic climate large lot subdivisions which require only limited servicing are highly profitable and a convenient alternative for conventional residential subdivisions. If the rural-residential concept becomes too much in vogue, then planners will have to be extra wary that a casual acceptance of the technique does not compromise the most preferable rural and regional planning strategies.



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2. Interim Decision Appeal No. 1366/75. 17/74.
3. Kaye B.L. **Statement of Evidence** (Appeals 425/72:486 - 490/72)
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6. **A.R.A. Regional Planning Scheme and Changes 1, 2, and 3.** Planning Division February 1976 and April 1977.
8. Jowett J.H. **Small Rural Properties** M.O.W.D., Town and Country Planning Division 1975 p3.
9. Jowett J.H. **Small Rural Properties** M.O.W.D. Town and Country Planning Division 1975.
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An Analysis of Wellington Region's Public Transport

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Introduction:

Public transport is currently a controversial topic, with major issues being the mounting financial losses, the need for vehicle replacement, increasing fares, vehicle unreliability and breakdown, and falling patronage. The Holmes task force[1] summed this up by saying (p322) "urban transport is a major disaster area of New Zealand Transport". The Carter Committee of Enquiry[2] recommended government action in 1970, but it was not until this year's budget that any significant financial relief has resulted. Two major questions remain. Given its unprofitability, what is the most appropriate role for public transport in the urban transport system, and how should it be financed and organised. A government white paper[3], has recently addressed these questions.

This paper is based on a study carried out for the Wellington Regional Planning Authority[4]. It first discusses supply, demand and cost of public transport in the Wellington region. The high cost of peak services is demonstrated, and the large costs caused by school children shown. Historic trends in patronage and cost are discussed, as is the competing role of the car. Finally the advantages of public transport are discussed, relative to the problems faced in urban transport. Public transport in the future is likely to be equally as valuable for its indirect benefits as for its direct transport benefits. This is a large change from its role in the past, and will require a higher degree of co-ordination of the competing components of the urban transport system. The run down of oil reserves also creates uncertainty as to the cost and type of fuel that will replace petrol. Public transport, as an energy efficient mode, should be supported at least until the contingency of high future fuel prices can be ruled out.

Description of the Region:

Wellington is topographically rather different from other New Zealand cities. The five major subcentres, Wellington, Lower Hutt, Upper Hutt, Porirua and Kapiti are distinctly separated by undeveloped land, and form two major corridors centring on the Wellington central business district (CBD). However, demographically, Wellington follows the New Zealand pattern. The older residential suburbs are in Wellington and Lower Hutt, with newer suburbs further out. Employment is predominantly in the Wellington CBD (47% in 1971), but employment is established in Lower Hutt, and is growing in other suburban areas, with a distinct trend to decentralisation. There is still however an employment surplus in the CBD and deficit in the newer suburbs, as shown in Table 1. This gives rise to major commuting flows. Total population was 349,000 in March 1976, and employment was 153,000.[4]

Public transport is operated by several operators. Wellington City Transport (WCT) operate buses in the Wellington city area, New Zealand Railways (NZR) operate four suburban lines to the outer northern suburbs, and operate feeder bus services to these lines. As well as there are three smaller private operators, in Porirua, Upper Hutt and Newlands, and Eastbourne Council buses.

Demand and Supply of Services by Time of Day:

The major characteristic of urban transport is weekday morning and evening peak demand of people going to and from work and to and from school. Public transport operation is dominated by this peak.

Although demand is high in the direction of flow at the peak, vehicles usually return empty, and average vehicle patronage per round trip is about the same as for off peak services. Estimates of WCT and NZR rail demand and services for peak, off-peak, Saturday and Sunday services are given in Table 2.

The consequence of this highly peaked demand is that the majority of public transport vehicles need be operated for less than four hours per day. For instance WCT requires 198 buses for the peak, and at

Table 1: Population and employment by sub-region

	Percent of 1976 population	Percent of 1976 employment
Wellington City	40	61
Lower Hutt/Wainuiomata	28	24
Porirua	16	7
Upper Hutt	10	6
Kapiti	6	2

Table 2: Peak, Off-Peak and Weekend Patronage

	Weekday Peaks		Weekday Off-Peak		Saturday	Sunday
Estimated Daily Patronage						
W.C.T. (1976 March Year)	42,000*		43,000*		25,000	11,000
W.C.T. (1967 March Year)	46,000*		62,500*		28,000	14,400
N.Z.R. Rail (March 1976 counts)	32,000		16,200		14,900	8,300
N.Z.R. Rail (March 1968 counts)	30,000		15,200		21,000	10,000
Daily Services Operated**	Morning	Evening	Midday	Evening		
W.C.T. (1976 round trips)	350	396	428	185	543	211
N.Z.R. Rail (1976)	62	72	76	99	171	112

* Estimated as counts not available
** Derived from 1976 timetables

most about 80 for the remainder of the day. NZR requires a maximum of 50 carriages off peak as against 198 at the peak, and NZR Hutt Valley buses require 32 buses off peak as against 58 for the peak. Smaller operators have similarly peaked services. Consequently, the cost of providing peak services is high because of the low utilisation of vehicles and drivers. As well, driver workload is split, with a six hour gap between, making driving an unattractive job.

Public Transport Users and Patterns of Use

Survey and census information from 1971 gives the only available picture of public transport's share of the peak urban travel demand, and of the type of travel for which public transport is used. Results from the WERLUTS study[5] are given in Table 3. Almost one third of person trips in the morning peak are by public transport, and the flow is large, being equivalent to over one thousand busloads. A major point of interest is the numbers of school children travelling. They made up almost one third of all morning peak public transport trips. (School trips commence before 4 p.m., so are not included in the evening peak in Table 3.) In the evening peak 77 percent of person trips were work-home. This underlines the importance of work and school trips in demand for public transport.

Results from the 1971 census journey to work allow a comparison of Auckland, Wellington and Christchurch modal split (Table 4). A sizeable proportion of people, about 10%, indicated they walked to work. Public transport use was higher in the Wellington region than in Auckland or Christchurch, and peak services relative to off-peak services were consequently higher. Because of this greater peak, Wellington region public transport will be more expensive to provide.

Table 3: Vehicular Transport Demand. Person-trips by Destination Purpose, Morning and Evening Peaks.

Destination Purpose	Trips completed between 7 a.m. and 9 a.m.		Trips started between 4 p.m. and 6 p.m.	
	Car driver or Passenger	Public Transport	Car driver or Passenger	Public Transport
Home	5,500	–	75,000	32,500
Work	66,500	36,000	6,500	–
Shop	2,500	–	8,500	1,000
Business	10,000	1,000	9,000	–
School	13,000	16,500	–	–
Social/Recreational	3,500	–	13,000	2,000
Other	17,500	–	11,500	–
TOTALS	118,500	54,000	123,500	37,000

Source: 1971 WRLUTS survey data, MWD. Totals below 500 neglected

Table 4 1971 Percentage Modal Split for journey to work

Mode	Wellington	Auckland	Christchurch
Car/Van driver	38	49	49
Car/Van passenger	10	10	7
Bus or Train	34	23	14
Cycle or Motorcycle	2	2	15
Walk	12	10	9
Other	4	6	6

Tends in usage since 1971 show a relative decrease in public transport use.

