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POINT-TO-POINT COMMUNICATION
IN NEW ZEALAND
OVER THE NEXT 30 YEARS

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The views expressed in this paper are those of the author and do not necessarily represent the views of the Commission For the Future.

Point - to - Point, Wired Communication
in New Zealand over
the next thirty years.

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1.

1.0 Introduction

This paper attempts to examine the possibilities for the growth, implementation and penetration of point-to-point communication in a New Zealand typified by four possible scenarios. The scope of the examination extends over the next thirty years.

1.1 The Four Scenarios

Four Scenarios have been outlined by the Commission for the Future and they reflect distinct lifestyles, policies, economies and social orientation which serve as a platform for examining the future. These Scenarios are sensible when viewed from some datum - our present society - and allusions drawn from that datum indicate possibility rather than probability.

The Scenarios, A to D, view society from an individualistic through community range of personal orientations with corresponding indications away from nature and the environment through to orientations towards nature and rejectful of exploitative policies. In Chapter 3 any differences in policies affecting point-to-point communications will be examined.

1.2 Present Reticulated Networks

Since the mid-nineteenth century there has been a gradual enhancement of the mail, telephone and telegraph systems. Modernisation consistent with technology has occurred in quantum stages. Conceptually, one living in the early twentieth century would recognise the present implementations of mail, telephony and telegraphy. No consternation would be experienced regarding these new technologies themselves but there would be amazement at the way modern point-to-point communication is universally implemented, is efficient and relatively inexpensive. Developments over the past century amount to enhancements in cables, telephony and mail handling together with the commonsense amalgamation of typewriters with morse-like codes. Ownership of all major communications in this and many similar nations is in the hands of the state.

Long-standing legislation - the Post Office Act - establishes the limits of encroachment by private enterprise and, until re-drafted, explicitly rules out entrepreneurial activities based on third party services. Any such re-draft would likely be occasioned only by a significant alteration in our environment, as different from the present as the present is from earlier in the century.

Under current conditions New Zealand can expect to see a creeping implementation of modern point-to-point communication technologies - stored programmed control exchanges, fibre-optic transmission, widespread facsimile, computer networking, advanced mail handling, access to visual information databases - and a host of others. What needs to be answered is not what technology will ultimately become available in the world but what (and in what time frame) will be introduced here!

1.3 Indications for Change

In many areas there often arises an intermediate development which portends a more significant change. In the electronics industry examples of this are seen in pocket calculators foreshadowing personal computers, cross-bar switching paving the way for stored program controlled exchanges and electronic games falling victim to sophisticated extensions of home processing units (computer games and home video systems). These intermediates possess the common factor, so far, of being out of kilter with historical usage patterns and bridge gaps while the eventual worth of the technology is developed. Consumer products and In-house developments by multi-nationals are favourite proving grounds for nascent technology and a vision of the future may often be obtained by identifying these catalysts. Electronic communication is not the only area in which this technique is useful but few other disciplines enjoy such a rapid design cycle and identifying the catalysts is harder.

Overseas patterns indicate that the role of telephone networks has edged away from merely providing random access voice communication to providing sophisticated data and information networks. It has not been necessary to undergo a technological change to facilitate this shift in usage but should the networks of the future be more orientated towards data links a re-appraisal of telephone switching principles is mandatory.

Voice communication links are mathematically dimensioned (or provided for) by noting several statistical quantities; the average call holding time, measured in minutes and the average lost call rate, measured in lost calls/thousand attempts. In New Zealand, the average call holding time is of the order of three minutes and lost calls average between 10 to 50 per thousand. By far the most important of these two is average call holding time because a dramatic increase in this factor increases the number of lost calls by exponential-like quantities and severe degradation in network usefulness is instantly observed. No network ever provides enough communication paths for all possibilities and it is usually sufficient that given the two previous quantities only the peak or "busy hour" is provided for.

Data Communication has an average holding time in excess of fifteen minutes - often extending for hours in toll-free areas. Such usage would cripple a properly provisioned voice communications system. To cater for this new trend either extra equipment needs to be installed or data circuits be identified and accorded different connection paths from voice circuits.

Indications overseas point towards "packet switching" - a technique permitting more economical and efficient use of a single line. Although yet to be used on a global basis, the next five years should show packet switching growing more rapidly in usage than telex or existing data links.

