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LEGAL ASPECTS OF MULTIMODAL TELECOMMUNICATIONS

by

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A Thesis submitted to the Faculty of Graduate Studies and Research in partial fulfilment of the requirements of the degree of Masters of Law

 May, 1995

ISBN 0-612-08064-1

The views and conclusions expressed are those of the author. They are not intended and should not be thought to represent official ideas, attitudes or policies of any agency of the United States Government. The author has not had access to information not otherwise releasable to the public and has employed only material available to any writer on this subject. The research was conducted in 1994 and covers the period up to December, 1994.

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THE FUTURE GLOBAL TELECOMMUNICATIONS ENVIRONMENT

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Interconnection of National ISDN Network Systems

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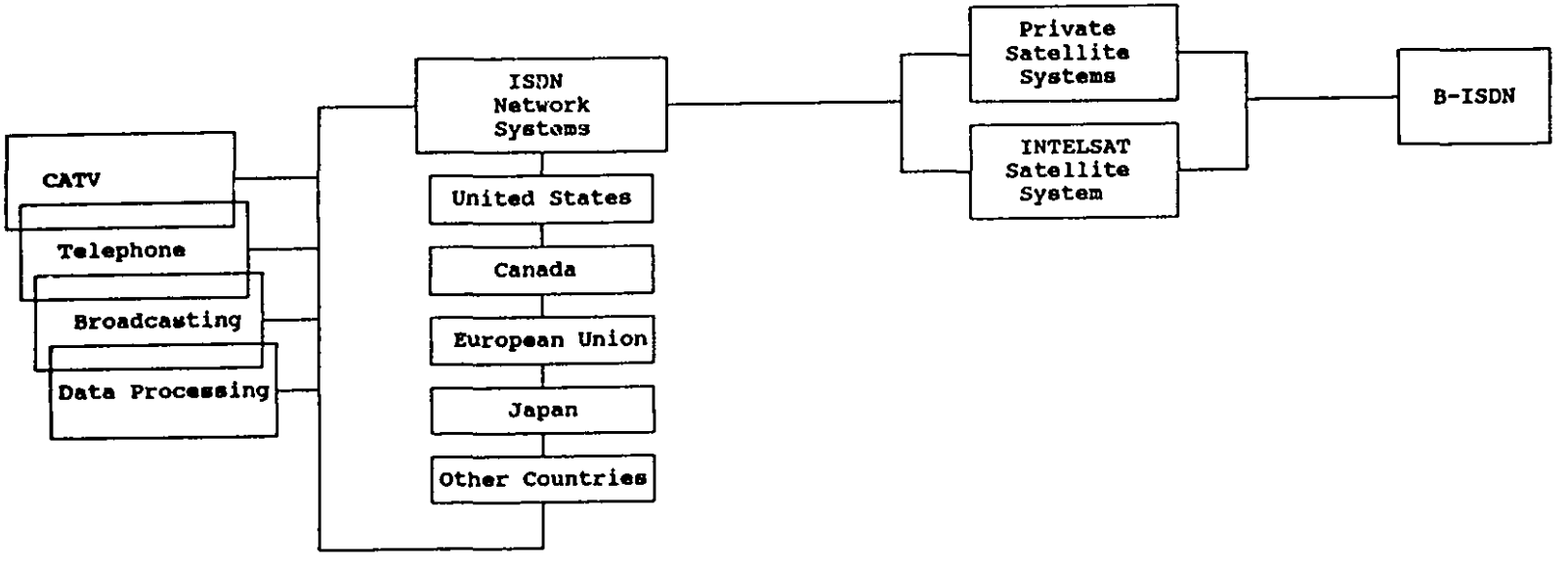
Development of Advanced Digital Satellite Systems and Interconnection with ISDN Network Systems Allowing for B-ISDN Satellite Traffic

Future Global Infrastructure

Expansion of global B-ISDN Information Infrastructure in a Multimodal Telecommunications Environment



ACKNOWLEDGEMENTS

This Thesis is dedicated to my family and friends for their love, confidence, and inspiration. I am especially grateful to my friend Li-Juan Ko for her warm friendship throughout my studies at McGill University.