Usage of public transport is not the same in all areas of the region. Work trips to the Wellington central business district in 1971 were dominantly by public transport (either train or bus). The ratio was 55% to 45%. Work travel to other areas was dominantly by car (78% : 22%).

There are a number of reasons for high use of public transport to the CBD. These include existence of train services, which are popular with commuters, and captured two thirds of CBD bound commuters from suburbs served by rail. Parking in the CBD bound commuters from suburbs served by rail. Parking in the CBD is a major problem. Also congestion on CBD routes reduced the relative speed advantage of the car. The existence of well developed, regular and relatively cheap services to the CBD is also a factor.

Newer suburbs are generally not well served by public transport. Also, employment in the industrial areas is more dispersed, making it more difficult to obtain the high origin-destination volumes needed for public transport.

The Cost of Providing Peak Public Transport Services

One major reason why newer suburbs have poor public transport services is because of the loss likely to be incurred in providing them. Operating costs of peak only public transport services are high. The estimated cost of buying a new 40 seat bus for SCT and operating it on one or two trips in each peak is shown in Table 5.

Assumptions made are that the bus costs $46,000 new and has a life of 20 years, and that the money is borrowed at 8%. Fuel and maintenance costs are assumed incurred on a per kilometre basis, with a round trip of 16 km. Driver costs include 20% for wage overheads. Revenue is assumed as 50 people per trip at 24c each. No administrative overhead charges are included.

The table shows that additional peak services at 1976 fare levels would not cover incremental cost, and may cover less than 50% of incremental cost. The 1977 budget will remove capital as a cost, but

Table 5: Loss from Operating Additional Peak Vehicles (March 1976 Costs)

	WCT Bus Two Peak Trips Daily	WCT Bus Four Peak Trips Daily
Amortised vehicle capital cost	$4,700	$4,700
Annual driver or crew costs	$6,000	$6,000
Annual fuel and maintenance	$2,000	$4,000
(25 c/km bus, 37 c/km train)		
Totals	$12,700	$14,700
Annual Revenue	$6,000	$12,000
Loss per additional vehicle per year	$6,700	$2,700
Loss/seat per year	$170	$67

Note: Inflation will have increased these figures substantially.

addition of an extra bus could still be a loss making proposition, without any contribution to overheads, even when operating full. The situation for rail rolling stock is similar. It is not surprising that operators are reluctant to provide additional services.

WCT administration charges are currently 23% of expenditure. A breakdown of WCT operation, allocating capital and driver costs to the peak, and splitting administration costs equally between the peak and off-peak allows an assessment of the profitability of peak, off-peak and weekend services. ([4], P35)

Although the method is approximate, it indicates the large loss incurred in the peak, because of the large capital and driver costs. The high cost of weekend services is because of the high overtime rates for drivers.

Six thousand school children make up about a third of WCT peak demand. They travel for about one quarter of the adult fare. The loss, on a pro-rata basis, caused by them is estimated at about $1 million in the WCT area, and could be greater than $2

	Estimated cost ($ million)	Estimated revenue	Loss ($ million)
Weekday Peak	3.9	1.7	2.2
Weekday off peak	1.6	1.4	0.2
Weekend	0.6	0.3	0.3

million for the region as a whole. This is over one quarter of the region's total public transport loss of $7.6 million in 1976.

Historic Trends of WCT Finances

The loss making situation for public transport is a relatively recent phenomenon. For instance, in 1961 WCT loss was 12% of expenditure, 19% in 1966, 39% in 1971 and 47% in 1976. There appear to be two main factors increasing the loss.

Firstly, patronage has been decreasing, especially off-peak, and there has been a consequent fall in revenue relative to costs. Concession fares increased 11% in real terms (i.e. relative to the consumer price index) between 1961 and 1976 and patronage decreased 35%. Revenue decreased in real terms by 28%.

Secondly, costs have increased faster than inflation, in spite of falling patronage. WCT expenditure was 20% higher in real terms in 1976 than in 1961. One reason is that public transport is labour intensive. WCT's labour bill appears to average about 65% of expenditure. Wages have increased faster than costs, and wages for employees rose 26% in real terms between 1965 and 1976. Also, although patronage has fallen by a large amount, staff levels have not been cut. Patronage dropped 29% between 1965 and 1976, but staff levels remained constant. Mileage decreased 22%. Although wage increases are more or less in line with local authority increases generally, it is not clear why staff numbers could not have been reduced. Auckland, Christchurch and Dunedin local authority bus operators have also had little success in maintaining productivity per staff member employed. Investigation of methods of improving productivity appears a pressing current problem.

Reasons for Declining Patronage

Public transport patronage relative to population served has been declining, at a rate of three percent a year over the last 10 years, in Auckland, Wellington and Christchurch. ([4] Tables 3.1 and 3.3).

A major reason for this is private car ownership, which has climbed steadily as bus patronage has dropped. This is demonstrated in Table 6 for New Zealand car ownership, and WCT patronage. Population in the area served by WCT has remained relatively constant over the time interval.

New Zealanders see private car travel as more convenient than public transport, except for CBD travel. As long as our affluence increases, the trend of increasing car ownership is also likely to increase. Motorway improvements also encourage private car use by making cars proportionately faster. For example, improvements to the Hutt Motorway in 1972 noticeably reduced Hutt rail patronage ([4], P18)

Secondly, because of the expense of providing peak services referred to previously, few new services have been added in the developing suburbs, or between these suburbs and new employment areas. Consequently, the proportion of the population who have the option of travelling by public transport has been decreasing. This effect is difficult to quantify,

Table 6: Car Ownership per 1000 People and Bus Ridership

Census Year	Wellington*	Auckland*	Central* Canterbury	New Zealand	WCT Annual Patronage (March Year) Millions
1956	168	180	196	182	41.7
1961	206	214	248	218	36.1
1966	261	272	289	270	30.7
1971	315	326	346	317	26.6
1976	366	388	406	374	23.5

Source: Carter Committee Report[1], Post Office Car Registrations
* Areas are postal districts

but is borne out in the Wellington region by the small number of new routes introduced in the last five years. In 1976, ten percent of households were more than 400 metres from a public transport route ([4], Table 8.7). A greater proportion of households would have been further than this from a route serving their journey needs.

Car Operating Costs and the Energy Crisis

The increased fuel costs resulting from the 1973 oil price rise might be expected to have increased costs more for the motorist than for public transport. This does not appear to have happened. The cost per mile run by WCT buses has risen 29% in real terms in the five years 1971-76. Different people perceive car costs in different ways and a range of factors must be considered. Petrol price to the motorist has risen 49% in real terms in the 5 years. New car price for a 1300 — 1500cc sedan has risen 14%, and running costs, as measured by Ministry of Transport have risen 22%. It appears that car technology has been more able to improve its product and hold prices than public transport. Although petrol prices may be considered high now, they are only 20% higher in real terms than in 1961 (Table 4.1, [4]). Real private after tax income appears to have risen by more than 20% in the last 15 years.

New car sales are still well above the scrapping rate of about 40,000 per year. Fuel costs at $240,000 made up only 4% of WCT expenditure in 1976.

