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ALTERNATIVE FUTURES:
THE CANADIAN TELECOMMUNICATIONS CARRIAGE INDUSTRY
1985 - 2000

Prepared for the Department of Communications,
(Telecommunications Policy Branch) Ottawa, Canada.

Principal Investigator: Thomas L. McPhail, Ph.D.

Research Associate: Brenda M. Downey, M.A.

The University of Calgary,
Graduate Programme in Communications Studies,
Calgary, Alberta.

March, 1985

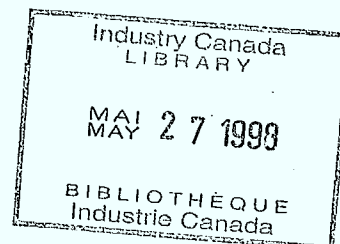
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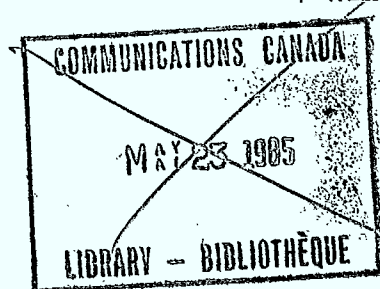
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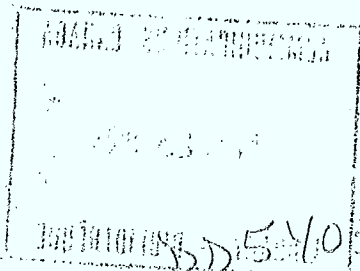


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EXECUTIVE SUMMARY

This research project addresses the issue of the Canadian telecommunications environment to the year 2000. In particular, observations are made and data is assembled concerning the evolving telecommunication technologies, market structures, and regulatory framework along with further comments concerning their impact on each another. Two major types of sources were utilized. First, an extensive computer-based literature search and review was undertaken and second, interviews with senior telecommunication decision makers from all sectors, including public and private enterprises in Canada were held.

A major component of the project involves the creation of a series of building blocks which detail three major telecommunication elements. These include:

1. Technology and Services
2. Market Structure
3. Regulation

In turn, the preceding blocks are combined into scenarios that reflect a range of outcomes from a minimal impact scenario to a number of considerably altered telecommunication environments by the year 2000. Both the building blocks and scenarios were forwarded for discussion and feedback regarding the elements of the building blocks as well as the perceived likelihood of the various scenarios. In addition, comments were received with respect to what factors will either inhibit or encourage the evolution of certain scenarios.

Finally, a major piece is included which deals with international communication concerns and influences. The issue of "bypass" which is alluded to in the literature review and some of the feedback is discussed in detail in Chapter Six. This chapter reviews the deregulatory trends in the United States and speculates on the susceptibility of the Canadian telecommunication market place to potential U.S. entrants.

The final chapter provides a summary of the research, including a discussion of the implications of the feedback concerning the most likely and/or most preferred building blocks and scenarios. The following major conclusions are forwarded.

- (1) The preeminent dominance of technological changes in the telecommunication industry is determining not only market structure, but also the viability of some public policy decisions.
- (2) A national telecommunications policy framework is necessary.
- (3) A joint federal/provincial regulatory authority should be created to facilitate the development of national telecommunication planning.
- (4) Increased competition is inevitable.
- (5) An interim phase allowing for gradual rate-rebalancing in a regulated environment is necessary prior to an inevitable, more open and competitive telecommunications environment.

EXPOSE SUCCINCT

Ce projet de recherche s'adresse à la question du milieu de télécommunications au Canada jusqu'à l'an 2000. Notamment, nous faisons des observations et nous assemblons des données au sujet des technologies toujours croissantes en télécommunications, des structures du marché, et des cadres régulateurs. Nous avançons aussi des observations sur l'impact de l'un sur l'autre. A cette fin, nous avons exploité deux principales sortes de sources. En premier lieu, nous avons entrepris, par moyen d'un ordinateur, une recherche et une réévaluation considérables de la littérature en télécommunications, et, en deuxième lieu, nous avons eu des entrevues avec les cadres principaux de tous les secteurs qui contrôlent les organes de décisions y compris les entreprises publiques et privées au Canada.

Une composante majeure du projet engage la création d'une série d'unités de base (building blocks) qui exposent en détails trois principaux éléments de télécommunications. Ceux-ci comprennent:

1. Technologie et Services
2. Structure du Marché
3. Règlements

En outre, ces unités de base sont réunies en scénarios qui révèlent une gamme de résultats en passant d'un scénario suggérant un impact minimal à plusieurs milieux de télécommunication ayant subis des changements importants en l'an 2000. Nous avons retransmis les unités de base et les scénarios afin d'engager les pourparlers et les réactions vis-à-vis les éléments des unités de base ainsi que la probabilité des divers scénarios. De plus, nous avons reçu des commentaires quant aux facteurs qui soit empêcheront soit encourageront le développement de certains scénarios.

En dernier lieu, nous présentons aussi une partie importante qui traite d'intérêts et d'influences internationaux en communication. La question de contournement (bypass) à laquelle nous faisons allusion dans le parcours sur la littérature et dans certaines des réactions reçues est discutée au Chapitre Six. Ce chapitre réexamine les tendances vers le dérèglement aux Etats-Unis et s'interroge sur la prédisposition du marché canadien en télécommunications à l'entrée éventuelle des concurrents des Etats-Unis.

Au dernier chapitre, nous fournissons un résumé de la recherche, y compris une discussion des implications des réactions au sujet des unités de base et des scénarios les plus probables et/ou les plus privilégiés. Nous avançons les conclusions principales que voici.

1. La prédominance des changements technologiques dans le domaine de la télécommunication décide non seulement les structures du marché mais aussi la viabilité de certaines décisions d'intérêt public.
2. La formulation d'une politique nationale en télécommunication est essentielle.
3. La création d'un organisme paritaire fédéral/provincial, investi d'un pouvoir de réglementation, faciliterait le développement d'une planification nationale en télécommunication.
4. Une augmentation de concurrence est inévitable.
5. Une remise au point graduelle des tarifs dans un milieu réglementé sera nécessaire pendant une période intérimaire qui précéderait le mouvement inévitable vers un milieu de télécommunication plus ouvert et plus concurrentiel.

ACKNOWLEDGEMENTS

This research project was undertaken as part of the university-based research grant awarded to The University of Calgary by the Department of Communications (DOC). In particular, the researchers are grateful to Mr. Peter Smith of the Telecommunications Policy Branch (DOC), for his advice and assistance throughout the project. In addition, the research project was supported through assistance from The Graduate Programme in Communications Studies at The University of Calgary. Also, the researchers are grateful to the numerous individuals who assisted with supplying feedback to the building blocks and scenarios during personal interviews, by telephone, or mail.

We are also grateful for the contribution of Dr. William Melody (Simon Fraser University), who produced Chapter 6 of this research report.

The opinions expressed are those of the authors and do not necessarily reflect the views of the Department of Communications. Finally, all errors of omission or commission are the sole responsibility of the principal investigator.

TABLE OF CONTENTS

TELECOM 2000

EXECUTIVE SUMMARY		i
EXPOSÉ SUCCINCT		ii
ACKNOWLEDGEMENTS		v
CHAPTER		
1	AN OVERVIEW	1
	Introduction	1
	Approach & Methodology	4
2	THE EMERGING TELECOMMUNICATIONS ENVIRONMENT - TECHNOLOGY	8
	Technology & Services - Conservative Development T ₁	12
	Technology & Services - Innovative Development T ₂	18
	Summary	23
3	THE EMERGING TELECOMMUNICATIONS ENVIRONMENT - MARKET STRUCTURE	25
	Current Market Configuration	29
	Possible Future Market Configurations	35
	Market Structure - Minimal Competition MS ₁	43
	Market Structure - National Competition MS ₂	48
	Market Structure - International Competition MS ₃	54
	Summary	56

4	THE EMERGING TELECOMMUNICATIONS ENVIRONMENT - REGULATION		58
	Regulation - Modified Status Quo	R ₁	66
	Regulation - Joint Regulation	R ₂	67
	Regulation - Federal Control	R ₃	69
	Regulation - Minimal Regulation	R ₄	70
	Summary		71
5	POSSIBLE FUTURE SCENARIOS		72
	Scenario I		72
	Scenario II		75
	Scenario III		78
	Scenario IV		81
6	INTERNATIONAL CONCERNS		84
	(prepared by Dr. Wm. Melody)		
7	SUMMARY AND CONCLUSIONS		115
	Summary		115
	Conclusions		119
	Summary statements		125
	BIBLIOGRAPHY		128
	APPENDIX I		143
	Telecom 2000 Survey Schedule		
	APPENDIX II		155
	Telecom 2000 Survey Responses		
	APPENDIX III		226
	The Telecommunications Competition Issue in Canada:		
	A Selected Bibliography		

TABLES

TABLE		PAGE
2.1	Estimated Telecommunications Traffic Growth	19
3.1	Major Canadian Telephone and Telecommunications Carriers, Ownership and Territory	30
3.2	Canadian Telecommunications Market Structure, 1983	36
3.3	Possible Canadian Telecommunications Market Structure, 2000	37
3.4	Market Structure - Minimal Competition - MS ₁	44
3.5	Market Structure - National Competition - MS ₂	49
3.6	Bell Canada Enterprises - Corporate Structure	50
3.7	Market Structure - International Competition - MS ₃	55
4.1	Major Canadian Telephone and Telecommunications Carriers, Regulatory Authority	62
7.1	Respondent Reaction to Building Blocks	122
7.2	Respondents' Scenario Selection	125

CHAPTER ONE

AN OVERVIEW

Introduction

Canada, like other Western nations, is in the midst of a period of substantial transition, particularly in the telecommunications sector. Indeed, the basis of our national economy is shifting. Once a resource-based, industrial society, Canada's reliance on information is rapidly increasing. The dawning of the Information Age was ushered in by dramatic technological innovations and advances in communications systems as exemplified recently by the convergence of the telecommunications and computer industries. This blending of communication technologies enhances the capabilities of each but it also inhibits the ability to control or regulate their use or development even for legitimate national goals or objectives.

Currently, a number of monopolies, guided by regulatory forces, dominate the Canadian telecommunications market. Economies of scope and scale, exaggerated by the vast size of the country and its widely dispersed population, reinforce this market structure as an efficient and effective method of providing telecommunications services, particularly to meet national objectives.

Recent developments, however, question this premise. Not only is competition possible in several emerging service areas, but it is also technically feasible in the delivery of basic services. This new trend is considered inevitable, if not desirable, by many who are familiar with the evolving telecommunications environment.

A number of competitive forces exist. One is the example set by the U.S. industry. In addition, as the traditional service and supplier boundaries continue to blur, the pressure to deregulate or at least, re-regulate, increases. Technology is changing the areas of communication enterprise and challenging the role, as well as the effectiveness of the current regulatory framework. Furthermore, it must be noted that some of these competitive services are available from foreign sources, outside of the purview of Canadian regulators.

In Canada today there are a number of regulated telecommunications entities which come under the federal regulatory umbrella. Some are there because of historical accident and others through deliberate policy decisions so as to ensure that the federal position is maintained. But now, a series of new telecommunication services and suppliers are emerging which have no restrictions or conditions placed upon their market or economic behaviour. They, ironically, are the representatives of a free enterprise model in which the dynamics of the market place determine the winners and losers. On the other hand, regulated telecommunication carriers and suppliers must work through a maze of requirements and suffer the time delaying processes which inhibit communication and market place realities.

A new public policy agenda is evolving which considers at least two major types of issues.¹ One involves arrangements for the information infrastructure or conventional communications policy. A second issue area is

¹Marc U. Porat, "Communication Policy in an Information Society," in Communications for Tomorrow, Policy Perspectives for the 1980s, ed. Glen O. Robinson (New York: Praeger Publications, 1978), p. 12.

information policy, the application of the information technology in other sectors of Canadian society. Policy makers can no longer ignore or diminish the impact of technological change on existing economic, social and political systems if these technological innovations are to assist in the achievement of broader goals for the benefit of Canadian society. Despite the importance of these issues, this paper primarily addresses the first question. Many concerns exist regarding the telecommunications infrastructure. These range from maintaining technological standards and compatibility to ensuring access to service to resolving jurisdictional issues.

However, without a well defined policy agenda these matters may pass from political to judicial decision-makers. The recent case involving AGT and CNCP Telecommunications serves as a vivid example.² The court bases its decisions on narrow legal interpretations. The possible political ramifications of these decisions are not considered; nor is there room for negotiation and compromise. Therefore, in order to achieve their objectives, legislators and their regulators need to understand the environment and determine what goals can be realistically achieved.

The purpose of this study is to make some observations about evolving telecommunications technologies, market structures and regulatory frameworks and the manner in which they impact on one another. It develops, describes and assesses credible, internally consistent projections of alternative telecommunications futures to the year 2000. As such, it permits decision-makers

²Alberta Government Telephones v. CNCP Telecommunications & CRTC (Federal Court, Trial Division, Reed J., 26 October 1984, not yet reported).

to evaluate each alternative from a public policy perspective. Decisions can then be taken to foster or inhibit the development of the proposed future scenarios. (detailed later)

Approach and Methodology

This study was undertaken at the request of the Telecommunications Policy Branch of the federal Department of Communications as a contribution to its telecommunications policy review. The project had three related objectives: to develop, to describe and to assess credible alternative futures for Canadian telecommunications over a ten to fifteen year time span. The approach taken was dictated by these objectives and combined a series of alternative data gathering and evaluation methods.

The first major task was to assemble, through an extensive computerized literature search, a series of background texts and articles dealing with the general area of the future of telecommunications. Also included was a technology review supplied by Loecus Informatics Inc. (Ottawa). This task identified currently relevant issue areas and disclosed recent and possible future developments in the telecommunications environment. Detailed attention was directed to three specific topics: regulation, carrier roles and services and pricing. However, the literature concerning recent technological innovations was also addressed, in an effort to assess future possible applications.

On the basis of the insights and information gathered during the literature search, a series of building blocks and integrated scenarios was developed. (See Appendix I.) Each of the building blocks addressed one of three elements. Although a number of possible blocks can be imagined, these were limited to include:

1. Technology and Services - Conservative Development
 - Innovative Development
2. Market Structures - Minimal Competition
 - National Competition
 - International Competition
3. Regulation - Modified Status Quo
 - Joint Regulation
 - Federal Control
 - Minimal Regulation

To create the five alternative credible futures, one block from each of these elements was incorporated into a scenario. Predictions, based on the literature review, were made as to the probable outcome of each combination. The scenarios provided included:

- I - Conservative Technology and Services Development
 - Minimal Competition
 - Modified Status Quo Regulation
- II - Conservative Technology and Services Development
 - International Competition
 - Federal Control
- III - Conservative Technology and Services Development
 - National Competition
 - Minimal Regulation

IV - Innovative Technology and Services Development

- National Competition
- Joint Regulation

V - Innovative Technology and Services Development

- International Competition
- Federal Control

In order to assess these scenarios in terms of their internal consistency and likelihood, input from a variety of sources was sought. The building blocks and associated scenarios were presented to knowledgeable individuals involved in the telecommunications industry for their review and analysis. The data base was derived from telecommunications common carriers, cable television companies, manufacturers, users and consultants. In total, more than seventy individuals or companies were approached. Feedback was received through personal interviews, telephone conferences and/or written responses.

Approximately forty percent of the selected subjects responded to the request for input. Although this reflects a higher than average response rate for this type of research, it was somewhat lower than expected. A number of potential respondents personally contacted the investigators to explain their reluctance to participate. Two major concerns were expressed. The first involved a number of individuals who essentially refused on the basis of a series of concerns ranging from confidentiality - the necessity of revealing priority corporate information, to anxiety over their relationship with federal authorities. The second group was dubious with regard to the efficacy of their efforts. They were aware that Minister of Communications had already been briefed with respect to future telecommunications policy in December 1984 and believed that the major decisions had already been taken.

Further input would, therefore, be ineffective. This reaction was particularly noticeable and unfortunate during a critical phase of the research which occurred in January 1985. Although potential respondents were sympathetic to both the methodology and the investigators, in light of competing demands on their time, they were unwilling to undertake a response, either in person or in written form, as part of an exercise which they viewed as being an after-the-fact examination of rather serious issues.

However, in spite of these difficulties, the responses received represented all classes of potential respondents. Furthermore they were of high quality and reflected a genuine interest in and concern for this policy field. (See Appendix II.) This feedback was then analyzed and the information was utilized to revise the building blocks and alternative scenarios that follow. Each was reassessed and conclusions were drawn.

CHAPTER TWOTHE EMERGING TELECOMMUNICATIONS ENVIRONMENT - TECHNOLOGY

In 1978, Walter Baer warned that "...any attempt to predict the technology of 1990 is doomed to failure."¹ However, despite the inherent difficulties and dangers of prediction, the effort must be made because "modern invention, technology and cost efficiency...define at least our near-term future."² Schroeder agrees. He argues that technological change underlies changes in society's operating ground rules.³ Marc Porat,⁴ describes technology as the "big wheel" which moves all the "little wheels". In his analysis of technological determinism, communication technology is viewed as the controlling factor which promotes changes in all other areas - economic, political, social and ideological.

Already, advances in telecommunications technology are forcing a rethinking of current market structures and policy agendas. Future possibilities are almost limitless. The new technology offers not only greater transmission capacity, but also an expanded choice of transmission modes. Because of the rapidity of these changes, policy makers require some form of

¹Walter Baer, "Telecommunications Technology in the 1980s," in Communications for Tomorrow, Policy Perspective for the 1980s, ed. Glen O. Robinson (New York: Praeger Publishers, 1978), p. 61.

²Joseph N. Pelton, "The Future of Telecommunications: A Delphi Survey," Journal of Communications (Winter 1981): 177.

³See: Richard C. Schroeder, "Telecommunications in the Eighties," Editorial Research Reports 1:5 (4 February 1983): 91-108.

⁴Porat, "Communication Policy in an Information Society," pp. 3-60.

telecommunications forecasts in order to make informed decisions about future policies.

Two major sources of change exist.⁵ The first is found within the telecommunications industry itself; however, the other is created by the convergence of communications and computers. The development of solid-state microelectronics has had a massive impact on the telecommunications industry by integrating data processing, storage, retrieval, and communications functions. In addition, reductions in size, cost and power consumption have been accompanied by increased speed, reliability, capability and capacity. A number of technological innovations are responsible for these changes, but only a few will be discussed briefly.⁶

The "traditional" transmission facilities include paired copper cable, microwave radio and coaxial cable. Although each has its disadvantages when compared to the new technologies, these three form the basis of the current telecommunications infrastructure. Wholesale replacement is prohibitively expensive, however, future installations will increasingly utilize new technologies. For the present, improvements to existing technologies have increased their capacity in order that they may be better utilized to meet

⁵Brian R. Woodrow and Kenneth B. Woodside, "Players, Stakes and Politics in the Future of Telecommunications Regulation in Canada," a paper prepared for the Conference on Competition and Technological Change: The Impact on Telecommunications Policy and Regulation, Toronto, 25-26 September 1984, (Mimeographed.) pp. 11-12.

⁶A detailed review of the technological aspects of the telecommunications revolution may be found in a companion research document entitled "Telecommunications Technology, Impacts on Services and Services Delivery, 15 Year Horizon" prepared by Locus Informatics Inc., December 1984.

growing demands.

When one investigates the range of newer carriage systems, three predominate. The first utilizes satellites to transmit voice, video and data over large distances. These signals are both distance and terrain insensitive but they are subject to cosmic interference. As improvements are made to increase the power of satellites, to improve the channel allocation, and to ensure more accurate position and attitude control, satellite transmission will become more economically attractive. However, launch costs remain high and could cancel out any economic advantage otherwise gained. In addition, satellite signals experience a .33 second delay which makes them unsuitable for two way communications and thereby limits their applicability.

The second major innovation is the development of pure glass fibres capable of transmitting high density signals. Optical fibres are more efficient and reliable than copper cable. They are smaller, lighter and interference free. Although still relatively costly, they potentially offer reductions in transmission costs on a per channel basis. Optical fibres will gradually replace both the paired copper and cable technologies in trunking systems because of their greatly increased capacity.

Third, the cellular mobile radio technology permits more effective use of the radio spectrum and thereby increases capacity. It provides higher quality, more private signals, both voice and data, than existing mobile radio systems. Although currently expensive, costs will decrease over time, particularly as more subscribers join the system.

In addition to these three major innovations, others are being introduced on a smaller scale. For example, meteor burst communications⁷ utilizes the ionized trails left by meteorites entering the earth's atmosphere to reflect radio waves. This system can provide low cost, remote or emergency service. Such services have limited applicability but they do provide alternatives to conventional carriers.

In conjunction with these innovations, other technological developments occurred that supplemented and enhanced them. These include digital transmission capabilities, packet switching and "smarter" computers. In sum, these technologies are more efficient, reliable and flexible than their predecessors. They permit the integration of voice, video and data and allow for functions other than basic communications to be accommodated. These other functions include, for instance, storage and retrieval, call forwarding and data processing services. The new technologies also enhance and encourage network development. Because networks permit the interconnection of data bases, as well as traditional telecommunications functions, they are growing in use.

These innovations and improvements have created new information services and distribution systems. The traditional market structure has already begun to feel the impact of the new information technologies which are "multidisciplinary, multi-industry, multigovernmental and multinational."⁸ It is for these reasons, Brock argues, that technological change must

⁷Secret radio messages bounce off meteorites," Toronto Star (20 February 1984), p. A 14.

⁸Hudson Janisch and Manley Irwin, "Information Technology and Public Policy: Regulatory Implications for Canada," Osgoode Hall Law Journal 20 (1983), p. 611.

be considered in a broader context than that of a single industry.⁹

The following sections outline two possible technological futures in the Canadian telecommunications industry. Each is based on information gathered during the literature review and revised to acknowledge the industry feedback in response to the original blocks. In addition, elements of the "Loecus Report" have been incorporated in the revised blocks. Because of the difficulty of conceptually separating the technologies from the services they provide, these building blocks incorporate both to a limited extent. However, the issue of services is also addressed under the heading, "Market Structure".

Technology and Services - Conservative Development - T₁

This building block is based on the assumption that the acceptance and utilization of the new telecommunications technologies in Canada will be slower than optimistic futurists predict. Three related observations led to this supposition.

First, it was acknowledged that a market for the new technologies and services must exist before they are developed extensively. New technologies will not create new markets. Currently, there are an estimated 150,000 data

⁹Gerald W. Brock, The Telecommunications Industry, The Dynamics of Market Structure (Cambridge: Harvard University Press, 1981), pp. 300-302.

network connections in Canada; however, many of these are not used.¹⁰ In some cases, personnel have not been adequately trained in the operation of this equipment. In others, fearful and/or older workers are reluctant to use the advanced technology for the purposes for which it was designed. Two problems, therefore, must be overcome before a rapidly expanding market can develop. Office cultures need to develop an awareness of and appreciation for the potential benefits of automation and enhanced telecommunications options. Furthermore, the technology has to be packaged in a practical, easily understood manner to facilitate its acceptance and use.

The second factor considered was the present state of the Canadian economy. Available capital is limited. Unless the new technology can guarantee greater productivity, businesses will be reluctant to invest scarce dollars. Furthermore, although the costs of the new equipment has declined steadily in the past, recent trends indicate a levelling off of prices. Many small businesses still find the technology out of their economic reach and without their participation growth will be slower.

Finally, it has been recognized that there is no one technical solution to the problems facing business today. Earlier technological soothsayers enthusiastically predicted that the marriage of telecommunications and computers would reduce costs, increase profits and secure success.

¹⁰Loecus Informatics Inc., "Report for the Department of Communications, Telecommunications Policy Branch on Telecommunications Technology, Impacts on Services and Services Delivery, 15 Year Horizon," (Ottawa: Loecus Informatics Inc., 1984), pp. 17-18.

These overly optimistic prophecies have been tempered by the realities of the marketplace. The new technology is increasingly viewed as merely one tool, albeit a powerful one, available to business today.

Nevertheless, even this "conservative" building block does assume substantial growth in the acceptance of the new telecommunications technologies. Based on the estimates provided in the "Loecus Report", the number of data network connections is projected to increase by a factor of ten to 1.5 million by the year 2000.¹¹ The amount of traffic will increase accordingly. However, the majority of this growth will occur during the last half of the study period. The following elements, therefore, are included in this block.

i) Microwave, paired copper and coaxial cable remain the dominant transmission technologies in terms of in-place facilities.

- . These technologies are already in place. Their replacement will be gradual, as the need arises.
- . Each technology will function most effectively in specified delivery or service areas:
 - microwave - long distance voice and data
 - paired copper - local voice and data, especially residential
 - coaxial cable - video-cable TV, LAN's.
- . Improved techniques will increase the capacity of these technologies to handle more traffic.
- . Cable companies are likely to continue their reliance on coaxial cable rather than upgrade their physical plants. Representatives argue that a restricted rate of return and an unduly heavy regulatory burden make further investments unwise.

ii) Optic fibres are increasingly utilized for heavy volume trunk and feeder lines.

- . As local trunk systems are gradually upgraded to meet the needs

¹¹Ibid., p. 18.

of growing traffic, fibre optics will replace paired copper cable.

- . New installations will utilize fibre optics in anticipation of increased traffic and lower maintenance costs. For example, fibre will be installed along the CNR right-of-way from Edmonton to Vancouver to be used for CNCP's future national network.¹²
- . With the eventual establishment of a national long distance fibre network, the future of satellite use for national traffic will increasingly be called into question. Fibre is less expensive, and offers more reliable and secure transmission services.

iii) Satellite transmission facilities continue to be under utilized.

- . High development and launch costs keep the price of satellite services high. Despite earnest attempts to utilize available facilities, excess capacity will continue to exist. Telesat now operates at 55 - 60 percent capacity. This will increase only marginally over the study period.
- . Satellites will be utilized to supplement other long-haul terrestrial technologies, but high costs will favour the use of the others over satellite.
- . Satellite technology's greatest contribution will be in the servicing of overseas international voice and data traffic because of its ability to transmit from one large geographical area to another large geographical area.
- . Satellites will also play an important role in the provision of remote communication services.
- . Because of a technological advantage in point to multi-point transmission capabilities, satellites will continue to carry broadcast video signals. This service function is expected to grow. In addition, satellites could be effective in the delivery of "NABU" type services.
- . Another possible growth area involves the development of private networks for large companies which have offices and plants scattered over the country. These would be especially effective for linking remote locations. Imperial Oil's network serves as an example.

¹²"Canstar Lined up for Major Fibre Optic Deals," Canadian Communications Network Letter 4:40 (17 December 1984), p. 1.

iv) Cellular radio technology experiences slow but steady growth. The rate of growth increases towards the end of the study period.

- . Local mobile radio in urban centres will provide the first market for the cellular technology. Initially high prices will limit the market share. However, over the next five to ten years, costs will decrease as more and more subscribers join the system. The initial increase in subscribers will occur as potential users discover the advantages of cellular over conventional radio technology. The increased privacy and flexibility will encourage many to join the system.
- . Mostly voice traffic will be carried on the system during this century, but data services will increasingly become available.

v) Digital technologies steadily replace existing analogue ones.

- . These developments will evolve more rapidly than the change to fibre for a number of reasons. First, despite initial higher costs, digital transmission and switching technologies will enhance the capabilities of existing infrastructures. Digital is more reliable. More intelligence can be built into digital systems. Finally, digital technologies are more compatible with data transmission services.
- . New systems will incorporate digital techniques immediately. The major telcos will enhance their digital capabilities as they upgrade their current facilities. For example, by 1990, Bell Canada is expected to have digital switches in most of its central offices.¹³
- . The implementation of digital techniques will blur the current distinctions among voice, data and video signals.

vi) The installation of privately owned and operated network systems continues at a slow but steady pace as individual companies attempt to optimize the effectiveness of their expensive equipment for internal communications functions.

- . Private PBX's and LAN's will be installed to make computer to computer and computer to data base communications more efficient.

¹³Loecus, "Report", p. 11.

- . Individualized systems permit greater specialization and networks can be developed to suit the precise needs of each user. Such systems are more economical because they recognize that all equipment and resources are not required by all workers.
- . Large enterprises may use coaxial cable or optical fibres in their installations. However, since a paired copper cable infrastructure already exists within most buildings, it can be expected that many networks will utilize it to keep costs down.

vii) The demand for value-added and enhanced services will experience steady growth.

- . There will be increased demand for business-related services including electronic mail, store and forward messaging, processing of data/text/voice, and facsimile related services.
- . The ability to access national and/or specialized data bases will be highly valued by many business users. Residential access demands will be much lower.
- . Personalized services involving telebanking and teleshopping type services will not be developed effectively until after the end of the study period.

viii) Voice communication will still predominate, but non-voice services will steadily grow to narrow the gap between the two.

- . Based on the assumption presented earlier, the majority of business workers will continue to utilize direct person-to-person communication.
- . As the number and variety of services increases, and as workers become more comfortable with the new technologies, the proportion of data and text traffic will also increase.
- . The preference for personal communication will enhance the development of teleconferencing systems. Audio-only will be the most widely utilized but services which incorporate video and facsimile services will capture a more significant market share by 2000.

Technologies and Services - Innovative Development - T₂

This building block differs from T₁ in that it assumes that the new telecommunications technologies will be more widely accepted and business, in particular, will demand more capabilities, speed and functions. This more rapid development depends on two factors. The required equipment must be easier for workers to operate. This involves not only the development of more user-friendly interfaces, but also more effective training procedures. Second, the cost to users for equipment needs to decrease. As the market grows and R & D costs are shared ever more widely this is expected to happen. Lower costs will enable both large and small users to invest in the requisite equipment.

The more rapid acceptance of the new technologies will lead to further trends. It will create a proliferation of new services. Business will demand services and equipment packaged to meet its individual requirements. However, it will also demand a high degree of compatibility. This will permit access to a wide variety of other systems and data bases. Furthermore, it will allow business greater choice in its selection of hardware. This flexibility is a highly valued attribute.

The amount of growth expected is based on the estimates provided in the "Loecus Report".¹⁴ As Table 2.1 illustrates, T₂ is much more optimistic than block T₁. It assumes an average growth rate of twenty percent com-

¹⁴Ibid., pp. 18-19.

Table 2.1

ESTIMATED TELECOMMUNICATIONS TRAFFIC GROWTH

	<u>Number of Data Network Connections</u>	<u>Usage/Day (Hours)</u>	<u>Aggregated Usage/Day (Hours)</u>
1984	150,000	2.0	300,000
T ₁ - 2000	1.5 million	2.5	3.75 million
T ₂ - 2000	3.0 million	3.0	9.0 million

Note: The "Loecus Report" based its conclusions on the following estimates. By the year 2000, 6 million Canadian will be employed in offices. In T₂, it is assumed that 50 percent will have and use network² connected terminal devices. T₁ assumes only one in four workers will use such devices.

Sources: Loecus Informatics Inc., "Report for Department of Communications, Telecommunications Policy Branch on Telecommunications Technology, Impacts on Services and Services Delivery, 15 Year Horizon", (Ottawa: Loecus Informatics Inc., 1984), p. 18.

pounded annually and the number of connections estimated doubles that predicted in block T₁. Moreover, the aggregated hours of daily usage will be multiplied thirty times the current rate as compared to twelve times for T₁. These more optimistic assumptions were utilized to develop the following elements of this block.

i) Microwave, paired copper and coaxial cable continue to serve as the backbone of the telecommunications infrastructures.

- . This statement is especially applicable to the current major players who have large investments in the present system.
- . The anticipated increases in traffic put more demands on the system and upgrading occurs at a much increased pace.
- . Paired copper and coaxial cable will continue to provide transmission services to individual users.

ii) The rate at which optic fibres replace the existing technologies in trunk and feeder systems will be accelerated.

- . The large and steady increase in volume will necessitate a more rapid transition to optic fibres in order to ensure reliable transmission facilities.
- . The push for new facilities will be further enhanced by the desire of the carriers to minimize operational costs. Fibre, though, more expensive to install, is more efficient than the existing technologies for high volume transmission and it offers lower maintenance costs than paired copper or coaxial cable. Lower costs can then be passed on to the users who will demand reliable, low cost services.
- . Many of the new services offered require more sophisticated technology, teleconferencing for example. Growing demand will necessitate upgraded facilities.
- . As a national optical fibre network develops, it will begin to threaten the established long distance technologies, such as microwave terrestrial links and satellites. The fibre network will provide more capacity, reliability and security at less cost. This could become an important factor towards the end of the study period.

iii) The cable companies acknowledge the need to upgrade their current

infrastructures in order to expand the range of services they offer.¹⁵

- . Higher resolution video signals and stereo audio both require dramatic improvements in the cable companies technical plant and infrastructure.
 - . In order to offer the services that are expected to be in more demand, technological improvements are necessary. These include security and "NABU" type services, interactive or semi-interactive services, and pay-per-view video.
- iv) Satellite costs remain high relative to other technologies but satellite transmission is utilized for private networks, remote communications and broadcasting services. Moreover, it continues to be utilized to supplement long haul digital microwave transmission.
- . This element is very similar in both blocks. Satellites major role continues to be in the delivery of overseas services. Other technologies, especially fibre optics, are simply more cost effective.
 - . Private satellite networks increase in number by the end of the study period. Although not the most economical form of communications, satellite facilities will be selected for other attributes that suit the needs of the users. These include point to multi-point services and access to remote locations.
 - . Satellites are utilized more, in conjunction with cable operators, for the delivery of "NABU" type and information or data services. This market is expected to grow for both business and residential users.
- v) Cellular radio gains rapid and wide acceptance in urban areas for mobile communications.
- . The advantages of cellular technology will quickly become evident and outweigh the disadvantage of the high cost. This rapid

¹⁵The cable industry is facing a dilemma. A major financial commitment is required now to upgrade its delivery system. To delay will only permit competitive forces to systematically reduce their subscriber base and thus make it increasingly difficult for the cable industry to finance new investment in delivery technology later.

growth in the subscriber base will be stronger. However, such developments are not expected much before the end of the century.