I would like to express my thanks to my husband, Andrew Kirk, for his understanding of my efforts.

I wish to express my profound appreciation to Dr. Ram Jakhu, Adjunct Professor at the Institute of Air & Space Law, for his encouragement and valuable academic guidance. I also wish to thank Peter McCallum and Barbara Ursel at the Legal Department of the CRTC for providing me with research materials and helpful suggestions, as well as Hubert Fournier at Teleglobe Canada for his assistance.

Last but not least, I owe a special gratitude to Dr. Michael Milde, Director of the Institute, Dr. Nicolas Mateesco Matte, Director Emeritus of the Institute, and Professor Peter Haanappel who were the principal promoters of my studies in air and space law.

Finally, I would like to say that the writing of this thesis was an enriching experience, as I explored in my mind's eye the telecommunications environment of the future. The potential benefits of a Global Information Infrastructure are tremendous for mankind. However, the potential benefits can be outweighed by the many problems which will arise in the absence of appropriate government responses to the legal and other implications of ISDN development, proper consideration of the issues of privacy and security, and sensitivity with respect to the impact of such development on different cultures and mankind as a whole. Ultimately, man's wisdom will determine the potential benefits, complications, and dangers which will form part of the future global telecommunications environment. Collective wisdom, however, begins with the individual wisdom of each man.

ABSTRACT

The telecommunications industry is being shaped by technological and market developments, and is moving into the 21st Century. The telecommunications technology of the future is integrated services digital networks. ISDN, which is the concept for a future digital telecommunications network for delivery of a wide range of innovative voice, data and video services through satellite systems and the national information highways being developed in several countries, will lead to a Global Information Infrastructure. ISDN development will pose challenges to traditional telecommunications regulation, lead to increased multimodal competition between ground and space-based transmission systems, and erode INTELSAT's market base since future digital ISDN systems will be interchangeable with satellite systems.

This study begins in Chapter I with an examination of the emerging technologies and recent market trends which challenge traditional regulation, as well as the importance of upholding regulation in the emerging ISDN telecommunications environment. Chapter II discusses the recent market developments in Canada, the legal implications of emerging technologies for the current regulatory regime, and the need for comprehensive policy and regulation. Chapter III discusses the role of satellites in the emerging global ISDN environment, the mandate of INTELSAT in terms of spectrum/orbit resource management, the regulation of multimodal telecommunications under the INTELSAT Agreement, the challenges to INTELSAT represented by ISDN development, the role of the ITU in the regulation of the emerging global ISDN environment, and the future of INTELSAT in light of competition, technological progress, and regulatory trends. This is followed by a conclusion in Chapter IV.

RESUME

A l'approche du 21e siècle, l'évolution technologique et l'essor des marchés sont en train de faconner l'industrie des télécommunications. La technologie des télécommunications de l'avenir repose sur les réseaux numériques à intégration de services (RNIS). Le RNIS est le concept sur lequel se fondent les futurs réseaux de télécommunications numériques, permettant d'offrir une vaste gamme de services innovateurs pour la transmission de la voix, des données et de la vidéo au moyen des systèmes satellites et des autoroutes électroniques en voie de développement dans de nombreux pays. En établissant un réseau mondial d'information, le RNIS posera des défis concernant la réglementation traditionnelle des télécommunications et accroitra la concurrence multimode entre les systèmes de transmission par voie terrestre et par satellites. Il minera donc la part de marché d'INTELSAT, puisque les systèmes numériques RNIS de demain seront interchangeables avec les systèmes satellites.