Indirect Benefits from Public Transport:

Previous sections have shown that public transport cannot support itself at current fare levels. Full-fare passengers on WCT services currently pay about two thirds of the cost of their transport. There are however a number of indirect benefits of public transport, which should be considered.

School children, who travel at reduced rates have already been mentioned. The major beneficiary from these services is the local Education Board, which can reduce its costs by building large schols, and which has no incentive to resite schools now in inappropriate places for the pupils they serve (such as in the Wellington Central Business District). A share of public transport losses of greater than $2 million for the Wellington region, appears to be the unrecovered cost of school bus services.

City centres benefit from public transport use in a number of ways. Financially, the greatest benefit is the reduced need for expensive parking buildings. Environmentally, there are a reduced number of cars in the city, reducing congestion and pollution, and making walking more pleasant. Less space is required for roads, and motorways. Commercially, public transport is important, because it gives ready accessibility to workers and shoppers. This is a major benefit to employers and retailers.

Central government gains through greater fuel savings. In the usual urban operating environment buses appear about three times as fuel efficient per passenger mile as the average car. Overseas exchange may be saved through lack of need for a car or second car. In Wellington, train services aid the government's historic land use strategy of dormitory suburbs for government workers in the Hutt Valley and Porirua.

The community at large gains through the cheap and ready availability of travel opportunity provided by public transport. Residents near a service gain easy access to services, and consequently supposedly higher property values. Such residents are often the most reluctant to see services discontinued.

Car commuters, and road building authorities gain through less congestion, or alternatively, through less need for peak hour roading capacity.

Current payments by these different groups in the Wellington region include:

1. Education Board — no contribution.
2. Wellington ratepayers — about $2.3 million in rates support to WCT.
3. Other sub-regional centre ratepayers — no contribution.
4. Central government — a contribution to Wellington City rates and currently a $4.6 million grant for the rail loss (though normally this would be a subsidy provided by other rail users).
5. The community at large makes no direct payment for the accessibility provided by public transport.
6. Wellington City car users pay $0.8 million in local authority petrol tax. Other regional car users contribute nothing.

The indirect benefits of public transport appear of substantial value. Raising fares to completely cover the cost of public transport, as private operators in the region are currently forced to do, would reduce these indirect benefits by encouraging car use. Rather there is a need to shift to a cost-benefit management strategy. This is a large change in direction from the current profit-loss view, but would allow more appropriate measures to be taken to solve current urban transport problems.

The Problems Facing Urban Transport

A cost-benefit strategy for managing urban transport would not accept any level of loss for public transport. It would look at the best way of alleviating current urban transport problems. Public transport would simply be one of the methods available.

Six of the current major urban transport problems appear to be:

1. Control of car growth in major business areas.
2. Reduction of demand for urban motorways, because of their expense, the land that they use, and the urban travel that they encourage.
3. Provision of urban mobility for non-car users at a reasonable cost.
4. Movement of children to school cheaply.
5. Reduction of the total cost of urban transport.

Motorway costs and new technologies in public transport are increasingly expensive.

6. Conservation of fuel use in urban transport. Uncertainty in the cost of future transport fuels makes short term concern with fuel economy important.

A fuller discussion of urban transport problems, and of the policies to deal with them, is given in[6].

A New Management Strategy

The best approach to alleviate these problems will require a mix of policies involving public transport, car pools, taxis and mini buses, urban land use planning, parking control and roading planning.

Public transport can be useful in alleviating all six problems above. The number of cars in city centres can be reduced. Two hundred buses carry as many people into Wellington in the morning peak as 10,000 cars. There is reduced need for motorways. More people come to work in Wellington each morning on the Hutt Rail line than use the Hutt Motorway. Urban mobility is provided, although where volumes are low, or outside normal working hours, costs are high. Public transport is used to transport children to school, but is relatively expensive compared with walking or cycling. Public transport travel is cheaper than car at current occupancy levels, and uses less energy.

Car pools, taxis and mini buses would reduce car use in cities, and could be a cheaper alternative than public transport in some instances. Encouragement of employer provided transport for employees, such as mini-buses would help reduce peak public transport. Urban planning measures could encourage high density housing in city areas, and suburban employment located nearer to residence, thus reducing the need for travel.

Parking charges reflecting the true cost of provision, and other control measures is an effective way of discouraging car use in city centres.

Roading planning that provides fast roads encourages residential location at a greater distance from workplace, and encourages use of car, and fuel. This leads to high transport costs, high fuel use, cars in cities, poorer alternative services, and greater demand for further services for the car. Consequently, attempts to reduce the urban transport problems mentioned above require co-ordination with road construction.

Conclusion

Individually we tend to consider public transport a second best urban transport alternative to the car, as is evidenced by the trend of falling public transport patronage. However, from a community viewpoint, and especially in central business districts, public transport gives a number of important indirect benefits compared with car. These include cheapness, fuel economy, reduction of congestion, lack of need for parking, more intensive use of land and mobility to those without cars. The most appropriate way to combat the urban transport problems faced by major New Zealand cities would be with a mix of policies, including a long term commitment to public transport where it is appropriate.

More specifically,

(a) Although the peak is expensive to serve by public transport, doing so gives major indirect benefits to city centres by reducing the need for car use.

(b) Off peak services give mobility to those without access to car, and are an essential service to the whole region.

(c) School children being taken to school cause over one quarter of the current public transport loss in the region.

(c) Although public transport could be self supporting, this would encourage a shift to car commuting that would reduce many of the major indirect benefits of public transport.

(c) The recent record of local authority public transport productivity is poor and analysis is needed to determine the causes of this.

(f) Public transport provides community benefits in terms of reduced fuel consumption, reduced need for peak roading expenditure, and reduced use of land for transport facilities.

(g) The future management approach to current urban transport problems should include use of a range of policies, including public transport, as appropriate. This entails a broader viewpoint than the current narrow profit-loss approach to public transport.

(h) Long term financial arrangements are needed for public transport, based on the indirect benefits provided, so that it can maintain and expand services in appropriate areas.

The vehicle replacement policy and organisational changes brought forward in last year's budget provide a major step towards the new management approach required in urban transport.

References

1 **"New Zealand at the Turning Point"** — Report of the Holmes Task Force on Economic and Social Planning, December 1976, Government Printer, Wellington.

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3 **"Urban Transport in New Zealand"**, White Paper, November, 1977, Government Printer, Wellington.

4 **"Trends in Public Transport in the Wellington Region, 1966-1976"** H. Barr, V. Mabin, R. Taylor, Wellington Regional Planning Authority, July 1977.

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6 **"Transportation Policy in the Eighties"**, Martin Wachs, Transportation, Volume 6 (1977) p103-120.

I wish to thank the Wellington Regional Planning Authority, and Wellington Region public transport operators, for their co-operation in this project.

Practice Note

The Establishment of Noise Zones in the Mount Eden Borough

P.J. Harland

Introduction

At present noise control and abatement in New Zealand works on the premise that "generally a nuisance exists only when it is distinctly perceptible above the ambient (background) noise level".[1] However, for the practicable enforcement of a noise bylaw or town planning ordinance a numerical standard is needed, for enforcement has to show that the noise is a nuisance in that specific case.