- Cellular radio will also be used for point-to-point voice communications in rural and remote areas. It will reduce the need for wire line service and thereby provide more cost effective transmission in these hard to serve areas.
- vi) Digital transmission and switching facilities will continue to be quickly incorporated into the telecommunications infrastructures to accommodate the increased volume of traffic.
 - The added intelligence will permit carriers greater flexibility in the delivery of a variety of services.
 - Digital technologies encourage the integration of voice, data and video signals, thereby making regulation, as we know it, more difficult.
 - The move to digital will permit the establishment of an Integrated Services Digital Network. (ISDN¹⁶) for business users mid-way through the study period. The major advantages will be the capability of interfaces and broad variety of services available. As stated earlier, business users will demand this capability because it offers them potential cost savings and greater flexibility.
- vii) Office automation will proceed at a pace double that of block T₁.
 - Business users will rapidly establish their own networks using PBX's or LAN's. They will demand specialized designs that suit their needs for security, interconnectivity and usage patterns.
 - In order to ensure that their systems are capable of handling all communications functions, business users will upgrade their own infrastructures to coaxial cable or fibre optics.
- viii) Demand for enhanced and value-added services will at least double that estimated in T₁.
 - Following the costly installation of PBX's, LAN's, micro-computers, facsimile machines, copiers and storage devices,

¹⁶This paper does not attempt to tender the definitive definition of ISDN. The purpose of the paper is served by acknowledging that ISDN is a set of protocols for voice, data & video, both bulk and interactive that permit the interconnection of equipment and networks.

businesses will demand their use. Services, including electronic mail, store and forward messaging, facsimile reproduction, and information processing, will be highly utilized.

- . The wider acceptability and utilization of such services, also means that users can communicate with many other users than in T_1 . The increased subscriber base, in itself, ensures more traffic.
 - . Home and personal services will also experience growth. However, this service area is not expected to be substantial by the end of the study period.
- ix) Although voice communications remains the preferred method, non-voice services will consume increasing amounts of time on the system.
- . Direct personal communication will continue to afford numerous advantages to the business user.
 - . Teleconferencing services will be more widely utilized as the facilities develop.
 - . Data and text communication services will begin to expand as users realize the efficiency of direct computer-to-computer communications for many of the structured tasks associated with business management.
 - . Home and personal services will also experience growth. However, this service area is not expected to be substantial by the end of the study period.

Summary

Both of the technology and services building blocks outlined above foresee growth in this sector. T_1 is less optimistic in its outlook based on the assumption that office automation will proceed at about half the rate expected in T_2 ¹⁷. However, it must be acknowledged that both blocks envisage dramatic changes in the telecommunications environment.

¹⁷See Table 2.1.

All respondents agreed with that assessment. However, they were evenly divided with respect to their choice of expected development. Half of the respondents predicted T_1 to be the more likely outcome, while the other fifty percent believed that T_2 was a more accurate estimate. Across most classes of respondents the ratio remained constant. Only respondents from the manufacturing sector deviated from this pattern: all responses indicated a preference for the more innovative block.

In addition, there was general agreement that long-established boundaries within the telecommunications sector, such as local service and long distance, are eroding. So are the boundaries between this industry and others in the information business. The integration of voice, data and video and the convergence of computers and communications have removed the factors which once separated and defined the telecommunications sector. In addition, new and improved technologies can provide alternatives to the traditional range of telecommunications services once offered. These new services are finding a market and the industry is responding. Finally, there is concern that national boundaries are also threatening the stability of the national industry.

The impact of these changes then, has been to increase the degree of competition which exists within the industry. The current regulated monopolistic structure is under attack from a broad range of sources both within the industry and outside of it. A number of alternative market structures and policy positions have been proposed. Recognizing that each actor may have a self-serving agenda, it is necessary to thoughtfully assess the impact of the predicated technological changes already outlined on the current market structure.

CHAPTER THREETHE EMERGING TELECOMMUNICATIONS ENVIRONMENT - MARKET STRUCTURE

"Canadians consider cheap and reliable telephone service their birth right."¹ They have one of the best telecommunications systems in the world and they are reluctant to risk damage to that system. Until now, open competition has been rejected in favour of continued regulation in the public interest. However, competition does exist to varying degrees within the Canadian market.

Perfect competition in any industry is rare but workable competition² is not. Competition within the telecommunications sector involves three industries once considered distinct - telecommunications, data processing and office products. However, these boundaries are blurring as the market expands and diversifies. The industry is increasingly volatile and variable³

¹"Is deregulation catching?" Connections, World Communications Report 9 (4 June 1984), p. 5.

²Jerry B. Duval, "The 1982 AT & T Consent Decree: Some Implications for Competition in the Telecommunications Industry", a paper presented at The Associated Telephone Answering Exchanges, Inc. Annual Convention. (San Diego, California, 14 June 1982), p. 7. "A market is workably competitive if, from a structural perspective, entry barriers are modest; multiple though not necessarily "many" firms supply the market; the product or service is only slightly differentiated from one seller to the next; and buyers and sellers are fairly well, although not perfectly, informed about prevailing market conditions. In terms of conduct, workable competition may imply conscious rivalry among sellers, but there is substantial uncertainty among competitors concerning the extent of such rivalry or its importance in making business decisions. A market that is workably competitive will result in a volume of output that is reasonably responsive to consumer demand. Moreover, prices will tend to reflect the cost of production with limited or only transitory supranormal earnings for the firm. For further discussion, see F.M. Scherer, Industrial Market Structure and Economic Performance, 2d ed. (Chicago: Rand McNally, 1980), pp. 41-44."

³Woodrow & Woodside, "Players, Stakes and Politics," p. 26.

and there is worldwide pressure for change. Whereas protected monopolies were once assumed necessary to the efficient functioning of telecommunications infrastructures, that presumption is presently being challenged. Many now argue that monopoly is nothing more than the ability to manipulate prices and eliminate competition unilaterally. Moreover, current technical, economic, ideological and political developments make monopoly in telecommunications more difficult to justify.

Technological innovations have created a number of new configurations for the delivery of telecommunication services. Four major types of competition exist, but these may be combined to create a larger number of possibilities.

1. Brokers may purchase transmission capacity from a facility-owning carrier and resell that capacity to the end user. They may also provide the interconnection with the telephone company's (telco's) network.
2. Additionally, resellers may add enhanced services to their basic transmission capabilities. These value-added services would include computer processing of information.
3. The third possibility involves the establishment of new facilities. New carriers could own their telecommunications facilities and sell their services in competition with the established carriers.
4. Finally, of course, privately-owned networks which bypass the public network could be established.

In sum, all of these types of competition threaten the monopoly position of the current carriers and create pressure to more closely align prices and costs.

The latter two possibilities are especially troublesome for the existing carriers. They are specifically intended to bypass the facilities of these carriers and thereby avoid their interconnection and transmission charges. This sort of bypass competition is technologically feasible and it is a development that some forecasters believe to be inevitable.⁴

In addition, the technology has created increased flexibility and individualization in the services available. Consumers, especially business users, are becoming increasingly sophisticated and are demanding these user-oriented services at lower prices. This demand is influenced by developments in the United States. Both the Canadian and American systems have traditionally offered similar services and adopted common technologies. Canadians, aware of the proliferation of services in the U.S. market, are frustrated by the limitations at home.

A competitive market offers several advantages. It promotes the efficient management of telecommunications suppliers. Prices are forced closer to costs and consumers benefit from lower rates. Competition also encourages innovation and quality control. The number of services and suppliers increases and customers have expanded choice. Furthermore, it is argued that competition has positive effects on a country's economy by strengthening its position in the world market.

Increased competition may also have adverse consequences for consumers and the country. Universal service is the cornerstone of the Canadian telecommunications system. However, without regulation, carriers may be reluctant to undertake unprofitable services such as the provision of basic

⁴"Bypassing the unnatural monopoly," Connections, World Communications Report 10 (18 June 1984), p. 6.

service to rural and remote locations. There is also a fear that residential and rural rates will escalate as costs are shifted to those who have no "bypass" alternatives. Basic service rates may increase to a point beyond the reach of some Canadians. In a society that is increasingly information-based, the discrepancy between "haves" and "have-nots" will be exaggerated.⁵ Furthermore, the American experience with deregulation has proven very confusing for the residential consumer who witnessed substantial increases in his/her monthly bill but recognized no additional benefits.⁶

Another concern questions the ability of actors in the telecommunications sector to compete fairly. Economics of scope and scale may inhibit competition. Furthermore, in a regulated market, in which some services are regulated and others are not, predation is a possible outcome. Contrived barriers may prevent or foil the entry of new suppliers. Alternatively, fierce competition may also be undesirable. Profitless growth creates disenchantment. Product quality and research and development suffer. Eventually, most smaller firms withdraw, are forced from the market, or merge with larger ones. In any case, an oligopoly results.

Finally, increased competition may pose a threat to Canadian telecommunications sovereignty. Canadians are heavy users of telecommunication services and represent a profitable market. With increased competition, there is no guarantee that the new entrants will be Canadian. Given their existing infrastructures, the cost for U.S. carriers or suppliers to enter

⁵T.L. McPhail, "Interactive Cable Connection Services: The Duplex Society Problem", Canadian Journal of Communications 4:4 (Spring, 1978): 1-7.

⁶"Divestiture One Year Later: It's Not Working", Access (November/December 1984): 1,14.

certain sectors⁷ of the Canadian market are minimal. Moreover, because their costs are distributed over a larger market base, prices to individual consumers can be lower than current Canadian prices. Increasing dependency on foreign suppliers jeopardizes sovereign jurisdiction over a vital, national service.

Current Market Configuration⁸

Based on information available in a 1983 federal Department of Communications' publication entitled Canadian Telecommunications: An Overview of the Canadian Telecommunications Carriage Industry,⁹ seven categories of service suppliers were identified: regional and local telcos, CNCP Telecommunications, Telesat Canada, Teleglobe Canada, cable companies, radio common carriers and other non-carriers. The first five sectors are included in Table 3.1 which identifies their territorial market base and ownership classification.

The first category includes the nine major regional telephone companies and over 150 smaller systems.¹⁰ Most are majority owned by Canadian

⁷These market sectors include long distance services, equipment sales, satellite communication and cellular mobile radio. More detail on foreign factors is provided in Chapter 6.

⁸See also: Appendix III.

⁹Canada, DOC, Canadian Telecommunications: An Overview of the Canadian Telecommunications Carriage Industry (Canada: Supply & Services, 1983).

¹⁰The nine major regional telcos include: British Columbia Telephone Co., Alberta Government Telephones, Saskatchewan Telecommunications, Manitoba Telephone System, Bell Canada, New Brunswick Telephone Co. Ltd., Maritime Telegraph and Telephone Co., Island Telephone Co. Ltd., and Newfoundland Telephone Co. Ltd. Examples of the smaller systems include: 'edmonton telephones', the Thunder Bay Telephone System, Télébec Ltée, NorthWestTel and Terra Nova Telecommunications.

Table 3.1

Major Canadian Telephone and Telecommunications Carriers
Ownership and Territory
1984

<u>Company</u>	<u>Ownership</u>	<u>Territory</u>
*Newfoundland Telephone Co. Ltd.	private	Newfoundland
Terra Nova Telecommunications	public (CN)	Newfoundland
*Island Telephone Co. Ltd.	private	Prince Edward Island
*New Brunswick Telephone Co. Ltd.	private	New Brunswick
*Maritime Telegraph & Telephone Co.	private	Nova Scotia
*Bell Canada	private	Quebec, Ontario & Eastern N.W.T.
Québec - Téléphone	private	Quebec
Télébec Ltée.	private	Quebec
Northern Telephone Ltd.	private	Ontario
*Manitoba Telephone System	public (provincial)	Manitoba
*Saskatchewan Telecommunications	public (provincial)	Saskatchewan
*Alberta Government Telephones	public (provincial)	Alberta
'edmonton telephones'	public (municipal)	Edmonton
*British Columbia Telephone Co.	private	British Columbia
NorthwesTel	public (CN)	N.W.T., Yukon & Northern B.C.
CNCP Telecommunications	private/public (CN)	Canada
*Telesat Canada	private/public **	Canada
Cable Companies	private	Canada - specified territory
Teleglobe	public (federal)	International/Overseas

Notes: * A member of Telecom Canada.

** An incorporated company owned jointly by the Government of Canada and the member companies of Telecom Canada.

Source: CNCP Telecommunications, The Crisis in Canadian Telecommunications Policy and Regulation, (Toronto: CNCP), p. 20.

investors or governments and together they comprise the key element of the telecommunications sector by providing the network for local and long distance transmission. Telecom Canada,¹¹ an unincorporated association of the largest telephone company operating in each province was formed in 1928. Telesat also became a member in 1969. Telecom Canada's objective was to develop and maintain a Canadian transcontinental network. It owns no equipment and has no permanent employees. It relies on its member companies for both. It also functions to allocate, among its members, revenues generated by long distance services. Although Telecom Canada remains an unregulated entity, many of the services it provides are regulated through regulation of its member companies.

CNCP Telecommunications is a partnership of Canadian National Railways and Canadian Pacific Ltd. During the 1950s it began to establish a nation-wide microwave network to offer private line and data communications services to major business users. It has continued to develop and promote its services and its rivalry with Telecom Canada has intensified. CNCP perceives itself as an alternative national network and presents itself as Canada's "only national telecommunications carrier".¹²

Telesat, established in 1970, is Canada's monopoly domestic satellite company. It is jointly owned by the federal government, Telecom Canada

¹¹Telecom Canada was originally organized under the name - TransCanada Telephone System (TCTS). Its members include the nine major regional telecos listed in Note 11 and Telesat Canada.

¹²Don Wells, "Competition in Provision of Communication Services," in Proceedings of Communication in the 80's: Major Issues, eds. T. McPhail and S. Hamilton (Calgary: University of Calgary, 1984) p. 46.

members, Québec Téléphone, Ontario Northland Transportation Commission, Canadian National Railways and Canadian Pacific Ltd. Telesat Canada functions as a carriers' carrier. It leases satellite capacity to "approved" carriers and to broadcasting undertakings. However, it is under increasing pressure to liberalize its access rules and possibly become a carrier to its own right.

Teleglobe Canada provides Canada with telecommunication links overseas. A federal crown corporation, established in 1949 as the Canadian Overseas Telecommunications Corporation, it remains unregulated. Teleglobe arranges for overseas telecommunications services, including the provision of private switched networks and leased circuits. It also serves as Canada's representative in international organizations such as the Commonwealth Telecommunications Organization, INTELSAT, INMARSAT, and the International Telecommunication Union (ITU).

These four carrier categories provide a variety of services. Currently, the local or regional telcos have a monopoly on local service. They provide the facilities for transmission and switching. Paired copper cable is utilized in local loops. Public switched long distance service is provided via two coast-to-coast microwave relay routes, coaxial cable and satellite channels leased from Telesat. The Telcom Canada carriers have transborder intercarrier agreements with U.S. telcos to provide service to American destinations. However, overseas international traffic is arranged through Teleglobe Canada which utilizes transoceanic cables and INTELSAT satellites to transmit its traffic. The rates for these services are regulated (except those for Teleglobe services) by the appropriate agencies

but two major pricing principles apply - rate averaging and value-of-service pricing.¹³ In addition, costs and usage are considered to a lesser degree.¹⁴

Long distance leased circuits are available from Telecom Canada members, CNCP and Teleglobe. CNCP operates its own microwave relay system and switching centres, but usually leases local loops from the telcos. Interconnection of leased circuits to the public switched system is permitted in certain circumstances.

In addition to the traditional voice services, these carriers also offer data and image services. Telecom's Datapac and CNCP's Infoswitch both offer public switched and leased circuit data services. Both can interconnect with Globedat (Teleglobe) to provide overseas service. In all cases, rates are based on either a fixed or variable access charge and the volume of traffic transmitted. Image transmission services, such as video conference calls, are provided by Telecom Canada carriers, in conjunction with Teleglobe, if necessary. These services are provided via the same technologies as voice and data. A number of "text" services are also available. These include access to teletype installations, facsimile communication services for the transmission of text or graphics, electronic mail, and viewdata and videotext services. Finally, all carriers can provide programme transmission services both audio and video.

¹³Rate averaging means all customers pay the same rate for the same class of service. Value of service pricing, on the other hand, means that rates will vary based on the value of the service to the subscriber.

¹⁴Higher rates are sometimes applied to services that are more costly to provide. For example, operator-assisted calls cost more than direct dialed calls.

CNCP has a monopoly on public message services - telegrams. International connections are made through Teleglobe. However, the use of this service has been steadily declining with the advent of the newer, more sophisticated services.

The fifth category of service providers is the cable companies. Approximately 500 cable systems offer services to about 80 percent of Canadian households, over fifty-five percent of which subscribe. The cable industry has primarily functioned as an extension of the broadcasting sector by providing for the delivery of broadcast signals. However, it is beginning to enter the telecommunications field in a limited way by providing special services such as alarm monitoring.

The sixth group in the supplier category is the Radio Common Carriers (RCCs). First licensed in 1963, RCC sales reached \$125 million twenty years later.¹⁵ RCCs provide a broad array of services including paging, mobile radio, telephone answering, message forwarding, digital and data transmission, and alarm monitoring. They are regulated with respect to spectrum allocation and interconnection¹⁶, and operate in competition with the local telcos.

The final group of suppliers involves other non-carriers - equipment manufacturers and data processors - who provide both telecommunications hardware and a number of enhanced services. For the purpose of this paper an

¹⁵Meline C. Batten, "Competition in Provision of Communication Services," in Proceedings of Communication in the 80's: Major Issues, eds. T. McPhail and S. Hamilton (Calgary: University of Calgary, 1984), p. 33.

¹⁶The regulator actually regulates the telephone companies and not the RCCs. Therefore, the telco regulator may determine and/or approve the terms of the interconnection between the RCC and the telco.

hardware and a number of enhanced services. For the purpose of this paper an enhanced service will include any one which provides for more than the basic transmission of messages - voice, data, or image. This may involve functions such as directing, storing, retrieving, sorting, merging and processing transmitted messages according to programmed instructions. This supplier group competes directly with the traditional established carriers in both the provision of equipment and enhanced services functions.

The current market structure, therefore, includes seven categories of suppliers which provide twelve major types of services. This configuration is graphically represented in Table 3.2. The suppliers are listed on the horizontal axis and the services along with vertical axis. At the points at which they intersect, an indication is made as to whether or not that segment is regulated. The table illustrates which service sectors operate as monopolies and which are currently competitive.

Possible Future Market Configurations

The preceding section outlined the current telecommunications market structure. However, recent technological innovations have created a proliferation of transmission techniques and services. The development of computer enhanced telephony has changed the way that content is processed and transmitted. Consumers are demanding more user-specific services and products. These factors have caused the market to expand. This will be reflected in an increased number of suppliers which enter this market. In addition, current suppliers will expand the range of services offered. Table 3.3 provides an illustration of the possible market structure by 2000. The information provided is based on an extensive review of the relevant literature. It is not presented as a prediction of the 2000 market but as a representation of

TABLE 3.2

Canadian Telecommunications Market Structure

1983

SUPPLIERS →	Regional & Local Telcos	CNCP	Telesat	Teleglobe	Cable Companies	Radio Common Carriers	Other Non-Carriers
SERVICES ↓							
VOICE -local -public switched	R						
VOICE -long distance -public switched	R			U			
VOICE -long distance -leased circuits	R	R		U			
DATA -public switched	R	R		U			
DATA -leased circuits	R	R		U			
IMAGE -public switched	R			U			
IMAGE -leased circuits	R			U			
Switched Teleprinter/Other Text (Videotex)	R	R		U			
Public Message Service		R		U			
Program Transmission * (Audio & Video)	R	R	R	U	R		
Mobile Communication	R/U					U	
Enhanced Services	R	R		U	U		U

NOTE: R-regulated; U-unregulated

* This category includes services whereby a broadcaster may lease circuits to connect different transmitters, as well as local distribution of signals to the end receiver.

Table 3.3

Possible Canadian Telecommunications Market Structure
2000

SUPPLIERS	Regional & local Telcos	New Entrants -Own Facilities	New Entrants -Brokerage	New Entrants -Value Added	CNCP	Telesat	Satellite Resellers	Teleglobe	Cable Companies	Radio Common Carriers	Canada Post	Non-carriers
SERVICES												
Voice												
-local	V	P			P					P		P
Voice	V	L	V	V	V	V	L	V		P		L
-long distance												
Data	V				V	V		V		P	V	
-public switched												
Data	V	L	L	L	V	V	L	V				
-leased circuits												
Data		L	L	L	L	L	L	V	P	P		V
-private												
Image	V				V	V		V				
-public switched												
Image	V	L	L	L	V	V	L	V				
-leased circuits												
Image		L	L	L	L	L	L	V	P			V
-private	V	V	L	V	V	V	L	V	P		P	V
Switched Teleprinter & Other Text (Video)					V			V				
Public Message Services												
Program Transmission (Audio & Video)	V				V	V	L	V	V			V
Mobile Communication	V	V				V	L			V		V
Enhanced Services	V	V	L	V	V	V	V	V	P	L	P	V

Note: V - Very Likely, L - Likely, P - Possible but not likely

possible market segments. The table will also be utilized to develop the market structure building blocks which follow this section. First, however, an explanation of the categories is provided.

Essentially, the established telcos will continue to exist with a broadened range of services. They will utilize new technologies, such as fibre optics, to increase their capacity and capabilities. However, it is possible, that new telco entrants may appear by 2000 to offer regional, national and international services. A number of possibilities exist. Some may own their facilities, but others may lease capacity from established carriers. For example, BC Rail already owns and operates a microwave system north from Vancouver. It would like to offer telecommunications services through interconnection with BC Tel.¹⁷ The ramifications of this are substantial. Any company that has access to a right-of-way can, theoretically, establish a new telecommunications network using fibre optic cable. For instance, Bell Canada Enterprises, as a major shareholder in the TransCanada Pipeline, could incorporate as an interexchange carrier and offer national long distance services. Such activities reflect the difficulty in assigning traditional roles to major participants when they or their subsidiaries are able to shift to other sectors without concern. Another such example is provided by CNCP which has already applied to the CRTC for permission to compete with Telecom Canada in the long distance voice sector.

To further complicate an accurate mapping of the market structure, it is also conceivable that foreign telcos could enter the Canadian market. As providers of long-distance services, they could reroute traffic through their

¹⁷"Is deregulation catching?" p. 5.

own networks. Once they have an established network in the U.S., their costs to move into the Canadian market are marginal but the opportunities to increase their market share are considerable. U.S. carriers have cost advantages over their Canadian counterparts. These include not only a larger base market but also freedom from most of the regulatory restraints imposed on Canadian carriers. They could, therefore, offer competitive services at much lower rates, particularly in urban centres, and undermine the position of Canadian carriers.¹⁸

This eventuality is not as improbable as it may first appear. The Canadian market is an attractive one for U.S. firms. A few examples will illustrate this. Although not restricted to telco entrants, the following cases clearly illustrate American interest in the Canadian telecommunications market.

- i) Longnet, an American firm, is already providing cheaper long distance services to users in British Columbia. Currently service is provided only to U.S. destinations but international service will be available by the end of April 1985. Moreover, Longnet expects to extend its services into Toronto and Montreal markets by the end of the year.
- ii) Network I of Fort Lauderdale, Florida plans to resell long distance services to Canada from Florida at rates 5-7% lower than AT & T.

¹⁸See also: Chapter 6.

- iii) Satellite Business Systems (SBS) of Maclean, Virginia reports that several of its customers are planning to offer service to Canada.
- iv) American Technologies Corp. of Chicago has applied for permission to purchase about 20% of Cantel Cellular Radio Group Inc. of Montreal. Ameritech sees the Canadian endeavor as a natural extension of its U.S. operations and predicts that the two companies will eventually link their services.
- v) AT & T Canada Inc., was established in January 1984 to sell the company's hardware in the Canadian market.

Satellite transmission offerings may also change. With liberalized access rules, Telesat could become a retailer of satellite transponder capacity. Sharing and reselling of satellite channels are possible. Companies similar to SBS in the U.S., may be established to offer high quality satellite communications of voice, data and image. Cancom is a possible example. Imperial Oil has already leased a private satellite network. Spar Aerospace Ltd. and Bell Communications Systems Inc. have launched a study that is expected to lead to joint marketing of private satellite communications systems for business because they perceive a growing trend in this direction. It is also possible, of course, that American satellite firms might attempt to enter this market sector.

The cable companies may begin to perceive of themselves as alternative common carriers due to technological advances with respect to their interactive capability, a capability that offers important advantages over satellite transmission. Cable systems already connect many homes. They may be able to offer a broad range of non-programming services including videotext, tele-shopping and electronic funds transfer. Over time, these non-broadcast

services via cable may exceed their broadcast counterparts. However, this potential has been largely unrealized because of market place and regulatory uncertainties.

The Radio Common Carriers may also have an expanded future role. With the advent of cellular radio systems, the RCC's can expand their services and offer both local and long distance services. These networks may interconnect with the public switched network or they may be completely independent.

Canada Post is also recognized as a possible new entrants. Although it has worked in conjunction with other carriers in the past, future electronic mail services may be transmitted over a privately operated network. The dominant firm in the electronic mail sweepstakes is yet to be determined.

The final supplier category in Table 3.2 covers the manufacturers and providers of the electronic equipment required to operate a modern, efficient telecommunications system. It is also important to realize that many of these firms are likely to be U.S. subsidiaries. The market for this equipment has grown steadily. However, it should be recognized that although much of the equipment is utilized in conjunction with the systems of established carriers, it need not necessarily be so. These suppliers can install totally private networks within large office structures to handle internal communication requirements. This is a considerable segment of the market since about 60% of any firm's communication is internal.¹⁹ These

¹⁹Steven Globberman, "Economic Factors in Telecommunications Policy and Regulation," paper presented at I.R.P.P. Conference on Competition and Technological Change: The Impact on Telecommunications Policy and Regulation in Canada, Toronto, Ontario, 25 & 26 September, 1984, (Mimeographed.) p. 57.

private networks can be programmed so as to best suit the needs of each firm and can, therefore, ultimately offer important cost savings.

The number and variety of services available in the future will also increase to include any potentially profitable service. The current voice, data and image services will be supplemented by the addition of private ones which may bypass the public switched network. These services will be provided by a variety of suppliers, some foreign owned and operated, utilizing microwave, satellite, cellular radio, optical fibres, and cable technologies. The range of services included in the category of "Switched Teleprinter and Other Text" will continue to expand. Teletext and videotext offerings may include directories, news, data, teleshopping, billing and banking services. The potential growth in this category is immense and most telecommunications providers will want to be involved. Finally, the enhanced services sector is growing at an unprecedented rate. New multifunctional products are revolutionizing the manner in which communications are transmitted and processed. All carriers will be obliged to provide such services if they wish to remain competitive in the rapidly changing telecommunications market place.

The foregoing reviews of current and possible market configurations form the basis for the following building blocks. The elements are variously combined to form three potential market structures. The first is basically a modified status quo. The second reflects a nationally competitive structure and the third is based on international competition involving American entrants. These blocks were developed on the basis of the literature review and the feedback received from industry representatives. However, market forecasting is a very difficult and risky endeavour because of a number of unknowns, including consumer behaviour, which cloud the task. The following

blocks, therefore, represent possible future market structures given certain assumptions. They represent trends or themes, rather than predictions of actual outcomes.

Market Structure - Minimal Competition - MS₁

Building block MS₁ assumes minimal change in the Canadian telecommunications market configuration. It presumes that the small (vis-a-vis the U.S.) Canadian market base inhibits competitive forces. Continued regulation is expected. Competition will be selectively introduced and carefully overseen by regulatory forces. The major established carriers will retain their predominant position. Growing consumer demand will, however, encourage an expanding range of consumer services. Table 3.4 provides a graphic illustration of this block which includes the following features.

- i) The regional telcos maintain their monopoly over local loops.
 - . Local service, both residential and business, remains almost exclusively the domain of the regional or local telcos. (See point iii.)
 - . Any other carrier or private network user which wishes to interconnect with the local public-switched network will be obliged to pay an access fee.
 - . Local rates will increase slightly because of the introduction of interexchange competition (See point ii.), however, this increase is not expected to be high enough to result in an appreciable number of residential disconnects.
 - . The radio common carriers or the regional telcos themselves may introduce cellular radio technologies for some point-to-point communications. This possibility is particularly relevant in

Table 3.4

Market Structure - Minimal Competition - MS₁

SUPPLIERS	Regional & local Telcos	New Entrants -Own Facilities	New Entrants -Brokerage	New Entrants -Value Added	CNCP	Telesat	Satellite Resellers	Teleglobe	Cable Companies	Radio Common Carriers	Canada Post	Non-carriers
SERVICES												
Voice												
-local	V									L		V
Voice												
-long distance	V	L			V	V		V				L
Data												
-public switched	V				V	V		V			V	
Data												
-leased circuits	V				V	V		V	L			
Data												
-private						V			L	L		V
Image												
-public switched	V				V	V		V				
Image												
-leased circuits	V				V	V		V	L			
Image												
-private						V			L			
Switched Teleprinter & Other Text (Video)	V				V	V		V	L		L	V
Public Message Services					V			V				
Program Transmission (Audio & Video)	V	V			V	V		V	V			V
Mobile Communication	V					L				V		
Enhanced Services	V				V	V		V	L	V	L	V

Note: V - Very Likely, L - Likely

rural or remote areas where land-line costs are considerably higher than the revenues they generate.²⁰

ii) Interexchange competition involving Telecom Canada and CNCP Telecommunications will be permitted.

- . Telecom Canada members will achieve some degree of "rate rebalancing." Local rates will be permitted to increase slightly and long distance charges will be reduced. This "rebalancing" will be minimal and rates will not accurately reflect costs.
- . Little change will be reflected in rates because CNCP will be required to pay an access charge to interconnect with the local networks provided by the regional and local telcos. This access charge will be used to support local service and will force long distance rates to remain high.
- . For the reasons outlined above, there will be little appreciable difference in rates charged to the consumer.

iii) Large business users, frustrated by the high cost of telecommunications service will search increasingly for ways to reduce their financial burden.

- . Big business users will begin to establish private networks, both local and long distance, to avoid the high rates charged by the carriers. This activity will escalate by the end of the study period. There is currently evidence of this trend in the United States where competitive services are already in place. For example, Boeing is considering the installation of a 70,000 line network in Seattle to reduce its costs.²¹
- . The development of LANs, PBXs, etc. allow for the establishment of local networks. Given the high proportion of internal communication within any organization, the cost savings could be substantial. In addition, these devices offer increased speed, flexibility and individualization.
- . Long distance networks also offer cost advantages. Satellites are an especially attractive alternative with recent "seat-sale" price reductions.

²⁰Just such an experiment is proposed by AGT and NovAtel for northern Alberta. Cellular point-to-point radio is expected to be less expensive. It will also eliminate the need for bothersome party lines.

²¹"Did it Make Sense to Break up AT & T?" Business Week (3 December 1984):88.

- . In addition to establishing their own networks, companies will search for other alternatives to reduce costs. This may include using the services of American discounters such as Longnet to access the cheaper U.S. carriers. Canadian subsidiaries of U.S. companies can also direct-dial their nearest American office and thereby, interconnect with U.S. services.²² Moreover, this type of activity is very difficult to regulate.
 - . These trends can create serious problems for the major carriers. Because almost 80 percent of a telco's revenue is derived from business users, which represent about twenty percent of its customers, the telcos must cater to this sector. However, should the telcos lose this share of the market, they will be less able to invest in the new technologies needed to further update their systems and attract new business. Business Week predicts that U.S. telcos could lose up to half their total revenue.²³ Another forecaster estimates that the number of bypass networks in the U.S. will increase five times between 1980 - 1990.²⁴
- iv) The mobile communications market sector is expected to grow with the introduction of cellular radio technology.
- . As outlined earlier, the growth of cellular mobile radio will start slowly but increase rapidly by the end of the study period. Some industry representatives predict that almost everyone will have a mobile personal communications device by the year 2000.
 - . Long distance mobile communications services will develop towards the end of the study period. This will help to equalize rural and urban telecommunications services. Many of these services will involve satellites to supplement cellular services. Telesat has already initiated plans for such a mobile satellite service (M-SAT).
 - . By the end of the study period consumers will begin to demand increased data and enhanced services via mobile radio.
- v) Because competition is limited in this block, cable companies will have more opportunities to improve their infrastructures and develop the

²²"Telco Opposition to U.S. Discounters Unlikely to Deter Government; Bypass "Evidence" Questioned," Canadian Communications Network Letter 5:5 (11 February 1985):1.

²³"Did it Make Sense to Break up AT & T?" p. 112.