La présente étude aborde le sujet au chapitre I en examinant les technologies de pointe et les tendances récentes du marché, qui remettent en cause la réglementation traditionnelle et l'importance de maintenir une telle réglementation dans ce nouvel environnement de télécommunications RNIS. Le chapitre II présente les récents développements sur le marché canadien, les répercussions juridiques des nouvelles technologies sur la réglementation actuelle et la nécessité de mettre en place une politique et une réglementation globale. Le chapite III explique le rôle des satellites dans l'environnement RNIS mondial et le mandat d'INTELSAT relativement à la gestion des ressources du spectre et de l'orbite. Il traite également de la

réglementation des télécommunications conformément à la convention internationale d'INTELSAT, des défis que devra relever INTELSAT dans le nouvel environnement des télécommunications, du rôle de l'UIT dans la réglementation du nouvel environnement RNIS mondial et de l'avenir d'INTELSAT compte tenu de la concurrence, de l'évolution technologique et des tendances réglementaires. Le chapitre IV termine l'étude par une conclusion.

LIST OF ABBREVIATIONS

ACTS	Advanced Communications Technology Satellite System
ATM	Asynchronous Transfer Mode Technology
B-ISDN	Broadband (ISDN) Communications
CANCOM	Canadian Satellite Communications Inc.
CATV	Cable Television
COMSAT	Communications Satellite Corporation
CRTC	Canadian Radio-Television and Telecommunications Commission
DBS	Direct Broadcast Satellite
FCC	Federal Communications Commission
HDTV	High Definition Television
INMARSAT	International Mobile Satellite Organisation
INTELSAT	International Telecommunications Satellite Organisation
ISDN	Integrated Services Digital Network
ITU	International Telecommunication Union
ITU-T	Telecommunications Standardization Sector of the ITU
LEO	Low Earth Orbit
NASA	National Aeronautics & Space Administration
NII	National Information Infrastructure Initiative
OECD	Organisation for Economic Cooperation and Development
OTA	U.S. Office of Technology Assessment

SDI	Strategic Defense Initiative
TDF	Transborder Data Flow
VSAT	Very Small Aperture Terminal

INTRODUCTION

Technological progress, the market forces of privatization and deregulation, and the overall globalization trends in business are changing the international telecommunications market structure.[1] These recent trends will lead to the transition to digitalization, the convergence of telecommunications and computing industries, and the development and widespread use of digital transmission technologies. The emerging technologies and market trends will in turn drive the need for international connectivity of communications systems, which will be met through the development of ISDN.[2]

ISDN which is the concept for a future digital telecommunications structure[3] will

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1 The convergence of telecommunications and computing technologies, the transition to digitalization, the development and use of fibre optic cables, and the overall globalization trends in business, are creating a new telecommunications environment whereby terrestrial networks are becoming generators of numerous telecommunications services and opportunities for network operators. See Terol-Miller, Luis, "Open Network Provisions", USERCOM 89: Global Interconnectivity, Proceedings of the Third International Telecommunications User Conference (Geneva: ITU, March 1989) at 193.

2 The concept of ISDN began in the early sixties with the process of digitalization of telephone networks in different countries. ISDN development will evolve from the existing telephone networks into digital multi-service networks by means of the implementation of digital technology and fibre optic cables. These digital networks will eventually replace the telephone networks. Gagliardi, Diodata, "ISDN: The Concept, its Origin & Direction", Proceedings of the International ISDN Conference, Vol. 1 (London: June 1986) at 3-4.

3 ISDN is the complete interconnection and interoperability of nearly all computers and telecommunications systems through a common network model to provide universal and complete services for capturing, storing, processing, and transporting most information which society desires to retain or communicate. Rutkowski, A.M., "The Integrated Services Digital Network: Issues and Options for the Future" (1983) 24-25 Jurimetrics Journal 19 at 19.

allow for the delivery of a wide range of innovative voice, data and video services[4] through the national information highways being developed in the United States, Canada, the European Union, and Japan, and eventually these evolving national highways will be interconnected transnationally with ISDN systems in other countries, as well as with advanced satellite systems to create the Global Information Infrastructure envisioned by the Clinton Administration under the slogan "one world one network".