Another indication for change is the incentive to use existing telephone networks for extended customer services. Since it is difficult for the private sector to offer wide benefits to the public because of legal constraints one might expect the Post Office to take the lead. One possibility for this lack of opportunism might be in the present tariff policy.

A flat rate tariff for local calls seems an egalitarian ideal but can be injurious to growth. To encourage telephone usage, for any reason, would automatically require extensions to all major exchanges in the nation. The capital outlay would be vast, employ only marginally more technicians than currently are engaged, draw heavily on overseas reserves and precipitate a re-appraisal of tariffs for the "average" user. It would seem more egalitarian to have a "user-pays" tariff in such circumstances.

Recent trends indicate that the existing telephone network has undergone changes which make it more efficient economically but render it more likely to suffer overload if an increase in demand occurred.

A declining population rate coupled with more uniform usage patterns has created the situation where peak usage is static but overall usage has increased. Peak usage (inter alia) determines the total number of circuits whereas high average usage is a measure of economic efficiency. Packet switching seeks this exact situation. Population growth usually affects peak traffic and hence the system's ability to handle calls without excessive loss. Any marked increase in population or usage would destroy this current balance, which was unplanned, and necessitate expansion.

The British Post Office, which uses a charge per call tariff, can - and indeed does - induce subscribers to increase peak traffic and fund expansion from increased revenue. Whereas such a policy not only enhances telephony in that nation, it also aids private industry, via manufacturing opportunities, provides research funds, increases employment in both state and private sectors and provides potential for entrepreneurial and export endeavours. In this country we could expect a subset of these benefits to accrue in a short space of time given appropriate legislative changes in the Post Office Act.

The surest indicator of change seems to be the medium. Given the medium, the message soon follows. Fibre-optic conductors offer reliable, low-cost, high bandwidth and low loss point-to-point communications. Since they are manufactured from readily available raw materials (albeit via sophisticated processes) and offer losses of less than 4dB/km (0.7 dB/km in laboratory conditions) with a typical cost of \$0.046/metre the obsolescence of copper and aluminium conductors is determined. Fibre-optic conductors are not as rugged as metal conductors and require sophisticated connectors but the advantages of low cost and maintenance will cause them to be used increasingly in public networks.

1.4 Reasons for change

Excluding obstacles relating to supply, New Zealand has followed

overseas telecommunications developments selectively. A close copy of telephony, telex and, to a lesser extent, mail facilities exist between ourselves and many other nations. We have advanced, skipping technologies where appropriate and implementing others. Cable TV, facsimile and public information systems have not yet been implemented while cross-bar switching is a technology briefly sampled and then passed over in favour of lower-cost, more reliable electronic technology.

Two reasons for change exist in our current social setting - demand for service from the public and desire for technological equity from government technologists. Public sector demand usually arises from the needs of the bureaucracy - enhanced data communications to facilitate the revenue collection and disbursement activities of the Departments of Social Welfare and Inland Revenue, the banking activities of the Post Office and record keeping of numerous other Departments. The greatest data transfers to the largest databases are undoubtedly in the public sector, although their networking is unsophisticated by comparison with techniques available in other lands, its effectiveness ought not to be questioned!

Private Sector communication is restricted to the use of existing telephone circuits via modems, where data links are required, or via conventional speech links. There is no comparison between the extent of interconnection achievable through modems and through speech. Anybody can talk to any other person but it is not legal for groups of individuals to network together via leased circuits for data interchange. In theory the ability to network via dial-up modems is unchecked but it is mandatory for users to lease equipment from the Post Office and supply could ultimately form the controlling influence.

The advantages of electronic mail, information data banks and shared networking are normally unavailable to those who desire them. Should the same organisations merge under one corporate structure, the legal constraints formerly preventing networking completely disappear. Already, multi-nationals such as Hewlett-Packard have for almost a decade ceased to use telex or telephone for bulk or common information transfer. Offices connected on a "comsys" network of computers dial

a central point daily to give and receive mail. International interoffice memoranda can take but a day, desk-to-desk. Universal extension of the electronic mail information system is inhibited only by statute, the technology is more than a decade old.

2.0 Introduction to the Future

The technological penetration pattern is based on the economic principle of "more for less". The componentry of modern electronic communication systems is cheaper and more reliable than ever before and will improve by several more orders of magnitude before limits are encountered. New ideas are more attractive and more easily exploited in this climate than any other. Cost of service is the factor accounting for the widespread growth of telephony and other electronic communication methods. Any departure from the economic reason for growth and development of point-to-point communication will, likely, be caused by either "rejection" or inability to purchase overseas developments for inclusion in our networks. Freely available technology in a network nation will likely be caused by an economically successful society requiring local tools for export development.