²⁴See: Art Torino, "LANs - Partners with Voice/Data Systems," Telecommunications 18:9 (September 1984): 64 p.

expertise necessary to provide the quality of service that will be demanded in the future.

- . Cable companies currently operate primarily as regulated suppliers of broadcast programme transmissions. In this sector they are forced to compete with unregulated suppliers - VCR dealers, video rental outlets, TVROs and MATV systems. This creates much uncertainty for the cable industry.
- . The cable companies will seek regulatory changes to permit them to offer their subscribers more choice. Permission to do so will encourage them to undertake the technological improvements to accommodate digital picture transmission and stereo sound.
- . Non-programming services will be slow to develop but many possibilities exist, including videotext, and NABU-type services. Moreover, cable companies may extend their range of services to include the establishment of private data and/or image networks.
- . The cable companies are unlikely to prove a serious threat to the telcos, but they may emerge as a competitor in some service sectors.

vi) The enhanced services sector is the one that is expected to experience the greatest growth in this block.

- . The major established carriers will continue to compete among themselves. However, new entrants are also expected. These include not only other carriers such as the RCCs and the cable companies, but also non-carriers.
- . The current regulated carriers can be expected to try and limit the definition of enhanced services in order to reduce the degree of competition.
- . As individual companies establish their own private networks, they will incorporate enhanced services individualized to suit the needs of the user.
- . This sector will prove so profitable that competition may become more active than many anticipate. For example, Teleglobe Canada may offer enhanced services in direct competition with Telecom Canada and CNCP.

vii) Voice related services will maintain their predominant position, but data and text services will steadily increase as a proportion of the total market.

- . This element was already discussed in detail in Chapter Two.

- . Teleconferencing will slowly gain an increased share of the market. Audio-only conferencing will emerge as the dominant form during the early part of the study period. However, since full service teleconferencing requires specialized facilities, it will be some time before it is widely used.
- viii) The terminal attachment will become increasingly competitive.
- . Regulation will continue to change to allow all Canadian consumers to purchase their own terminals.
 - . The manufacture and sale of this terminal equipment will become highly competitive sectors and prices will closely reflect costs.

Market Structure - National Competition - MS₂

This building block recognizes the power of technological innovations and market forces to effect change in the telecommunications market configuration. MS₂ describes a more active and dynamic market, which provides increased choice and capacity based on consumer demand. This block assumes that regulatory changes will occur to allow new Canadian entrants to compete in all sectors of the market except local service. Table 3.5 illustrates the possible market environment.

- i) Many new entrants will emerge to compete in this field.
- . At first, the market will be dominated by the established carriers, but new entrants will quickly attempt to carve out a place for themselves.
 - . New carriers may own their own facilities or lease capacity from established carriers and resell it to the end user. Other combinations are also possible including the option of adding value through enhanced services to leased facilities.
 - . All technologies will be utilized by entrants trying to achieve and maintain a competitive edge.
 - . Regulation will require that carriers establish subsidiaries to separate their business activities. This has already been done by some carriers. Table 3.6 illustrates the manner in which Bell Canada Enterprises has distributed its corporate activities. This move prevents carriers from subsidizing losses in one sector with profits from another. Although this enhances the opportunity for fair competition, some argue that it works to the

Table 3.5

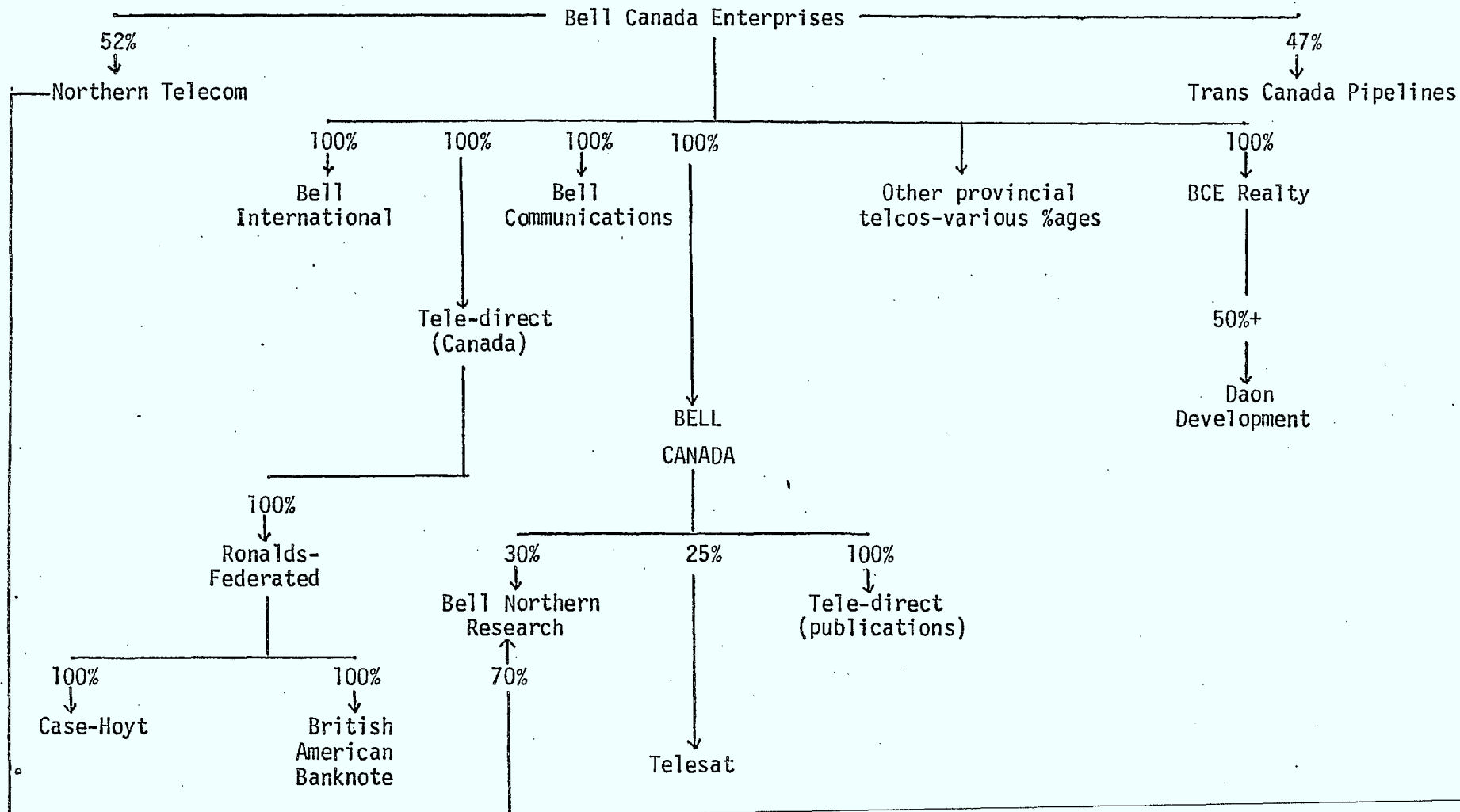
Market Structure - National Competition - MS₂

SERVICES	SUPPLIERS											
	Regional & Local Telcos	New Entrants -Own Facilities	New Entrants -Brokerage	New Entrants -Value Added	CNCP	Telesat	Satellite Resellers	Teleglobe	Cable Companies	Radio Common Carriers	Canada Post	Non-carriers
Voice												
-local	V									L		V
Voice	V	L	V	V	V	V	L	V				V
-long distance												
Data	V				V	V		V			V	
-public switched												
Data	V		V	V	V	V		V				
-leased circuits												
Data			V	V	L	V	L	L		L		V
-private												
Image	V				V	V		V				
-public switched												
Image	V		V	V	V	V		V				
-leased circuits												
Image			V	V	L		L	L				V
-private												
Switched Teleprinter & Other Text (Video)	V	L	V	V	V	V	L	V				V
Public Message Services					V			V				
Program Transmission (Audio & Video)	V				V	V	L	V	V			V
Mobile Communication	V	V				L				V		
Enhanced Services	V	V	L	V	V	V	L	V		V		V

Note: V - Very Likely, L - Likely

Table 3.6

Bell Canada Enterprises - Corporate Structure



50

Source: "Maple Multinational", The Economist (9 February 1985): 71.

disadvantage of subscribers who originally paid for the development of these services and are now unable to reap the dividends.²⁵

- Small carriers will be unable to compete successfully against some of the telecommunication giants. Mergers can be expected. Moreover, firms with out-dated technology may also experience difficulty. One respondent predicted that cellular radio technology may spell "the beginning of the end" for small telcos who cannot afford to upgrade their facilities. He argues that cellular reduces the need for expensive hardware (land lines, etc.) and it is, therefore, more cost effective.
 - The digitization of the network will blur the distinction between data/voice/video. All carriers will be capable of providing all services and existing structural differences will begin to disappear.
- ii) Local service will remain basically a regulated monopoly.
 - Rate-rebalancing will occur before the regulator permits the entry of competition in other sectors. Prices will be market based and increases in local rates can be expected to rise.
 - The rate structure for local services will change. Higher rates will necessitate the introduction of local measured services (LMS) before the end of the study period.²⁶ Life-line rates may be provided. Government may feel obligated to provide subsidies for low income users.
 - Private networks for local intra-office communications will grow rapidly as companies try to reduce their local service costs. These networks will interconnect with the public switched network for other local and long-distance services.
 - Many respondents believe that MS₂ presented no threat to basic universal service, but the U.S. experience disputes that claim. The residential consumer has no alternative opportunities for telephone service and is obligated to pay the rates demanded by the local carrier or discontinue service. (LMS rates may mitigate, to some degree, the effects of local rate increases.)
- iii) Active competition in interexchange carriage is expected.

²⁵ See the November/December 1984 issue of Access. It reviews the results of the AT & T divestiture one year later. Many articles deal with just this argument.

²⁶ "Interest in Local Measured Services Simmers." Canadian Communications Network Letter 5:4 (4 February 1985):2.

- . A wide variety of players is expected in this sector. For example, Bell Canada may establish interexchange services in direct competition with Telecom Canada and CNCP or Teleglobe may offer services to the U.S. via the INTELSAT satellite.²⁷ There is some doubt with respect to the long term survival of Telecom Canada under these conditions.
 - . Rate rebalancing will lower the long distance toll rates. The regional and local telcos will charge for access to their network but this fee will be less than in MS₁.
 - . Fewer private networks for long distance are likely to be established. Bypass will be less economically attractive when rates are low.
 - . Teleglobe will maintain its monopoly in the overseas market.
- iv) The establishment of private networks is likely to flourish as consumers try to individualize their communications services.
- . More competition will force prices closer to costs and hardware prices will decline. Many networks will utilize leased services because of lower costs.
 - . Bypass of carrier networks, however, is less likely. Lower rates will encourage consumers to use the public network. High degrees of interconnectivity will be expected.
- v) Cellular mobile communications growth will be similar to MS₁ but it is expected to gain a larger market share by the end of the study period.
- . At first, cellular radio telephones will not be used to bypass the public wireline network but rather will interconnect. However, as cellular costs decline and as LMS is introduced, cellular may provide a cheap but reliable alternative.
 - . Data and enhanced services will be more in demand. These will be provided to a limited degree by the end of the study period but these services will be expensive.
 - . This sector is expected to witness fierce competition. Mike Kedar of KVA Communications and Electronics predicts that by the year 2000 five percent of the existing RCCs will control 80

²⁷"Government carrier competes against another," Canadian Communication Network Letter 5:1 (14 January 1985): 3-4.

percent of the mobile communications market.²⁸

Long-distance mobile communications capabilities will expand.

vi) Because of an anticipated acceleration of competition, the cable industry's survival in this block is more doubtful. Its role is expected to be minor.

- Rapid competitive development is expected to eliminate cable as a major telecommunications contender. Cable will fail to reach its potential for three reasons: the industry is too fragmented; regulation has inhibited its ability to increase its market base; profits have not been high enough to permit investment to up-date infrastructures.
- Program transmission will continue to be the cable industry's major function. However, subscribers will demand higher quality and more individualization. Pay-per-view television is a possibility.
- Because of cable's shaky future, the telcos may express interest in buying the larger companies in urban centres to augment their own facilities.

vii) The enhanced services sectors can be expected to follow the development pattern outlined in MS₁. However, the competition can be expected to be more dynamic.

- The actors will include all of those in MS₁ (except the cable companies). Moreover, new entrants will appear, some designed specifically to offer enhanced services.

viii) Data becomes an increasingly large share of the transmission capacity.

- Voice will continue to predominate to the end of the study period but its share will decrease steadily.
- Teleconferencing will become increasingly popular because of lower costs for long distance service.
- The home data and text services market will grow slowly. The telcos are likely to fill the void left by the failure of cable to enter this sector.

²⁸"Study for DOC Predicts RCC Mergers, Buyouts Will Leave 5% Controlling 80% of Market in Five Years," Canadian Communications Network Letter 4:39 (10 December 1984): 3.

Market Structure - International Competition - MS₃

As in block MS₂, this market is expected to be very competitive and very dynamic. It assumes regulatory changes which will open all sectors of the market to all interested competitors. International entrants, especially American ones, will emerge to compete with domestic carriers and non-carriers alike.²⁹ This market configuration is represented in Table 3.7.

i) As in block MS₂, many new entrants are expected. Some of these will be foreign.

- . If the regulation is relaxed to admit foreign competitors, American firms can be expected to be active in all market sectors. They may establish their own facilities or they may lease capacity.
- . This block also assumes that Canadian firms could enter the U.S. and/or international markets as well.

ii) Local service monopoly will be threatened by the end of the study period.

- . Private networks and other possible alternatives, including the use of cellular radio for point to point communications, will appeal to large consumers as a means of reducing costs.
- . The regional and local telcos may experience difficulty in this sector because of the lively competition that is expected in others.
- . Universal service will be threatened because carriers will try to maximize their position overall. This means higher local rates and a reluctance to serve unprofitable areas.

iii) Interexchange competition will be especially active with the entrance of foreign firms.

- . American firms may be able to offer substantially lower rates by rerouting traffic through the U.S. This eventuality would mean that Canadian carriers may be bypassed.
- . The fastest growing segment of this market is expected to be overseas calling. U.S. carriers will compete with Teleglobe and threaten its monopoly position.

iv) Individualized leased networks will continue to flourish but bypass will be avoided.

²⁹For further information, see Chapter 6.

Table 3.7

Market Structure - International Competition - MS₃

SUPPLIERS	Regional & local Telcos	New Entrants -Own Facilities	New Entrants -Brokerage	New Entrants -Value Added	CNCP	Telesat	Satellite Resellers	Teleglobe	Cable Companies	Radio Common Carriers	Canada Post	Non-carriers
SERVICES												
Voice												
-local	V	L								L		V
Voice												
-long distance	V	V	V	V	V	V	V	V		L		V
Data												
-public switched	V				V	V		V			V	
Data												
-leased circuits	V	V	V	V	V	V	V	V				
Data												
-private		V	V	V	L	L	V	L		L		V
Image												
-public switched	V				V	V		V				
Image												
-leased circuits	V	V	V	V	V	V	V	V				
Image												
-private		V	V	V	L	L	V	L				V
Switched Teleprinter & Other Text (Video)	V	V	V	V	V	V	L	V				V
Public Message Services						V		V				
Program Transmission (Audio & Video)	V					V	V	L	V	L		V
Mobile Communication	V	V					V	L		V		V
Enhanced Services	V	V	L	V	V	V	V	V		V		V

Note: V - Very Likely, L - Likely

- . Competition will keep costs low and bypass will become an uneconomical alternative.
- . Foreign firms will provide both the hardware and software required to establish networks.
- . The value of interconnectivity will increase with the possibility of cheap access to the entire North American market.
- v) Mobile communications will be readily accepted.
 - . American firms may offer lower rates because of their large market base.
- vi) The prospects for the cable industry are similar to MS₂.
 - . American firms may purchase the Canadian ones. If regulatory restrictions on channel prioritization are dropped, this would lead to the creation of "super-stations". One U.S. station could serve a number of Canadian cities.
- vii) The demand for enhanced services will grow as in MS₂.
 - . Foreign firms may enter this segment at little cost.
- viii) MS₃ resembles MS₂ in many ways but competition is expected to be much fiercer.
 - . Small or poorly financed firms will fail to remain competitive. They will disappear, merge or be taken over by larger ones.
 - . Canadian entrants in all supplier categories, who are already subsidiaries of American firms can be expected to do well initially. They are less likely to face competition from foreign sources.

Summary

The Canadian telecommunications industry is currently very successful in providing the service required by Canadian consumers. For this reason, many of the respondents believed that little change would be accepted in this industry. However, almost all of the industry representatives preferred more competition. Some said it was an inevitable development. Others argued that despite the advantages offered, the Government was unlikely to accept a competitive telecommunications industry. Forty-one percent preferred the

regulated competition described in MS₁, while 48 percent selected MS₂. MS₃ was the least acceptable. Most respondents agreed that the introduction of foreign competition could have only negative effects on the provision of telecommunications services in Canada.

CHAPTER FOURTHE EMERGING TELECOMMUNICATIONS ENVIRONMENT - REGULATION

When discussing regulation in the telecommunications sector, it should not be forgotten that this is an area in which the economic and political stakes are high. Objectives include universal access, substantial Canadian ownership and regional development goals. The Canadian Government has stated its policy objectives with respect to telecommunications.

3. It is hereby declared that (a) efficient telecommunications systems are essential to the sovereignty and integrity of Canada, and telecommunications services and production resources should be developed and administered so as to safeguard, enrich and strengthen the cultural, political, social and economic fabric of Canada;¹

It was assumed once that telecommunications services could only be delivered on a monopoly basis, therefore, regulation was required to prohibit discrimination and prevent abuse and an elaborate regulatory mosaic evolved to monitor the telecommunications infrastructure.

In order to achieve universal access a number of regulatory policies were implemented. Regional telcos were required to provide service in both profitable and unprofitable areas. The basic pricing principles established, value-of-service pricing and system wide price averaging, served to create an elaborate system of income redistribution. Business users, urban communities and long distance toll charges make larger contributions to the common telecommunications costs than do residential users, rural residents and local rates. Any significant shift in one of these domains may affect universality

¹Canada, Parliament, House of Commons, Bill C-16 (1978), s. 3 (a).

and other government objectives. Although these practices have caused the telcos some financial strain, they have also kept local rates low. This has helped to enlarge the size of the public network, thereby increasing the value of the system.

Regulation also attempts to ensure that the technology adopted promotes universal access and serves the Canadian public interest. It recognizes that technologies are not neutral and unbiased; that the selection of technologies involves questions of equity. Regulation, therefore, sets technical standards and ensures compatibility in an effort to provide telecommunication and information services to all. Regulators have heeded Madden's warning.

Do not, ... assume that the system will automatically ensure that...the new technologies (are) put to good use. ...to benefit us all.²

Finally, regulation assures universal access by preventing concentration of control. In a monopoly service, there is always the danger that special interests will gain control to the detriment of the general public. The aim of regulation is to compensate for market failures and prevent monopoly abuses such as discrimination and predation. The excesses of market forces are mediated by regulatory rules.

The second objective of the government is the maintenance of Canadian sovereignty in the telecommunications sector. Fear of foreign domination is reflected in three policy positions. Canadian ownership and control is deemed essential. A growing societal dependence on information, makes the

²John Madden, "Julia's Dilemma," in Gutenberg Two, eds. Godfrey and D. Parkhill (Toronto: Press Porcepic Ltd.; 1980), p. 36.

nation increasingly vulnerable to a variety of threats. This susceptibility is lessened if Canadians have sovereign control of their communications system. This is critical in such major areas as national defence or inter-governmental communications. It also has strategic economic and social significance for the nation.

Telecommunications technology has also raised concerns about information privacy.

...the claim of individuals, groups, and institutions to determine for themselves when, how and to what extent information about them is communicated to others.³

Regulation's role is to prevent abuses of individual privacy. By determining which firms and organizations can provide information services, regulators can define the limitations and punish the offenders. Providing, of course, the offense occurred in a Canadian data base, in Canada.

Third is the ever present issue of Canadian identity and cultural sovereignty. The intensification of international transborder competition, influences the degree to which a strong national industry can exist which reflects Canadian values and needs, is subject to Canadian laws and responds to Canadian policy objectives. Regulators have the responsibility to develop a framework to ensure this.

The regional development objective is also a broad one. Although it varies from region to region, telecommunications is integral to any development scheme. Regulation allows governments to impose development responsibilities on the telecommunications sector in order to achieve its much

³Alan Westin, Privacy and Freedom (New York: Atheneum, 1967), cited in B.C. Tel, "Enhanced Service Proceedings," p. 60.

broader mandate. The vital area of employment opportunities in various regions is also part of the motivation to develop regional telecommunication sources and systems.

However, despite the unarguable fact that regulation seeks to promote laudable goals, the regulatory framework is under severe strain. A number of issues have become increasingly problematic. However, a regionally fragmented regulatory system presently exists which defies logical explanation. (See Table 4.1.) Federalism, constitutional ambiguity and rapid technological change make it difficult to achieve a cohesive, compatible national policy. The "regulated" believe that a settlement of the jurisdictional entanglement is "...an integral and essential component of any effort to rectify or improve telecommunications policy in Canada."⁴

In addition, many observers believe that the information technology is beyond regulatory control.⁵ It cannot be managed. To date, regulation has not kept pace with technological change. The convergence of communication and computer technology has not been recognized. Not only is monopoly no longer necessary in many sectors, it may not be possible or where possible, perhaps dysfunctional. The ability of regulators to effect change has been reduced. Increased pluralism makes consensus building more difficult.

⁴Eldon D. Thompson, "Competition in Provision of Communication Services," in Proceedings of Communication in the 80's: Major Issues, eds. T. McPhail & S. Hamilton (Calgary: University of Calgary, 1984), p. 32.

⁵See: H.N. Janisch, "Winners and Losers: The Challenges Facing Telecommunications Regulation," paper presented at I.R.P.P. Conference on Competition and Technological Change: The Impact on Telecommunications Policy and Regulation in Canada, Toronto, Ontario, 25 & 26 September 1984, (Mimeographed.), p. 9.; and Richard J. Schultz, "Regulation as Maginot Line: Confronting the Technological Revolution in Telecommunication," Canadian Public Administration (Summer 1983): 214.

Table 4.1

Major Canadian Telephone and Telecommunications Carriers
Regulatory Authority
1984

<u>Company</u>	<u>Regulatory Authority**</u>
*Newfoundland Telephone Co. Ltd.	Provincial
Terra Nova Telecommunications	Federal
*Island Telephone Co. Ltd.	Provincial
*New Brunswick Telephone Co. Ltd.	Provincial
*Maritime Telegraph & Telephone Co.	Provincial
*Bell Canada	Federal
Québec - Téléphone	Provincial
Télébec Ltée	Provincial
Northern Telephone Ltd.	Provincial
*Manitoba Telephone System	Provincial
*Saskatchewan Telecommunications	Provincial ***
*Alberta Government Telephones	Provincial
'edmonton telephones'	Municipal
*British Columbia Telephone Co.	Federal
Northwestel	Federal
CNCP Telecommunications	Federal
*Telesat Canada	Federal
Cable Companies	Federal
Teleglobe	Unregulated ****

- Notes: * A member of Telecom Canada.
 ** Unless otherwise noted an independent board or commission holds the regulatory authority.
 *** Regulated by the Provincial Minister of Communications.
 **** Reports to the Federal Minister of Communications.

Source: CNCP Telecommunications, The Crisis in Canadian Telecommunications Policy and Regulation, (Toronto: CNCP), p. 20.

Preoccupation with possible abuse slows innovation and fosters the status quo. Noll argues that regulation has a conservative bias⁶ and Schultz warns that unless the situation is altered, regulation will leave society's interests exposed and defenceless.⁷

Another serious problem facing regulators is the pricing system. Stanbury and Thompson see it as the most important barrier to deregulation.⁸ It is criticized as grossly inefficient, inequitable and unresponsive. With the advent of competitive and bypass technologies, carriers are demanding rate rebalancing - prices should reflect costs. The problem, of course, is that higher rates could threaten universal service if some lower income subscribers were forced to drop off the system. A recent study⁹ has predicted that should the telcos lose 20 percent of their traffic to competitors, assuming 1982 rate structures and demographic characteristics, a maximum of 5000 to 6000 residential subscribers might drop out of the telephone system. These numbers might be somewhat higher in 1990. Many solutions to this problem have been offered. These include life-line rates, direct government subsidies and multi-party service. However, regulators are aware that rate rebalancing creates the impression of inequality. Business users will

⁶Roger G. Noll, "Regulation and Computer Service," in The Computer Age: A Twenty-Year View, eds. M.L. Dertouzos and J. Moses (Cambridge: The MIT Press, 1979, 1981), p. 259.

⁷Schultz, "Regulation as Maginot Line," p. 218.

⁸W.T. Stanbury and F. Thompson, Regulatory Reform in Canada (Montreal: I.R.P.R., 1982), p. 57.

⁹Peat, Marwick and Partners, National Economic Research Associates, Inc., and Telecomsyst Services, Inc., Impacts of Competition in Message Toll Telephone Services (Toronto: Peat, Marwick & Partners, 1984), p.9.

experience dramatic savings but average subscribers will confront higher rates.

Finally, the carriers worry that regulation prevents them from operating their businesses in the most efficient manner possible. Regulatory restrictions slow the adoption of new technologies and inhibit flexible responses to market demands. Furthermore, regulation is costly in terms of both time and money. The regulated carriers claim that consumers are bearing the heavy burden of continued regulation and the country will suffer for it.

There is widespread support for reform of the regulatory system.¹⁰ A move towards reregulation is evident but the likelihood of deregulation appears slim. A review of the literature uncovers three fundamental factors that are required in a successful future environment.

1. Attitudes that encourage cooperation and consultation among governments, current carriers, new entrants and consumers need to be developed. The telecommunications sector is rapidly changing. No one actor can possibly be aware of all the possibilities or consequences.
2. Parliament needs to be actively and constructively involved in the national debate. A strong political will should be evident in the establishment of the overall telecommunications strategy. The policy agenda should be selected on the basis of five crite-

¹⁰Canada, Parliament, House of Commons Special Committee on Regulatory Reform, Report (Ottawa: Supply & Services, 1981), p. 2.

ria - technology, ideology, impact, market solution and political feasibility.¹¹

3. The regulatory burden has to be reduced. Although the rules of competition may be determined, technical standards set and the public interest protected, regulation should strive to be as unobtrusive as possible. Wherever possible, the market place should be allowed to operate freely.

Schultz described the three purposes of regulation as policing, promoting and planning.¹² However, opponents and proponents alike, are aware of the limitations of regulation. Its tools are limited; its process - adversarial. Its time-frame and bureaucratic requirements a burden. Currently, regulation is a blunt instrument. Many argue that reform is required to make regulation more flexible and anticipatory, reflective of the technological realities of the Communication Age. There needs to be a recognition of present realities and future potentials. According to Dealy, regulation should begin to address society's changing needs not its own past principles.¹³

The following building blocks address some of the weaknesses and problems identified in the foregoing review. Four blocks are offered. R₂

¹¹Porat, "Communication Policy in an Information Society," p. 19.

¹²Richard Schultz, cited in Robert D. Cairns, Rationales for Regulation, Technical Report No. 2 (Ottawa: Economic Council of Canada, 1980), p. 4.

¹³John F. Dealy, "Telecommunications: Policy Issues and Options for the 1980s", The Brookings Review 1:2 (Winter 1982):31.

and R_3 are similar with respect to competition and pricing but R_1 and R_4 represent virtually opposite ends of the regulatory spectrum.

Regulation - Modified Status Quo - R_1

- i) The debate over jurisdictional issues continues.
- . The failure of the federal and provincial governments to reach a consensus regarding jurisdictional issues results in the continuation of the current regulatory mosaic.
 - . The CRTC is admitted as a member of the Canadian Association of Members of Public Utilities (CAMPUT) by 1990. This provides a forum for federal/provincial regulatory discussions.
 - . Answers to jurisdictional conflicts that cannot be solved at the bureaucratic or ministerial levels will be sought from the courts. Although the governments themselves may seek to avoid this route, other actors, including carriers or potential entrants, may force the issue. The recent case involving AGT and CNCP Telecommunications provides just such an example.
- ii) Policy development decisions continue to be determined on an incremental basis.
- . The federal government will determine broad policies to direct the activities of the CRTC. (See Bill C-20.) Some provincial governments may follow this lead.
 - . The lack of a national planning body to direct regulatory activity contributes to the ad hocery in decision-making. This will contribute to increase conflict in a number of policy areas including terminal attachment, systems interconnection and interprovincial rates.
 - . The regulatory decision making process will continue to be a lengthy one because of the lack of national direction.
 - . Policies will continue to be developed in response to new technological innovations. Because of the regulator's inability to control events, policy decisions will be primarily reactive.
- iii) Competition will be limited and regulated.

- . Local voice service will continue to be regulated as a monopoly. This is a matter of political choice not technological impossibility.
 - . Competition will be permitted, but regulators will oversee the entry of new competitors and the price structures that are developed to ensure that government's objectives are attained.
 - . Some service areas will be less controlled either because they are less vital to the government's objectives or because the technology permits evident benefits from a competitive approach. Enhanced services may be an example of a more flexible arena.
 - . The cable industry regulation will continue to permit the introduction of non-programming services such as videotext, NABU type services and alarm monitoring. In the programming sector, the cable companies will be required to carry priority stations, but tiering and pay-per-view services will be permitted.
 - . Many decisions regarding competition will be decided on a case-by-case, jurisdiction-by-jurisdiction basis. Differences will develop across the country as provinces differentially admit competition.
- iv) Pricing continues to be largely determined by regulatory forces.
- . The regulators' primary objective in this sector will be to maintain basic universal service.
 - . All competitive services that interconnect with the public networks will be charged an access fee.
 - . Long distance toll rates will decrease slightly. The access fee will add to the carriers' costs.
 - . Local rates will also rise slightly because of the introduction of competition in the long-distance toll sector. "Rate-rebalancing" will be incomplete.
 - . The cost of regulation is expected to rise. This will add to carriers' costs and be reflected in higher rates.

Regulation - Joint Regulation - R₂

- i) A joint regulatory body with representatives from each province and

the federal government will evolve.¹⁴

- . This body will meet regularly to discuss telecommunications regulatory issues involving or impacting on more than one province and make recommendations to the appropriate regulatory agencies.
 - . The regulatory function remains with the existing boards or commissions. In addition, Ontario, Quebec and British Columbia may wish to establish their own regulatory agencies.
 - . Intra-provincial decisions will continue to be made without consultation.
- ii) The newly established joint regulatory body will take responsibility for protecting the national interest.

- . It will identify national priorities and establish national goals.
 - . This body will attempt to be more flexible than current regulatory agencies. By instituting both formal and informal input procedures it will attempt to be more receptive to industry and consumer concerns. Moreover, it will make increased efforts to anticipate technological changes rather than reacting to these development after they occur.
 - . The blurring distinction among voice/video/data transmission signals makes the task of regulation more difficult.
- iii) Competition is permitted in all sectors except basic local voice service.

- . Rates are rebalanced to permit the introduction of competitive services.
- . Open competition is permitted. Only two barriers will be erected to entry. One is a requirement that the company be Canadian owned and operated. Foreign investment will be capped at 20 percent. The second will include the establishment of technical standards.

¹⁴Robert J. Buchan et al., Telecommunications Regulation and the Constitution (Montreal: I.R.P.P., 1982), pp. 12-13.

- . Cross ownership rules will be relaxed but the establishment of separate subsidiaries will be required in most cases.
 - . The cable industry will be permitted flexibility in both programming and non-programming services.
- iv) Market-based pricing will be introduced so that prices will more closely reflect costs.
- . Local measured rates will be introduced. Prices will reflect two factors, an access charge and a usage sensitive charge. The access charge will be about the same as current rates and provide a "life-line" service.
 - . The regional and local telcos will levy an access fee against all carriers or private network users who want to interconnect with their systems. This will add to the cost of long-distance toll rates and "bypass" alternatives.
 - . Government will be obliged to treat telephone service as a social responsibility. A tax may be levied against all carriers and competitors to finance service to those who would otherwise be forced to disconnect.
 - . The cost of regulation will decrease.

Regulation - Federal Control - R₃

- i) The federal government will emerge as the primary regulatory body.
- . Failure of the provincial and federal governments to reach a consensus results in a decision by the courts to award the responsibility for all interprovincial matters to the federal government and its regulators.
 - . The provinces retain control of local regulatory concerns. Their sphere of influence will decrease steadily as more and more issues involve interprovincial concerns. They will become increasingly incapable of affecting change.
- ii) Parliament will establish national goals for telecommunications.
- . The federal Department of Communications will have a large role in advising the Minister with respect to national policy concerns.
 - . The Minister and Cabinet will direct the national regulator as to the direction regulation must take.

- . Keeping with the tradition of consultative federalism, the provinces will be asked for input and federal/provincial conferences will be frequent.
- iii) Competition is permitted in all sectors except basic local service.
 - . See R₂.
- iv) Market-based pricing will be introduced so that prices reflect costs.
 - . See R₂.