There is documental evidence[2] which indicates noise can affect the health and general well-being of the inhabitants in an area as well as detracting from the amenities. As such, the setting of performance standards to control noise is necessary if district schemes are to achieve their purpose as set out in Section 18 of the Town and Country Planning Act, 1953.

Thus, if the background and peak noise levels are known for different land use zones and adjacent to various roads in the hierarchy (regional to local roads), town planners can establish "noise zones" to ensure an acceptable noise environment is maintained. This technique is not new; in 720 B.C. the city of Sybais in Italy instituted a zoning system to confine noisy metal work to industrial areas in order to protect the quiet of residential areas.[3]

The Mount Eden Borough Noise Survey

In order to establish noise zones in the Mount Eden Borough, a noise survey was undertaken in December 1976. Twenty-two sites were established in different land use zones and adjacent to various roads in the hierarchy. The Mount Eden Borough District Planning Map and aerial photographs of the borough were used to determine whether each site was checked individually in the field to ensure there would be no problems caused by reflections and reverberations caused by fences, sheds and adjacent buildings. Sound levels were monitored simultaneously at the front and rear of each of these sites by two sound level meters and tape recorders. The selection process resulted in the following numbers of sites:

Residential B:	9 Front Measurement Positions 10 Rear Measurement Positions
Residential C:	5 Front Measurement Positions 6 Rear Measurement Positions
Commercial B:	2 Front measurement positions 3 Rear measurement positions
Commercial C:	4 Front measurement positions 5 Rear measurement positions

When related to the road hierarchy these sites resulted in:

Regional Road:	1 Front measurement position
(Balmoral Road)	1 Rear measurement position
Arterial Road:	6 Front measurement positions
(Mt Eden Road)	6 Rear measurement positions
Principal Street:	4 Front measurement positions
(Dominion Road)	2 Rear measurement positions
Local distributor Roads:	3 Front measurement positions
(Marsden Ave., Grange Rd., Landscape Rd.)	3 Rear measurement positions
Local Roads:	8 Front measurement positions 9 Rear measurement positions

The noise levels were monitored at each of the sites during three different time periods:

Time Period A: 7.30 am — 9.00 am or 4.00 pm — 5.30 pm

Time Period B: 9.30 am — 3.30 pm

Time Period C: 6.30 pm — 11.00 pm

The tapes were analysed by the National Audiology Centre using a general radio real-time analyser and digital controller analyser. This analysis consisted of the:

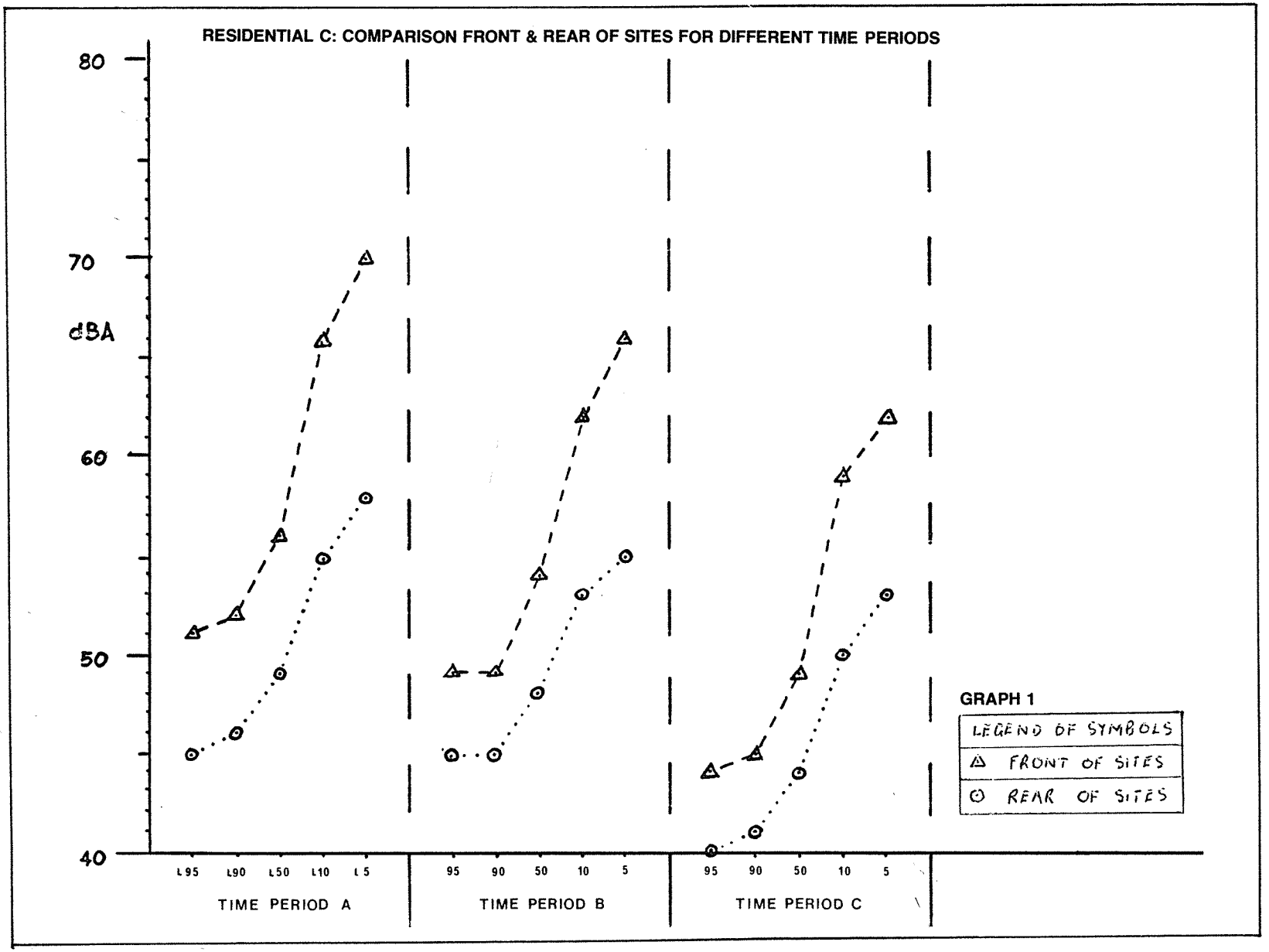
L 95 (noise level exceeded for	95%	of the sample period)
L 90 ("	90%	")
L 50 ("	50%	")
L 10 ("	10%	")
L 05 ("	5%	")