The process towards the global telecommunications environment of the 21st Century has begun with the development of digital transmission technologies which are eroding the boundaries between the formerly distinct telecommunications and computing industries through the ability to deliver their different services, namely, telephone, television, CATV, and data processing services using digital fibre optic cable systems. The development of these communications networks is stimulating competition and partnerships among CATV operators, telephone companies, DBS operators, and computing companies anxious to develop innovative

---

[4] The digital telecommunications structure will allow for an integrated use of digital telephone networks in that non-telephonic services such as movies on demand, music on demand, videogames on demand, home shopping, home gambling, home banking, student multimedia systems, interactive television, database access, distance learning, medical services, and other new multimedia services will be provided through a standard set of user-to-network and network-to-network interfaces. According to the Delphi study of the U.S. market involving senior executives from the core industries affected by convergence, conducted by the international management consulting firm of Deloitte & Touche, the most popular products in the multimedia age will be multi-use portable personal computers, wireless personal communicators for voice and data, HDTV for the home, videophones, and personal computers with videoconferencing capabilities. Allen, Dwight L., Elbeling, H. William & Scott, Lawrence W., Speeding Toward the Interactive Multimedia Age (Washington, D.C.: Deloitte & Touche, 1994) at 5.

product offerings aimed at the evolving national information highways. The process towards the global telecommunications environment of the 21st Century will continue with the interconnection of ISDN systems with high-powered digital satellite systems, with the goal of achieving a seamless information infrastructure for the delivery of telecommunications services in a multimodal environment.[5]

Telecommunications service providers view the information highways and ISDN development as key to their future, and the changing market structure is being supported by government initiatives for the development of national information highways and a relaxation of government regulation. In view of technological progress, and the market forces of privatization and deregulation, and the overall globalization trends in business, traditional regulation of telecommunications is being challenged. Although the guiding principle for regulation by national governments in the future, will be regulation only where required and only to the extent necessary, continued regulation will ensure that ISDN development is done in a manner which upholds traditional public policy goals.

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[5] Multimodal environment refers to the future digital telecommunications structure, namely, the expanded information and communications network infrastructure through the integration of wireless terrestrial and satellite networks, integration of CATV and telephone networks, as well as enabling digital technologies which optimize the use of networks and the delivery of innovative voice, data, and video services. See Ottawa, Spectrum Information Technologies and Telecommunications Sector of Industry Canada, The Canadian Information Highway: Building Canada's Information and Communications Infrastructure (Ottawa: Minister of Supply and Services Canada, April 1994) at 18.

ISDN development poses several challenges to the international regulatory framework. The regulatory role of the ITU will be important in terms of ensuring that ISDN development meets public policy objectives. Its role will be critical in ensuring that the broadband radio frequency spectrum, which is the wireless equivalent of terrestrial ISDN systems, is managed in the best interests of all countries in accordance with the fundamental principle of equitable access under Article 44 of the International Telecommunications Convention.

The challenges of ISDN development to INTELSAT are significant, in view of the fact that Article XIV of the INTELSAT Agreement does not address the issue of intermodal competition, despite its objective of upholding INTELSAT's viability. The changing international telecommunications environment raises questions about INTELSAT's mandate in terms of spectrum/orbit resource management, and concerns about its future viability.

ISDN development poses a real threat to INTELSAT's long-term viability. The fact that future ISDN systems will be interchangeable with advanced satellite systems, renders INTELSAT vulnerable in an increasingly deregulated and competitive telecommunications environment. Several initiatives for advanced high-powered digital satellites have been taken by the private sector, NASA, and INTELSAT in response to the competition represented by ISDN development. Although overall growth in new satellite and terrestrial services is expected to continue in the years ahead, the global trend towards deregulation and privatization of

international telecommunications,[6] combined with competition from terrestrial ISDN systems may have a significant impact on future patterns of international telecommunications traffic over the INTELSAT system.

There are several reasons for protecting INTELSAT's future viability in the emerging global ISDN environment, especially in view of the recent decisions of the Clinton Administration to auction broadband radio frequency spectrum to the private sector as part of its national information highway infrastructure initiative (NII), and to streamline procedures for the allocation and use of the spectrum resource to ensure access to the NII.