Regulation - Minimal Regulation - R₄

- i) The current regulatory framework persists.
 - . The CRTC joins CAMPUT which functions as an arena in which to air differences.
 - . The failure to resolve the federal/provincial conflicts permits technological factors to determine many outcomes and governments discover that they have relinquished control unwittingly.
- ii) The market is allowed to develop independently.
 - . The regulators' ability to control events is eroded by the introduction of new and innovative technologies.
 - . Regulators concentrate on achieving one or two goals, such as economic development or basic universal service.
 - . Policy development is primarily reactive in nature.
- iii) Open competition is permitted in all sectors.
 - . Following rate rebalancing, attempts are made to maintain a monopoly in local service but this proves to be increasingly difficult.
 - . Different provinces develop at different rates but the eventual outcome is the same.
 - . No barriers to entry are erected. Foreign investment and foreign entrants are permitted.
- iv) Regulators have no control over prices.
 - . Governments levy a tax on telecommunications providers to finance their own telecommunications goals.
 - . Incentives or grants are used to ensure universal service.
 - . The costs of regulation are minimal.

Summary

In response to the regulatory building blocks, 37 percent of the respondents selected R_2 - Joint Regulation as the most desirable or most likely outcome by the year 2000. R_3 was rejected because of a perceived distaste in various parts of the country for federal control. R_4 was favoured by about 25 percent of respondents, however, most believed it to be too far out of line with the reality of the Canadian situation. Another 25 percent of the respondents predicted that R_1 , a modified status quo, would evolve. Therefore, it is evident that the vast majority of respondents expect at least some change in the regulatory environment. Few want or expect to operate in a completely open market but most want some loosening of the regulatory reins. Only one respondent rejected any change in this area.

CHAPTER FIVE
POSSIBLE FUTURE SCENARIOS

The possible future scenarios that follow were developed using the building blocks outlined in Chapters Two to Four. Each scenario incorporates a block depicting technology and services, market structure and regulation. The scenarios present credible, integrated, cohesive future telecommunications environments. Each explores the logical inter-relationships among the elements and attempts to determine the likely long-term stability of that particular combination. Obviously some combinations "fit" together better than others. The choice of scenarios developed here reflect the predominant views expressed in the literature and by the respondents to this study.

Scenario I - T₁, MS₁, R₁

Scenario I is primarily a modified version of the status quo. As such, it incorporates the following elements.

Technology and Services - Conservative Development

- i) Microwave, paired copper and coaxial cable remain the dominant technologies in terms of investment.
- ii) Optic fibres are increasingly utilized for heavy volume trunk and feeder lines.
- iii) Satellite transmission facilities continue to be under utilized.
- iv) Cellular radio technology experiences slow but steady growth. The rate of growth increases towards the end of the study period.
- v) Digital technologies steadily replace existing analogue ones.
- vi) The installation of private networks continues at a slow but steady pace as individual companies attempt to optimize the effectiveness of their expensive equipment for internal communications functions.
- vii) The demand for value-added and enhanced services will experience steady growth.
- viii) Voice communication will still predominate, but non-voice

ser-
vices will grow steadily to narrow the gap between the two.

Market Structure - Minimal Competition

- i) The regional telcos maintain their monopoly over local loops.
- ii) Interexchange competition involving Telcom Canada and CNCP Telecommunications will be permitted.
- iii) Large business users, frustrated by the high cost of telecommunications service will increasingly search for ways to reduce their financial burden.
- iv) The mobile communications market sector is expected to grow with the introduction of cellular radio technology.
- v) Because competition is limited in this block, cable companies will have more opportunity to improve their infrastructures and develop the expertise necessary to provide the quality of service that will be demanded in the future.
- vi) The enhanced service sector is the one that is expected to experience the greatest growth.
- vii) Voice related services will maintain their predominant position, but data and text services will steadily increase as a proportion of the total market.

Regulation - Modified Status Quo

- i) The debate over jurisdictional issues continues.
- ii) Policy development decisions continue to be determined on an incremental basis.
- iii) Competition will be limited and regulated.
- iv) Pricing continues to be largely determined by regulatory forces.

Scenario I suggests that the acceptance of the new technologies will be conservative and that regulatory changes will be minimal. In such an environment where competition is regulated, the established carriers will retain their dominant position. However, assuming that the regulations governing the cable industry are relaxed as indicated, this environment also provides cable with the opportunity to update its infrastructures and develop the expertise required to expand its range of services. It is doubtful that

the cable industry will prove a threat to established telcos during the study period, but its survival with an increased variety of services is possible.

Competition will be permitted in a number of service areas but rates and entry will be controlled by the regulators. Because of the existing regulatory mosaic, the introduction of competitive services will occur at different times in different provinces. The rules for competition will also vary. However, it is unlikely that any one regulator will be capable of withstanding the competitive forces once one or two provinces take steps to liberalize this sector.

Competition in long-distance toll service will have minimal impact on the rates charged to customers because of expected high interconnect fees. Initially, the entrants will be limited to Telecom Canada members and CNCP but during the second half of the study period non-carriers and Telesat can be expected to obtain a larger share of the market as more users turn to private or leased long distance networks. New facility-owning carriers can also be expected to emerge by the end of the century. If, as indicated earlier, these include new subsidiaries of existing regional telcos which are prepared to compete against their Telecom Canada partners, Telecom Canada's continued existence is questionable.

Competition is also expected in data and text services, mobile communications, enhanced services, and equipment manufacture. In addition, the competition in broadcast program transmission will escalate. The degree of regulation in each sector will vary across the country, intensifying the confusion faced by the industry and possible new entrants.

Towards the end of the study period the industry will face increasing pressure. Suppliers of services and users alike will become increasingly frustrated with the country's patch work regulatory environment. What is

possible in one province may not be in another. Moreover, because the regulator will continue to monitor long-distance rates, these are expected to remain high. Large users will look for more economical means of satisfying their telecommunications needs. As they do, their contribution to the costs of the common carrier will decline. Consequently, the carrier will be obliged to increase rates even more, to make up for that shortfall in revenue. Higher rates will encourage and/or force more subscribers, both commercial and residential, to drop off the system.

The regulators will be unable to control events as they have in the past because the new technologies will have stripped them of that capability. Furthermore, the regulatory stalemate will inhibit the establishment of forward-looking, effective telecommunications policies. Without constructive intervention, the future for the Canadian telecommunications industry appears bleak.

Scenario II - T_1 , MS_2 , R_2

Scenario II describes a more competitive environment than Scenario I. It includes the following elements.

Technology and Services - Conservative Development

- i) Microwave, paired copper and coaxial cable remain the dominant technologies in terms of investment.
- ii) Optic fibres are increasingly utilized for heavy volume trunk and feeder lines.
- iii) Satellite transmission facilities continue to be under utilized.
- iv) Cellular radio technology experiences slow but steady growth. The rate of growth increases towards the end of the study period.
- v) Digital technologies steadily replace existing analogue ones.
- vi) The installation of private network systems continues at a slow

but steady pace as individual companies attempt to optimize the effectiveness of their expensive equipment for internal communications functions.

- vii) The demand for value-added and enhanced services will experience steady growth.
- viii) Voice communication will still predominate, but non-voice services will steadily grow to narrow the gap between the two.

Market Structure - National Competition

- i) Many new entrants will emerge to compete in this field.
- ii) Local service will basically remain a regulated monopoly.
- iii) Active competition in interexchange carriage is expected.
- iv) The establishment of private networks is likely to flourish as consumers try to individualize their communication services.
- v) Mobile communications growth will be similar to MS₁, but it is expected to gain a larger market share by the end of the study period.
- vi) Because of an anticipated acceleration of competition, the cable industry's survival in this block is more doubtful. Its role is expected to be minor.
- vii) The enhanced services sectors can be expected to follow the development pattern outlined in MS₁. However, the competition is expected to be more dynamic.
- viii) Data becomes an increasingly important share of the transmission capacity.

Regulation - Joint Regulation

- i) A joint regulatory body with representatives from each province and the federal government will evolve.
- ii) The newly established joint regulatory body will take responsibility for protecting the national interest.
- iii) Competition is permitted in all sectors.
- iv) Market based pricing will be introduced.

Scenario II is also based on the assumption that the acceptance and utilization of the new technologies will proceed, initially at least, at a conservative pace. It should be remembered, however, that T₁ actually

envisages much technological change. This slower rate of development will allow some time for the federal and provincial governments to reach an agreement with respect to a joint regulatory body. However, the window of opportunity is small. Unless some body begins to direct the development of the industry, the technology may proceed to develop in a manner contrary to the national interest.

Once the regulatory question is resolved, competition will be permitted in all service sectors except local basic service. Rates will be rebalanced and local rates can be expected to rise.

Provincial regulators will govern all intra-provincial matters, including local service. Many will permit the introduction of local measured service (LMS) so that life-line access rates may be initiated. This step will prevent a large number of disconnects, but provincial governments will be obliged to make a political decision regarding those who are unable to afford even life-line service.

Competition in all other sectors is expected to reduce prices as rates are forced closer to costs. However, prices will be determined by market factors not by regulators regardless of what direction they move. In addition to the existing carriers, many new entrants can be expected. Regulatory requirements will ensure that new companies are Canadian owned and operated. Some will create their own facilities, others will utilize liberalized resale and brokerage regulations in competition with major carriers. The continued existence of Telecom Canada, in its present form, is doubtful because some of its more progressive members may move in such a way so as to under cut others.

Large users will continue to install private networks to individualize and facilitate their internal communications. However, because rates are

expected to closely reflect costs, "bypass" will probably be uneconomical and therefore will be avoided. Moreover, business-users are likely to increase their demands for a high degree of interconnectivity among systems and networks. The proposed joint regulatory body may have a role to play here by facilitating the establishment of standards and criteria for integrated systems.

The cable industry is unlikely to flourish in this environment unless changes within the industry occur very rapidly. Once open competition is permitted, cable will find itself without the necessary infrastructure and expertise to compete successfully in this market scenario. It will likely to continue to serve a broadcast program transmission function in larger urban centres until the end of the century.

By the last third of the study period, competition will heighten. Weak competitors will be forced from the market but a large group of healthy competitors are expected to remain. There will be increasing pressure on local service rates and regulators will need to be supported by a strong political will to enforce universal service requirements. Governments may need to provide direct subsidies to some residential users or create incentives for carriers to provide service.

Scenario III - T_2 , MS_2 , R_3

The third scenario assumes national competition similar to Scenario II. However, the technology and services and regulatory blocks change.

Technology and Services - Innovative Development

- i) Microwave, paired copper and coaxial cable continue to serve as the backbone of the telecommunications infrastructures.
- ii) The rate at which optic fibres replace the existing technologies

- in trunk and feeder systems will be accelerated.
- iii) The cable companies acknowledge the need to upgrade their current infrastructures in order to expand the range of services they offer.
 - iv) Satellite costs remain high relative to other technologies but satellite transmission is utilized for private networks, remote communications and broadcasting services.
 - v) Cellular radio gains rapid and wide acceptance in urban areas for mobile communications.
 - vi) Digital transmission and switching facilities will be quickly incorporated into the telecommunications infrastructures to accommodate the increased volume of traffic.
 - vii) Office automation will proceed at a pace double that of block T_1 .
 - viii) Demand for enhanced and value-added services will at least double that estimated in T_1 .
 - ix) Although voice communications remains the preferred method, non-voice services will consume increasing amounts of time on the system.

Market Structure - National Competition

- i) Many new entrants will emerge to compete in this field.
- ii) Local service will basically remain a regulated monopoly.
- iii) Active competition in interexchange carriage is expected.
- iv) The establishment of private networks is likely to flourish as consumers try to individualize their communication services.
- v) Mobile communications growth will be similar to MS_1 , but it is expected to gain a larger market share by the end of the study.
- vi) Because of an anticipated acceleration of competition, the cable industry's survival in this block is more doubtful. Its role is expected to be minor.
- vii) The enhanced services sectors can be expected to follow the development pattern outlined in MS_1 . However, the competition can be expected to be more dynamic.
- viii) Data becomes an increasingly important share of the transmission capacity.

Regulation - Federal Control

- i) The federal government will emerge as the primary regulatory body.
- ii) Parliament will establish national goals for telecommunications.
- iii) Competition is permitted in all sectors except basic local service.
- iv) Market based pricing will be introduced.

Scenario III assumes a more rapid acceptance and growth of new services made available through the new technology. Because of this accelerated development, there is insufficient time to permit the negotiations that might have led to the creation of a joint regulatory body. Instead the federal government will emerge as the one responsible for the establishment of national goals and priorities and the regulation of all inter-provincial matters.

As in Scenario II, competition is permitted in all sectors except local basic service after rates are rebalanced. Provincial governments will continue to regulate intra-provincial matters, such as local service but their ability to control events will be weakened. For example, rate rebalancing will force local service rates to rise, provincial regulators will be forced to react to this eventuality. Their options are limited. Local measured service rates may be introduced, special taxes levied and/or incentives or grants offered carriers or suppliers to ensure the continuation of universal basic service.

In all sectors prices will reflect market place factors. Rates are expected to decline as many new entrants appear to offer services in competition with established suppliers. New entrants will be Canadian owned and operated. They will employ a variety of new technologies and techniques in their attempts to provide the services demanded by consumers. Because of

these lower costs, "bypass" technologies will be avoided and users will push for a high degree of interconnectivity.

The heightened level of competition is likely to create difficulty for the cable industry which will find itself unable to provide the new services it must to remain competitive. Like other weak competitors, it will be forced from the market as an oligopoly of strong healthy competitors emerge in total control of the marketplace.

One further problem is possible. If the provincial governments who own or regulate regional telcos levy high interconnection access charges on interexchange and/or competitive carriers, this whole scenario is jeopardized. High access rates will force prices higher; consumers will seek alternatives and the whole Canadian telecommunications industry could face severe threats by the end of the century.

Scenario IV - T₂, MS₃, R₄

Many observers believe this scenario to be the one least likely to evolve in the Canadian telecommunications environment. It includes the following elements.

Technology and Services - Innovative Development

- i) Microwave, paired copper and coaxial cable continue to serve as the backbone of the telecommunications infrastructures.
- ii) The rate at which optic fibres replace the existing technologies in trunk and feeder systems will be accelerated.
- iii) The cable companies acknowledge the need to upgrade their current infrastructures in order to expand the range of services they offer.
- iv) Satellite costs remain high relative to other technologies but satellite transmission is utilized for private networks, remote communications and broadcasting services.

- v) Cellular radio gains rapid and wide acceptance in urban areas for mobile communications.
- vi) Digital transmission and switching facilities will be quickly incorporated into the telecommunications infrastructures to accommodate the increased volume of traffic.
- vii) Office automation will proceed at a pace double that of block T_1 .
- viii) Demand for enhanced and value-added services will at least double that estimated in T_1 .
- ix) Although voice communications remains the preferred method, non-voice services will consume increasing amounts of time on the system.

Market Structure - International Competition

- i) Many new entrants are expected. Some of these will be foreign.
- ii) Local service monopoly will be threatened by the end of the study period.
- iii) Interexchange competition will be especially active with the entrance of foreign firms.
- iv) Individualized networks will continue to flourish but bypass will be avoided.
- v) Mobile communications will be readily accepted.
- vi) The prospects for the cable industry are limited.
- vii) The demand for enhanced services will grow rapidly.
- viii) Competition is expected to be fiercer than under national competition.

Regulation

- i) The current regulatory framework persists.
- ii) The market is allowed to develop independently.
- iii) Open competition is permitted in all areas.
- iv) Regulators have no control over prices.

Scenario IV assumes rapid acceptance of the telecommunications technology. It also assumes that the federal and provincial governments fail to resolve their jurisdictional disputes and the current regulatory mosaic

persists. However, as the technology develops, the regulators increasingly lose the ability to control this market. New entrants and prices are determined by market place factors. The role of regulation is restricted to one or two areas and the regulators have difficulty achieving their will here as well.

This relaxation of control removes the current rules, regulations and purchasing policies which currently protect or aid the Canadian telecommunications industry. Foreign entrants, particularly American ones, will be permitted to operate in the Canadian market. Conversely, Canadian firms will have access to foreign markets in order to aggressively expand their sales and market penetration. This may help carriers like Telesat who have excess capacity. However, the entry of foreign carriers and suppliers will further weaken the ability of regulators to enforce any direction.

In this new market structure prices will be determined by market factors. Local rates are expected to rise and basic universal service will be severely threatened. Regulators will need to find means of encouraging service to unprofitable rural and remote areas and subsidizing phone service for those who cannot afford it.

In the long run this actively competitive market will determine its own winners and losers. There is no guarantee that Canadian firms will emerge as winners. However, it can be expected that any large carrier or supplier who has the advantages of a good product or service line, a reasonable market share and an efficient pricing system will survive. Small, inefficient carriers will likely be bought out or will merge with more successful ones. Cable's survival is doubtful. Regulation will continue to be minimal and the ability of governments to utilize the telecommunications industry in the public interest or for national purposes will be lost.

CHAPTER SIXINTERNATIONAL CONCERNS
(Prepared by Dr. Wm. Melody)I. Background

The telecommunication industry historically has been heavily monopolized and integrated both vertically (equipment manufacturing and service provision) and horizontally (local and long distance). In addition, it has been regulated under government policies that deliberately have restricted competition. This industry, perhaps more than any other, has been protected from the direct influence of changing market forces, including not only the threat of direct competition for existing services, but also changing demand and technology. The industry was thought to be characterized by conditions of natural monopoly, that is, technologically determined economies of scale of such magnitude that competition was precluded. Thus, telecommunication systems have been either publically owned (PTT's in Europe, Japan and other countries), or privately owned but publically regulated (as in the U.S.)

In Canada, a mixture of these approaches has been taken. Although there are many private and public companies, each is a monopoly in its region. Together the monopoly telephone companies provide long distance services in common as a legal cartel. They have been insulated from competitive market forces by the characteristics of the technology, by their monopoly power, and most significantly, by government policy. In return for the privileged position of monopoly, telephone companies have their profits regulated to reasonable levels, and purportedly serve as instruments of social policy in extending service to unprofitable areas.

Over the past quarter century, the forces for change have been building. Not only has there been rapid growth in the use of telecommunication systems, particularly long distance systems, but also voice communication

demands have been supplemented with data communication and requirements for more diversified and specialized services. Stemming from technological developments in microelectronics, there has been a merging of computer and telecommunication technologies.

At the local level, the plain old voice telephone service (POTS) network is being upgraded to the higher technical standards of the integrated service digital network (ISDN), using digital switching and fibre optic cable. Long distance communication now can be supplied by several technologies (radio microwave, coaxial cable, satellites and more recently fibre optic cable) each with specialized advantages for particular distance and types of communication. An infinite variety of telecommunication terminals are available ranging from inexpensive extension phones to multi-million dollar computer systems. And more and more independent companies desire to sell data and information services over telecommunication networks. This has led to a questioning of the current relevance of the historical policies of natural monopoly, and particularly to the breadth of their justified application in the telecommunication industry. This questioning came first in the U.S., undoubtedly because it represents the largest domestic telecommunication market. It is now occurring in other countries, including Canada, the United Kingdom, West Germany and Japan.

It is important to note that the evolution toward increased competition has proceeded at a pace dictated by public policy decisions, which generally have lagged behind the technological and market possibilities. In Canada, the raising of policy issues generally has lagged behind the U.S. many years, so that at the present time Canada is just beginning to raise public policy issues that already have been addressed in the U.S.

The major market segments leading to changes from historic monopoly policies are as follows: a) terminal equipment - the right of users to own their own terminal equipment, whether extension phones or sophisticated computer systems; b) the equipment market, covering the manufacturing and sale of all types of telecommunication equipment including terminals, switching machines, satellites, and other equipment sold in national and international markets; c) long distance transmission services, including networks of high capacity coaxial cable, radio microwave, satellites and fibre-optics facilities for the provision of voice, data and television transmission services; d) local communication services, including networks of copper wire, higher capacity coaxial cable, fibre optic cable, mobile radio and cellular facilities, for the provision of local telephone and other specialized services; e) information services - data and information banks, including the collection, storage, organization and retrieval of general and specialized information.

The new technologies have led to a substantial expansion of capacity on the telecommunication system. This has been associated with both an expansion and a diversification of demand. The characteristics of the computer industry - the rapid rate of technological turnover, the application of sophisticated marketing and aggressive competition, - gradually have moved into the telecommunication industry. This of course, is because the future of the computer industry lies not in stand-alone data processing but in teleprocessing, data processing over distance using telecommunication lines. Thus, new data and information services, including enhanced and value-added services, and even the straight reselling of traditional telecommunication services have introduced a new emphasis on retailing, a function that

historically hardly has been performed in the monopoly telecommunication industry.

In addressing the impact upon Canadian telecommunication carriers of competition from U.S. carriers, it is important to consider the issue within the broader context of telecommunication technology and markets, as well as its impact upon Canada's overall economic policies.

II. The U.S. Telecommunication Market: Industrial and Regulatory Structure
(Refer to Notes for detailed references and history.)

Traditionally long distance telecommunication services were provided by AT&T under monopoly conditions. Although there are about fourteen hundred 'independent' telephone companies (formerly many more), these companies provided only the local exchange connections for long distance service. They did not provide long distance facilities or services. Revenues were shared between AT&T and the independent telephone companies via the process of revenue settlements, comparable to the Telecom Canada Revenue Settlement Plan (RSP) currently in use in Canada. Although Western Union, like CNCP in Canada, had been offering telegraph, telex, and limited private line voice and data services for many years, the competition with AT&T had always been rather passive, with Western Union serving about 2 percent of the market in a lopsided duopoly.

The first area of policy change in the direction of competition in the U.S. was the Federal Communications Commission (FCC) decision in the Carterfone Case (1968). This was followed by implementation decisions so that by 1974 active and effective competition had begun to take hold. Major beneficiaries of the FCC competitive policy with respect to terminal equipment have been Canadian equipment manufacturing firms, especially Northern Telecom and Mitel. At present, the terminal equipment market is regarded as

fully competitive in the U.S. The transition period was almost a decade from fundamental policy change to the implementation of effective competition.

In contrast, terminal equipment competition has been introduced gradually as a result of policy changes at the CRTC in 1980 and 1982. The provincial regulatory boards are just now in the process of examining the issue and in some cases changing their policies so as to permit the sale of terminal equipment by competitive suppliers. It is important to note however that this policy response on the part of Canadian regulators essentially has been a response to the reality of terminal equipment markets that has been thrust upon them. Terminal equipment competition has become so widespread in the U.S. that the introduction of terminals into the Canadian market could not be stopped. Canadian subscribers in large numbers were buying terminals in the U.S., and later in Toronto or Montreal, taking them home and connecting the terminals themselves. The phenomenon is directly parallel to that of the installation of satellite dishes for receiving U.S. television signals. The major force behind the policy change has been the growing realization on the part of the telephone companies and the regulator that it is impossible to keep competitive terminals out.

The policy changes relating to the introduction of competition in the long distance telecommunication market in the U.S. took place between 1968 and 1971. The MCI application was initially approved by the FCC in 1968. In 1971, the FCC adopted a general policy of competition in the supply of domestic satellite services. MCI began constructing its transmission system and first offered service in 1973. It has continued to expand its construction and its service offerings for more than a decade and continues to do so.

Many other competitors entered the market in the early 1970s. Some, like Data Transmission Company, went out of business and some were absorbed by others. The major firms that now supply long distance service primarily over their own facilities are relatively few. In addition to AT&T and MCI, they are GTE Sprint (formerly South Pacific), U.S. ITT (a subsidiary of ITT), and Satellite Business Systems (SBS), a subsidiary of IBM and other companies. The remaining competitors, provide value-added - integrated data processing and telecommunication services, or simply resale telecommunication services by leasing capacity on the networks of other companies (WATS and leased lines).

As of 1984, the long distance telecommunication market shares were approximately as follows: AT&T (92%), MCI (4%), all other new carriers (4%). Competition in the U.S. long distance market clearly has not yet been achieved. Although MCI is approaching \$2 billion a year in revenues, this is less than the annual growth in the market. Therefore, even if the competitors grow at a very high rate, it will take 15 or 20 years before AT & T's market share could possibly be reduced below 60 percent.

The divestiture of AT&T from the Bell System Operating Companies is expected to be a major force in the direction of increasing competition. A major problem in attempting to implement a competition policy in the telecommunication field has been the fact that monopoly over local distribution facilities can be used to control the long distance market. Not only can the local telephone monopoly place restrictive conditions on long distance competitors but it can also engage in cross-subsidy whereby local telephone subscribers bear substantial portions of the telephone company's costs of providing its long distance services.

The FCC has been unable effectively to resolve the problem of whether the new long distance competitors were receiving fair access to local exchanges at prices comparable to that which the telephone company was implicitly charging itself. This issue was resolved in the U.S. with the divestiture of AT&T. Now all long distance companies, including AT&T, must pay access charges for the right to use the local distribution system of the local telephone companies.¹

Major policy issues to be resolved in the U.S. with respect to long distance competition revolve around the conditions of access that long distance competitors will have to local exchanges. The initial FCC policies related only to interstate long distance communication. However, this represented about 70 percent of the total market. Most of the larger states have followed with pro-competitive policies. Thus, state commissions are considering the competition issue together with the problems surrounding access charges that should be paid by the long distance carriers.

Perhaps even more significant is how state commissions will address the issue of access charges that may be imposed on subscribers directly by the telephone companies, called customer access line charges (CALCs). The local telephone companies, the long distance companies, the major business users and the FCC all have supported the view that a major portion of the local distribution costs should be charged directly to subscribers as a charge for access to the telecommunication network. Users then would pay

¹The acquisition of Sprint by GT&E might appear to be a violation of this policy. However, by terms of a U.S. Justice Department consent decree, Sprint must be operated as a separate company dealing at arms-length with other GTE companies. Also the great majority of Sprint's local connections are not with GT&E companies.

usage fees for the types of services that they actually used. If this proposal were fully implemented, there would be an access charge of \$30 - \$40 per telephone line for access to the system. The telephone companies argue that if customer access charges are not employed, long distance carriers and large industrial users will bypass the local network. Consumer groups have emphasized that high subscriber access charges will force a significant portion of the population to disconnect from the telephone network, thereby losing even basic telephone service. The U.S. Congress rejected the attempt by the FCC to implement customer access line charges at the levels initially proposed. At present the charges are \$1 for residence and \$2 for business lines, with no increases on the horizon. However, the issue is now and will continue to be debated before state regulatory commissions over the next several years.

The provision of equal access resulting from the AT&T divestiture, will mean that all long distance competitors will obtain equal access to that of AT&T, including the same number of digits that is necessary to dial, over the next several years. Now that competition within the U.S. is on the verge of adjusting to its final phase, U.S. competitors, including AT&T, are in a position to expand their horizons. AT&T has been in the business of supplying international communication for many years. MCI already has expanded its system to Europe and the Far East, and has negotiated agreements with Telecom Canada for services to certain major cities in Canada. Recognizing the evolution of the U.S. market, it is clear that the U.S. carriers are ready to enter the Canadian market. If the opportunity arises for them, they will of course view this opportunity as simply a convenient and efficient way to expand and extend their existing U.S. systems to a few additional major population centres in the North American telecommunication system.

III. Telecommunication Competition in the Context of Canadian Economic Policy

Although the Canadian government has not attempted to implement a formal national economic policy with respect to the telecommunication industry, there has been a consistent historical recognition that a Canadian controlled telecommunication infrastructure has been vital to the future growth and development of the Canadian economy. For example, in 1979, the Consultative Committee on the Implications of Telecommunications for Canadian Sovereignty urged "the Government of Canada and the governments of the provinces to take immediate action to establish a rational structure for telecommunications in Canada as a defence against the further loss of sovereignty in all its economic, social, cultural and political aspects."² With respect to satellite communication, the Department of Communications stated in 1980 that, "obviously the availability of these [satellite] services will be an essential factor in the continued social and economic development of the country. Control of the facilities and data flow will be an important consideration in the maintenance of our cultural and economic sovereignty."³

The telecommunication infrastructure in Canada must grow in a way that is responsive and complementary to broader aspects of national economic policy. As international markets for Canadian products have become more competitive, it has become necessary for the Canadian economy to diversify and to specialize in the production of selected high-technology products.

²Consultative Committee on the Implications of Telecommunications for Canadian Sovereignty. Telecommunications and Canada. Department of Communications, Ottawa: Supply and Services, March 1979.

³Department of Communications. The Canadian Space Programme: Five Year Plan (80/81-84/85) Ottawa: Supply and Services, 1980.

Existing resource-based industries must become more productive. To achieve broad economic objectives that require continuing growth and profitability and increased employment opportunities, the telecommunication services that provide the network for the flow of both domestic and international information within Canada must facilitate communication on an east-west basis and between Canadian urban centres and distant manufacturing and production centres.

A priority for increasing the international competitiveness of Canadian produced goods and services is to lower the costs of communication within and between firms located in Canada. Financial and other forms of information about domestic markets and production priorities within Canada are as important, if not more so, as access to information regarding international markets. If the Canadian economy is to be strengthened by its telecommunication network, it must be able to provide a full range of voice and data services to all sectors of the Canadian economy at rates that do not inflate production costs above those of international competitors. Therefore, it is important to recognize the impact of U.S. competition in the Canadian telecommunication market upon national economic objectives and Canadian control over its own economy.

IV The Impact of U.S. Entry to the Canadian Long Distance Market

In the transition from monopoly to competition in the long distance market, Canadian policy is at least fifteen years behind the U.S. The U.S. is in the final stages of the transition. The surviving new competitors have grown for more than a decade. The established telephone companies gradually have reoriented their activities away from erecting artificial barriers to new competitors. They have begun to act more like competitors than

recalcitrant monopolists. The struggle between monopoly and competition is over. All parties have accepted the fact that the new competition has established itself, and there is no turning back to the nostalgic days of government protected monopoly.

The adjustment process has not been easy for many companies, especially the former telephone monopolies and the historic token competitor, Western Union. With the AT&T divestiture, both AT & T and the Bell Operating Companies have cut back on their labour forces by about 15 percent. AT&T has taken a substantial obsolescence asset write-off which, although primarily relating to terminal equipment, included write-downs of the value of some equipment used for long distance services. Aggressive marketing activity and diversified service offerings responding to the specialized needs of different industries and types of use have replaced the traditional passive and reactive industry approach to marketing and services. The telephone companies have found it necessary to replace telephone sales and marketing people with recruits from the computer industry.⁴ Price competition has been vigorous. Western Union, which historically has occupied a similar position in the U.S. market to that of CNCP in the Canadian market has not done well and is on the verge of bankruptcy. The most successful new competitor, MCI, has expanded its markets to include overseas services and joint services to Canada and Mexico with their respective domestic carriers. AT&T has become a much more aggressive competitor in international markets.

⁴See Alvin von Auw. Heritage and Destiny: Reflections on the Bell System in Transition. New York: Praeger Publishers, 1983, for a description of the difficulty of the AT&T adjustment by a high level executive who lived through it.

The U.S. long distance companies that may enter the Canadian long distance market include AT&T, MCI, GTE-Sprint, SBS, and possibly U.S. ITT. In addition, at least three or four resellers could readily extend their coverage to include the larger Canadian cities. There is a large attraction because Canadian long distance rates are 50 percent - 200 percent higher than U.S. rates, depending on distance and type of service.

The most efficient way for U.S. companies to extend their facility networks would be to connect Canada's larger cities to the nearest border point of their U.S. systems, for example, Vancouver-Seattle; Toronto-Buffalo, or perhaps from the top of the CN tower across Lake Ontario, etc. This could be done with a few microwave hops, miles of fibre optic cable, or satellite dishes. Probably no more than one or two companies would build facilities, and if existing capacity is available at a reasonable price from a Canadian carrier, such as CNCP, a railroad, a hydro company, or Telesat, they would lease it.

In most cases, other Canadian cities would be served, if there was enough demand, by having them connect to the nearest major Canadian city. However, some would link up directly to an American city, such as Windsor, which would connect with Detroit. Facility extensions would be made - most probably by radio microwave - in a few instances, such as Ottawa and London where demand would be high. Eventually the most that one can conceive is a possible fibre optic cable from Buffalo, via Hamilton and Toronto to Montreal, with spurs to Ottawa and to London - Windsor, connecting at Detroit. But the rest of the nation could be served using leased lines and resold WATS from the established telephone companies to the extent that the various cities and towns could be profitably served.

There would be relatively little new facility construction in Canada because of the economies of adding Canadian demand to the existing U.S. facility networks. Montreal to Vancouver traffic could be served most efficiently over the U.S. system. Moreover, the dominant traffic patterns involving Canada in North American telecommunication networks are North-South in any event, due primarily to the branch plant character of most Canadian industry. Addition of the entire Canadian long distance market would increase demand on the U.S. system by about 10 percent, or the growth in demand on the U.S. system for about eight or nine months. It would be less than half the unused capacity on the system at any point in time. Obviously the Canadian demand would not be uniformly distributed over the U.S. system, but when considering alternative routing possibilities, and the enormous capacity of the newest cable (fibre optics) and radio microwave (single side band) systems, absorption of the Canadian demand between major cities would not be a difficult task.

We must also recognize that a federal policy change may only affect Ontario, Quebec and B.C. The provincial regulators and governments in the other seven provinces can be expected to remain hostile to competition, refusing necessary operating franchises to competitors, U.S. or Canadian, in any event. Thus, for all practical purposes, the U.S. carriers would be serving Vancouver, Montreal and southern Ontario, with resale service to the rest of the provinces via existing Canadian telephone company facilities, to the extent that it is profitable.