In some cases the future of some ideas - electronic mail for example - will be dependent on the marginal benefit they hold over existing methods. Some claim that once a service reaches an acceptable standard, such as mail deliveries in some countries, further innovations are ineffective unless they offer an order of magnitude improvement. Supersonic transport is a current example of this trend in the Aerospace field. In a similar vein, Societies seeking to replace human labour with technology will see an increase in social disorder unless careful planning occurs. Societies mindful of labour utilisation will use technology to an appropriate level and reject its introduction for its own sake. The Social Surveys of Murphy indicate that the public currently prefer the latter approach.

2.1 Present Indications Extrapolated

Point-to-point communication has followed the following trends since 1870:

| | | | | |
|------|------|------|------------------|-------------------|
| | | | | electronic office |
| | | | | colour fax, |
| | | | | videophone, |
| | | | | home newspaper, |
| | | | electronic mail, | |
| | | | prestel, | |
| | | | radio paging, | |
| | | | tele conference, | |
| | | | low cost fax, | |
| | | | telemetry, | |
| | | | telecommand, | |
| | | | enhanced data, | |
| | | | radiophone, | |
| | | | DATEL | |
| | | | TELEX, | |
| | | | facsimile, | |
| | | | telephony, | |
| | | | telegraphy | |
| 1870 | 1900 | 1970 | 1980 | 2000? |

Over the last one hundred years analogue transmission has predominated. Digital transmission will proceed from its modest contribution of only a few percent in 1980 to near totality by 1999. The reasons for this are primarily due to the cost reduction available from extended research into digital techniques and from the fact that such techniques enable error detection and correction, less expensive transmission media and a higher tolerance to noise. These advantages are virtually unavailable in existing analogue transmissions.

As outlined earlier, the shift in telephone usage has lessened the overall need for growth in circuits. Replacement of aging equipment is still necessary as is the continual improvement of service to far flung subscribers. Extra services would enhance point-to-point communication but in the current climate these would be orchestrated by the Post Office. Ideally the task of providing for New Zealand's future needs should lie not only with one or two government departments but with

representatives of the Private Sector and other parties whose interest in social, demographic, industrial, data-processing and related affairs is extremely relevant to the topic of communication. Instead of the ideal, one observes a tightening of the already substantial grip held on communications by the Post Office and Broadcasting Corporation. Unless the quest for total control over all point-to-point services is stayed, we, as a nation, are unlikely to receive the best advice and make the best judgements over the forthcoming thirty years.

The 1980 Technological Study Report issued by the Post Office Union is a document which covers most of the innovations listed at the start of this section and discussed how members would benefit from an enlargement of current services. The policy adopted by the Union's conference indicates strongly that new technology should be introduced where services available to the user are expanded and where employment conditions are subsequently improved.

Technology introduced solely on the grounds of feasibility or commercial profitability was unacceptable. This policy is in force and has had the effect of delaying numerous schemes designed to enhance the efficiency of many areas of technical management. The Post Office Union is but one of a large number of parties likely to provide useful input for future planning, but should they continue to be one of three or four parties only, we are unlikely to see a deviation from the usual scenario of forbidding private enterprise from competing with the state run networks, even in minor roles.

2.2 The Crystal Ball

Progress over the next thirty years will be driven by a reduction in "cost" of electronic equipment. The "cost" reduction should be seen as "more for less" as it is debatable whether actual prices for computer orientated products will be less than they are at present. Elsewhere, solid conductors will give way to soft conductors and this fibre-optic pathway, formerly confined to harsh environments and laboratories, will enable wide band, bilateral communication throughout the community. This country will enjoy growth in terms of technology implementation but unless a marked alteration in monopolistic policies occurs 30 years overseas will equal about fifteen here. Evidence of a movement towards electronic banking, minor point-of-sale networks, inter-computer communications and viewdata systems shows that we do follow foreign

trends.

Whether we achieve the futuristic concepts of decentralised employment, electronic offices and prolific services based on a fibre-optic pathway is not so much dependent on foreign advances in technology but international appreciation of our need to communicate and through trade, enable us to afford and sustain these systems here.