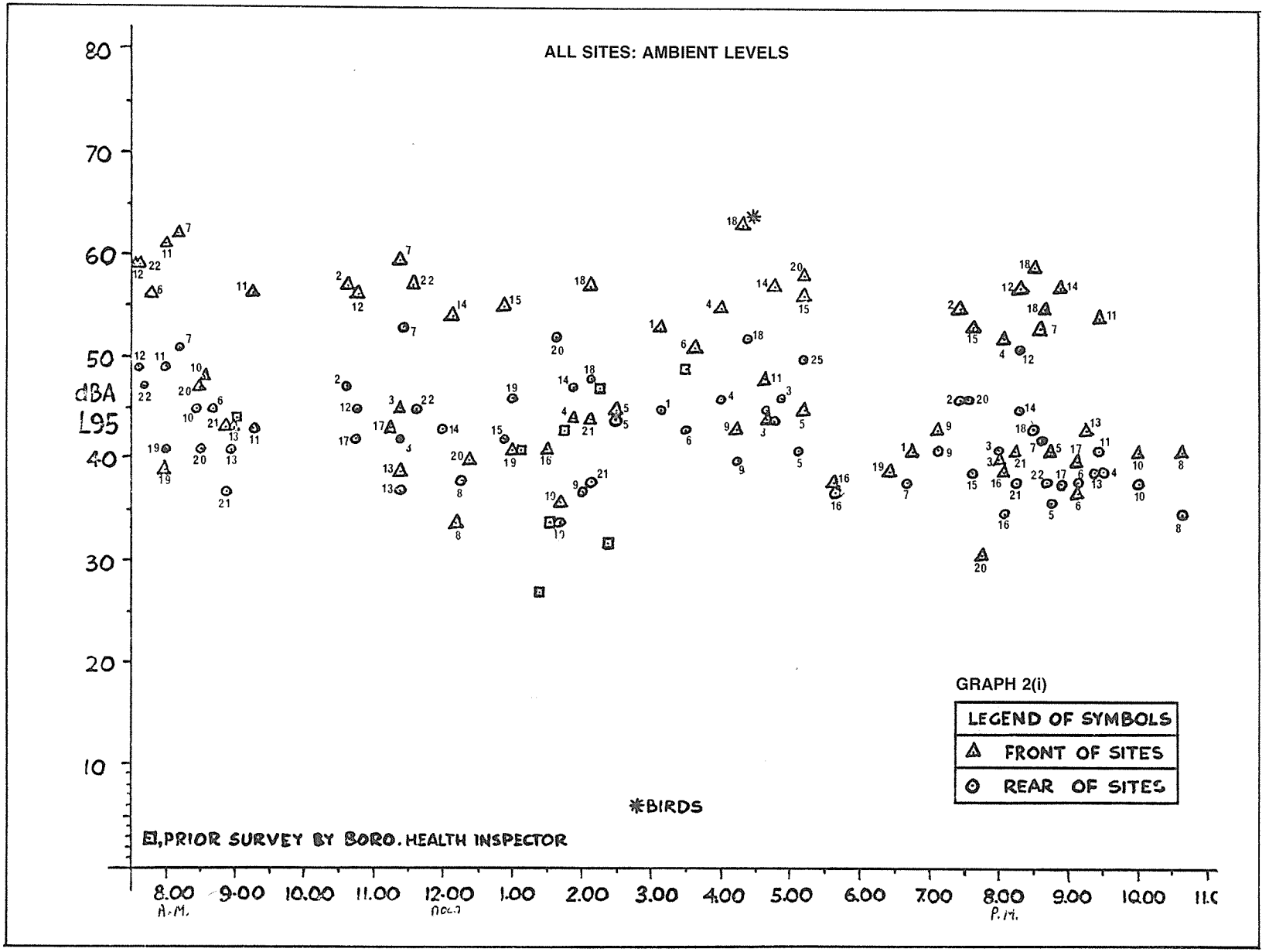
noise levels, and the L50 noise level for 1/3 octave bands. Graph 1 shows the relationship between the L95, L90, L50, L10 and L05 noise levels.

Results of the Survey

As can be seen from Graphs 2(i) and 2(ii), noise levels vary quite markedly between the front and rear of each site and between sites. When these data were compared on the basis of land use or road type the following results were obtained:

1. (i) The ambient (L95) and peak (L10) noise levels at the front of Commercial B and C sites were excessively high as a result of the volume of traffic using Mt Eden and Dominion Roads;
   (ii) The ambient and peak noise levels at the rear of Commercial B and C sites were virtually identical to the ambient and peak noise levels at the rear of residential B and C sites. This was due to the commercial buildings acting as noise screens and thus casting noise shadows.


RESIDENTIAL C: COMPARISON FRONT & REAR OF SITES FOR DIFFERENT TIME PERIODS
80
70
dBA
60
50
40
L95 L90 L50 L10 L5
95 90 50 10 5
95 90 50 10 5
TIME PERIOD A
TIME PERIOD B
TIME PERIOD C
GRAPH 1
LEGEND OF SYMBOLS
FRONT OF SITES
REAR OF SITES


ALL SITES: AMBIENT LEVELS
dBA
L95
80
70
60
50
40
30
20
10
8.00 A.M.
9.00
10.00
11.00
12.00 Noon
1.00
2.00
3.00
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7.00
8.00 P.M.
9.00
10.00
11.0
*BIRDS
E, PRIOR SURVEY BY BORO. HEALTH INSPECTOR
GRAPH 2(i)
LEGEND OF SYMBOLS
FRONT OF SITES
REAR OF SITES

2. The noise levels in the Industrial B zone were found to be reaching nuisance levels in 1975. The three residential sites in this survey did not have sound characteristics noticeably different from similar residential sites not adjacent to the Industrial B zone. However, there is a need for further field work with the Industrial B zone, and at the Industrial B/residential interface to confirm the truth of these findings.
3. During the day, the residential C sites had noise levels noticeably noisier than residential B sites. This was due to motor vehicles using the one way street system in this area.
4. (i) The front of residential sites adjacent to the three major arterial routes, Balmoral, Mt Eden and Dominion roads, have an undesirable noise environment as one consequence of the volume of traffic carried on three roads;
   (ii) The ambient and peak noise levels monitored at the rear of residential sites adjacent to the three arterial routes were above the noise levels monitored at the rear of residential sites adjacent to local distributor and local roads. However, the increases in noise levels were not great enough to degrade the noise environment to such an extent that it was unacceptable. This result was due to the effectiveness of houses acting as noise screens, offering between 7 to 17 dBA attenuation of traffic noises.
5. The residential sites adjacent to local distributor and local roads had an acceptable noise environment which should be preserved.
6. Traffic noise is the predominant source of background noise in the Mt Eden Borough; birds, crickets and cicadas were the dominant background noise source in a small number of sites.

Mount Eden Borough Noise Levels Compared to New Zealand Guidelines and Standards

Graph 3 depicts the Mt Eden Borough ambient (L95) noise levels compared with **Draft New Zealand Standard D2.6801,** and the document **Environmental Nuisance Noise** compiled by the National Audiology Centre. It is apparent that the residential B zone is below the noise levels set in both of the documents whereas the front for residential C sites are 3 dBA above the noise levels set in both documents. This latter result is due to through traffic from Wynard Road to Mt Eden Road or vice versa, using the one way streets in the Residental C zone.

The ambient noise levels at the front of Commercial B and C zones were well above the noise levels set for commercial areas in either of these documents. The noise levels recorded were high enough to cause speech interference to both shoppers and shopkeepers. Because of the screening effect of buildings, the noise levels recorded at the rear of Commercial B and C zones were below the noise levels set in these documents.

The ambient noise levels in the Industrial B zone (in 1975) were below Draft Standard D2 6801 and the environmental Nuisance Noise Guidelines for Industrial areas. However, noise levels reached nuisance levels under some operations in 1975 and it is possible that ambient noise levels have risen within the zone since then.