In contrast to the aggressive competitive marketing of telecommunication services in the U.S., the Canadian market is still very much a closed, highly regulated, lopsided duopoly. For example, the recent CNCP application to the CRTC to provide public voice telephone service is a modest move,

seeking survival in a changing market, more than it is an aggressive approach to serving the long distance telephone market. The telephone companies, supported by the provincial regulatory agencies, with the exception of B.C. and Ontario which are federally regulated in any event, have successfully resisted and compromised competition at every step. To date, the CRTC's view of competition has precluded price competition except in a regulated and limited sense. In Canada, resistance to competition remains very strong and very successful. Preservation of the shared monopoly option is still very much the dominant policy. Neither the industry nor the regulators are prepared for hard-nosed competition U.S. style. In sum, the U.S. companies are finely-tuned competitors ready to extend their markets. The Canadian companies and policy-makers are busy jockeying for position and dealing with problems in the Canadian market, and their range of vision has extended for the most part no further than the border.

The benefits of U.S. competition for Canadians would be in the significantly lower rates and more diversified service offerings available. Ironically, the major beneficiaries are likely to be smaller business users and residential users. Large business and government users, and special service users, (e.g., data), now receive substantially reduced discriminatory rates through Telpak, Datapac, and other tariffs. Competition tends to eliminate monopolistic price discrimination by bringing down the prices of the higher priced services. Therefore, those already receiving discriminatory low rates are likely to benefit much less than those who are not. In any event, long distance rates in Canada land between Canada and the U.S. can be expected to decline significantly.

The response of the Canadian telephone companies, since they supply both long distance and local services in common, will be to raise local

telephone rates to compensate for forced competitive rate reductions in the long distance market. The U.S. telephone companies have responded to long distance competition by imposing special charges, entry fees, on telephone subscribers for access to the telephone network for any service at all. The U.S. Congress resisted attempts by the FCC to impose substantial access charges, but nevertheless a present nominal customer access line charge (CALC) is being imposed.

Given the historical role of the CRTC in regulating the rates for the monopoly services of Bell Canada, B.C. Tel or Telecom Canada,⁵ the probable result of the introduction of aggressive competition for long distances would be drastic increases in local rates. Bell Canada already has submitted a study to the CRTC claiming that, if all the local loop costs that are common to local and long distance service are allocated to local, the costs of local service would be \$30 - \$40 per month. If competition is permitted in long distance, Bell Canada and B.C. Tel would propose to allocate their costs in this manner. Nevertheless, the major impact of competition from U.S. carriers is likely to be an immediate drastic restructuring of rates by the Canadian telephone companies, reducing long distance and increasing local, so as to make entry by the U.S. carriers less profitable.

There is a high probability that CNCP and Telesat would be put in a deleterious position by active competition from U.S. carriers. Since both

⁵The Cost Inquiry begun by the Canadian Transport Commission 13 years ago, has still not been completed. The purpose is to develop a procedure to assign telephone company costs to monopoly and competitive services so that the telephone companies cannot use their monopoly services to subsidize their competitive services. The most recent phase (Phase III) does not even address the issue of monopoly local telephone service subsidizing competitive long distance.

companies have a close relationship to the federal government, the government is likely to be faced with a decision as to whether it wishes to subsidize these companies to maintain a stronger Canadian presence in the market. Bell Canada and B.C. Tel should not be threatened so severely, although B.C. Tel's manufacturing affiliate, Microtel, would likely be affected. B.C. Tel is the dominant purchaser of Microtel equipment that has not been terribly successful in open market sales. Competition is likely to force B.C. Tel to buy more equipment from the lowest priced suppliers, thus decreasing Microtel's sales to B.C. Tel.

Northern Telecom has been very successful in the U.S. and international equipment markets and should be expected to do well in a competitive Canadian market. Nevertheless, it presently has major captive customers for several lines of telephone equipment used by Bell Canada and its Maritime subsidiaries. Competition should force some of these markets open, causing a loss in market share to Northern. Perhaps even more significant for the longer term may be an increased incentive for Northern to move its headquarters to the U.S. if it loses its privileged position in the Canadian market, and if it can obtain the full benefits from competing in Canada even though it is a U.S. company.

Teleglobe's privileged position as the Canadian monopoly on overseas communication would also be threatened. AT&T, MCI and U.S. ITT have their own overseas connections and services. There has been competition among U.S. companies for international traffic originated or terminated in the U.S. for several years and it has become quite aggressive. Not only would the U.S. companies carry their own Canadian customers' overseas traffic, but they would likely undercut Teleglobe's prices or revenue sharing agreement to Bell Canada and other Canadian telephone companies that originate and terminate

Canadian overseas traffic. Teleglobe's days as a high profit monopoly clearly would be over, and unless it could adjust to competition rapidly, it too could be placed in financial difficulty.

U.S. competition would require major changes in the current structure of Telecom Canada, and could lead to its demise. The current Revenue Settlement Plan (RSP) by which the telephone companies share the revenues from providing cross-country traffic is based upon a presumption of co-operative monopoly sharing. Under competition, this system would have to be completely reorganized and a new methodology worked out whereby local telephone companies charge long distance carriers for obtaining access to customers via local company exchange facilities. Recognizing that most provinces will attempt to maintain monopoly policies, it is difficult to predict how the new arrangements are likely to be worked out, or whether it will be done in uniform or fragmented fashion.

U.S. competition would promote certain patterns of communication and discourage others. Rates between Canada's largest cities would decline as would rates to U.S. cities. North-South communication patterns would be encouraged by major rate reductions. Local and most intraprovincial communication patterns would be discouraged by increasing rates. Canadians would be able to obtain access to U.S. data banks, value-added services and information services at reduced cost. This would help Canadians as consumers of these services, but would discourage Canadian companies attempting to establish these services in Canada. The Canadian data processing industry estimates that Canada already has lost 180,000 computer software jobs because of transborder data flow to the U.S.

The problem of Canadian control over Canadian content, an historic concern of Canadian governments, would be exacerbated for all types of

content. Data and information bank would acquire a similar status to that of direct broadcast satellite (DBS) delivery of television signals today. Canadians would have easier access to U.S. services through North-South connections than to equivalent Canadian services.

Moreover, the impact on Canada's balance of payments would be substantial. Competition from U.S. telecommunication carriers will make it easier for Canadians to obtain access to U.S. goods and services, thereby placing Canadian suppliers of similar goods and services at a competitive disadvantage. It is difficult to see any Canadian carrier making a successful entry to the U.S. market, or the competitive advantage of any Canadian industry, except the retailing of U.S. services, being improved. Canada's future in the information economy would tend to be even more dependent on the U.S. economy, making the unresolved questions relating to Canadian control over Canadian information, privacy, and so on, even more serious than they are now.

V. Conclusion

The Canadian telecommunication market, supplied by a cartel of regional monopolies and protected by regulatory policies that discourage aggressive competition, may be facing a substantially altered market environment. The U.S. carriers, honed by a decade of aggressive competition and industry restructuring, are showing signs of expanding into the Canadian market place. As consumers of long distance telecommunication and information services, Canadians in the major cities could benefit significantly by low cost access to U.S. services. However, most local and intraprovincial rates would increase significantly, and Canadian suppliers of telecommunication and computer equipment and services, as well as information and data bank

services could suffer. Some jobs could be lost and the trade deficit in the information sector could be increased.

But Canada can only put off the day of reckoning with the microelectronics revolution and its implications for the information economy so long, and the longer the delay, the more difficult the adjustment. Canada can make the adjustment in a manner best for Canadians by encouraging real competition among domestic suppliers immediately. In a sense it would be both ironical and unfair for Canadian policies to place greater restrictions on Canadian entrepreneurs than on U.S. firms. Many imaginative Canadians have been restricted from pursuing their proposals in telecommunications because of the historic monopoly policies. Why not turn the Canadian entrepreneurs loose to improve the efficiency of the telecommunication industry in Canada? Then Canadians may benefit in all respects.

Only after an adjustment period of at least four to five years will Canadian firms be in a position to hold their own against competition from the U.S. carriers. The adjustment period has not yet begun in Canada, and at the current rate of change, it is not likely to begin until events require it at some future time. The government can start the adjustment process now by a major policy initiative along the lines suggested above.

Notes: The Telecommunication Competition Issue in the U.S.

This Note provides a comprehensive listing of Federal Communication Commission (FCC) decisions that have been directed to developing and implementing policies appropriate to a competitive telecommunication industry in the United States. The bibliography includes selected entries in the following categories: i) articles bearing on the local exchange service and bypass issues; ii) bypass studies, reports and testimony; iii) court decisions; iv) FCC dockets and decisions - access charges, AT&T divestiture, bypass and local service, competition in terminal, private line and MTS/WATS markets, allocation of local exchange costs, Regulatory Rules and Procedures and, v) government reports.

The transition from a highly monopolized industry structure to a more competitive structure can be traced through the entries listed below. The earliest regulatory decisions concerning competition in the U.S. telecommunications industry can be traced to the Hush-A-Phone (1955) and Carterfone (1968) decisions that led to the transformation of the terminal equipment industry. These decisions culminated with the requirement that AT&T and the Bell Operating Companies market terminal equipment through separate subsidiaries. In 1982, procedures were implemented for removing embedded (installed) terminal equipment from the carriers' rate bases.

The long distance telecommunication market began the process of transformation with the Above 890 Decision (1959) that permitted construction of private microwave systems. The FCC's pro-competitive policies became more visible in three decisions: Microwave Communications Inc. (1969), the DOMSAT decision (1970), and the Specialized Common Carrier decision (1971). Rapid changes in technology and a vastly expanding market for more diversified services resulted in the possibility that competitors could operate

profitably without damage to existing carriers. One of the most successful Specialized Common Carriers, MCI, entered the long distance intercity market by constructing a microwave network and offering point-to-point private line services. In spite of the refusal by AT&T to grant MCI the interconnections it requested, MCI was able to expand its services that compete with AT & T's private line, message toll (MTS) and bulk public message (WATS) services. AT & T's ability to curtail access by competitive long distance carriers to the local exchange facilities required for local distribution of messages was finally eliminated by the 1983 Consent Decree. AT&T was required to divest itself of the assets of the Bell Operating Companies. Today, AT&T must access the local exchange distribution plant in much the same way as the other operating long distance carriers.

In the mid-1960s AT&T responded with competitive rate responses for its private line service offerings. TELPAK tariffs, and subsequent private line tariffs, were not found to be cost justified by the FCC. They were also the subject of litigation for many years. In its attempt to ascertain the nature and extent of anti-competitive cross-subsidies between competitive and monopoly services, the FCC developed a detailed cost methodology that required a full allocation of costs among major service categories and for practical purposes, rejected marginal or incremental cost methods. An interim cost manual was finally adopted in 1980.

Other barriers to the emergence of competition in the long distance market were eliminated by FCC decisions regarding resale and sharing of service offerings such as TELPAK and WATS (1977, 1980). The latter opened the door for non-facilities based competitors in the long distance market to purchase capacity at bulk discount rates and to resell services to users.

The first FCC decision to have a major effect on the merging of the computer and telecommunications industry in the U.S. was Computer I (1971). This was followed by a reexamination of the role of common carriers in an industry in which the ability to process, store and forward data is becoming increasingly important. In its Computer II decision in 1980 the FCC decided that common carriers should offer services that result in processed information through separate subsidiaries. Enhanced or value-added services can be offered by local exchange telephone companies that operate under state jurisdiction.

As policies regarding the competitive nature of the long distance telecommunications market in the U.S. have been put into place, the FCC has been forced to confront several crucial issues. The transition from monopoly to competition and its impact on telecommunication service users has required a resolution of the question of who should bear the costs of providing the local exchange distribution network that must be accessed by all competing long distance carriers. The FCC's position in 1985 (See series of decisions beginning in 1978.) is that the end user or subscriber should bear the cost of the local network that is in place to provide local and long distance services. The regulatory agency has been thwarted in its attempts to fully implement this policy by consumer complaints and Congressional action. They have argued that a policy of customer access charges is theoretically erroneous and likely to result in the demise of universal local service. The long distance carriers have argued that they should not pay for a share of the common costs of the local exchange facilities that they make use of, and that higher long distance rates will force large business users to construct private networks that do not require access to the local switched telecommunications network.

A series of studies commissioned by the FCC, the local operating companies and independent consultants have come to varying conclusions regarding the severity of the bypass threat. Independent studies generally have found that large users either do or propose to bypass the services provided by established carriers because the telephone companies' services do not meet highly specialized needs. In its 1985 order on the bypass issue, the FCC found that bypass by the long distance carriers, that is, private line services, poses the greatest threat to the costs of local service.

A review of court and regulatory decisions regarding competition in the U.S. telecommunications industry shows clearly that regulation is required to ensure that the local telephone companies do not exploit their monopoly power over local telephone service as the industry is being re-structured. Regulation in the transition to full competition has been required to protect both consumer and private interests.

(This chapter was prepared by Dr. Wm. Melody, Professor, Department of Communication, Simon Fraser University, Burnaby, B.C. He also wishes to acknowledge the assistance of Dr. Robin Mansell.

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U.S. v. Western Electric Company and AT&T. Opinion, Civil Action No. 82-0192. 8 July 1983 [fnts. 34 and 147, Court does not consider bypass to be an immediate large-scale problem].

IV. FCC Dockets and Decisions

A. Access Charges

1978

FCC. "In the Matter of MTS and WATS Market Structure." CC Docket #78-72 Notice of Inquiry and Proposed Rulemaking [Initial Notice], 67 FCC 2d 757 (1978); [Supplementary Notice], 73 FCC 2d 222 (1979); [Second Supplemental Notice] 16 April, 1983 [first access charge decision]; [Third Supplemental Notice] 1 August 1980; [Fourth Supplemental Notice], May 1982; Third Report and Order, 93 FCC 2d 241 (1983) [Access Charge Decision], modified, FCC 83-356, 48 Fed. Reg. 10319, 54 RR 2d 615 (1983) [First Reconsideration Order], further modified FCC 84-36, 49 Fed. Reg. 7810, 55 RR 2d 785 (1984); [Second Reconsideration Order], aff'd in part, National Association of Regulatory Utility Commissioners v. FCC. 757 F. 2d 1095 (D.C. Cir. 1984), petition for cert. filed, U.S. No. 84-95 (filed 18 July 1984).

1983

FCC. "Plan for Monitoring Effects of User Access Charges." CC Docket #78-72, Phase IV, FCC 83-254, Released 8 June 1983.

1984

FCC. "Switched Access Order." "In the Matter of Investigation and Divestiture Related Tariffs, MTS and WATS Market Structure." CC Docket #83-1145 and 78-72, Memorandum Opinion and Order, FCC 84-201 (Released 15 May 1984).

B. AT&T Divestiture

1982

FCC, "Brief as Amicus Curiae," Cir. Action No. 74-1698, at 7, 20 April 1982 [FCC brief pursuant to Tunney Act; argued divestiture would not affect rates or quality of communication service].

1983

FCC. "In the Matter of the Consolidated Application of AT&T and Specified Bell System Companies for Authority under S.214 and 310 (d) of the Communications Act of 1934 for Transfers of Interstate Lines, Assignments of Radio Licenses, Transfer of Control of Corporations Holding Radio Licences and Other Transactions as Described in the Application." Memorandum and Opinion, Order and Authorization, File No. W-P-C-4955, Released 23 December 1983.

C. Bypass and Local Service

1983

FCC. First Bypass Report, Appendix F, FCC. Third Report and Order, 93 FCC 2d 241 (1983).

FCC. "Analysis of the Effects of Federal Decisions on Local Telephone Service," 9 December 1983, in CC Docket #83-788, "Petition of the State of Michigan Concerning the Effects of Certain Federal Decisions on Local Telephone Service." Order, Released 21 December 1983 [See submissions by states on regulatory impacts; and reference fnts. 38-54, studies of demand for local access].

1984

FCC. "The Effects of Higher Telephone Prices on Universal Service." Office of Plans and Policy, Working Paper #10, K. Gordon and John Haring, March 1984.

FCC. "Supplemental Comments on the Bell Atlantic Companies." in the matter of the Commissions Request for Data, Information and Studies Pertaining to Bypass of the Public Switched Network, 21 May 1984.

FCC. "Bypass of the Local Exchange: A Quantitative Assessment," Office of Plans and Policy, OPP Working Paper Series #12, Gerald W. Brock, September 1984.

1985

FCC. "In the Matter of MTS and WATS Market Structure and Public Notices No. 3206 seeking Data, Information and Studies Relating to Bypass of the Public Switched Network." CC Docket #78-72. Order Released 18 January 1985 [Service bypass (i.e., the use of Private lines) will be the most prevalent form of bypass; Appendices: submissions references etc., not attached to order, on File at FCC, Washington, D.C.].

D. Competition in Terminal, Private Line and MTS/WATS (intercity business) Markets

1955

FCC. Hush-A-Phone Decision, CC Docket #9189, 21 December 1955, Hush-A-Phone v. FCC, Ct. Decision, 8 November 1956; FCC recon. 22 FCC 112, 6 February 1957.

1959

FCC. Above 890 Decision, CC Docket #11866, 27 FCC 359, adopted 29 July 1959.

1962

FCC. Domestic Telegraph Investigation, CC Docket #14650, Report of Committee, 1962, [recommend full cost pricing for competitive private line services, incorporated in CC Docket #16258].

1964

FCC. TELPAK, CC Docket #14251, Memorandum Opinion and Order, 37 FCC 1111, 23 December 1964 (TELPAK A and B not justified, TELPAK D and C incorporated into CC Docket #16258).

1967

FCC. AT&T Rates, CC Docket #16258, Phase I, Interim Decision and Order, 9 FCC 2d 30 adopted 5 July 1967; Order, 32 FCC 2d 701, 21 December 1971 [incorporated into CC Docket #18128].

1968

FCC. Carterfone Decision, CC Docket #16942, 13 FCC 2d 420, recon. denied, 14 FCC 2d 571 (1968).

1969

FCC. Computer I, CC Docket #16979, First Report 17 FCC 2d 587 (1969); Tentative Decision 28 FCC 2d 291 (1970); Final Decision 28 FCC 2d 267 (1971).

FCC. Microwave Communications Inc., 18 FCC 2d 953 (1969), recon. denied, 21 FCC 2d 190 (1970).

1970

FCC. DOMSAT Decision, CC Docket #16495, First Order and Report, 22 FCC 2d 86 (1970); Second Order and Report, 35 FCC 2d 844 (1972) recon. 38 FCC 2d 665 (1972); recon. 79 FCC 2d 895 (1979).

1971

FCC Specialized Common Carrier Decision, 29 FCC 2d 870 (1971), aff'd sub

nom. Washington Utilities and Transportation Commission v. FCC, 513 F. 2d 1142 (9th Cir.), cert. denied, 423 U.S. 836 (1975); Final Report and Order, 78 FCC 2d 1291 (1980).

1975

FCC. Terminal Interconnection, CC Docket #19528, First Report and Order 56 FCC 2d 593 (1975); Second Report and Order 58 FCC 2d 736 (1976); Third Report and Order 67 FCC 2d 1255 (1978); Memorandum Opinion and Order 70 FCC 2d 1800 (1979).

1976

FCC. Execunet, CC Docket #20640, Decision, 60 FCC 2d 25 (1976).

FCC. "TELPAC Decisions re AT&T competitive rate reductions," CC Docket #18128, 61 FCC 2d, 587 (1976); CC Docket #20814, 74 FCC 2d, 1(1979); Order 84 FCC 2d 156 (1981).

FCC. Effects of Competition, CC Docket #20003, First Report 61 FCC 2d 766 (1976); Second Report 75 FCC 2d 506, 29 January 1980.

1977

FCC. Sharing and Resale, CC Docket #20097, Memorandum Opinion and Order 62 FCC 2d 588 (1977).

FCC. AT&T Rates, CC Docket #19129, Phase II, Final Decision 64 FCC 2d 1. (1977).

1980

FCC. Second Computer Inquiry, 77 FCC 2d 384 (1980), recon. 84 FCC 2d 50 (1980), further recon. 88 FCC 2d 512 (1981), aff'd sub nom. Computer and Communication Industry Association v. FCC, 693 F 2d 198 (D.C. - Dir. 1982), Cert. denied, 103 S. Ct. 2109 (1983) [AT & T Information Systems (CPE and enhanced services); AT&T customer premises equipment through separate subsidiaries].

FCC. Resale and Shared Use of Common Carrier Domestic Public Switched Network Services - WATS, 83 FCC 2d 167 (1980).

FCC. "AT & T: Manual and Procedures for the Allocation of Costs." CC Docket #79-245, Report and Order 84 FCC 2d 384 (1980) [Interim Cost Manual]; recon. 86 FCC 2d 667 (1981).

1981

FCC. "Assignment of Orbital Locations," 84 FCC 2d 584, 586-89 (1981). [describes development of domestic satellite services).

E. Decisions re: Allocation of Common Local Exchange Facilities Costs - Separations Procedures

1979

FCC. Exchange Network Facilities (ENFIA), 71 FCC 2d 440 (1979) [competitive carriers interim access agreement].

1982

FCC. Joint Board Separations, CC Docket #80-286, Decision and Order 89 FCC 2d 1 (1982) [freeze Subscriber Plant Factor (SPF), phase-out CPE in separations process; Notice of Proposed Rulemaking 89 FCC 2d 604 (1982), 90 FCC 2d 52 (1982).

1984

FCC. Amendment of Part 67 of the Commission's Rules and Establishment of a Joint Board, CC Docket #80-286, FCC 83-564, 1 December 1983, released 15 February 1984 [separations, constant 25% SPF factor and Universal Service Fund for high cost areas].

F. Regulatory Rules and Procedures

1980

FCC. Competitive Carrier Rulemaking, First Report and Order 85 FCC 2d 1 (1980); 91 FCC 2d 59 (1982), recon. FCC 83-69, released 21 March 1983.

1981

FCC. Amendment of Part 31 CC Docket #79-105, 85 FCC 2d 818 (1981) [FCC, expensing station connections and amortizing previously capitalized investment].

1982

FCC. Amendment of Part 31 CC Docket #79-105, 89 FCC 2d 1094 (1982), recon. 92 FCC 2d 864 (1983), review pending sub nom. Virginia State Corporation Commission v. FCC, CC Docket #83-1136 (4th Cir., filed February 11, 1983) [FCC preemption of state control over depreciation for intrastate ratemaking].

FCC. Amendment Part 67 CC Docket #80-286, 89 FCC 2d 1 recon. denied, 91 FCC 2d 558 (1982), review pending sub. nom. MCI Telecommunications Corp. v. FCC, CC Docket #82-1237 (D.C. Cir.) [elimination of interstate revenue requirement associated with embedded customer premises equipment (CPE)].

1983

FCC. Long-Run Regulation of AT&T's Basic Domestic Interstate Services, CC Docket #83-1147, FCC 83-482, 27 October, 1983.

G. Government Reports

Congressional Budget Office. "The Changing Telephone Industry: Access Charges, Universal Service and Local Rates." Washington D.C., June 1984.

Congressional Budget Office. "Local telephone Rates: Issues and Alternatives." Staff working Paper, January 1984.

House of Representatives, Subcommittee on Telecommunications, Consumer Protection, and Finance, Committee on Energy and Commerce. Majority Staff Report. Telecommunications in Transition: The Status to Competition in the Telecommunications Industry. Committee Print 97-v, 97th Congress, 1st Session, November 1981.

U.S. House of Representatives. "The Impact of Changes in the Telecommunications Industry on Small business." Report of Committee on Small Business. 98th Congress 2nd Session. Report 98-1171, 10 December 1984.

CHAPTER SEVENSUMMARY AND CONCLUSIONSSummary

The Canadian telecommunications industry is facing a future which promises to be both changing and complex. A number of domestic and international forces beyond the control of the industry are calling current technological, market structure, and regulatory frameworks into question. The future holds forth the possibility of hitherto unconsidered options for the delivery of telecommunications services to increasingly sophisticated consumers. This study attempts to sketch the emerging environment by identifying the relevant issues and illustrating possible alternative methods of addressing these issues.

This research project utilized methodology developed in the 1970s. A series of building blocks were developed based on observations made with respect to three areas: technology, market structure, and regulation. Each block addresses one topic from a specified perspective and attempts to outline the characteristics consistent with that perspective. The blocks were then combined to create four credible future scenarios from which further observations were made. The blocks and scenarios were sent to a number of senior executives from the telecommunications industry in Canada. Based upon their input, revisions were made and conclusions drawn; therefore, the building blocks and scenarios reflect a combination of inputs from the literature review plus feedback from respondents.

This methodology was found to be particularly relevant to telecommunications research. It recognized the relevance of both the existing economic and future study disciplines, as well as the broader linkages among other disciplines. Moreover, it permitted researchers and respondents some

flexibility in projecting possible future telecommunications environments. Blocks could be combined in a number of ways to create scenarios that could result in desired or preferred outcomes.

In Chapter Two the issues related to the recent explosion of technological innovations in the telecommunications sector are outlined. It warns of the difficulty of attempting to project future technological environments and identifies a number of major trends. The marriage of the telecommunications and computer industries has eroded many traditional boundaries making regulation a more complex undertaking. Capacity and capabilities have both increased. Consumers are seeking more choice, individualizing their communication systems and demanding a high degree of compatibility and interconnectivity; this includes interconnection with U.S. data bases and services. Technological determinism is evolving into a reality that decision-makers should not ignore.

The chapter also reviews the current and future transmission modes and other technological advances. It develops two building blocks to describe future alternatives in this sector. Both project continued growth and innovation but T_2 - Innovative Development, assumes a level of acceptance twice that of T_1 - Conservative Development. This higher level of acceptance fuels a more rapid transition to the use of the new technological innovations. T_1 is predicted on the assumption that users will initially be more reluctant to utilize automated equipment. Growth will be slower, accelerating primarily during the last half of the study period.

Chapter Three explores telecommunication market structures. It identifies those factors that serve to encourage competition in this sector and examines the perceived advantages and disadvantages of allowing increased competition in an area once monopolized by chosen entrants. It reviews the

current market configuration and describes possible future suppliers and services.

Three market structure building blocks are then provided. Each one assumes some competition in the provision of telecommunications services. MS_1 - Minimal Competition describes an environment in which competition is regulated and introduced selectively. New entrants emerge but the established carriers maintain their predominant position. The cable industry has the opportunity to expand its role in this sector. The second block, MS_2 - National Competition, assumes a more active and dynamic market. Fewer regulatory restraints permit the entry of more suppliers offering a full range of services. The established carriers continue to operate but the future of the cable industry is doubtful. MS_3 - International Competition is predicated on an open border arrangement, particularly with the United States. As in MS_2 , many new entrants are expected, but this block assumes that some of these entrants will be foreign owned and operated. The incremental costs to U.S. firms entering the Canadian market is also discussed.

All blocks assume that local service will continue to be provided primarily on a monopoly basis, however, the likelihood of this outcome differs in each block.

Chapter Four reviews the current regulatory environment and identifies three major objectives: universal access, maintenance of Canadian sovereignty and regional development goals. The problems facing regulators are explored and factors necessary to create a successful regulatory environment are forwarded. Four regulation building blocks are presented. Each addresses four issues: jurisdiction, policy development, competition and pricing structures. R_1 assumes a modified status quo in which the current jurisdictional framework persists but some attempts are made to co-ordinate

policy development. Competition and pricing principles remain regulated. R_2 includes the establishment of a joint regulatory body involving federal and provincial representatives which establishes national priorities and decides inter-provincial issues. R_3 assumes that the national and inter-provincial regulatory issues devolve into the hands of a federal agency. Both blocks permit open competition among Canadian entrants in all sectors except local service. Prices reflect market factors. Like R_1 , R_4 is predicated on the continued existence of the current regulatory mosaic. However, it further assumes that the market place is permitted to operate freely in all sectors except the delivery of local service. Although market based pricing is permitted, regulators attempt to ensure continued monopoly in local service to maintain the universal access objective.

Chapter Five combines the blocks outlined in the preceding chapters to create four integrated credible future scenarios. Each is assessed with respect to its long term viability. The scenarios attempt to predict possible future technological environments, market responses and regulatory frameworks. These will be discussed later in more detail.

Chapter Six, assesses the possible economic impact on Canadian telecommunication carriers of the entry of U.S. carriers into the Canadian market. It argues that the U.S. carriers have undergone a fifteen year period of readjustment which has been difficult but which has readied them to enter the Canadian market. It describes the threats that such entry poses and predicts the failure of some Canadian carriers, the loss of national sovereignty over telecommunications, and an increasing deficit in our balance of payments in this sector.

Conclusions

The following highlights the major conclusions drawn from the preceding chapters and summary. The conclusions essentially follow from two research areas, the one being the literature review and the other the development of the building blocks and the scenarios, both incorporating the feedback. In turn, this will be followed by major statements concerning the overall evaluation of telecommunications to the year 2000.

In terms of the literature review, the following are the major thrusts. First and foremost, the literature acknowledges the compelling nature of recent technological changes in the telecommunications industry. Many experts believe that the technology is determining, not only the manner in which the market functions, but also the public policy decisions made by the "governors". Even if one rejects these theories of technological determinism, the impact of technological innovation cannot be ignored. Modern techniques are making it virtually meaningless, for policy purposes, to differentiate among different sorts of carriers delivering different types of transmission signals. These boundaries are blurring and their use for policy purposes is becoming increasingly artificial.

Moreover, the literature reveals that the realities of these technological developments have made increased competition inevitable. There are no longer technical grounds for continued monopolies in many service sectors. The extent of the possible choices available to users has expanded and costs are declining. The consumer wants greater flexibility and the attendant benefits of increased choice.

This leads, therefore, to questions with respect to the current regulatory environment. Most pundits applaud the stated regulatory

objectives, but criticize the established framework as unworkable. The divided regulatory control means that there is no one authority for determining the national priorities. Regulatory agencies are making public policy decisions without the benefit of national political directions. Moreover, since each jurisdiction establishes its own rules, the acceptance of technological innovation, competitive market structures, and market-based pricing principles vary across the nation.¹ When this situation is assessed in terms of the standard economic policy criteria of growth, equitability and efficiency the continued success of the Canadian industry is questionable. Indeed, some maintain that even with a national authority establishing the goals, Canada's future as an information economy may still be impaired because of increasing trans-border traffic and international suppliers which operate outside of the jurisdiction of Canadian authorities.

Moreover, the concept of the "regulatory burden" was one which consistently resurfaced. Not only must regulated carriers expend considerable amounts of time, effort and money to provide the materials and information required by regulators but they also must abide by the ultimate decisions which also may impose increased costs on the regulated entity. By contrast, new entrants are not necessarily subjected to either of these burdens. They reflect a free enterprise orientation and as competitors in the telecommunications sectors, are allowed a systematic advantage since they do not operate under the same regulatory constraints. This consequence

¹This is further complicated by the fact that the various regulatory authorities are each influenced by powerful interest groups which have a vested interest in maintaining the status quo at least as a short run policy objective.

questions the concept of a level "playing field" for all telecommunication entrants.

Many of these same concerns were expressed in the building block and scenario phase of this research project. Table 7.1 illustrates the reaction of the survey respondents to the various building blocks provided.

With respect to the Technology and Services blocks, respondents were equally divided with respect to which was most likely to evolve by the year 2000. In terms of the overall support for these two options, the responses are consistent across subsets of various telecommunication sectors, e.g. cable, telcos, etc. The only exception to this is equipment suppliers who strongly favour T_2 - Innovative Development scenario, which, of course, reflects their vested interest in open ended, aggressive, technological acquisition by Canadian consumers.

Two factors may have contributed to this finding. First, there may have been a weakness in the original survey schedule, in that it failed to differentiate sufficiently between the two blocks. In addition, the result leads one to question the ability of individuals to predict future technological developments. It is undoubtedly a difficult and complex task. Further research is required to clarify this finding. However, for the purposes of this study, it is sufficient to acknowledge that all respondents expect significant systematic changes to occur in the telecommunications technological environment; most differ primarily over the rate or pace of the change.

In terms of market structure, MS_2 - National Competition, was identified as the preferred building block. A close second is MS_1 - Minimal Competition, but most of those who prefer that building block see it as an interim phase leading into the MS_2 block. MS_3 - International Competition,

Table 7.1
Respondent Reaction to the Building Blocks*

Block **	Most Likely/Most Preferred
T ₁ - Conservative Development	50%
T ₂ - Innovative Development	50%
MS ₁ - Minimal Competition	38%
MS ₂ - National Competition	47%
MS ₃ - International Competition	15%
R ₁ - Modified Status Quo	26%
R ₂ - Joint Regulation	37%
R ₃ - Federal Control	13%
R ₄ - Minimal Regulation	24%

Notes:

* This table simply illustrates the responses received. It is not presented as statistically significant data because of the limited sample size.

** As described in the Survey Schedule, Appendix I.

had little overall support. Those that referred to it acknowledged that it could result in excessive damage to the Canadian telecommunications infrastructure if it were fully implemented. Moreover, they argued that the benefits to Canadian telcos competition in the U.S. would be slight relative to the consequences of U.S. entry into the Canadian market. The important finding here, however, is that 62 percent of all respondents would prefer or foresee a more competitive market structure than the CRTC is currently considering. This finding concurs with that outlined in the earlier. Increased competition in this sector is inevitable.