2.3 Limitations to Growth

Technology, as described by current physical models, is not unlimited in its eventual scope. These laws of physics which assist in design warn of physical limitations of minaturisation and information transfer rates. Some commentators observe that current technology is but a few orders of magnitude away from these limits and since a generation of development is of the order of 10 years, the next thirty or forty will see these observations tested.

In New Zealand one of the major limitations to growth is the extent to which we remain affluent enough to afford technology. Section 2.2 postulated a "more for less" rule rather than a "lot for nothing" rule. Affluence will still be needed to keep up with societies currently similar to ourselves. Population and sociopolitical factors are our prime limitations to growth unless efficiency increases. A decrease in population would not create a climate conducive to our adopting high technology but an increase in population coupled with favourable trading circumstances would advance the need and justification for this technology.

3.0 Policy and Technology in the Four Scenarios

Whatever direction technology takes over the next thirty years will, to a great extent, be related to social development. The relationship between communications and social setting is symbiotic for each literally causes the other to develop. The best advantage is obtained from a harmonious mix of technology (or technique) and the worst advantage is likely to be obtained from strained, maladjusted technology which sought to keep pace with social movements but failed.

It is no great admission that no person can reliably predict the development of point-to-point communications in this country for the next thirty years and for this reason greater wisdom lies in using some mechanism other than personal appraisal. Scenarios have been devised by the Commission for the Future and apart from a brief allusion in Section 1.1 a fuller description is given in a Commission For the Future publication "Contexts for Development: Clarifying Values" in the 'New Zealand in the Future World' series.

A recent social survey conducted by B.D. Murphy, "Attitudes to the Future", produced some preferences and rated each of the Scenarios in order. Such a survey is valuable in determining what people like - but unsurprisingly what we like most is what we are accustomed to - and this was a characteristic of the preferences held by those sampled with respect to living conditions under these four Scenarios. While the preferences of New Zealanders are valid and should be of immediate interest to politicians and planners, they do not indicate how the future will be. The scenario is a tool which alleviates the crystal ball gazer of unwitting exuberance or pessimism. A Summary of the Scenarios is placed in Appendix 1. This Summary has been extracted from the Commission's publication.

3.1 Scenario A

Pursuit of our own best interests and a belief that technology has an almost limitless role in assisting with information interchange; the pursuit of leisure and the reduction of inefficiencies in labour intensive activities is the essence of this social setting. In this scenario global interaction would be a keenly sought goal and wired communication would flourish to enable efficient information interchange. On a national basis, communication between commercial and production locations would expand to accommodate computer-to-computer data transfer, remote modelling of production processes, video phone, electronic fund transfer, mail, voice mail and facsimile; the media being fibre-optic rather than copper.

Despite the obvious trend towards commercial and entrepreneurial ventures, communication growth would conform to strict cost-benefit rules. Technological profligacy is not implied by this or any other scenario because technology is usually the only means to an end rather than an end in itself. The scenario will automatically draw communications standards into line with imported components. These standards,

haphazardly applied between computer manufacturers and the like, are the subject of International Committees at present.

The communication network of the future will be well ordered and subject to fewer constraints regarding access and usage than at present. Community and business needs will be predominantly catered for by private rather than public bodies but trunk routes and local connections will probably still be maintained by a public body whose brief and responsibility ends at the connection box in the home, office or factory. Policy relating to network services will be the responsibility of a "Telecommunications Commission" with members appointed by Government, Industry, Engineering Institutions and Community bodies. Government involvement will be a monitoring rather than controlling affair because such a network will be expected to pay its way and not need a Ministerial imprimatur as public funds will not be appropriated.

This scenario implies a drift away from the socialisation of wired, point-to-point communication facilities to metered, user-pays systems with the corresponding enhancement of services to encourage usage and dependence on them. Since the scenario implies buoyant commercialism and national growth, a necessary redistribution of skills towards business. technology, light and heavy industry, medicine and transportation will also occur. This is the society with the central electronic highway. (The Social Survey conducted by Murphy indicated that 7% of those sampled favoured Scenario A as a context for the future).

3.2 Scenario B

Still a Society orientated towards playing as full a part in world affairs as it can and interacting on a basis determined by trade with only a shade more constraint than the previous scenario. This scenario would see osmotic absorption of communications technology, especially between our trading partners. Compared with Scenario A, the control of point-to-point communication is public rather than private. Expansion and the provision of new services would need to be justified by the benefits accruing to New Zealand and financed as a result of trade. This style of growth is similar to that seen in our current social setting where functional rather than sophisticated, central rather than regional, and public as opposed to private describe the gradual build-up of services.