The issue of multimodal competition merits examination, and it is submitted that it represents an important one for international satellite telecommunications. Intermodal competition from future ISDN systems and intramodal competition from advanced private satellite systems threaten the future integrity and economic viability of INTELSAT. It is submitted that intermodal competition and ISDN technology undermine INTELSAT's purposes of ensuring equitable use of the spectrum/orbit resource and the use of the most advanced technology for the benefit of all mankind, which serve as means of furthering world peace and understanding.

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6 Arnst, Catherine & Edmondson, Gail, "The Global Free-For-All" Business Week (September 26, 1994) at 118.

INMARSAT which provides mobile satellite services engages in intermodal competition with maritime radio communications, as well as with cellular networks in coastal areas operated by mobile Earth station operators.[7] In a competitive environment, INMARSAT's market base may also erode as a result of ISDN technology. However, the scope of this thesis is limited to the impact of competition and ISDN development on the INTELSAT system.

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[7] Lundberg, Olof, "Competition and the Threat to INMARSAT" InterMedia, Vol. 14, No. 2, (1986) at 32.

CHAPTER I
THE REGULATION OF TELECOMMUNICATIONS IN A CHANGING ENVIRONMENT: AN OVERVIEW

A. THE RELATIONSHIP BETWEEN REGULATION AND TELECOMMUNICATIONS

1. Rationale for Traditional Public Regulation

Telecommunications which is defined as "any transmission, emission or reception of signs, signals, writings, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems"[1], evolved from the development of the modern telegraph and Samuel Morse's code in the early 19th Century. Historically, the development of telecommunications was of strategic importance for national survival and defence against military threat[2] and was as important to governments as the development of transportation. These historical factors explain why telecommunications emerged from the public sphere and under public regulation. Traditional regulation of telecommunications is based on the public interest school of thought which held that regulation prevents monopolistically structured industries from earning supranormal profits by "contriving a scarcity and charging high prices".[3]

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1 Final Acts of the Additional Plenipotentiary Conference (Geneva, 1992), Constitution and Convention of the International Telecommunications Union (hereinafter 1992 International Telecommunications Convention) ITU, 1993, ISBN 92-61-04771-8.

2 Snow, Marcellus S., Marketplace for Telecommunications: Regulation and Deregulation in Industrialized Democracies (New York: Longman Inc., 1986) at 7.

3 Ibid.

2. Impact of Technological Progress on Regulation

Public regulation based on the public interest school of thought is, however, being challenged by the introduction of new transmission technologies such as digitalization, fibre optics, ISDN, as well as the convergence between computing and telecommunications technologies. These recent technological developments are changing the telecommunications market structure and weakening arguments in favour of traditional regulation based on the public interest standard.[4]

Traditionally, telephone companies provided telephone services, cable operators provided CATV services, and computer companies provided data processing services. The telecommunications market structure was comprised of well defined service providers using different technologies to deliver distinct services. Regulatory authorities understood the boundaries and were able to regulate the telecommunications industry accordingly.

Recent technological developments are, however, eroding the boundaries between the formerly distinct industries,[5] blurring the distinctions between telecommunications and

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[4] McPhail, Thomas L. & McPhail, Brenda M., Telecom 2001: A Strategic Forecast, The Canadian Telecommunications Carriage Industry, 1990-2001 (Calgary: McPhail Research Group, 1989) at 180.

[5] Fibre optics and digital technologies are leading to industry convergence, namely, the trend of companies involved in broadcasting, CATV, computers, entertainment, retailing, and telecommunications to form joint ventures, and partnerships across industry lines. The overall effect is to blur industry sectors and integrate previously unrelated industries. Several terms are being used to

computing, and stimulating the demand for broadband communications networks capable of transmitting high quality voice, data and video services. In addition, traditionally distinct service providers are seeking to provide innovative multimedia services using different transmission technologies. In the same manner that the monopoly of telephone companies in transmission was challenged by microwave technology in the 1950s, satellite technology in the 1960s, and cellular radio technology in the 1970s,[6] the introduction of innovative services will lead to greater competition between the traditionally distinct service providers for innovative product offerings, as well as competition in transmission mediums. As a result of technological progress, the telecommunications market structure is being driven towards greater competition and traditional regulation[7] is being undermined.