Regulation has been a major focus of this particular research report. The responses reflect the industry's awareness of current regulatory difficulties; over 70 percent of the respondents indicated support for some type of major regulatory change. R_1 - Modified Status Quo, a modified status quo, received some support but R_2 was most favoured. This finding is of considerable interest because R_2 includes joint regulatory efforts on behalf of the federal and provincial authorities. In particular, many respondents stated that some type of uniform national regulatory mode and mechanism for implementation of policy across Canada was a necessary precondition to an orderly and efficient allocation of Canadian telecommunication services.

R_3 - Federal Control, received little support for two, fairly distinct reasons. Some suggested that there was basically a lack of confidence in the ability of federal regulatory agencies, particularly the CRTC, to implement policies that would work on behalf of the consumers, manufacturers, and suppliers in all regions of the country. Others were concerned that the federal authority would fail to recognize the idiosyncrasies and uniqueness of the needs of the smaller, less technologically-developed areas.

Therefore, respondents believed that this centralized federal authority would create problems and it is not a desirable outcome.

R_4 - Minimal Regulation, representing basically an open competition situation, was also selected by some. Some perceived it to be an inevitable outcome produced by market forces; others simply desire to see a more open competitive situation.

No obvious consensus regarding a preferred scenario was evident. Given the five choices offered in the Survey Schedule (see Table 7.2) both Scenario I - T_1 - Conservative Development, MS_1 - Minimal Competition, R_1 - Modified Status Quo and Scenario IV - T_2 - Innovative Development, MS_2 - National Competition, R_2 - Joint Regulation each received the support of 20 percent of the respondents. In addition, 17 percent created a new scenario which combined blocks T_1 - Conservative Development, MS_1 - Minimal Competition, R_2 - Joint Regulation. In many cases Scenario I was viewed as an interim environment which would evolve into a more competitive scenario.

Moreover, another scenario may be developed on the basis of the most popular building blocks. This would involve either T_1 or T_2 combined with MS_2 - National Competition and R_2 - Joint Regulation. The choice of the technology and services block, however, is critical to the long term outcome of scenario. Given T_1 , the cable industry may be capable of playing a more significant role, whereas with T_2 , events will likely overtake cable and it would flounder in the new, more competitive environment. Therefore, despite the fact that the respondents did not achieve a consensus on the technology, but rather were evenly divided, in terms of market structures, there is a considerable if not vast difference between the eventual outcomes.

Table 7.2

Respondents Scenario Selection*

Scenario**	% who selected
I - T ₁ - Conservative Development MS ₁ - Minimal Competition R ₁ - Modified Status Quo	20%
II - T ₁ - Conservative Development MS ₃ - International Competition R ₃ - Federal Control	0
III - T ₁ - Conservative Development MS ₂ - National Competition R ₄ - Minimal Regulation	3
IV - T ₂ - Innovative Development MS ₂ - National Competition R ₂ - Joint Regulation	20%
V - T ₂ - Innovative Development MS ₃ - International Competition R ₃ - Federal Control	3%
T ₁ - Conservative Development MS ₁ - Minimal Competition R ₂ - Joint Regulation	17%
T ₁ - Conservative Development MS ₂ - National Competition R ₂ - Joint Regulation	7%
Other	30%

Notes:

* This table simply illustrates the responses received. It is not presented as statistically significant data because of the limited sample size.

** The first five scenarios were provided in the survey schedule. The last two and those indicated as "Other" were created by the respondents.

Summary Statements

In sum, the major conclusions of this research project are as follows:

1. Technological change in the telecommunications field is the driving force which is affecting all other aspects. In particular, the market structure of future telecommunications services will be determined more by technological innovation than by regulation.
2. Given that this rate of technological innovation is increasing the number of consumer choices, competition is inevitable. It may appear in different sectors or in different regions at different times, but ultimately a competitive model will be the preeminent one in the telecommunications sector in Canada, particularly as Canada evolves into an information-based economy.
3. In light of numbers 1 and 2 above, there is a necessity of a national telecommunications framework that is designed primarily to affect an orderly pace of change in the telecommunications field. In addition, the national telecommunications framework should reflect the national public policy priorities which are necessary in terms of legitimate federal government policies and objectives.
4. The above national framework should be accomplished by a joint and cooperative Federal - Provincial regulatory authority created for two purposes:
 - i) to affect an orderly change in the Canadian telecommunications industry; and,
 - ii) to determine and ensure national Canadian public policy objectives such as: sovereignty, privacy, universal access, regional development goals, and employment opportunities in

the high technology sector.

5. In light of international competitive factors and alternative regulatory models, it is necessary that an interim phase be designed to assist Canadian telecommunication manufacturers and service suppliers with sufficient incentive and protection prior to an open marketplace situation which recognizes the international influences that affect the Canadian telecommunications industry. The failure to provide a buffer stage will result in severe dislocations within the Canadian telecommunications industry in the short-run. In the long run, the failure to recognize the international nature of telecommunications technologies and markets means that an isolationist or restrictionist policy is basically unfeasible and untenable. Such a policy would be to the detriment of both the Canadian telecommunications industry, in general, and the level and quality of services available to individual Canadian consumers, in particular.

In closing, the telecommunications environment that exists in Canada in the year 2000 is clearly a function of decisions that are being taken now - not in the year 2000. Since most other Western societies by then will be information-based economies, Canada has little choice but to make policy decisions that will assist, if not guarantee, that the Canadian economy will be on the leading edge of the international telecommunications sweepstakes.

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Also reviewed for this project were the submissions of the following groups or individuals in response to Canada Gazette Notice No. DGTN-001-84 - Telecommunications Policy Review.

Association of Competitive Telecommunications Suppliers
 Bell Canada
 British Columbia Telephone Company
 Canadian Bankers' Association
 Canadian Business Equipment Manufacturers Association
 Canadian Cable Television Association
 Canadian Federation of Communications Workers
 Canadian Independent Telephone Association
 Canadian Industrial Communications Assembly
 Canadian Manufacturers' Association
 Canadian Petroleum Association
 Canadian Press
 CNCP Telecommunications
 Commercial Union Assurance
 Data Processing Management Association
 DMC Datasystems
 'edmonton telephones'
 Government of Manitoba
 Government of Newfoundland and Labrador Intergovernmental Affairs
 Secretariat, Executive Council
 Greater Winnipeg Cablevision Ltd.
 International Business Council of Canada

Kuriasaki, Yoshiko

Manitoba Telephone System

Maritime Telegraph & Telephone Company Ltd.;

The New Brunswick Telephone Company Ltd.;

Newfoundland Telephone Company Ltd.; and

The Island Telephone Company Ltd.

Mitel Corporation

Ontario Ministry of Transportation and Communications

Radio Advisory Board of Canada

Telesat Canada

Appendix I

Telecom 2000

Survey Schedule

January 10, 1985

YnameY

YsalutationY

The enclosed materials, which consist of a series of building blocks and five future scenarios, are being forwarded to you for review and comment. The five scenarios depict a range of possible Canadian telecommunication market configurations to the year 2000.

These materials form part of a university-based research project funded by the federal Department of Communications (DOC) as part of their examination of the future of telecommunications services.

By February 4, we would appreciate your reactions to these scenarios and projections.

Your responses should reflect your industry's concerns and expectations in light of the telecommunication's environment within a fifteen year time frame. As a result, you will find some scenarios more plausible than others; also, you may determine that there are significant elements not being addressed. Please feel free to add to, or delete from, any building block or scenario. In addition, if you would like to design a model scenario based upon your own knowledge of the telecommunication industry, we would be more than willing to consider it.

We greatly appreciate your attention to this matter. We recognize that your valuable time will be required to complete this survey but rest assured that the overall value of the study will certainly be enhanced by the quality of the replies received. (Please note that no individually identifiable reply will be used in the final report to DOC.)

If you have any questions or concerns, please feel free to call (collect) the project's research associate, Brenda Downey at (403) 283-7711 or (403) 284-6357.

Thank you for your co-operation.

Regards,

Thomas L. McPhail, Ph.D.
Director & Professor

TLM/srm
enclosure

SECTION 1

Building Blocks

This section outlines a series of building blocks which will be utilized to develop the future scenarios that follow. Each block is consistent with its major theme. There are three elements to each scenario - technology, market structure, and regulation. Within each element a number of possible futures may be imagined. However, for the purpose of this study, the number of blocks will be limited and will include the following:

Technology and Services

- T₁ Conservative Development
The acceptance and utilization of new technologies and the provision of new services is significant. However, it proceeds at a slow but steady pace.
- T₂ Innovative Development
An enthusiastic response to the new technologies and services is projected. Growth is rapid.

Market Structures

- MS₁ Minimal Competition
Major established carriers will continue to dominate. Competition will be introduced gradually and selectively.
- MS₂ National Competition
Competition is permitted in all sectors. New entrants must be Canadian owned and/or controlled.
- MS₃ International Competition
Open competition is permitted. American firms enter the Canadian market place.

Regulation

- R₁ Status Quo
The current regulatory framework continues to exist. Decision-making is an incremental, ad hoc process.
- R₂ Joint Regulation
A joint federal-provincial regulatory body is established to set national goals and priorities.
- R₃ Federal Control
All interprovincial matters become the responsibility of a federal regulator. National goals established by Parliament.
- R₄ Minimal Regulation
The current regulatory framework continues but little effort is made to control developments.

Technology and ServicesT₁ - Conservative Development

- . office automation will proceed rapidly but growth will be slower than originally anticipated
- . microwave, copper wire and coaxial cable remain the dominant technologies
- . fibre optics are increasingly utilized for local, heavy volume circuits, costs decrease, volume increases, and fibre becomes major transmission mode
- . satellites have excess capacity but costs remain constant, prices remain high
- . satellites are used to complement other terrestrial technologies and are used for private networks, and remote coverage but growth is slow
- . cellular radio technology is increasingly used for mobile communication
- . analogue technologies are only gradually replaced by digital
- . the distinction among voice/video/data blurs with the shift to fibre and digital transmission; all carriers will begin to carry all services
- . non-voice services grow steadily
- . enhanced services experience steady growth
- . electronic mail service grows
- . local private networks (LAN's, PBX's) are established to allow for more efficient computer to computer communications.

T₂ - Innovative Development

- . office automation proceeds at a rapid rate
- . volume greatly increases, especially data transmission
- . microwave and copper serve as the backbone of the infrastructure
- . fibre optics rapidly replaces copper wire for local and inter-city trunk lines because it is more cost effective
- . coaxial cable is increasingly used for point-to-point communications and private network installations
- . cellular radio is widely utilized for mobile communications and plays a smaller role in rural and remote point-to-point communication
- . satellite costs remain high, but satellites are used for private networks, remote services and broadcasting
- . digital transmission and switching technologies begin to predominate
- . enhanced services are demanded to more efficiently handle heavy volume of traffic
- . private networks utilizing LAN's, PBX's, cable and satellites grow rapidly as individual companies attempt to interconnect their equipment and personalize their service.

Market StructuresMS₁ - Minimal Competition

- . assumes minimal change, gradual evolution
- . major established carriers will predominate
- . range of services will gradually expand
- . competition will be introduced selectively
- . "local loop", owned and operated by regional telcos, maintains monopoly
- . minimal rate rebalancing will force local rates slightly upwards
- . long distance toll service will be offered on a competitive basis by Telcom Canada and CNCP
- . interconnect charge will be levied against CNCP to help keep local rates low; long distance rate reductions will be minimal.
- . private networks will continue to be established by the major carriers for their customers; growth will be slow initially but will increase as large users try to reduce communication costs and tailor systems to suit their own needs.
- . equipment suppliers will become involved in network development, LAN's, PBX's, etc.
- . data and text requirements will steadily increase as computer to computer communication increases
- . the role of cable companies as telecommunications carriers will intensify as they develop interactive capacity for the delivery of videotext services leading them into direct competition with the telcos
- . mobile communications services will gain more subscribers
- . cellular radio will be recognized as a viable local bypass technology by the end of the study period
- . enhanced services will be offered by a variety of suppliers; this sector will grow more rapidly than others and competition will be more active
- . by the end of the study period, bypass will become a more obvious option; large users will become increasingly frustrated by high costs and seek out cheaper services from a range of providers.

MS₂ - National Competition

- . power of technological innovation and market forces recognized
- . information becomes an ever more important commodity
- . increased information transfer capacity
- . existing suppliers continue to operate, but many new entrants appear - satellite resellers, equipment suppliers, cable companies and new telcos; these must be Canadian owned and controlled
- . competition is permitted in all sectors
- . services become increasing user-specific
- . data and text services predominate
- . teleconferencing is more widely used
- . local area networks grow rapidly but many interconnect with the public switched network
- . prices reflect costs, local rates increase

- . by 1990 basic universal service will be severely threatened
- . smaller carriers have difficulty maintaining their competitive position; many merge or fail leaving a fewer number of larger firms in the field
- . competition between the telcos and cable companies for the right to bring all services via one carrier intensifies; this push for cost efficiency leads to the demise of the cable companies which fail to recognize and develop their potential
- . cost of equipment declines so that even smaller companies can afford to personalize their communication systems
- . brokerage and resale of capacity are permitted

MS₃ - Open Competition

- . open competition is permitted
- . several American firms enter the Canadian market; resale and own facilities; their costs are marginal but possible profits are attractive
- . the number and variety of services increases
- . the market is very active and dynamic at first
- . prices reflect costs, but U.S. entrants have cost advantages
- . eventually most Canadian companies are forced to merge or fail; an oligopoly results
- . competition is very destructive of the quality of service
- . rural services decline or disappear

Regulation

R₁ - Status Quo

- . jurisdiction
 - . failure of the federal and provincial governments to reach a consensus results in the continuation of the current regulatory mosaic
 - . CRTC is permitted to join the Canadian Association of Members of Public Utilities Tribunals (CAMPUT) by 1990
 - . debates continue over jurisdictional issues, and answers continue to be sought from the courts or cabinet
- . policy development
 - . ad hocery continues
 - . decisions are incremental and reactive
 - . decision making is a lengthy process
- . competition
 - . regulated competition coupled with minimal rate rebalancing is permitted in long distance toll service, mobile communications and satellite transmission services on a jurisdiction-by-jurisdiction and case-by-case basis
 - . entry and development are regulated as the preoccupation with theoretical abuse continues
 - . other sectors are permitted more flexibility - enhanced services, text
 - . local service remains monopolistic

- . cable videotex service is regulated to ensure access is equitable
 - . pricing
 - . attempts are made to continue the current subsidization scheme
 - . interconnection charges are levied on all competitive services to finance this
 - . long distance toll service rates decrease marginally
 - . local rates are rescheduled to include two components, an access charge (life line service, about the same as present local rates) and a usage sensitive charge.
- R₂ - Joint Regulation
- . jurisdiction
 - . a joint regulatory body is created with representatives from each province and the federal government
 - . this body makes recommendations regarding issues involving more than one regulatory jurisdiction
 - . the regulatory functions remain with existing agencies
 - . intra-jurisdictional decisions can be made without consultation
 - . policy development
 - . joint body sets national goals and priorities
 - . attempts are made to anticipate technological change and establish suitable policy in advance
 - . competition
 - . all service categories except local voice service are permitted competition
 - . provincial regulators continue to impose quality of service requirements on intra-provincial services
 - . pricing
 - . as in MS₁, an interconnection charge is levied against all competitors to help subsidize service
 - . rates are rebalanced
 - . governments levy a tax on all telecommunications firms to finance service to remote areas.
 - . local service rates become usage sensitive

- R₃ - Federal Control
- . jurisdiction
 - . failure to reach a consensus results in further recourse to the courts, which decide that all provincial matters are the responsibility of the federal government
 - . federal agency becomes the dominant regulatory force, deciding all matters affecting more than 1 province
 - . provinces retain control of local regulatory concerns, but become increasingly incapable of affecting change
 - . policy development
 - . Parliament establishes national goals
 - . anticipatory regulation is attempted
 - . competition
 - . basic and enhanced services continue to be separated

- . regulation of basic services does not include entry or fair competition provisions but seeks to ensure basic universal service
- . pricing
 - . market-based pricing predominates
 - . rates are rebalanced and prices reflect costs
 - . governments subsidize local service with direct payments, eg. Welfare or Pension allowances are increased
 - . government grants or incentives are required for provision of service in remote areas
- R₄ - Minimal Regulation
 - . jurisdiction
 - . the current regulatory configuration persists
 - . CRTC is admitted to CAMPUT which functions as an arena in which to air differences
 - . ability of regulators to control developments is eroded by technological innovation.
 - . policy development
 - . in most cases, the market is allowed to develop independently
 - . regulators concentrate on achieving one or two major goals only, eg. economic development or basic universal service
 - . competition
 - . very liberal competition policy is adopted
 - . federal regulators impose strict Canadian content and ownership rules
 - . pricing
 - . regulators have no control over prices
 - . governments employ incentives or grants to ensure universality

SECTION 2

Future Scenarios

The scenarios that follow have been developed utilizing the building blocks outlined in the preceding section. Each scenario includes a prediction about the technology, market structure, and regulatory environment. The previous building blocks were combined to create credible possible futures.

Scenario I - T₁, MS₁, R₁

Scenario I is primarily a modified version of the status quo. It suggests that the adoption of the new technologies will be conservative. Therefore, the market structure remains much the same. The established carriers dominate. Competition in long distance toll service is permitted but the impact is minimal due to expensive interconnect charges. Cable companies, cellular mobile radio carriers and equipment retailers all begin to gain a bigger share of the market. However, their growth is initially moderate. The regulatory environment experiences no major changes. Both the structure and the aims remain constant.

However, toward the end of the period studied, the situation begins to change dramatically. Large business users become frustrated with high costs and limited services. More and more attempt to bypass the public-switched network. As the established carriers begin to lose their major customers, prices escalate and the drop-off rates increase. The regulatory stalemate inhibits the establishment of effective policies and control mechanisms. Without constructive intervention, the future for the Canadian telecommunications sector appears bleak.

Scenario II - T₁, MS₃, R₃

Scenario II assumes that the adoption of the new technologies by the Canadian industry will be gradual. However, it suggests further that the regulatory environment will soon change to one of federal control. Under this regulatory framework, basic and enhanced services are separated. Competition is encouraged and international players enter the Canadian market. First through resale of capacity but eventually they establish their own facilities. Because of their positive economic and technical position and because the Canadian carriers have been slow to adopt new technologies, the foreign carriers have a marked advantage. They can offer more sophisticated services at lower costs and quickly attain a large share of the Canadian market.

Canadian carriers will find it increasingly difficult to compete. As their share of the market decreases, so will their profits. Little money will be available to update their services/equipment and their competitive position will suffer further. Without substantial financial assistance, a long term viable future for the Canadian telecommunications industry is doubtful.

Scenario III - T₁, MS₂, R₄

The third scenario also acknowledges that although the technological environment changes significantly, growth is not as rapid as many expected. However, the potential of the technology and market forces is recognized and regulation is minimal.

Within this scenario, the increase in the volume to be transmitted encourages the entrance of a wide variety of carriers into the market. A liberal competition policy is adopted. Other than strict ownership controls, regulators leave the rules and prices to be determined by market forces. This is especially the case in areas of CRTC authority. However, provincial regulators are incapable of preventing the erosion of their control.

As a result, universal basic service is no longer a reality by 1995. Governments are obliged to consider extending direct welfare subsidies to those who can no longer afford basic service.

A push for cost efficiency forces a rethinking of the current situation. Currently, at least two carriers provide service through separate facilities to most homes and businesses - the telephone and cable companies. This is recognized as inefficient and the two compete for this market. The telephone companies eventually win out because of their foresight in improving their band width capacity through the adoption of optic fibres. Cable is slow to recognize its potential as a carrier. Once it overcomes the current regulatory hurdles and enters the race, the telephone companies have too great an advantage.

In addition to the demise of the cable companies, smaller carriers have difficulty maintaining their position against their larger competitors. Many fail or merge to leave a few large firms, including the major telcos and CNCP in the market place.

Scenario IV - T₂, MS₂, R₂

This scenario projects rapid acceptance and utilization of the new technologies. Computer to computer communications will grow rapidly and increase the demand for user-specific enhanced services and private networks.

In addition to the existing carriers, many new entrants will appear. Some will create their own facilities, others will utilize liberalized resale and brokerage regulations to offer services in competition with the major carriers.

A joint regulatory body will be established to govern issues involving more than one province. This body will encourage competition by allowing rate rebalancing. Provincial regulators will continue to maintain a monopoly for local service. Although local rates will become usage sensitive, basic universal service will be subsidized by an interconnection charge levied against all telecommunications carriers.

By the end of the study period, weak competitors will have been forced from the market place but a large group of competitors will remain including the telcos, equipment suppliers, cellular radio suppliers, and satellite resellers.

Scenario V - T₂, MS₃, R₃

This scenario combines rapid and innovative technological development, open international competition and federal regulatory control. The increased volume of traffic and the low entry costs makes the Canadian market an attractive one for international suppliers, particularly American ones.

This scenario envisages a relaxation, with federal government consent, of many of the rules, regulations, and purchasing policies currently protecting or aiding Canadian telcos. In return, both the federal government and large telcos will have access to several foreign markets in order to aggressively expand their sales and market penetration. Foreign investment in Canadian telcos combined with licensing agreements will blur any unique distinction among North American telecommunications suppliers.

Essentially a deregulation philosophy approach is extended to enhanced services while basic Canadian telephone service remains regulated with reference to traditional economic and social concerns.

Appendix II

Telecom 2000

Survey Responses

restricted its comments to those of a general nature and has suggested which scenarios it believes to be more likely than others. The various assumptions under each of the different futures for each element will first be discussed, followed by comments on the five future scenarios and suggestions for alternative scenarios.

1) Technology and Services

There appears to be less of a distinction between the two futures within technology than among the three futures within market structure and the four futures within regulation.

Perhaps the distinction between the conservative and innovative development of technology could be increased by slowing down the pace of technological growth and innovation somewhat under the conservative development. For example, fibre optics could replace microwave as the major transmission mode by the mid-1990s and the establishment of local private networks could proceed at a slower pace. Under the innovative development, fibre optics could replace microwave and

copper as the dominant technology and office automation, private networks, and enhanced services could proceed at a more rapid rate.

2) Market Structures

There is one assumption under minimal competition which could be changed in order to maintain a more consistent market structure: the role of cable companies as telecommunications carriers. The Science Council of Canada held a conference in March 1984 consisting of experts in the telecommunications and cable industries. The conclusion generally agreed upon was that it was too late for the cable companies to enter the telecommunications industry in any strongly competitive manner; therefore, the Status Quo scenario of minimal competition should assume that the cable companies play a minor role in telecommunications. For further information and transcripts of speeches, Dr. Arthur Cordell may be contacted at the Science Council of Canada, 100 Metcalfe Street, Ottawa, K1P 5M1. With regard to the market structures of national competition and open competition, it is not clear as to what the intent is by assuming such disparate views between these two structures and the minimal competition structure. If the intent is to formulate a range of likely market structures in the future, then believes that the last two structures should be redefined so as to eliminate open international competition and split national competition into two separate structures. National competition (MS₂) would have many of the same assumptions as the existing MS₂ except for the following:

- resale and sharing are permitted but the number of new entrants is limited;
- competition is permitted in all sectors but local;
- there is no threat to basic universal service; government provides subsidies to pay fixed common access costs;
- the cable companies do not compete with the telephone companies in telecommunications; they continue to offer existing services.

Open competition (MS₃) assumptions would change as follows:

- open competition is allowed in all sectors but firms must be Canadian-owned and controlled;
- the number and variety of services increase;
- the market is very active and dynamic;
- prices reflect costs;
- many new suppliers appear - satellite resellers, equipment suppliers, cable companies, and new telcos;
- basic universal service is threatened; there are no government subsidies and local rates pay the totality of the fixed common access costs.

One assumption under open competition which is questionable is that American firms have cost advantages in Canada; it is difficult to understand why U.S. entrants would have substantially lower costs than Canadian entrants. Furthermore, it appears that the existing open competition structure is improbable; the consequences are so negative that it is difficult to believe that a regulatory authority would allow international competition as described.

3) Regulation

I would suggest the following changes to the various regulatory scenarios proposed. Under the Status Quo (R₁), I would like to add the assumption that the costs of the regulatory process to carriers becomes higher and higher. Under Joint Regulation (R₂), there is no requirement to levy an interconnection charge against all competitors to help subsidize local service if rates are rebalanced because under the telephone companies' definition of rate rebalancing, local service rates will cover all local variable costs and fixed common access costs. An interconnection charge may be levied against all competitors and the telephone companies to ensure that universal service is maintained (so that rate rebalancing would not be complete).

4) Future Scenarios

Because I have suggested that Open Competition (M₃) be modified to mean open competition among Canadian firms (as mentioned earlier) and National Competition (M₂) be modified as outlined earlier, two of the scenarios have been replaced. I would suggest that the following scenarios are among the most likely to occur and will provide the most useful information to the Department of Communications in formulating telecommunications policy:

Scenario I	-	T ₁ MS ₁ R ₁ (Status Quo)
Scenario II	-	T ₁ MS ₁ R ₃
Scenario III	-	T ₁ MS ₂ R ₂
Scenario IV	-	T ₂ MS ₂ R ₂
Scenario V	-	T ₂ MS ₂ R ₃
Scenario IV	-	T ₂ MS ₃ R ₃

As well, it is believed that the assumption of Minimal Regulation (R₄) is incompatible with any assumptions of fair and equitable competition in the Canadian telecommunications market because of the market power and dominance of the telephone companies and their ability to cross-subsidize competitive services with monopoly services revenue.

Response 1002

Re: Your Letter on Scenarios for the Future of Canadian Communications

Your call for comments on this matter just reached my desk today, well past your deadline for response. This is unfortunate since as you know [redacted] plays a major roll in canada's communications structure and our input should be helpful. Had time permitted I would have delighted in [redacted] a reply.

While we were unable to respond on time I will still circulate your letter as food for thought on this matter.

While I'm an optimist at heart I have to say that I would personally predict Scenario I as the most likely. It would take uncustomary foresight on the part of both our Canadian regulators and industry to rise to the market's potential.

Response 1003

SUBJECT: DOC Telecom 2000 Study

We have reviewed your materials on the possible scenarios of future Canadian telecommunications and forward these views to you.

In our analysis we distinguish between our preferred Corporate view vs what we feel is more probable to occur. In addition, several specific points are worthy of mention for clarification of the scenarios. Finally, some general comments have been included for your consideration.

As we have not fully rationalized a number of these issues ourselves, the attached comments do not reflect the official position. They are intended to be used for the purposes of your undertaking.

We trust these comments will contribute to the overall value of your study.

Comments on Telecommunications
Services Scenarios

<u>Component</u>	<u>Corporate View</u>	<u>Viability or Probability of Occurrence</u>
T1	Less Desirable	More Probable
T2	More Desirable	Less Probable
MS1	Most Desirable (note 1)	Less Probable
MS2	Less Desirable	Less Probable
MS2.5	Less Desirable (note 2)	Most Probable
MS3	Least Desirable	Least Probable
R1	Less Desirable	Most Probable
R2	Least Desirable	Less Probable
R3	Less Desirable	Less Probable
R4	Most Desirable (note 3)	Least Probable

Corporate View: Scenario T2 MS1 R4
(Most Probable View: Scenario T1 MS2.5 R1)

Notes:

1. MS1 In this "minimal competition" component, comments referring to increasing competition between cable companies and telcos should be removed.
2. MS2.5 This scenario component was added to reflect current realities, not covered in MS2 or MS3. It is defined as "Canada/U.S. competition". Typical activity in this component is East/West L.D. by-pass via Cross Border Long Distance interconnection and re-salers. (MS3 is understood to mean International, not just American competition).
3. R4 "Very liberal competition policy" is also understood to permit a route leading to the capture of total market share, in line with market structure components such as MS1.

General Comments

Though mention was given to products and manufacturing, there seemed to be more emphasis on phone service, in fact long distance (in the scenarios discussed). Terminals, manufacturing as well as local and toll carriage should be viewed in an overall context.

Secondly, the themes behind the scenarios presented for telecommunications and their corresponding social/economic infrastructures apply to most enterprises in Canada (e.g. airlines), not just telecommunications. Such general policies in turn create politically and socially unacceptable scenarios, which in turn eliminate some desirable telecommunications scenarios.

Response 1004

Re: Canadian Telecommunication Research Project

Thank you for the opportunity to provide input to your research. The documentation which you provided is very thought provoking and your organization of the various scenarios is interesting.

The following comments summarize the views held by the various personnel in who were able to review your document. They do not necessarily reflect the views of

Based on our observations of the technological, market and regulatory developments taking place in Canada, we feel that Scenario IV is the most plausible overall pattern for the next fifteen years; however, there are several points that should be clarified.

The rapid acceptance and growth of new technology and services is not expected to begin immediately. Technology push is still a fact of life for many new technologies. Significant market demand is not expected to emerge for 3-5 years. This gradual technology adoption will lead to rapid growth in sales in the ensuing years.

The requirement for Canadian ownership of new entrants is questionable in light of the latest FIRA modifications under the Conservatives; however, we do not feel that allowing American entrants spells the ultimate demise of Canadian carriers as we know them today. It is more likely that they will be permitted entry under some regulatory arrangement designed to protect the Canadian industry. Prices will be market driven and will reflect Canadian cost factors.

I hope this information will assist your research.

Response 1005

I am responding to your request for input to the possible Canadian Telecommunication market configurations to the year 2000 on behalf of
In formatting my reply I reviewed the material with the

The approach used causes us some concern in that we could not completely agree with any one of your scenarios. While you gave us the option to construct our own I am sorry that I didn't take the time to do so. We feel your material should have been laid out on a grid or matrix where we could assign probabilities. The shades as you've laid them out are too subtle to do.

However, in specifically answering your grid our reply would be:

T_{1.5} MS_{1.5} R₂

This means that we agree mostly with T₂ but see a pull back to T₁ as your comments on Fibre Optics are too strong for us in T₂. On MS₂ we accept most of the items but cannot agree that data and text services will predominate as people will still like voice as the primary communicating mode. We saw some pull back to R₁, however, feel that R₂ is most probable. If you cannot handle our coding above then on a compromise vote we would settle for: T₂ MS₂ R₂ as the most likely projection for the next decade (1990's).

Response 1006

T₂Innovative Development

- . office automation proceeds at a rapid rate ✓
- . volume greatly increases, especially data transmission ✓
- . microwave and copper serve as the backbone of the infrastructure ✓
- . fibre optics rapidly replaces copper wire for local and inter-city trunk lines because it is more cost effective ✓
- . coaxial cable is increasingly used for point-to-point communications and private network installations ✓
- . cellular radio is widely utilized for mobile communications and plays a smaller role in rural and remote point-to-point communication ?
- . satellite costs remain high, but satellites are used for private networks, remote services and broadcasting ✓
- . digital transmission and switching technologies begin to redominate? ✓
- . enhanced services are demanded to more efficiently handle heavy volume of traffic ✓
- . private networks utilizing LAN's, PBX's, cable and satellites grow rapidly as individual companies attempt to interconnect their equipment and personalize their service. — ✓

MS₂National Competition ✓

- . power of technological innovation and market forces recognized information becomes an ever more important commodity
- . increased information transfer capacity
- . existing suppliers continue to operate, but many new entrants appear - satellite resellers, equipment suppliers, cable companies and new telcos; these must be Canadian owned and controlled
- . competition is permitted in all sectors
- . services become increasing user-specific
- . data and text services predominate
- . teleconferencing is more widely used
- . local area networks grow rapidly but many interconnect with the public switched network
- . prices reflect costs, local rates increase
- . by 1990 basic universal service will be severely threatened X
- . smaller carriers have difficulty maintaining their competitive position; many merge or fail leaving a fewer number of larger firms in the field
- . competition between the telcos and cable companies for the right to bring all services via one carrier intensifies; this push for cost efficiency leads to the demise of the cable companies which fail to recognize and develop their potential
- . cost of equipment declines so that even smaller companies can afford to personalize their communication systems
- . brokerage and resale of capacity are permitted

R₂Joint Regulation
jurisdiction

- a joint regulatory body is created with representatives from each province and the federal government
- this body makes recommendations regarding issues involving more than one regulatory jurisdiction
- the regulatory functions remain with existing agencies
- intra-jurisdictional decisions can be made without consultation

policy development

- joint body sets national goals and priorities
- attempts are made to anticipate technological change and establish suitable policy in advance

competition

- all service categories except local voice service are permitted competition
- provincial regulators continue to impose quality of service requirements on intra-provincial services

pricing

- ~~as in MS₁, an interconnection charge is levied against all competitors to help subsidize service~~
- rates are rebalanced
- governments levy a tax on all telecommunications firms to finance service to remote areas & those who cannot afford basics.
- local service rates become usage sensitive

*inconsistent
- don't need contributions
to support local
once rates are
rebalanced.*

Scenario IV - T₂, MS₂, R₂

This scenario projects rapid acceptance and utilization of the new technologies. Computer to computer communications will grow rapidly and increase the demand for user-specific enhanced services and private networks.

In addition to the existing carriers, many new entrants will appear. Some will create their own facilities, others will utilize liberalized resale and brokerage regulations to offer services in competition with the major carriers.

A joint regulatory body will be established to govern issues involving more than one province. This body will encourage competition by allowing rate rebalancing. Provincial regulators will continue to maintain a monopoly for local service. Although local rates will become usage sensitive, basic universal service will be subsidized by an interconnection charge levied against all telecommunications carriers.

By the end of the study period, weak competitors will have been forced from the market place but a large group of competitors will remain including the telcos, equipment suppliers, cellular radio suppliers, and satellite resellers.