In this scenario many of the futuristic point-to-point technologies would be implemented eventually but since the controlling organisation is most likely to be government with few services open for private control, emphasis would be placed on services retaining labour and offering career prospects. The policies of Unions would be orientated towards staff retention, retraining and re-deployment rather than redundancy. The introduction of new technology could be much more expensive under this scenario because labour reduction would not occur in public network installation, planning, maintenance and administration.

Services likely to be introduced are no different to Scenario A but not in the same timespan or at the same rate. Some new services are likely to be "given" to private control on a regional basis. Networking by private groups would be controlled and policymaking in overall point-to-point communication would be only slightly influenced by the private sector. Naturally enough, proven techniques which enhance efficiencies in export related industries will be implemented at the request of the private sector but entrepreneurial activities which would rely on free access to the network would be treated with suspicion.

Pricing policies under this Scenario could be either user-pays (with base-rate charges for essential communications) or by scaled usage schedules. Either tariff technique would be sufficient to sustain the osmotic growth envisaged.

(59% of those surveyed by B.D. Murphy favoured Scenario B as a context for the future).

3.3

Scenario C.

This Scenario has the attributes of a co-operative Society where citizens are inclined towards involvement in important issues at both regional and national levels. In a consultative society with less emphasis on following an aligned foreign policy our information needs are differently positioned from those in previous scenarios but are not necessarily greatly reduced.

A society of this type needs reliable and functional communications but

whether they fall closely in step with methods available is questionable. In this society, communication is centered around voice and image transmission where advancing technology provides a low cost solution. Foreign technology will force certain techniques to be used irrespective of any Scenario and these include fibre-optic pathways, digital transmission etc. Whether or not the community is inclined towards sophistication at the user end of the network is a function of affluence because this country is unlikely to produce low-cost devices modelled on the current technology. Future techniques (plasma displays etc) may mean that the community orientated economy can provide low cost equipment for users so that education, recreation and information related to public involvement in the nation's affairs is effectively disseminated.

Planning and day-to-day control of the network is likely to be a state concern but in keeping with the social orientation of this Scenario decision-making would lie with some body representative of community opinion. Services over and above simple point-to-point connection would be provided by private organisations and some billing structure (similar to our STD service) would be in effect. Fees would be collected on behalf of the supplier by the network controlling body. Some "user-pays" approach is necessary in this Scenario to supplement the standard community services offered. Payments need not be excessive, and depending on the technology used, information costs may well be similar to the current costs of newspaper, telephone, mail and television services which are outlaid by families now.

Careful consideration would be given to ensuring maximum opportunity for communications related employment; local manufacturing, repair plants and information production should flourish.

Even though state ownership of a network existed, no state control of information would be countenanced. Self-regulation of the system would ensure balance. This Scenario would view point-to-point communications as a mixture of our current set-up together with some of the benefits of commercial access seen in the United States and to a much lesser extent, in the United Kingdom.

(21% of those surveyed by B.D. Murphy favoured Scenario C as a context for the future).

3.4 Scenario D

Where society favours individual development within a communal setting and prefers decentralisation, almost to the point of autonomy, sophisticated communications techniques are seldom required. Techniques which enable communities to communicate in the areas of speech, vision and print and which do not need to be part of a national network are somewhat simpler than those needed in other Scenarios. An example of the type of communications needed might equate to those found in some Pacific Islands today. Rugged and reliable interconnections between communities would be preferred. Examples might be telephone, low cost facsimile and some form of electronic mail or voice mail.

Observation of rural communities today indicates that apart from occasional urban contact, radio and telephone are all that are required to keep people informed. A judicious selection of radio stations even obviates the need for a newspaper - except for the farming pages.

A society operating in this fashion would appear to have chosen or have had imposed on it a renunciation of global interaction. A global catastrophe, severe national disturbance brought about by earthquake or volcanic activity are possibilities for instigating this society. Population would need to be lower than that currently seen in New Zealand because we are presently far too well populated to sustain the necessary requirements of such a society. In summary the information needs of such a society are high but restricted to local affairs. Interaction beyond the immediate community would be satisfied by technology no more advanced than that seen today.