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describe convergence, such as "information highway", "multimedia", "new media", and "interactive technology". Allen, Dwight L., Ebeling, H. William, & Scott, Lawrence W., Speeding Toward the Interactive Multimedia Age (Washington, D.C.: Deloitte & Touche, 1994) at 9. For details see infra, Chapter III.

6 Snow, supra note 2 at 174.

7 In North America, traditional regulation had as its primary objective the control of monopoly abuses in monopolistic telecommunications markets, and regulatory authorities sought to control against abuses using three methods. Firstly, overall profit levels were established through rate-base regulation whereby regulators examined the company's expenses, including a specified profit level and set a revenue requirement for the company. Secondly, categories of rates to be charged to the company's subscribers were subject to approval by the regulator to ensure that they were just and reasonable, and did not involve any undue discrimination. Thirdly, subscribers of the monopoly company were permitted to file complaints, and the regulator would investigate the complaints and issue a decision. Traditional rate-base regulation as well as line of business restrictions and cost allocation systems performed as a satisfactory constraint against monopoly abuse. These traditional regulatory instruments, however, have been criticized as performing poorly in terms of providing incentives for regulated companies to be efficient, innovative, or improve their productivity. Traditional regulation is viewed as providing a means of ensuring that competitive services

The relationship between regulation and technological progress in telecommunications is very dynamic. The traditional telecommunications market structure will continue to react to advances in computing and telecommunications technologies, forcing regulatory arrangements to accommodate technological progress. As emerging technologies provide new services and transmission media alternatives, one can expect a relaxation of public regulation by governments.

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are not subsidized by the monopoly services of monopoly companies entering competitive markets, thereby undermining the introduction and spread of competition. Traditional regulation in North America was essentially aimed at telephone companies because the view was that privately owned telephone companies would be able to exploit subscribers to earn monopoly profits and, while foreign governments opted for public ownership to address the problem, North American governments opted instead for traditional regulatory instruments to protect the interests of society. Schultz, Richard J., "Regulation and Telecommunications Reform: Exploring the Alternatives", Implementing Reforms in the Telecommunications Sector, ed. by Bjorn Wellenius and Peter A. Stern (Washington, D.C.: The World Bank, 1994) at 475-479.

B. THE TREND TOWARDS A GLOBAL ISDN ENVIRONMENT

1. Emerging Technologies and Market Trends

In recent years, governments have begun to recognize the importance of the telecommunications and computing industries to their national productivity. Since society is moving to an era of production which is heavily dependent on the manipulation of information which shapes opportunities for national economic development,[8] the tendency on the part of governments will be to support the introduction of innovative services into the marketplace by reducing regulatory barriers and limiting their control of private service providers. The trend towards a global world economy affects the attitude of governments towards greater competition and technological progress in telecommunications. Essentially, a competitive domestic telecommunications market is viewed as a prerequisite for successful competition in the world market, and therefore governments are encouraging competition in telecommunications as a means of fostering national goals.

With respect to creating a competitive environment, the United States took the lead in 1984 with the breakup of the American Telephone and Telegraph (AT&T) company,[9]

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[8] Janisch, Hudson N. & Schultz, Richard J., Exploiting the Information Revolution: Telecommunications Issues and Options for Canada (Montreal: The Royal Bank of Canada, 1989) at 5.