Response 1007

February 5, 1985

RE: Scenarios on Telecommunication Market Configurations

I personally favour a scenario based on the following blocks:

T_1 M_1 and R_2 or R_3

Response 1008

Thank you for including _____ on your list of recipients for discussion of the future of the Canadian Telecommunications Industry. Unfortunately, _____ we are unable to give this subject the attention it truly deserves. However, I would like to offer the following comments on your building block scenarios.

Given the blocks as described, I believe a scenario encompassing T2, MS1 and R1 is most likely. Let me explain.

1. Technology and Service

I believe that technology will continue to provide the push towards proliferation of office automation and enhanced transmission services. As individual companies, led by the large multi-nationals, move towards integrating voice and data, there will be rapid growth in all areas. This growth will be slowed by the regulatory/competitive environment but not to a significant degree.

2. Market Structures

This area is one of great concern. Competition will continue to grow, but will be dominated by the large national companies and carriers. Because regulatory functions will be slow to change and the large carriers reluctant to open the market, it will be difficult for new entrants to succeed if they get started at all. This will accelerate in the last half of the study period towards freer competition and less regulatory impacts.

3. Regulation

Although the regulatory scene will continue to evolve, the basic provincial/federal governmental issues will remain as they are with little change. The CRTC and Provincial bodies will gradually relinquish control to the marketplace, however, this will only occur as a result of tremendous user pressure demanding the application of new technology.

In summary, I believe that the marketplace will place very strong demands on the system and despite the system. It does not seem that Canada wants to promote a highly competitive environment, therefore, it seems more likely that controlled competition will be encouraged. As the regulators become more burdened and as technology continues to widen the gap between regulatory policy and reality, regulation will be abdicated to market influences.

I would like to apologize for the limited effort put into this discussion and trust that some of our views will be helpful.

Response 1009

Thank you for the very thoughtful scenarios forming the background for your work for DOC. I am pleased to provide some observations as requested.

General Observations

My comments should be taken as observations on what is most likely to happen rather than what I would like to see take place. In effect, I am offering my version of what Herman Kahn would call a 'surprise-free scenario'.

I tend to base my projections on Content Analysis which assumes that the only way you can make reasonable predictions is to ignore what people or organizations say and look at the way they have behaved in the past.

This approach for the Canadian telecommunications industry leads me to select a somewhat conservative scenario. My optimistic nature leads me to hope that the telecommunications powers in this country will change their approach. I hope by pointing out to DOC that unless a major change takes place the market will not realise its full potential, I will have assisted by being an agent of change.

Some General Assumptions

On the grounds that people will continue to do what they have done in the past, the limitations on a dramatic market turnaround by the year 2000 will be:

- The inertia of the public service regulatory system which in the past has stifled innovative development in the industry, e.g. delaying the introduction of television in Canada, delaying colour TV, delaying the introduction of pay TV, etc. The bright spot has been the rapid development in the cellular mobile telephone business.
- The hundred year tradition of federal/provincial jurisdictional jealousies. I see no let up in this and therefore the assumption of some amicable future arrangement would be optimistic.
- The 'government by public poll' that will likely slow anything that would be politically questionable, e.g. allowing substantial long distance bypass if that would affect the rates for local telephone use. When pitting benefits to business against benefits to voters there is no question how the decision will ultimately be made in Canada.
- The stated desire of all political parties to want to contain Canadian control of the communications industry.

This will likely lead to a legislative cap of 20% investment in communications-related firms by offshore organizations..

- Despite the likely ten year minimum life of the current government and their dedication to free enterprise, the 150 year Canadian trend has been toward increasing government involvement and giveaway programmes for political purposes. The well known fundamental problem with a democracy is that ultimately it will vote itself whatever income redistribution programmes the voters demand. There could well be a reaction in the U.K. and U.S. against the current trend to privatization and competition. This is already evident in the reaction to the Bell split up in the U.S.

A Surprise-Free Scenario

With regret, then, I would have to pick Scenario 1 as being the most likely.

With Canada's limited population and long tradition of evolutionary rather than revolutionary market develop-

ment, I feel this is the most likely.

I do not suggest this as being as 'bleak' as is suggested, but certainly not as exciting as it could be.

Cellular Mobile Telephone

Scenario 1 indicates that cellular mobile telephone carriers will begin to gain a bigger share of the market but the growth will initially be moderate. I believe this will be the case.

Initially the product will be a high ticket item and requires breakthroughs in equipment production to make cellular a major market force. However, having indicated that I think the growth will be slower than many pundits predict, I also believe that the acceptance within a decade will be far greater than most people expect. If asked whether I really believe that within ten years most people would have a personal communications device capable of two-way voice communication that would fit in their pocket or purse, I would say undoubtedly yes. When this time comes and the price is \$500 or less, cellular or its follow-on developments will become a major market item.

This development requires:

- a sharp decline in the cost of the units;
- a decrease in size to fit a pocket or purse;
- improvements in battery size and life.

In general I believe that personal communications will become a major factor in the telecommunications industry within a decade, and that a number of individuals may no longer have a hard wired phone. A transportable unit that can work in a car, in your pocket or at night be placed on a bracket on the wall, could well replace the old idea of having to go where a phone was located to be in touch.

Cable TV

I am less optimistic about the future of cable. As one

of the protagonists for the Wired City during the Seventies, I foresaw the evolution of cable into a second national communications network linked by satellite or microwave and capable of carrying a variety of broadband communications into the home or office.

That the industry has not yet realised this potential may have eliminated it as a contender, given the catch up capability of the telephone companies. The problem is that the industry:

- Is too fragmented with Mom and Pop shops to be able to offer a cohesive national programme.
- Has been over-regulated and has been made an instrument of government policy, e.g. Canadian content, protection of the over-the-air broadcast industry, etc.
- Is not sufficiently profitable to allow for adequate investment in plant. This is directly due to being rate regulated for many years as though we were a utility while we were in fact facing increasing competition. During the years when capital could have been ploughed back into the plants, rates were artificially restricted.
- Suffers from an approach by government that pays lip service to cable as the communications vehicle of the future, (see "Towards a New National Broadcasting Policy"), while acting as though it wanted to run rather than regulate the industry.

This is not to place all the blame on government. The industry has some very imaginative people but they tend to use their entrepreneurial skills to continue the development of cable as a broadcast receiving undertaking rather than a broadband common carrier.

Summary

There are some bright spots. The 'new' CRTC headed by its new Chairman is showing much more understanding of the needs of the communications industry. However, it still has a long way to go.

The DOC has been imaginative and responsive in launching cellular in Canada. This in turn has led to the involvement of a major new multinational in Canada - Ericsson. I believe this will have substantial industrial benefits

for Canada along the lines pointed out in more optimistic scenarios.

In summary, the situation can change but, for the reasons outlined in my earlier basic assumptions, there are too many unlikely factors in the later scenarios to make them as likely as Scenario 1.

Response 1010

The building blocks and elements appear to satisfactorily cover the possible scenarios. It does make an interesting mix of possibilities versus probabilities with a generous overtone of politics. My only suggestion then are that some of the five scenarios should cover the most probable events.

I would predict the most likely scenarios with equivalent percent probability as follows:

T1	MS1/MS2	R2/R3
90%	80% 20%	80% 20%

The building block scenario that I would like included is:

T1 MS1 R2

This also reflects our concerns with the longer term evolution of telecommunication policies and practices in Canada. At this time, Canada has no national common carrier. Telecom Canada is not a legal entity. It is an association that is allowed to exist to provide national services as a monopoly. In Canada, we are in the equivalent to the U.S.A. divestiture mode without having addressed the requirement for national competitive common carriers.

We definitely foresee a conservative development with minimal competition. The changes have to occur in the regulatory environment first. This will occur in a very politically sensitive area. We foresee an attempt at joint regulation which will evolve to federal control as telecommunication services become increasingly vital in the national sense.

Most probably, we hope, Telesat and CNCP will become interprovincial common carriers competing with Telecom Canada as a new corporate entity. From there on, change will be slow.

Response 1011

After some deliberation it is our opinion that Scenario IV represents the most likely forecast of the way that the market will unfold.

Technological development will continue to be innovative to meet the requirements of business and industry for low cost enhanced services, particularly data transmission. Satellite transmission will be attractive to high volume users in point-to-multipoint applications, but fiber optic transmission will be more economical for point-to-point services. Satellite costs will remain high.

In the area of market structures, we foresee that long distance services will be open to competition, but that competition in local services will be restricted to maintain the integrity of universal telephone service. The low population density of Canada will not permit open competition which would result in prohibitive costs for rural and small town subscribers.

We believe that the present regulatory mosaic will be replaced by a single federal agency, whether established by agreement amongst present regulators or as a result of court decisions. As noted previously, local service will be protected and an access charge will be levied to ensure that basic telephone service will be universally accessible. During the study period it is unlikely that the federal government would increase taxes in order to subsidize telephone service for those who could not otherwise afford it. In this aspect R2 is more representative of our outlook.

The trend to deregulation of telecommunications is spurred by events in the United States and by the transition to digital technology which blurs the distinction between voice, data, facsimile and video services. This country, by nature of its population distribution and its regional nature requires basic low cost universal telephone service (sometimes called POTS - Plain Old Telephone Service) which could not exist in an unrestricted environment. Although politicians tend to favor areas of high voter density, we believe that the checks and balances in our federal system will act to prevent an erosion of universal telephone service.

Response 1012

Section I - Building Blocks1) Technology and Services

The two technology and services building blocks to be used in construction of the future scenarios span a broad range of hypothesis. Nevertheless, in both the T1 and T2 technology models there are elements which appear to represent extremes as opposed to probables and in some cases appear to possibly represent misconceptions. As an example, under T1, one element states that microwave, copper wire, and coaxial cable remain the dominant technology, whereas under T2, fibre optics rapidly replaces copper wire for local and inter-city trunk lines with coaxial cable being used for point to point and private networks. Furthermore, under both the T1 and T2 models, satellites are described as having excess capacity with costs remaining high. While there are a number of elements in both T1 and T2 which appear to represent a reasonable expectation, neither of the building blocks cover a more reasonable expectation under which fibre optics is indeed used to phase out copper wire for local and inter-city trunk - lines but with digital microwave continuing to be used as an alternative media for inter-city trunk purposes, and

with satellites continuing to provide back-up facilities for long-haul restoration, video distribution, and digital private networks. While the cost of satellites is seen as remaining comparatively expensive for short haul trunking applications, it is still considered competitive on long-haul high capacity routes, and possibly also for multipoint private digital business services. Offsetting the possible trend for individual companies to establish private networks to meet their specific needs, there will likely be the introduction by the major inter-city inter-exchange carriers of a range of integrated services to be made available via the integrated services digital network. The prime attraction of this integrated services mode of operation will be high global interconnectivity, transmission characteristics more closely matched to specific needs and therefore tariffs more closely matched to costs.

2) Market Structures

Under the MS1 model the role of cable companies as telecommunications carriers is stated as intensifying. Such a probability is not seen to be entirely compatible with the longer term phasing-in of fibre at the local distribution level when coupled with the interconnectivity and cost trends of the ISDN evolution. Furthermore, under the MS1 model, cellular radio is stated as a means of viable local by-pass, yet with minimal rate rebalancing as assumed under this model the cost incentive would certainly not appear to be sufficient to drive companies to seek by-pass via a technology not suited to digital business needs. Competition at the enhanced services level is not mentioned although based on current events this is a very probable evolution.

The MS2 model is marked by its characteristic of open competition at the national level in all sectors, with basic universal service under severe threat, and an eventual convergence towards a market dominated by a small number of larger competitors. This model appears to emulate the projected market evolution within the U.S. and represents an extreme model which does not appear to recognize the basic difference between the size of the U.S. market which can permit an open market evolution and the very limited Canadian market base which is much more fragile from the onset. On the other hand, open competition restricted to enhanced services which would appear to be a more viable scenario is not specifically mentioned.

The MS3 model also is marked by open competition but with U.S. firms permitted free market entry. For the reasons outlined above, this very extreme model is not seen as a probable evolution in view of the current perceived difficulty of encouraging only one additional Canadian entrant at the inter-exchange level.

3) Regulation

The R2 regulation model appears to by-pass the extremes represented by the R1, R3, and R4 model, while admittedly assuming that a Federal/Provincial resolution of a rational joint national policy is achieved. The assumption concerning open competition except at the local level appears somewhat too open in view of the fragility of the market base as noted above whereas unlimited competition in the area of enhanced services would appear to be more consistent with current CRTC findings. The concept of Welfare or Pension allowances being used to offset the risks to universality as hypothesized under model R3 is not considered to represent a probable course of action in view of political realities whereas use of local measured service as a means of achieving an offset in the long term could be seen as a more socially acceptable and politically prudent choice of action.

In view of the above comments on the basic scenario building blocks it is not surprising that in reviewing the five scenarios I found each to contain elements which appeared logical and probable, while at the same time containing other elements which for the specific reasons outlined above appeared to represent extremes or unlikely evolutions taking into account current and past experience. Rather than criticize the individual scenarios, it appeared shorter to define an alternative scenario as outlined below which captures elements which are defined not as a philosophical or ideological alternatives, but rather as the logical products of the specific Canadian environment and experience.

Alternative Scenario

The new technologies are introduced at a moderate pace with the long term development of a healthy competitive market for enhanced services covering various special user needs. The local service continues to be provided on a monopolistic basis by the existing carriers. CN/CP has established itself as a competitive inter-exchange carrier and has achieved a significant percentage share of the interexchange market. While a number of private networks still exist, these are operating in severe competition with a range

of cost effective integrated digital services being provided via the switched public network by the current domestic carriers plus CN/CP. The terminal equipment market continues to be highly competitive with business desk to desk high speed electronic mail becoming a dominant service via the ISDN and largely replacing existing forms of message service. Cross-subsidization of local service by toll service has been replaced by a combination of access charges to the interexchange carrier and local measured service. Universal service is thus not seen at risk. Smaller cost effective satellites are being used for a combination of video distribution, D.B.S. (with 1 metre dish), private I.B.S., restoration of long haul trunking, and light density communications to the far North. Although the overall scenario is based upon a limited interexchange competition, open enhanced services competition and basically a continuation of the status quo for local service, there is potential for further continued limited expansion of interexchange competition, however the market base is still not seen as supporting unlimited open entry. On the regulatory scene while provincial regulators will continue to cover local service, the CRTC will in addition to providing such regulation in Ontario, Quebec and B.C., be mandated to overview services involving more than one province. The policy to be followed by CRTC will be the product of a joint Federal/Provincial consultation.

While the above noted scenario is not defined as an ideological proposal, it appears to me to flow logically from the technological, market and regulatory environmental evolution currently taking place. I recognize full well however that the construction of future scenarios is a highly subjective exercise and that there no doubt will emerge a range of view in the response to your letter.

Response 1013

I am writing in response to the Canadian telecommunications market survey.

The most desirable scenario of those presented is Scenario IV - T2, MS2, R2.

Response 1014

Thank you for including me in your list of respondents to your scenario for the year 2000. Personally, I find the following scenario to be the most plausible:

T₁, MS₂, R₂

My reasoning is this:

1. Technology and Service (T₁)

I foresee conservative development mainly because in recent years the majority of developments that were touted to be revolutionary in fact have turned out to be evolutionary forces in the final analysis. Office automation has been a very tough uphill fight mostly because a change of office culture is required, and as we all know, people do not change easily or without a struggle. Also, like housework, many office tasks (while individually simple) are very complex when taken as a set and so defy easy automation.

1. Technology and Service (T₁) (continued)

The change out of physical plant for telephone companies or cable companies may move increasingly to fibre in the late 1990's, however the vast base of conventional plant already in place will mean that even by the year 2000 the majority of plant in place will still be conventional even though the percentage of replacement and new plant which is fibre may be quite high. With cable plant lasting fifteen years on average, rebuilds done in 1985 will be ready for replacement in the year 2000, however I am not aware of any major switch to fibre and doubt that one will occur within five years.

2. Market Structure (MS₂)

Competition is increasing and I believe will continue to do so. However, I also believe that sufficient regulation will remain in place to minimize the risk to basic residential service for telephony and cable entertainment service (see my choice of R₂ below). There is no doubt that cable and telcos will increasingly have the capacity to compete with one another as the telcos gradually expand their band width capability and cable attains a continuing rationalization of small companies into larger ones that have the sophistication, financial base and planning ability to enter into the telcos' domain.

3. Regulation (R₂)

It would appear that some compromise will be made to involve the provinces without resorting to an unworkable two-tier system of regulation. The CRTC is almost a symbol for what many western Canadians find distasteful about Canadian federalism and in some cases (British Columbia in particular) the conflict between federal and provincial jurisdictions has been open. It would seem to me that a joint approach is the only one which gives way to current pressures without ending up with either an unworkable dual system or total deregulation, which I find unlikely.

I must say I found your methodology most interesting and useful, and I hope that my few comments will be of some assistance.

Response 1015

I have received the materials you sent me with your letter of January 10, 1985 and wish to make a few comments.

To begin, I applaud your work and find that your building blocks touch on most of the issues of concern to the overall market today. The only specific area not sufficiently illustrated, in my view, and one of great importance to my company is the future of video and audio entertainment services and particularly the role of the Cable Television industry in the continuing provision and expansion of such services.

When reviewing the five basic scenarios you presented I found one to be most reflective of my own views. Scenario three resembled my formula of T2, MS2 and R4 most closely. The key areas of difference I encountered were primarily contained in building block number T2 where I favoured the following issues relative to innovative development in the Cable Television industry. My comments follow each specific item.

- i) "Microwave and copper serve as the backbone of the infrastructure". This indicates a technology that survives based primarily on its efficiencies for voice and data transfer and clearly does not indicate a movement from coaxial cable as the leading efficient method for distribution of video and enhanced services.

- ii) "Coaxial cable is increasingly used for point to point communications and private network installations". This indicates a growing acceptance and expansion of the potential of coaxial cable. The existing and broadly extended major center cable companies will be best suited to this potential growth area. The large investments made by the cable companies in recent years, expanding the reach of coaxial cable are not likely to be duplicated by the telco's. However, this should not assume some movement by telco's to purchase or franchise local cable companies with the objective to use coaxial cable efficiencies as augmentation to telco-based enhanced services. The fundamental use for coaxial cable will continue to be video and audio entertainment with interactive capabilities secondary.
- iii) "Private networks utilizing LAN's, PBX's, cable and satellites grow rapidly as individual companies attempt to interconnect their equipment and personalize their service". This illustrates an area of growth for advanced and aggressively developing cable companies. A rapid movement by local operators into areas even now much more competitive than in recent years will give them a foothold in their communities. Telco dominance in this area will be directly affected by the speed at which cable companies can affect their own marketing and technical expansions into these markets. A growing public reliance on cable delivered entertainment services and increased profitability will allow cable companies to move in new directions, remaining competitive into the future.

Summarily, as you can see for the most part I agree with your third scenario. Changing technology, slower growth for telco's in a very competitive marketplace and a relaxed regulatory environment are key elements in my view. However, an expansion of video and audio entertainment services brought about by the market demands places cable companies in a stronger and more competitive position.

With the burdens of meeting competition head-on in areas such as interconnect and local area networks, and the political and market complications faced with increased local rates and abandoned universality, telco's will not be in a position to push cable companies out of their dominant entertainment role. Therefore, I reject the component of scenario three that predicts the demise of cable companies in favour of a continued place for coaxial cable and the infrastructure it fits in today. The basic needs for and efficiencies of coaxial cable will keep these companies in business. I do concede however that telco ownership of cable companies due to a relaxed regulatory climate is possible under my scenario and therefore a role limited solely to video and audio entertainment services for cable operations could result.

Response 1016

This letter is in response to your request for a reaction to various scenarios of telecommunications development to the year 2000.

Our review of your scenarios has resulted in a conclusion on our part that technology will likely change faster than we expect and society will likely be less impacted than we predict. This opinion is based generally on past experience from watching other electronic technologies develop. Our opinion therefore, is that your scenario four will likely come closest to actual activities through to the year 2000. T₂ of this scenario was selected because we feel technology will develop quickly. MS₂ and R₂ were selected because they represent the middle of a road with respect to marketing structures and regulation.

We have broadly reviewed the five scenarios and the building block material as you requested. While we may quarrel with some points of the building blocks, it would in general be a subjective disagreement and therefore not worth noting. There are some specific points we have identified in our attachment that we feel are worth making as they pertain to more than one scenario.

There are some general comments, practical and otherwise, that form our perspective impact on any scenario of future developments.

Investments. It is highly unlikely that any operating telephone company can afford to invest in anticipation of market evolution. For example, Teledon experimentation (which was a sobering experience for everybody concerned) would not be supported by operating companies today. It is clear that product development, based on technology push, is a poor way for anybody to conduct their operating business.

ISDN et al. The great universal multifunctional voice/data/video network is a delusion supported by the PTTs of this world. It is unlikely to manifest itself in any form in North America, and in fact the byword for the U.S., and increasingly for Canada, will be specialization and customization.

80/20 rules. Business customers always have generated the most revenue for telephone operating companies, and today still represent the greatest potential for growth. Typically, a small percentage of these customers generate a hugely disproportionate amount of the total company revenue. Ultimately, if an operating company wants to remain healthy, it will either cater to their needs, or be bypassed in a variety of ways.

Trans border slop over. The U.S. represents both the greatest market and greatest example for Canadians. The \$100 (or \$200) per month coast to coast facility, which will be available sometime soon in the American market, will have a traumatizing effect on Canada. It will effect both competitiveness of our industry in that market and the world, as well as our measure of the appropriate cost of communication in this country.

Globalism. In designing its latest generation of cars, Ford is using a CAD/CAE system that has co-operative on line input from England, Germany and the U.S. By several orders of magnitude, the fastest growing segment of the Canadian Long Distance market is overseas calling. The Americans have just introduced limited competition for overseas carriers in a market that previously was an Intelsat monopoly. This action was strongly seconded by Japan.

Regulation. Vancouver is, by a pronouncement of its city council, a nuclear free zone. This act, the mayor reported, "was motivated by a genuine concern for the well being of our citizens and a firm determination that it will not happen here". In real terms the CRTC has about as much chance of effecting its will as Vancouver's City Council.

What's your business? The participants in what has loosely been termed the Information Industry are a confused lot; and rightfully so. All the nice divisions and boundaries that used to delineate their businesses have become blurred to the extent that suddenly participants in what were entirely separate areas, have become competitors. They remember the railways classic "transportation business blunder", however all that seemed so simple in the face of the publishing/computing/telecommunications/ broadcasting/etc. dilemma that faces them now. If the industry insiders don't understand how things will unfold, the concept of "picking winners" from outside it seems somewhat absurd.

Carrier Opportunities. Two shoe salesmen, one Canadian and one American are sent by their companies to an African country. Upon arrival the Canadian salesman wires his head office in Toronto "hold all shipments, terrible situation, no one here wears shoes". The American wires his head office in New York "send all possible stock, tremendous opportunity, no one here has shoes".

There is no scenario where Canadian enterprise enters and competes successfully in the American market either directly or through association. This is a viable alternative.

While it is likely that microwave and copper will remain the dominant technology if the measure is total investment, clearly all new growth in the trunking and feeder distribution networks will soon be exclusively fiber. This will happen simply because new fiber will be cheaper than new copper or new microwave. No company, in any scenario, is likely to go back and replace all sunk investment in the other technologies as it wouldn't make much business sense,

Of the scenarios presented, I seems the more likely outcome, as it is the traditional "Canadian Way" and III, the more rational version of I, the second ranked possibility.

The Financial Post

Future managers get taste of meetings high-tech style

THE VIDEO teleconference is still something of a novelty today, but as travel costs increase, future managers will find themselves sitting in front of TV cameras for some of their long-distance meetings.

This eventuality is the main reason why Montreal-based Teleglobe Canada recently provided its Toronto Confratel videoconferencing studio to six budding managers from York University's business school. Teleglobe hopes that by exposing young people to the technology, it will be developing interest among future decision-makers.

"We provided the studio free of charge to them because we feel they will be the next generation of Confratel users," says Sheila Wahl, telecommunications marketing representative for Teleglobe. She also sees universities as another potential client base for videoconferencing.

Videoconferencing, as provided by Teleglobe, provides two-way color audio-visual links via satellite to London.

As an assignment for their first-year microeconomics course, the York students used Teleglobe's Confratel studio to stage a mock overseas videoconference with the London Graduate School of Business to determine if videoconferencing was a viable means of reducing the cost of business travel. They looked at the medium's economics and efficiencies, comparing it with what two people would pay to travel for business meetings, assuming annual cost increases of 7%.

Their conclusion? Videoconferencing has a future in business, although at \$2,600 an hour, it's more costly than sending two people to an overseas meeting. But Ross

Beverley, one of the six students working on the project, predicted videoconferencing would justify its costs in two or three years' time.

However, he says it won't replace all face-to-face meetings. "According to industry studies and our own estimates, videoconferencing will replace only about 35% of present meetings. It's most likely that videoconferencing will be able to replace only those meetings that occur on a very frequent basis, and involve the same employees over and over again."

In the meantime, the students believe the technology has to be experienced to be fully understood. "Most people don't have an appreciation of where the technology stands," says first-year student Bill Graham, who also sees a future for it in education. "Our general feeling is that it is something that's coming for universities to use."

Carleton University in Ottawa recently used videoconferencing for a major seminar. Teleglobe's Wahl says there is no reason why it couldn't be used effectively by researchers or business schools to compare notes with their overseas counterparts.

However, Alan Hockin, dean of administrative studies at York, doesn't see a widespread use for universities — at least, not yet. "Given the kinds of things universities usually talk about, I doubt that it's going to be as important to them. But it could be for a particular researcher who had some material he wanted to show in graphic form. Otherwise, a telephone call will do."

— Bruce Gates.

Response 1018

Thank you for your interest in our opinions regarding the future of telecommunications in Canada. Having reviewed the scenarios made available in your letter of January 10, 1985, we have taken the liberty of developing an additional one. Please find attached a copy of that scenario.

We chose to develop an additional scenario as we felt the scenarios you presented were limited in their view of how common carriers will respond to existing and future situations. For example, scenarios I and II present strongly the point of view that telcos are unwilling or unable to compete. Scenario III implies that survival of the telcos will strictly be a result of benefits assumed to be provided by regulatory bodies. Although scenario IV and V do not directly address the nature of the common carrier, there is no indication that common carriers are and will continue to be an asset to the telecommunication marketplace.

Overall, the scenarios presented implied (with varying emphasis) that the relationship between common carriers and the marketplace is primarily an adversarial one. We disagree with this implication. We

*Possible Configuration of the Canadian
Telecommunications Marketplace*

Deregulation in the United States has provided Canadian telcos, regulating bodies and the public with many valuable lessons associated with deregulation and increased competition. Although specifics have been addressed below, the underlying impression is that telcos, regulating bodies and the public will recognize the need for increased competition, as well as the need for the continuance of Universal Service. A balance will be struck to optimize these apparently contradictory concerns.

The building blocks identified in the D.O.C./ University of Calgary package were not found to be mutually exclusive listings of situations. For example, under the headings of Market Structures, teleconferencing was identified as becoming more widely used with national competition, although today this marketplace is exploding in a flurry of activity with only minimal competition in place at this time. Provided below, under the designated headings, are the elements felt to be the most relevant.

Technology and Services:

The technology associated with new services will continue to develop rapidly throughout this period, and although initial customer acceptance of new services is slow, momentum will increase as the marketplace familiarizes itself with innovative communication services. Currently, fibre is rapidly replacing copper wire for local, heavy volume circuits, and it is expected that as costs continue to decrease, fibre will increase in importance as a major transmission mode. Satellites will continue to be used to complement other terrestrial technologies especially for remote coverage, with some limited use being made for private networks.

Even today, digital transmission and switching technologies are becoming the dominant form of transmission. Also, private networks utilizing LAN's, PBX's, fibre and cable are growing rapidly as individual companies attempt to interconnect their equipment and personalize their service. We see this trend levelling off in the future, as more innovative services become available on the Public Switched Network. Large customers will evolve to a balance between private and public switched facilities.

Market Structures:

It is important to recognize that bodies such as the CRTC are in place not to protect the carriers, but to protect the telecommunications marketplace, so that the provider is meeting the needs of the customers in an optimum fashion. They will continue to exercise regulation to this end until they are confident that the marketplace will operate to the advantage of all consumers, not just special-interest groups. Major established carriers will continue to predominate for the first part of the time frame, with regulatory bodies monitoring closely the progress of competitive services.

Local plant will continue to be the responsibility of the serving telco, although local bypass by heavy use corporate customers will increase as a threat. However, competitive pricing and attractive packaging by the serving telco will continue to remain the most cost effective alternative. The high cost of retaining only the residential customer in the local plant is recognized today, sparking a more competitive attitude by the telco to retain the large customers.

Rebalancing of rates is gradually occurring, with long distance rates being decreased and local rates increasing. Continued watch dog efforts by the regulating bodies will minimize the chances of local facilities becoming so costly that the concept of Universal Service is undermined. The necessity of cross-subsidization is recognized and will continue to be recognized as rebalancing evolves in a controlled fashion.

The number and variety of services will continue to increase, especially from telcos, as they recognize that large customers will respond positively to creative packaging of services, on both public and private networks. Although pricing will be an issue, it will not be the only issue. Customers are, and will continue to be, willing to pay slightly more for a higher quality, comprehensive package.

Regulation:

As implied up to this point, the regulatory bodies play an important role in evolving the balance between competitive services and Universal Service. They will continue to play an important role throughout the time frame.

The nature of the regulating body (i.e. national or provincial) is not an issue in the long run. The regulators seem to be evolving towards a similar end - their concerns with Universal Service and competitive issues are rarely influenced by their perspective as a national or a provincial body.

Drastic changes in this area are not called for. As long as policies and decisions are similar in nature, there is no need for "joint regulatory bodies" or complete control by one universal group. By keeping the interests of the Canadian public at the forefront, regulators will not conflict with each other.

Response 1019

Our observation is that you are quite correct in your notion that we would find that some of the scenarios presented were more plausible than others. As well we found that some of the elements were more akin to the telephone operating companies than to the telecommunications manufacturers, e.g. government regulation (Fed/Prov), ratios (tariff rates), services (MSI) etc. Notwithstanding this we recognize that any changes influencing the telephone operating companies will have an impact on the telecommunications suppliers by either inviting or creating competition or generating more demands on suppliers.

As you may know, _____ experienced rapid sales growth over the past several years. _____ the latest digital technology and the development of new products to satisfy user demand for both enhanced services and latest state of the art equipment.

In summarizing, we find that we relate more closely to scenario V modified by substituting R_1 for R_3 . We have listed below those aspects of the future which we feel are relevant to the telecommunications market:

- Continued rapid introduction of new features and technologies.
- Increased customer and subscriber service demands.
- Enhanced office automation with new product demands.
- Heated up competition in the Canadian and USA marketplace by USA and other international Telecom suppliers.
- GATT global free trade emerging from international agreements by 1990. In the interim Sectoral Free Trade agreements will emerge on a product-by-product basis with USA.
- Canadian and US telephone operating companies will be challenged by major toll and data carriers.
- Liberalization of interconnection will expand in Canada as more provinces deregulate. A few strong interconnectors will emerge and survive.
- More liberalization of regulatory matters affecting the telephone operating companies, e.g. prime Tel Set purchase, tariff rate to reflect line service charge, etc.
- Fibre optics will become a major transmission mode over the next ten years.

We hope we have been helpful with the above information and trust that your project is successful.

Response 1020

perspective has serious concerns that the Governments' (both federal and provincial) efforts to maintain the status quo in the midst of rapid technological change will result in the stagnation and eventual demise of the ^{come} industry.

Canada cannot maintain the insular policies of the past which were based on the ability to control the inputs from outside its borders. The advent of communications satellites, VCRs and the steadily declining costs of receiving and playback equipment has made U.S. satellite services and programming a real alternative to cable-delivered services for most Canadians. Yet the federal government and the C.R.T.C. have not been able to adequately deal with the problem. As cable loses ground, the ability of the government to exercise any regulatory control over non-Canadian programming is reduced.

Telephone companies continue to be regulated within the psychology that prevailed more than 50 years ago when the objective was to establish a telephone network across the country. That network has been established and the problems have changed - so should the psychology of regulation. The mix of private and government-owned Telcos makes it difficult to develop and implement a coherent national policy which would recognize the changing technologies, competition and the impact of U.S. deregulation on telecommunications in Canada.

Your Scenario I is the one I see as most likely. Maintenance of the status quo until forced (likely too late) to respond. At that time the telecommunications companies, who have in effect been insulated from the realities of international competition, will be unable to respond competitively. The only answer may well be direct government subsidy to an inefficient industry sector with little or no hope of improving its competitive position.

Scenario V in my view is the direction the government should pursue. It is the scenario that would enable the Canadian industry to survive and prosper in critical international markets. Canadian consumers would also enjoy the range of services available in the U.S. at competitive prices.

The success of Northern Telecom in the U.S. has demonstrated the capabilities that can be brought to bear in international markets if the incentives and regulatory structures are guided by enlightened and realistic government policies.