4.0 Conclusion

In preference to examining the style and appearance that point-to-point communications technology will assume over the next 30 years this paper has preferred to comment on policy issues likely to arise under a Scenario context for future New Zealand. We can assume very little as regards global development over the next thirty years and in similar vein assume little as to how New Zealand will actually fit within that development. But whatever occurs it must be in relation to where we are now and some areas which immediately present themselves in the area of point-to-point communications development and policymaking are:

- private as opposed to state network ownership.
- private as opposed to state network control.
- the right of third party access to the network.
- flat-rate schedules as opposed to "user-pays" tariff policies; or a mixture of the two for network sharing.
- public access to planning, budgeting and management information relating to telecommunications bodies, namely Broadcasting and The Post Office.
- public involvement in service provision and future planning in all areas of point-to-point communications (telephone, mail, data transfer, telex, facsimile, voice mail, electronic mail, video data services and the introduction of international standards and protocols).
- responsibility for network integrity.

With regard to ownership, the current situation is undoubtedly suitable for some and would suit the rest if ownership ceased to be held synonymous with control. Although we have a developing telecommunications network and mail service, the way in which it is managed is more conservative than liberal and in the future this stance could frustrate sections of the community. It was noted earlier that the largest users of network services for inter-computer communication, database management and equipment usage are government or quasi-government organisations.

Should this pattern reverse in the future fundamental changes would need to occur. Those changes would lie in the areas of third party access, tariff rates, private sector involvement in decisionmaking and a shift in the current stance of "all care taken but no responsibility" with respect to message receipt, connection availability and response to the repair of faulty equipment.

The future of point-to-point communications will not be described adequately by any single Scenario, rather, each will contribute to some extent to the policymaking options which need to be examined over the next few years.

In moving from our current social setting to any of those described by Scenarios A through D an awareness of the need for adaptability in planning and policymaking must be developed. Even if no movement in social setting occurs the exercise is unlikely to cause harm and should, instead, benefit all interested with point-to-point communication.

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APPENDIX 1 CONTEXT SUMMARY

| | A | B | C | D |
|--|---|--|--|---|
| View of Human Nature | Rugged individualism and optimism. | Individualism constrained by belief that science will not always have the answer. | Collective social responsibility to meet a wide range of human needs. | Community responsibility to meet a wide range of human needs. |
| View of Human Relationships with Nature. | Environment has no intrinsic worth. Technology and science will always solve problems. | Sustainable use of natural resources. Prevention of environmental problems may be better than curing them. | Environment has no intrinsic worth. Extraction of natural resources constrained by the belief that there is a social responsibility to keep a healthy environment. | Individual and community responsibility for the health of the natural environment. |
| Resource Management | Extraction and processing of all resources which will raise material standard of living. Tendency towards large-scale enterprise. | Maximum economic development constrained by desire to maintain a healthy environment. Tendency towards small scale enterprise. | Extraction and processing of resources to ensure useful activity for all. Both small and large scale enterprise. | Sustainable resource use only. Small scale enterprises only. |
| Participation Social Structure | Successful individuals have status, power and wealth. No formal impediments to participation in decision-making. | Skilled individuals have status, power and wealth. No formal impediments to participation in decision-making. | Co-operative individuals have status, power and share the wealth. Individuals are obligated to take part in decision-making. | In many communities all individuals have status, power and share the wealth. Individuals find it necessary to take part in decision-making. |
| Learning and Valuing | Equal opportunity to compete in the market place of life. The "successful" individual is prized. | Equal opportunity to get education, knowledge, qualifications. The "educated" individual is prized. | Equal opportunity to meet individual needs. Co-operation and contribution to social life are prized. | Equal opportunity to contribute to wellbeing of the community. Co-operation and contribution to community life are prized. |
| Structures and Rules | Free market environment. Govt. intervention in economy minimised. Major role in conflict resolution. | Free market environment constrained by large govt role in environmental, protection, education and conflict resolution. | A planned economy The role of govt is limited only by the aim to have individuals to meet their own needs. | Govt power decentralised to communities. Variation of rules and structures among communities. |
| New Zealand in the World | Self interested foreign policy. Trade opportunities determine foreign relations. | Self interested foreign policy constrained by a desire to help convert the world to sustainable use. Emphasis is on regional development | Independent foreign policy motivated by desire to help poorer countries to meet their own needs. | A neutral foreign policy is aimed at protecting the pace of change within NZ |