[9] Sarreals, Cheryl L., "International Telecommunications Satellite Services: The Spirit of Cooperation Versus the Battle for Competition" (1985) 26 Jurimetrics Journal 267 at 267.

which continues to influence increasing levels of competition in telecommunications.[10] The U.S. regional Bell companies' umbrella organisation, namely, Bell Communications Research Organisation (Bellcore) which was created following the breakup of AT&T, has become a driving force behind the Clinton Administration's NII Initiative announced in September 1993.[11] It is estimated that the NII Initiative to create a "network of networks" will cost in the range of US$650 billion to build,[12] and is projected for deployment by the year 2015.[13] ISDN which establishes connections for services such as voice, data, facsimile, videotext, teletext, video, and HDTV using digital technology, is considered a key element in the NII Initiative.

It is expected that the information highway initiatives in Canada, the United

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10 See Bradley, Stephen P. & Hausman, Jerry A., eds., Future Competition in Telecommunications (Boston, Mass.: Harvard Business School Press, 1989) at 96.

11 The Bell Communications Research Organization (Bellcore) which is a child of divestiture of AT&T and is jointly owned by the seven U.S. Regional Bell Operating Companies, was established as a central organization to maintain network performance, by the U.S. Federal Court which oversaw the AT&T breakup. Bellecore and the RBOCs have been active in policy discussions relating to the development of the NII Initiative, and the implementation of new technologies and services. See Bellecore, A Guide to New Technologies and Services, Special Report SR-BDS-000828, Issue No. 7 (Bellecore, 1993) at 12-2.

12 This figure accounts for the networking technologies of the NII, and does not include the cost of upgrading corporate America's PCs and workstations, the systems which will be used in public institutions, nor home/television/multimedia systems. Anderson, Patricia, et al., "Building the Information Superhighway: Policy, Infrastructure, and Applications", Datapro Management of International Telecommunications (New York: McGraw-Hill Inc., 1994) at MIT40-950-302.

13 Allen, supra note 5 at 13.

States, and elsewhere[14] will follow a common network model for interconnection on a global scale. In the United States, the U.S. Office of Science & Technology Policy has suggested that the NII Initiative must be developed in the context of evolving global networks and that the U.S. Government must work with the ITU and various international standards committees to ensure that technical standards are adopted for an effective global ISDN information infrastructure.[15]

Globally, billions of dollars have been earmarked for investment to bring the ISDN concept and the technical standards of the Telecommunications Standardization Sector (ITU-T) of the ITU into reality. As will be discussed in Section D of Chapter III, the success of ISDN standardization for interconnection of telecommunications services at both the national and international level rests with the planning efforts of the ITU-T, formerly known as the International Telegraph and Telephone Consultative Committee (CCITT).[16]

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14 Japan announced plans to construct a B-ISDN network based on fibre optic cables with nationwide coverage by the year 2015. See Ottawa, Convergence: Competition & Cooperation - Policy and Regulation Affecting Local Telephone and Cable Networks, Report of the Co-chairs of the Local Networks Convergence Committee (Ottawa: Minister of Supply & Services Canada, 1992) at 276. Also, Japan relaxed its telecommunications regulatory regime in 1993 and plans to draw other Asian countries into a pan-Asian information highway by the early 21st Century. See also Smith, Emily, "An Information Superhighway Snaking Across Asia?" Business Week (May 30, 1994) at 129.

15 DalBello, Richard, "The Role of Satellites in the National Information Infrastructure Initiative" Via Satellite (February 1994) at 56.

16 ITU-T, Construction, Installation, Jointing & Protection of Optical Fibre Cables (Geneva: ITU, 1994) at 1.

The evolving information highways and future interconnection of national and international networks through ISDN technology[17] is taking the CATV, telephone, broadcasting, and computing industries into the 21st Century. These industries and their transmission technologies are converging as they both compete to deliver high quality voice, data and video services through the evolving information highways.