Response 1021

considers that telecommunications is a critical industry to Canada both as a market for manufactured goods and as a domestic service industry providing an important source of Canadian jobs. However, considers that the even greater importance to Canada of telecommunications is its ability to provide Canada with an efficient and cost effective communications infrastructure. For consumers this can take the form of readily available and fairly prices voice communications both locally and nationally. In this regards telecommunications is a key to building a strong national identity. For business, communications is critical as a means to improve Canadian productivity and make Canadian products more competitive in world markets. It has been recognized that a primary reason for the lack of competitiveness of less development nations in the world is the lack of efficient communications infrastructure.

Section 1 - Building blocks

considers that the three sets of building blocks (Technology and Services, Market Structure and Regulation) are an appropriate means of defining the potential alternative futures for Canadian Telecommunications.

Section 2 - Scenarios

With respect to Technologies and Services, because of telecommunication's impact on productivity considers that it is imperative for Canada to create and foster an environment in which new telecommunications innovations are introduced at least as fast as other major industrial countries, specifically the U.S. In Scenarios I, II and III described in the study Conservative Development (T1) occurs. The results are consistently bleak for the Canadian telecommunications industry with the possible exception of Scenario III where a few large canadian firms survive.

Of greater significance than the fate of specific telecommunications suppliers would be the negative impact on all Canadians of being denied the resultant benefits of innovative technology and services. As a result considers it is essential that effort be applied by government and industry to ensure that one of the Innovative Development scenarios result. This can be attained by appropriate selection of Market Structure and Regulation.

supports that in the Scenarios IV and V which include Innovative Development of Technology and Services, that there is the best overall benefit to Canada. Both scenarios include increased competition and produce direct benefits: Scenario IV by the creation of large group of competitors in telecommunications and Scenario V by the success of Canadian telecommunications providers in foreign markets. considers both Scenarios IV and V to be Win/Win scenarios whereby benefits accrue both to the telecommunications service providers / manufacturers and to the Canadian public by the availability of innovative new telecommunication services. They should be supported.

considers that the five scenarios described demonstrate clearly the importance of Market Structures and Regulation to be attainment of these benefits. Essential to Innovative Development is either National or International Competition. Similarly, an essential pre-requisite for increased competition is a more progressive form or reduced form of regulation whether under the Joint Regulation, Federal Control or Minimal Regulation.

SUMMARY

In summary considers that the five proposed scenarios are a valid representation of the potential combination of innovation, market structure and regulation which may occur in Canada and considers that the combination of building blocks resulting in the five scenarios had properly eliminated the infeasible or unlikely scenarios.

considers that this analysis demonstrates the future success of the telecommunications industry will likely be dependant on government's success in reducing or streamlining regulation and encouraging competition.

Building BlocksTechnology and Services

- o The building blocks are entitled "Conservative Development" and "Innovative Development", yet the distinction between the two relate more to the rates of penetration of the various technologies rather than to degrees of technological development.

T1 - Conservative Development

- o Office Automation technology development will proceed rapidly; however, the rate of market penetration will be influenced by its cost/performance characteristics, availability of more "user friendly" man/machine interfaces and user acceptance.
- o "microwave ... remain the dominant technologies" and "fibre optics ... becomes major transmission mode".
 - These two points seem to contradict each other. Copper wire in the access network and microwave in the long haul will remain the dominant technologies. Coaxial cable will remain dominant for the CATV distribution and in-building LAN's. Fibre Optics Transmission Systems (FOTS) will increase in the metro-inter-office trunk network and will be used for growth based on the no-new copper policy being pursued by a number of telephone companies

- o "Analogue technologies are only gradually replaced by digital"
 - The rate of replacement is based on economic business rationale and strategies. Digital replacement will be accelerated in key locations, other less strategically important locations will be digitized at a slower rate.
- o "All carriers will begin to carry all services"
 - This depends on government/regulatory policy decisions on further competition in telecommunications.
- o LAN's, PBX's
 - These systems are established to allow more efficient terminal to computer (data base) communications as opposed to computer to computer communications.

Note: LAN's and PBX's are perceived as an on-site communication cluster which provides a more efficient means for linking terminals to data bases.

T2 - Innovative Development

- o Fibre is an alternative, more cost effective technology for growth in the metro-interoffice and intercity trunk networks. Systematic replacement of copper with FOTS will occur as economics dictate.

- o Coaxial cable usage will increase for private networks but the growth is limited to in-building LAN's and possibly as a local bypass technology if cost effective.
- o Cellular Radio will be widely utilized for public mobile communications. Its use in rural and point to point applications is a likely scenario.
- o Digital transmission and switching technology dominance is a likely scenario.
- o The Company's enhanced services today "efficiently handle" the associated demand and will continue to do so as demand increases. Competition in the provision of enhanced services is now permitted under the terms and conditions of Telecom Decision CRTC 84-18.
- o Private Network growth is a likely scenario but the telephone companies may also offer virtual private network or software-defined private networking capabilities.

Market Structures

MS1 - Minimal Competition

- o Rate rebalancing, mentioned either explicitly or indirectly in the market structure and regulatory building blocks, is of such fundamental importance that it should be addressed in a separate building block.

- o "Minimal rate rebalancing" is inconsistent with minimal competition. For example, today we are seeing the proliferation of U.S. based service providers taking advantage of our higher LD rates and carrying Canada-Canada and Canada-U.S. traffic.
- o We assume that the term, "interconnect charge", includes both the contribution payment described above and the rates paid for the telephone company facilities used by the interconnector.
- o Enhanced services are already being offered by a variety of suppliers.
- o "Bypass" is already being considered as users seek out lower cost options. Rate rebalancing would discourage uneconomic bypass (where bypass facilities are provided at less than carrier rates but greater than carrier costs).

MS2 - National Competition

- o Canadian ownership and control could be achieved through government imposed restrictions. Another approach that would meet the objective, and not foster international retaliation, would be the establishment in Canada of a positive economic environment that would encourage Canadian ownership and control of telecommunications systems. The following steps could be taken to establish such an environment:

- International agreements should be negotiated, particularly with the United States, which support the use of Canadian facilities to transmit, store, process and retrieve Canadian information, without unduly limiting the freedom of choice for users or the information industry.
 - Research and development in the information industry and in telecommunications technology should be stimulated through government policies which make it economically attractive, e.g., tax concessions, low interest loans, "buy Canadian" campaigns, export development assistance and establishment of requirements that offshore manufacturers perform a reasonable percentage of R&D work in Canada.
 - Canadian businesses should be encouraged to compete vigorously in international markets, concentrating on their fields of excellence.
 - Depreciation regulations should be modified to reflect the realities of competition and the rate at which technological change is occurring.
- o The projected more widespread use of teleconferencing would seem to better fit into building block T2 (more rapid acceptance of new technology and services). It is not clear how the forces of national competition would increase the use of this family of services.

- o The projected threatening of universal service could be mitigated through incentives or grants (included in R2, R3 and R4).
- o "smaller carriers have difficulty maintaining their competitive positions; many merge or fail". It is not clear who these carriers are. Existing carriers such as CNCP, Telesat and the Telecom Canada members will not likely fail. Independent companies may suffer from competition but as well will not likely fail (the municipalities they serve will not likely let them fail). Resellers, who are not normally considered to be carriers since they generally own no transmission facilities, will begin to fail as further competition or rate rebalancing drive prices closer to costs.
- o New entrants who build their own facilities with the current cost/revenue imbalance could fail as rates are rebalanced.
- o The "demise of the cable companies" would appear to be highly speculative.

MS3 - Open Competition

- o It is not clear that increased competition will increase the "variety of services" available to users. Experience in the U.S. would suggest that only a variety of prices for the same type of service would result.
- o It is not clear who the "Canadian companies" are that will fail. The comments made under MS2 respecting "carriers" apply here as well.

- o It is not likely that Canadian politicians will allow rural services to "decline or disappear".

REGULATION

R1 - Status Quo

- o The Company agrees with the "policy development" concerns as stated but notes that Bill C20, if passed into law, will allow the federal government to provide certain direction for federally regulated carriers.
- o "Regulated competition", in the Company's view, amounts to market allocation and not competition in its true sense. It is not clear that any of the benefits ascribed to true competition would be realized through such "regulated market allocation".
- o Long distance toll service rates are already decreasing in real terms year over year.

Joint Regulation

- o It is not clear in this block whether or not evenhanded regulation is applied to all parties in competitive markets.
- o Federal, as well as provincial regulators would continue to impose quality of service requirements.

- o An "interconnection charge" to "help subsidize service" in general would not be required if indeed "rates are rebalanced". Such a charge might be imposed for the purposes of a targeted subsidy.

Minimal Regulation

- o In the absence of a national telecommunications policy it is not clear why regulators would move to minimal regulation.

FUTURE SCENARIOS

Specific comments on these Scenarios are provided below, after which the Company presents its own preferred model, based on many of the elements of the building blocks provided in the paper and reflecting the various positions on key issues described above.

Scenarios I, II and III

- o In light of the current rapid rate of innovative development in carrier networks, building block T1, seems inappropriate for consideration in any Scenario.

Scenario I

- o It is not clear what is meant by an "expensive" interconnection charge. It is likely that if an interconnection charge is established as a result of the current IX proceeding it will include a fair rate for the telephone company facilities used plus a contribution charge that should be equivalent to the contribution charge borne by the telephone company's LD service. Such charges would only be "expensive" to inefficient entrants.

Scenario II

- o The "doubtful" future for the Canadian telecommunications industry does not seem to follow from the previous comments made under this scenario.

Scenario III

- o Universal basic service will likely still be a reality by 1995.
- o It is difficult to believe that cable companies currently provide service to most businesses.

Scenario IV

- o Since rate rebalancing would discourage inefficient entry by potential competitors and uneconomic bypass by users, we must assume that you mean that only efficient competition would be encouraged by rate rebalancing.

Scenario V

- o It is not clear what foreign markets are referred to here or what role our government would play in controlling entry into such markets. If free trade in telecommunications with the U.S. is contemplated here it should be noted that such free trade would likely benefit the U.S. more than Canada, particularly while Canadian LD rates are higher than corresponding rates in the U.S.

Preferred ModelScenario VI - T2, RR1, MS4, R5

- T2 - Innovative development of technology and services
- o Ongoing digitization of the public switched telephone network.
 - o Rapid continual incorporation of fibre optics.
 - o Innovative new services such as iNet.
 - o R&D expenditures by telecommunications industry remain at high level.
 - o Vertical integration assists Canada in maintaining its world class position as a developer, manufacturer, seller, user, provider and maintainer of telecommunications equipment.
- RR1 - is permitted to rebalance its rates over a planned time horizon in a manner which does not unduly affect universality of telephone service.
- o The Peat Marwick study on "Impacts of Competition in Message Toll Telephone Service", commissioned by the DOC and a number of provincial governments and introduced in the IX proceeding as a CRTC exhibit, suggests that significant net benefits to society as a whole would result from rate rebalancing.

MS4 - Further competition considered after rates are rebalanced

- o Inefficient entry discouraged.
- o Artificial opportunities, due to carrier rate structures, eliminated.
- o Economic waste, which would accompany wide open competition and associated overbuilding and excess capacity prior to rate rebalancing, would be avoided.

R5 - Enlightened regulation

- o Federal government develops national telecommunications policy to guide the industry.
- o No regulation or minimal and evenhanded regulation in competitive markets.
- o Regulation restricted to ensuring no cross-subsidization of carrier's competitive services from monopoly services and that the carrier does not give itself undue preference.

Response 1023

SECTION 1 - BUILDING BLOCKS

Technology & Services

- Office automation - rate of development will be variable. Word processors will become widely accepted and virtually all offices will have word processor capability within five years. Full office automation will lag because of the cost and problems of large scale "electronic filing". Electronic mail will be widely used for office communication and will rapidly replace TELEX for domestic and some foreign communications.
- Fiber optics (light guide) becomes the "technology of choice" for all new local inter-exchange circuits and all new intercity routes. Light guide will also be favored for all new high-volume local service drops (exchange to major telecommunications users). No major new microwave installations. Long haul video will be transferred from microwave to satellite making excess microwave capacity available for data/voice needs. Additional needs will be met by new light-guide systems. Coaxial cable will remain the medium for entertainment oriented cable-TV systems. Coaxial cable will also be popular for Local Area Networks (LAN's).
- Satellites have excess capacity. Pricing depends on "telecommunications politics". Telesat is an instrument of government policy. It is controlled by the federal government. Some provincial governments (through their telephone companies) are important shareholders and

have a great deal of control in deciding what traffic goes "satellite". Satellites are not suitable for two-way voice/data traffic on major routes. Principle use for satellites will be service to remote areas and video distribution services. Video business depends on government "broadcasting" policy. Many new video services in Canada will be received direct from existing services on U.S. satellites.

- Cellular radio technology will be used principally for mobile telephone service. Some data services will also be provided to "mobile" users. Cellular is not important to rural users as there are relatively few areas not served by "wire". Remote users will be served by M-SAT and by thin-route services on conventional C and K band satellites.
- Analog technologies are being rapidly replaced by digital in voice services, at least for interexchange and inter-city services. Digital technology is being rapidly introduced into "entertainment audio" in the form of "Compact Discs". Digital audio tape cassettes will be introduced within the next three years. Digital audio distribution by cable and broadcast will follow fairly quickly. Digital entertainment video will be introduced soon for video signal processing within TV sets within the next year. Other "digital video processing" applications such as "picture-in-picture" and "sequential scan" picture display will follow within three years.
- The distinction between voice and data is already blurred as much interexchange and long-haul traffic is already digital (PCM). Integration of "conference grade" video has already taken place. CODEC's that compress conference grade video to T-1 digital are already available and widely used. Integration of entertainment grade video will take much longer as affordable CODEC's are still some years away. The number of carriers in Canada is very limited. They mostly already carry "all services". I do not consider cable-TV systems to be "carriers". New, highly specialized "carriers" such as CANTEL (cellular radio) are relatively small factors.

- Certainly, non-voice service grow steadily. Much data service, however, will still be carried locally by "analog modems", i.e. on voice circuits. Interexchange and intercity services, as noted, will rapidly become digital as video services are moved to satellite. Enhanced services such as ISDN will be a long time coming (ten years at least).
- Local private networks (LAN's) will grow as more offices and plants go "multiple-computer", but not spectacularly. We have Wang word-processor, two IBM-PC's and an IBM-AT in our office and have not felt the need for a LAN to interconnect them. We just pass discs back and forth.

Market Structures

- The Canadian government regulatory structure and the "communications establishment" has the power to control the rate of technical innovation and market changes in communications. Witness the power of the Governments of Saskatchewan and Manitoba to restrict privately owned terminal equipment and alternative telecommunications systems. Witness the panic in the provincial government when the City of Edmonton threatened to install their own toll switch to bypass AGT for much of the long distance business originating in Edmonton.
- The range of services will gradually expand to include any potentially profitable service. Canadian communications services have never ignored profit opportunities. New services have not always become available at the low, competitive prices that they are available in other countries.
- Competition will be introduced very selectively in a "token" manner. CANTEL was licenced to provide a competitive cellular radio service more as a "token" than as a significant competitive factor. In areas where competition would produce really significant benefits, such as intercity traffic, present monopolies will be maintained.
- Political "populist" pressures will prevent any "rate rebalancing". Business and private "entities" in Canada have no "basic inalienable rights" in this area. This decision will be taken out of the CRTC's hands and returned to the politicians. We will get only what the politicians want to give us. "Rate rebalancing" doesn't get or keep votes. Neither does giving CN/CP the right to provide competing long distance services, except for some minor "token" concessions. The present massive cross-subsidy from business services and long distance to local private service will continue.
- Private networks have always been available and will continue to be on TCTS (or whatever their new name is) terms. There will be some savings to these large users because of more efficient lower cost switching and transmission technologies. These services will still be provided by monopoly carriers at rates which contribute substantially to the "local service subsidy" pool.

- It will be a long time before data and text services predominate. Voice will be the predominant communications service (measured in revenue) for many years.
- Cable TV companies have no present role as telecommunications carriers. Under present "telecommunications politics" conditions they have no prospect of becoming telecommunications carriers. By the time these problems are resolved, the present coaxial cable systems will be obsolete for telecommunications purposes and will have been surpassed in efficiency by new Telco ISDN facilities.
- Mobile services will gain more subscribers as new cellular techniques make more spectrum and more efficient spectrum use available. I don't see cellular radio as a viable local loop bypass technology - too expensive - capacity too limited. Local loop bypass is a "political issue". It doesn't happen unless government lets it happen. Canadian government isn't going to let it happen. The local loop is natural monopoly like water, gas and electricity.
- Bypass will certainly become increasingly attractive to large telecommunications users, but they will continue to be frustrated by the regulatory grip of the politicians. The example of growing bypass in the U.S. will aggravate this frustration.

Regulation

Jurisdiction

- New legislation currently before the House reduces the discretionary powers of the CRTC.
- The federal government will retain present powers over telecommunications and will move the determination of policy from CRTC to Cabinet (Department of Communications).
- We've never heard of the Canadian Association of Members of Public Utilities Tribunals (CAMPUT)! We doubt that CRTC members would ever participate or what benefits there might be.
- Courts have not been very helpful in jurisdictional matters. Only major issues have been "pay-TV" and broadcasting. "Combatants" have so far avoided the courts.

Policy Development

- Communications does not seem to be a major Mulroney priority. Ad hoc policy development will continue.
- Any "free trade" initiatives will exclude telecommunications services.

Competition

- No significant competition in telecommunications services will develop. There will be competition allowed in some "token" areas such as cellular.
- Rural and remote area services will continue to be financed by internal cross-subsidy within the telecommunications business. This cross-subsidy is already established and "works". New taxes are politically unpopular. Many provincial government already tax many telecommunications services for general revenue purposes.
- Enhanced services for business will develop as established carriers take advantage of proven profit opportunities. Enhanced services for non-business users will develop slowly because the demand will develop more slowly than for business uses.
- Local service will remain monopolistic.
- There is no cable videotex service in Canada and no prospect of such a service being provided.

SECTION 2 - FUTURE SCENARIOS

The Role of Cable

- Cable is not a carrier. It is a special kind of broadcasting system. "Broadcasting" in this context means the simultaneous distribution of the same information from one "source" to many "destinations". If none of the "information" has originated from federally regulated sources the cable system escapes federal jurisdiction. Because the prime function of a cable system is to redistribute federally regulated television and radio transmissions, the cable system itself falls under federal jurisdiction.
- There is no real prospect of cable becoming a "carrier" of other than "broadcast" services. Canadian telecommunications regulation does not favor competition in the local loop. Cable's technology is not optimum for local loop telecommunications functions. Telephone company local loop capabilities for services requiring substantially less than "entertainment video" bandwidths is growing rapidly. ISDN will handle all non-entertainment requirements. Cable companies, using conventional coaxial cable technology will continue to be the prime distributor of entertainment services until at least the end of the century (fifteen years).
- New "broadcast" services will develop and will be provided by cable systems. We "broadcast" sound and call the service "radio". We "broadcast" pictures and call the service "television". We will soon "broadcast" information and we will call the service "teletext". The "broadcast" of music in "digital" form will also become an important cable service within the next few years.

The Telecommunications Carriers

- Status Quo. The present telecommunications carriers will preserve their monopolies and operating modes. Canadian businesses will find ways to "plug into" competitive American carriers for their U.S. traffic because most Canadian business centers are so close to the border. Maintaining a monopoly on overseas traffic will be more difficult as Canadian businesses seek lower cost routes through the United States.
- The British Columbia, Ontario and Quebec governments will become frustrated with their lack of control over the principal telephone companies in their territories - BCTel and Bell Canada. These provincial governments will seriously consider "take overs" of these telephone companies. They will achieve the benefits of both ownership (revenues) and control (control over policy). It will be difficult for the federal government to prevent these "take-overs", considering the example of provincial ownership in Manitoba, Saskatchewan and Alberta.
- We see no real competition to the established carriers except in the provision of terminal equipment. The present CN/CP application to provide competitive long distance services will be decided by the "politicians" - Cabinet - in favor of the status-quo.

Conclusion

In opinion a primary objective for the Canadian telecommunications sector should be the development of policies suited to the needs of all of Canada with consultation and input from each of the diverse regions in the country. It is our hope that such a process would lead to the development of a meaningful 'Canadian' telecommunications policy and avoid the ad hoc process which exists today, all too frequently predicating its policy decisions on the American model. Through such a process it is intended that the benefits of open competition enjoyed in larger urban centres would not be at the expense of the smaller, rural parts of Canada.

In closing we would also like to comment on the importance and potential impact of a rate rebalancing program on the future telecommunication environment. It is now being recognized that the present rating structures (eg. high L.D. versus low local rates) employed by the industry have produced artificial business opportunities which have in turn served to attract competitors. A fundamental issue is the rebalancing of the current rate structures and, having completed that, reassessing the social and industry objectives for the future. We believe that if this occurs the impact on many, if not all, of the projected scenarios could be significantly altered.

Scenario IV

Of the five scenarios presented this one offers the most viable opportunity for the development and implementation of policies that will be appropriate for the region and Canada as a whole. A joint regulatory body, with the provinces and regions having sufficient input to policy and decision making, would better serve the needs of the unique, non-urban areas of the country. Similarly continued provincial control over intra-provincial services, eg. basic service, will enable each jurisdiction to address such fundamental issues in light of its own priorities and circumstances. Overall the market and regulatory structure proposed in this scenario offers the best opportunity, of the scenarios proposed, for what we believe should be the prime goal with respect to policy development in this sector, ie. the consultative development of Canadian policies reflecting the needs and circumstances of the diverse regions of the country. This should not be construed as support for this scenario but simply that it represents the most acceptable of the scenarios presented.

Scenario V

While this scenario may be of interest to the larger Canadian telcos and manufacturers, we fail to see how it would serve the needs of

Again we are somewhat doubtful of the probability of this scenario. As with Scenario III, we suggest that while this scenario may be plausible and offer benefits to the more cosmopolitan parts of the country, it only serves to increase the importance of the role of the regulator in ensuring that the benefits of competition are realized in the region.

Scenario II

We would also be concerned with the evolution of a Scenario II environment. While somewhat in agreement with the concept of Parliament establishing national policy goals, the past record of the CRTC gives rise to concern over the ability of a federal regulatory agency (who would oversee the attainment of the above goals) to appreciate and respond to the concerns and needs of the region telecommunication market. Similarly we question the impact on the public interest of the market structure developed in this scenario as it relates to the region, eg. In many ways parts of are predominantly rural in nature. Consequently, the statement that 'rural services decline or disappear' is of particular concern to . In brief, it sums up our concern for a regulatory framework and resultant market structure which are not in tune with regional realities. With respect to the probability of the scenario, we suggest that it is unlikely that foreign domination of the Canadian telecommunications, as a result of superior technological innovation, would go unnoticed. It is more likely that the Canadian participants would accelerate their rate of technical innovation (ie. move from T¹ to T²) and counter the thrust.

Scenario III

Minimal regulation and the resultant complete dependence on market forces would not in opinion serve the interests of telecommunications users in . Even the use of strict ownership controls would not necessarily, as the scenario acknowledges, protect regional interests. Market forces in many parts of the region are not of sufficient strength to maintain long standing public policy objectives eg. universal service. Again our concern in this scenario would be for the level and quality of service provided in . This scenario would in our estimate be unlikely in that it fails to recognize the key role played by the regulator in areas such as

Response 1024

Scenario I

The evolution of a Scenario I environment would be regrettable, particularly for regions such as . . . Continuation of the current regulatory structure, with increasing intrusion by the CRTC facilitated by the absence of regionally representative public policy guidelines, would only serve to further fragment the Canadian telecommunication industry. In general, given this scenario we would tend to agree with your prognosis for the telecommunication sector. We feel however that it is unlikely that the scenario would evolve as described. Instead we tend to believe it more likely that the industry would implement a rate rebalancing program (ie. local versus toll) that would negate the bleak forecast concluding the scenario.

Response 1025

Technology - T₂

- . rapid development
- . rapid acceptance - it will lower costs
- . digital techniques eliminate distinctions among voice/data/video, therefore, it is difficult to regulate carriers and services
- . the industry does not care what technology is used, as long as it is economical

Market Structure - MS₂ or MS₃

- . the environment is rapidly changing
- . bypass is technologically feasible and economically viable, it threatens the existing industry structure
- . customers want more choice
- . all carriers will be capable of all services
- . Telecom Canada won't continue indefinitely

Regulation R₃ or R₄

- . increasingly complex and difficult
- . current regulatory structure unworkable - rules are broken, costs are high
- . regulators cannot control the market place or technology
- . need one regulator to determine common goals and rules
- . pricing must be market based, rate rebalancing is essential
- . governments not carriers must take responsibility for universal service

Response 1026

Technology - T₁

- . there is no one technological solution
- . cable must deliver better signals - high resolution video, stereo sound
- . fibre will be used in trunking, it will not go to homes
- . DBS is not a factor in programme delivery in this century because we need more powerful, higher capacity satellites; this is 20 - 30 years away
- . interactive cable systems will be hybrid systems - cable will provide one way, the telephone system will serve to interface the return
- . "pseudo - interactive" systems will be the norm, fully interactive systems are not expected in the study period

Market Structure - MS₁

- . cable is facing increased competition in the entertainment television field - VCR, MATV, etc.
- . pressure from these forces will increase by 1990
- . the broadcasters will be more adversely affected than the cablecos
- . the trend to narrowcasting allows cable to service the demand by providing specialty services
- . interactive services will be slow to develop, technology will not force changes, people will

- . likely speciality services to be offered by cable - pay per view television, security services, meter reading, access to data banks, channels for advertising, eg. a real estate channel

Regulation R₁ - R₄

- . the federal government won't give up their broadcasting objectives; they are too important
- . dual regulation is possible but it will cause much difficulty within the industry
- . neither the federal nor provincial governments give communications the priority it deserves; governments fail to realize its importance
- . the current regulatory structure will persist, but the ability to control will decline; eventually R₄ will evolve not by choice but through neglect
- . regulation must become more flexible if the cable industry is to survive

General Comments

- . a slow but steady evolution will occur in all areas
- . the cable industry is fragmented, the entrepreneurs who operate small cablecos are not concerned with future strategic planning because they are unlikely to be affected to a large degree
- . competition will start in large urban centres; rural areas will not be affected during the study period

Response 1027

Technology - T₁

- . fibre is best for domestic high density routes; it is expensive; it is not suitable for point to multi-point communications
- . satellites are effective for international and other long distance transmission services
- . interconnectivity is highly valued; it will pull against the trend toward bypass

Market Structure

- . the current Canadian telecommunications industry structure has been very successful in providing high quality service
- . U.S. forces are causing problems in Canada; these range from the competitive example set to forcing acceleration of telecommunications technology in Canada to the entry of American carriers into the Canadian market
- . teleconferencing has large potential especially for overseas traffic
- . enhanced services must be competitive arena, many entrants possible

Regulation - R₁

- . universal basic service is a goal for Canadian telecommunications, it's a matter of conscious political choice
- . rates will continue to be regulated to achieve that goal
- . bypass will be discouraged by high access charges

Response 1028

Scenarios

- . prefers the status quo but sees an evolution to T_1 , MS_2 , R_2
- . no changes are necessary, the system works well the way it is

General

- . in future, all communications services will be software programmable
- . cellular radio is a real threat to small telcos; it could replace them; with cellular there is no need for poles or wire; prices will come down
- . cellular radio spells the beginning of the end for small telcos, not in fifteen years but in twenty-five
- . small telcos cannot afford to upgrade and experiment with new technologies

Response 1029

- . telecommunications is made up of three parts - terminals, networks, enhanced services.
- . Canadian telcos are vulnerable to competition in terminals sectors from Japan and U.S.
- . Canadian telcos are vulnerable to competition in enhanced services sector from U.S.; Canadians can compete in U.S. markets as well
- . the satellite sector was overbuilt and now is used in inappropriate ways because of excess capacity
- . within five years fibre will become the dominant transmission mode
- . scenario choice T_2 , MS_3 , R_4

Response 1030

- . the cable industry is facing competition from new sources - VCR, MATV
- . pay-per-view television is the direction that cable must go or survival beyond five years is doubtful
- . cable needs to upgrade infrastructures to handle digital picture transmission and stereo sound
- . consumers are forcing these changes, they want better pictures and more choice
- . fibre may be utilized on trunks but industry lacks finances to undertake this upgrading
- . since VCR and TVRO use is basically unregulated, the cable industry needs the same flexibility to compete successfully; that means no "Canadian content" rules
- . currently the rate of return is so low that the cable industry cannot undertake the research and development necessary to remain competitive in the new telecommunications environment
- . let the consumer determine the prices charged and services provided by the cable industry
- . choice of scenario T_1 , MS_2 , R_4

Response 1031

Please accept my apologies for the unavoidable delay in providing our comments on the marketing scenarios for the Canadian telecommunications market configurations to the year 2000. I have now reviewed the scenarios as you requested and have obtained comments from a number of specialists associated with our organization.

To comment in a general way, all the scenarios are plausible in the 1985-1995 time frame. In fact they could be combined into one scenario without too much trouble and be just as likely to come out as any of the five separate ones.

In summary, there are some conditions which are not well covered in the building blocks that would lead us to a consensus that a combination of building blocks or a sixth scenario would perhaps be most likely. This scenario would be T₁M₃R₁. The comments on each of these segments are as follows:

- o All inputs I received from our people were in agreement with the T₁ building block. The main reason for this conservative scenario selection is that the population of Canada is small and not projected to increase at a very rapid rate. Hence new consumer growth will be slow. We assume that the capacity of the current telecommunications system in Canada is exceeded by the U.S.A. only and possibly Japan, and therefore there will be no major incentive to bring the system up to international standards. This means that the telecommunications market growth will be slow but steady and will reflect the traditional conservative Canadian approach to technological development.

- o It was difficult to select between the building block MS₃ or MS₁. Some felt that minimal competition would continue and therefore support an MS₁ market structure. However, the general consensus was that the MS₃ competition would tend to override. Our selection of this block was influenced by the fact that Canada will continue to follow the happenings in the U.S., and the fact that the present Conservative Government will encourage closer relations, both trade and otherwise, with Canadian telecommunications suppliers. The trend towards more utilization of satellites in communications will encourage a broader look at international competition.
- o With regard to regulation, I have selected the R₁ as the most likely building block in our selected scenario, although some specialists feel there may be a trend towards R₄ or minimal regulation.
- o Public policy and regulatory processes in Canada always moved too slowly. They always have been a good distance behind technological progress and in many if not most cases have impeded technological development. We believe that any major changes in the regulatory process will be incremental and very slow indeed. We do not believe that in the foreseeable future there will be a melding of jurisdictional groups leading to a central or national regulatory control, and any major changes in the current regulatory framework is politically next to impossible to achieve.

For your information and in further support of the above scenario, the following are some factual inputs that I have received from the specialists I have consulted.

- o The statement "fiber optics rapidly replaces copper wire..." seems unlikely because it won't replace the copper already beneath our city streets. It is superseding copper as a transmission product on a gradual rather than rapid basis.
- o Cellular radio is in the same boat as Telidon in that the market is going to be a slow growth scenario. Both are expensive for rapid adoption although cellular has a more ready market. Office automation is in a different situation in that growth will be slow because technology is still facing the compatibility problem.
- o The diffusion and adoption processes -- from awareness to understanding, to acceptance, to application -- have been and will continue to progress at a slow time-consuming pace. The factors which include human nature and attitudes, and public policies and economic cycles, all form barriers to the adoption of technologies for competitiveness.

- o Canada will continue to follow happenings in the U.S., in this case the growing bypass of major established carriers.
- o Some Canadian businesses are already bypassing domestic established carriers by using U.S. private carriers to get from one part of Canada to the other through the nearest cross-border points because it is cheaper.
- o The dominant technologies are semiconductor, software, digital and fiber optics, not microwave, etc., as outlined in the scenario.
- o Scenario IV seems unlikely as technological innovation can only be supported by Canadian manufacturers which are successful internationally. Alternatively, the Canadian carrier could become technologically innovative by buying equipment extensively from foreign manufacturers. The latter would be in conflict with goals and objectives set by the regulatory bodies in Canada.
- o We have a very advanced and over-capacity industrial capability within the Canadian industry. This is supported by the fact that all of the major industrial firms involved in telecommunications are out selling their capability internationally.
- o The Conservatives are in power, the U.S. has deregulated to a large extent, and there are some signs of deregulation in Canada. If Canada does not go the Minimum Regulation route, the next most likely scenario in regard to regulation would be R_1 or Status Quo. R_2 and R_3 would appear to be too political and complicated to be implemented.

We hope our comments and information provided herein will be helpful to the University in completing the study that you have undertaken on behalf of the Department of Communications.

APPENDIX III

The Telecommunications Competition Issue in Canada:

A Selected Bibliography

Wm. H. Melody

The Telecommunications Competition Issue in Canada

A Selected Bibliography

The decisions and reports referenced here do not present a comprehensive review of government and regulatory commission positions on competition in the telecommunications industry. The materials included here are intended to indicate the time period in which competition issues have been given consideration and to highlight major policy changes. For a comprehensive review see Peter S. Grant (ed.) Canadian Telecom Alert 1983-1984. Toronto: Canadian Industrial Communications Assembly, 1983 (updated annually). For a discussion of issues see Thomas McPhail and S. Hamilton (eds.) Proceedings of Communications in the 80's: Major Issues. Calgary: University of Calgary, 1984. The entries are organized into five categories: I) Bypass; II) CRTC decisions; III) Federal Government Policy Reviews; IV) Provincial Regulatory Board Decisions; and, V) Independent Studies.

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