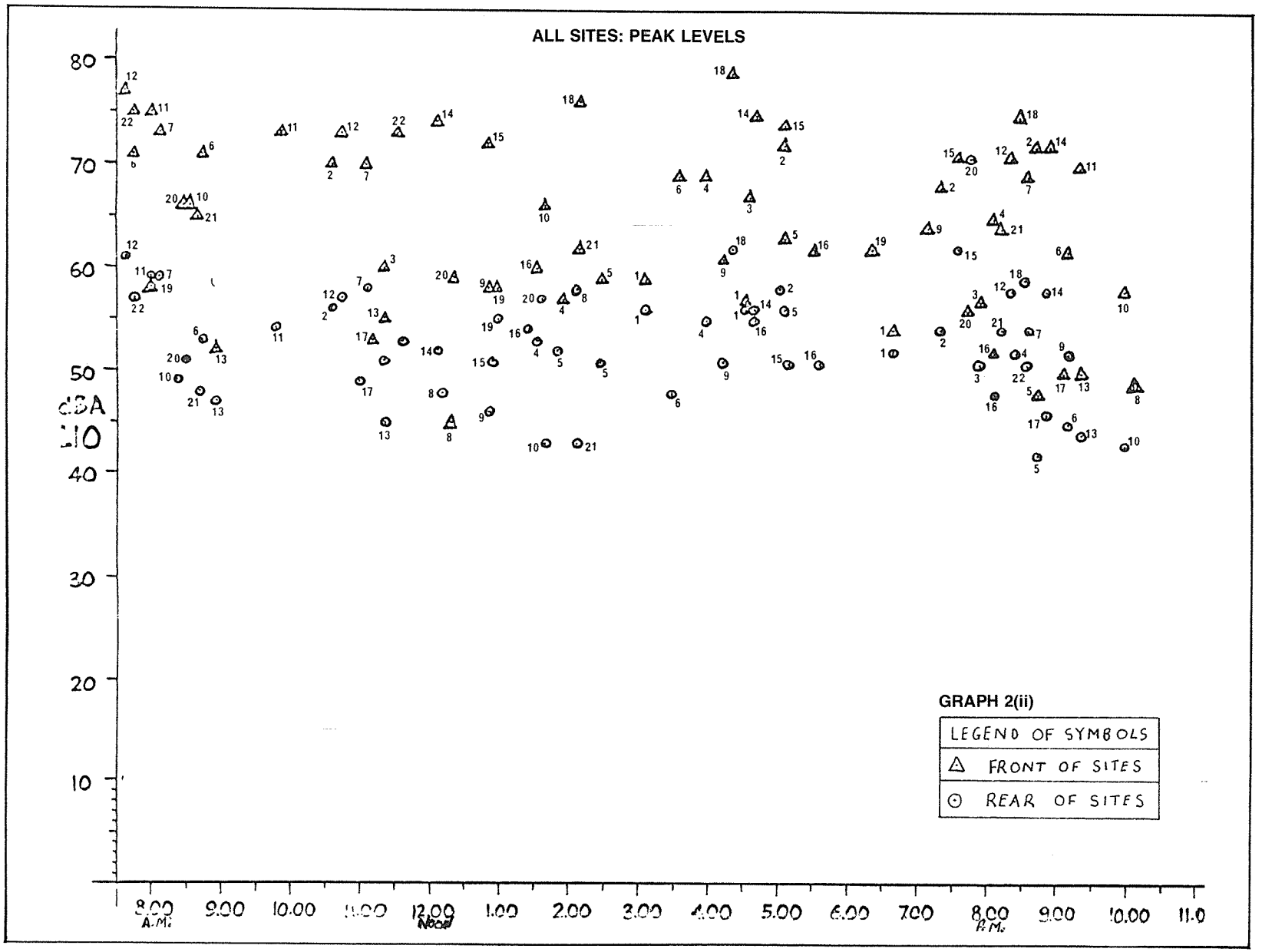
The Establishment of Noise Zones

The establishment of noise zones in the Mount Eden Borough is desirable if the existing noise environment is to be preserved. The establishment of noise zones and hence performance standards for these zones involve some major problems, most of which have been overcome by this survey. These problems include:

(i) The time and cost involved in establishing an effective set of standards and reviewing them each year;
(ii) The accuracy and acceptability of the standards to legal procedures;
(iii) The problems of implementation, i.e. sophistication of control and technical level of staff required.

Excessive noise is one of the major problems with industrial activity and some commercial activities, especially at the interface with residential areas. Noise zones for different land uses have the following advantages over the present methods of control of noise in the Mount Eden Borough:

(i) They provide an **objective** standard for investigating noise nuisances and consequently for taking action against offenders.
Also such action can be taken under Section 36 of the Town and Country Planning Act 1953, and if the offence continues there are financial penalties under Section 50B of the same Act;
(ii) If implemented satisfactorily, they can control increases in industrial and commercial activity noise by ensuring that no factories or commercial activities exceed the stated limit, thereby protecting the noise environment and amenities of adjacent zones;
(iii) They provide a clear indication to industrialists and owners of commercial premises as to what the Council views as an acceptable level of noise in industrial and commercial zones, and at what point they would take enforcement action. Thus, when a new factory or commercial premise is established in the borough, the industrialist or owner of the commercial premise has a set of specific parameters within which he is able to design his building and locate machinery;
(iv) The National Audiology Centre has set down explicit guidelines for the measurement of noise as does Draft New Zealand Standard DZ. 6802. Provided these guidelines are followed, the actual


ALL SITES: PEAK LEVELS
dBA
80
70
60
50
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20
10
8.00 A.M.
9.00
10.00
11.00
12.00 Noon
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00 P.M.
9.00
10.00
11.0
GRAPH 2(ii)
LEGEND OF SYMBOLS
FRONT OF SITES
REAR OF SITES

measurement of noise in a "Noise Zone" is not a difficult task, although in some instances assessment may require a fair degree of judgment.

On the basis of the results summarised earlier in this article, three noise zones have been established for the Mount Eden Borough. The noise zones correspond to the following land use zones:

Noise Zone 1 : Residential B and C
Noise Zone 2 : Commercial B and C
Noise Zone 3 : Industrial B/Residential interface

These noise zones and the ambient noise levels permitted during different times of the day are detailed below and depicted on Map 2.

Although a single figure dBA is given, it is emphasised that it represents the noise level exceeded for 95% of the time within a land use zone. In some instances, the ambient noise levels will be higher or lower than this figure for different sites in the same land use zone.

MONDAY TO FRIDAY	7.00am to 10.30pm	10.30pm to 7.00am
Noise zone 1		
Front of Residential B and C sites	45 dBA	34 dBA
Rear of Residential B and C sites	42 dBA	34 dBA
Noise Zone 2		
Front of Commercial B and C sites	53 dBA	40 dBA
Rear of Commercial B and C sites	42 dBA	34 dBA
Noise Zone 3		
Industrial B/Residential Interface	50 dBA	40 dBA

(Corrections to be applied)

Type of Operation or Character of noise	Correction in dBA
Noise source operates less than 20% of 1hr period	— 5*
Noise source operated less than 5% of 1hr period	— 10*
Noise source operated less than 1% of 1hr period	— 15*
Noise of impulse character (hammering, etc)	— 5
Noise of period character (hum, screech, etc)	— 5

*Apply one of these corrections only.

It is also important to note than the noise levels in zone 3 are intended to cover the area of the Borough presently zoned Industrial 'B' and any re-zoning of land in the Borough to allow industrial development should be subject to the noise levels in noise zone 1.

No noise levels have been taken on Saturday, Sunday, and public holidays. However, the only zone which is likely to have a significant redution in noise levels is Zone 3, due to the closing down of some industries during weekends. In lieu of further fieldwork, the following noise levels during Saturday, Sunday and public holidays were suggested:

SATURDAY, SUNDAY, PUBLIC HOLIDAYS*	7.00am to 10.30pm	10.30pm to 7.00am
Noise zone 1		
Front of Residential B and C sites	45 dBA	34 dBA
Rear of Residential B and C sites	42 dBA	34 dBA
Noise zone 2		
Front of Commercial B and C sites	45 dBA	40 dBA
Rear of Commercial B and C sites	42 dBA	34 dBA
Noise zone 3		
Industrial B/Residential Interface	42 dBA	42 dBA

* Add corrections as before

The assessment of a noise exceeding the levels set in Noise Zones 1, 2 and 3 should be at the **"nearest boundary of an affected residential property".****

It is intended that measurement would be carried out when all noise generating industries, commercial or residential activity were in operation at the time the noise levels are monitored. Only when this is done can the ambient (L95) at the residential interface be known with any certainty.

This is necessary because if two equal noises are added, the intensity will be doubled, but as the pressure is proportional to the square root of intensity, the pressure will increase by a factor of $\sqrt{2}$.

If the pressures are expressed in decibels the increase will be 3 dB. The method of adding sound pressure levels (decibels) is simplified by the use of the scale in Figure 1 below.

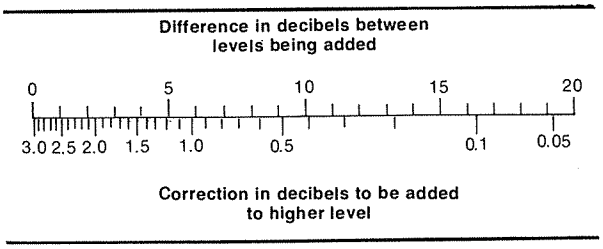
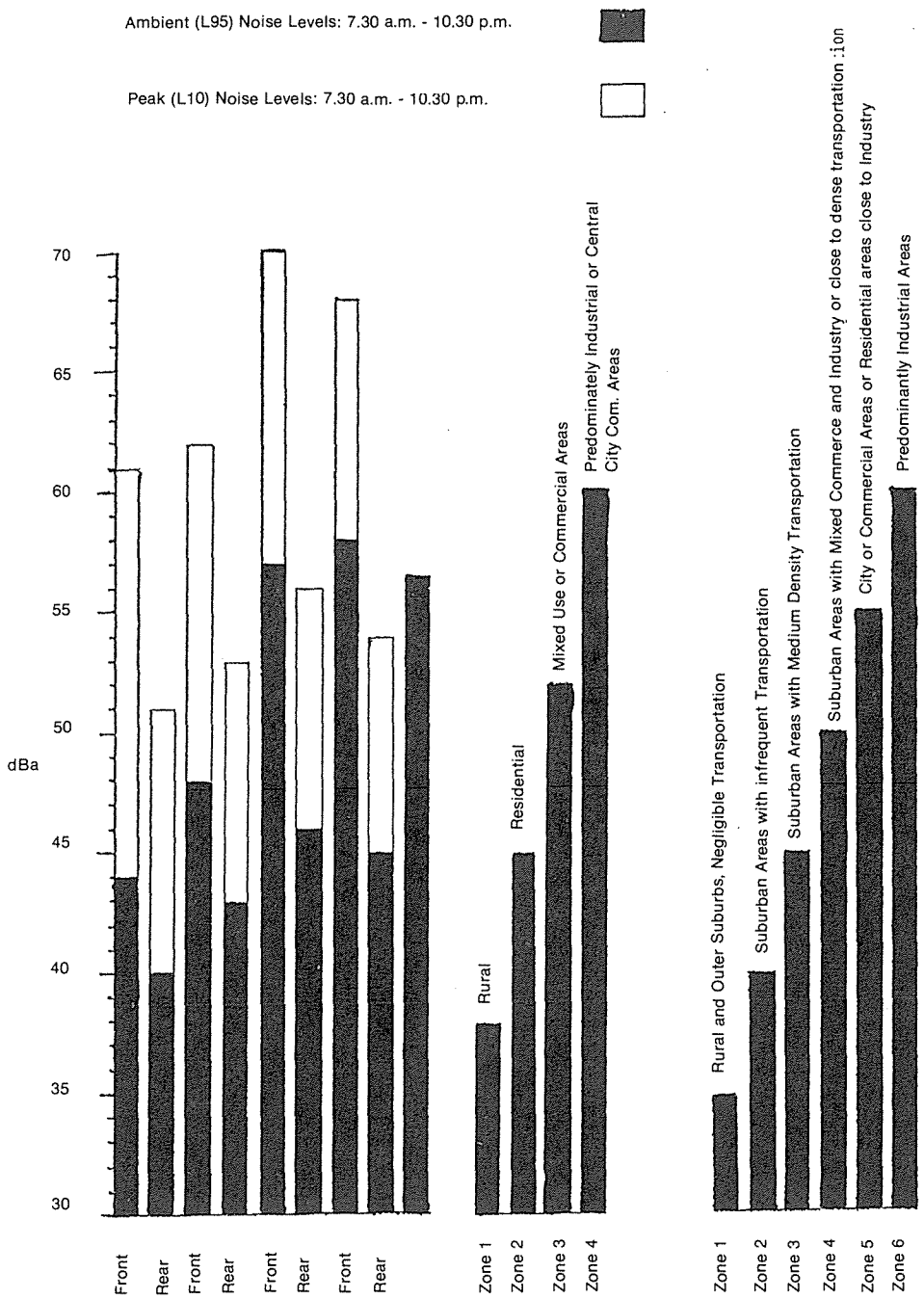


Fig.1 Scale for combining sound pressure levels

** An affected property is one where the ambient noise level (L95) prima facie exceeds the levels set in the performance standard during the time specified.

Comparison of noise levels in the Mount Eden Borough with New Zealand Guidelines.

GRAPH 3



Source: Standards association of New Zealand, Draft N.Z. Standard D26801, Table 1, P.5

Source: Environmental Nuisance Noise (National Audiology Centre) Table 2, P. 9.

An example is given below, using the Zone 3 (Industrial B/Residential Interface) noise level of 50dBA with 5 factories operating. Each factory is measured at this interface separately and the following sound pressure levels recorded:

Factory No.	(dB)
1	43
2	48
3	50
4	50
5	47

To find the total sound pressure level when all the factories are in operation, the two largest pressure levels are added first, and the other levels added to that total one at a time:

50 —50 (difference 0 — add 3) eq. 53
53 —48 (difference 5 — add 1.2) eq. 54.2
54.2—47 (difference 6.2—add 1) eq. 55.2
55.2—43 (difference 12.2—add 0.3) eq. 55.5

It will make no difference to the total if the figures are added in a different order. In the above example, each of the factories complied with the 50dBA Residential/Interface noise level; however, where they are all operating at the same time, the noise level produced exceeds 50dBA. The adding of sound pressures does not always work as depicted above in "free field" conditions because of the effect of masking and the drop-off of sound with distance. However, the above example does point to the danger of setting a noise standard such as "the noise level from an Industrial B site must not exceed 50dBA at the residential boundary". A better approach with a greater chance of success in holding the aural environment at a level which protects the residential amenities of the area, is to set a dBA limit from a **"noise zone" to be measured at the nearest boundary of an affected residential property".***

In the enforcement of such a noise level the components of the noise from each factory or commercial activity would need to be known and abatement action directed to the offending party. This is possible by 1/3 octave analysis of tapes carried out by the National Audiology Centre.

* An affected property is one where the ambient noise level (L95)prima facie exceeds the levels set in the performance standard during the time specified.

Conclusion

It is evident that noise and sound are part of the physical environment and as such it would appear that policies and objectives (not to say action) to achieve community noise control could be quite properly implemented in district schemes. By basing the Mount Eden Borough noise performance standards on noise levels monitored during different times of the day in separate land use zones, the "reasonable degree of certainty" required for town planning ordinances would appear to have been met.

Noise is a classic example of an 'externality' — the side effect of a private action imposing an environmental cost on third parties who are not partners to the action and who receive no benefit from it. Because market forces alone do not provide the producers of externalities with sufficient incentive to avoid their wide-spread side effects, control over such activities become a matter of "public policy".[4]

The need for regulation of noise in the community arises from the observation that noise is increasingly being recognised as an unjustifiable interferance with ordinary comfort and well-being.[5] In both the urban and rural environment, noise has some psychological as well as physical effects upon health which cannot be precisely defined but which are nevertheless experienced by everyone.[6] By quantifying the noise environment in various land use zones within Mount Eden Borough, the council is able to pursue a public policy designed to protect this environment, and to minimise the cost of externalities to residents arising from land uses which generate noise. It is important to remember that due to the uncertainties of the individual response to noise, there will always be individuals of the opinion that the noise standard is either too low or unnecessarily high to be satisfactory to them.[6]

Footnotes

1. **Salmon, C.W. (editor) Environmental Nuisance Noise**, National Audiology Centre, Auckland, third ed. page 1.
2. New Zealand Board of Health Report Series, 1973, No. 21 **Noise** p.39
3. Curry, G.P. Legal Controls on Noise, **New Zealand Law Journal** 7 December, 1976, p.523
4. Organisation For Economic Co-operation and Development, **Urban Traffic Noise,** 1971, p.13
5. Noise Advisory Council, **'Neighbourhood Noise'** Report by the Working Group on the Noise Abatement Act, London, H.M.S.O., 1971.
6. New Zealand Board of Health, **op. cit.** p.11

Note: The original report (159 pages) is available from the Mount Eden Borough Council or Auckland University Architecture Library.

New Zealand Planning Institute
Professional Cards

These notes are inserted for the general information and guidance of the public. The consultant firms listed have one or more Members of the New Zealand Planning Institute amongst their partners.

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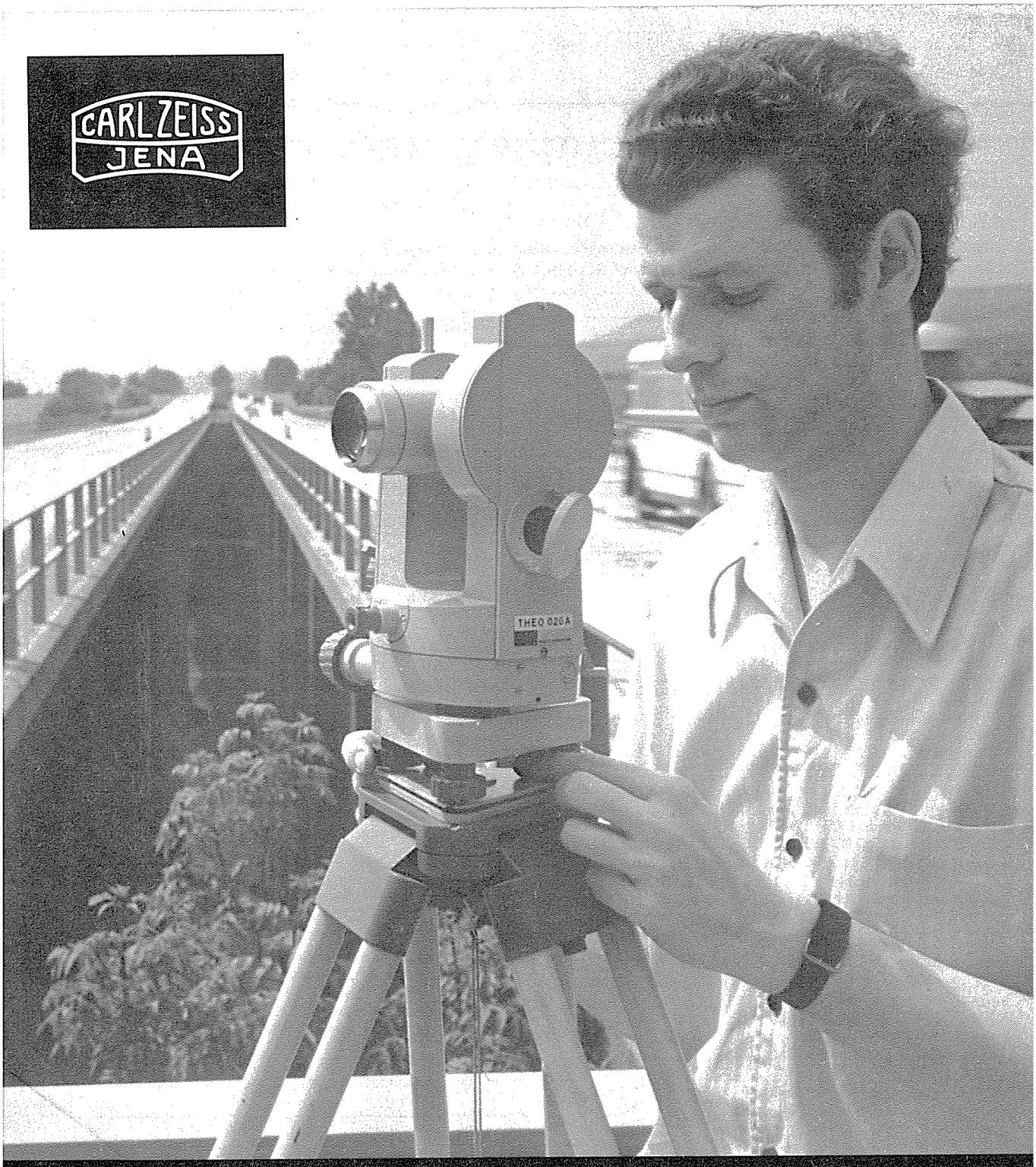

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