2. Market Developments

Rogers Communications, the largest Canadian CATV operator, intends to exploit the potential of Canada's evolving information highway, and is aggressively pursuing innovative services out of concern that Canadian telephone companies will overcome regulatory barriers and enter the cable market. Rogers Communications faces serious competition from Bell Canada and the Stentor group[18] of major Canadian telephone companies which announced the development of an CD$8 billion national information highway, known as the Beacon Initiative.[19] Canada's

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17 In the future fibre optic B-ISDN networks will provide capacity to carry a complete video service including digital HDTV and digital audio broadcast (DAB) services. The merging of communication, computer, and broadcast services has begun, and a range of multimedia services are being developed. These services will use ISDN and common networks to access computer databases, digital audio sources and video programs which will be combined in an interactive manner. See Lum, Y.F. & Sawchuk, W., "The Merging of Communications, Computers & Broadcasting", INTER COMM 90: Global Telecommunications Congress and Exhibition, Congress Proceedings, ed. by Peter J. Booth and Carla M. McEachern (Vancouver, October 23-26, 1990) at 296.

18 For the list of member companies of the Stentor group, see infra note 60.

19 "The Beacon Initiative Shines New Light on the Information Highway, Telecommunications File, published by Deca, The (Montreal) Gazette (June 9, 1994) 3.

Beacon Initiative to create a "network of networks" is expected to bring the information highway of voice, data and video services to Canadian businesses and homes by the year 2010.[20]

According to the Stentor group which is seeking CRTC relaxation of regulations which prevent its members from entering the cable market, a highly competitive marketplace is the only manner in which the private sector can build the kind of information highway that will serve Canadian economic, social and cultural interests.[21] The race is evidently on between Canadian CATV operators and telephone companies to provide an information highway of multimedia services. The partnership and competition between CATV operators, telephone companies, computer companies and other service providers is expected to grow as these formerly distinct industries seek to serve evolving information highways.

Rogers Communications recently concluded an agreement with Microsoft Corporation in the United States[22] in an effort to secure its place in the development of the Canadian information highway for the delivery of multimedia and interactive television. Microsoft Corporation which is a leading computer company, much like AT&T, views ISDN development and the information highways as key to its future. Consequently, the company is aggressively pursuing business opportunities in Canada and abroad. According to market

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20 A 40% penetration of multimedia services to Canadian homes is projected by the year 2010. Allen, supra note 5 at 22.

21 Zerbisias, Antonia, "Insight" The (Toronto) Star (January 29, 1994) Section B.

22 Brandt, Richard & Jones Yang, Dori, "Bill Gates: The Next Generation" Business Week (June 27, 1994) at 61.

analysts, CATV operators and telephone companies will be the real competitors of Microsoft Corporation as computing and telecommunications technologies converge.[23]

Canadian CATV operators and telephone companies are also trying to enter the field of broadcasting. Bell Canada Enterprises (BCE), is teaming up with Canadian Satellite Communications Inc.[24] to offer DBS services across Canada. Although BCE, which is the parent company of Bell Canada, is eligible to hold a broadcasting license, Bell Canada is prohibited under CRTC cross-industry ownership restriction rules from competing with CATV operators.[25] Bell Canada is, however, contesting the distinction between broadcasting and telephony on the basis that the distinction becomes artificial as all forms of communication from

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23 One strategic technology which is being developed by Microsoft Corporation is video servers software to deliver digitized movies and television programs across cable or telephone networks. Ibid. at 59.

24 Dougherty, Devin, "BCE, CANCOM to Offer TV Service" The Financial Post (May 6, 1994) 1.

25 Section 7 of the Bell Canada Act, S.C. 1987, c. 19, prohibits Bell Canada from directly or indirectly holding a broadcasting license or operating a CATV distribution undertaking. On the other hand, the basis for cross-industry ownership prohibition for other Canadian operating telephone companies lies in a CRTC public policy announcement dated December 3, 1969 entitled "Licensing Policy in Relation to Common Carriers", whereby the CRTC stated that it would not be in the public interest to encourage telephone companies to hold licenses for CATV systems, while recognizing the role of telephone companies in the development of cable television and inviting cooperation between telephone companies and the CATV industry. The policy announcement establishes a general policy under which the CRTC may issue a Direction which creates a specific prohibition. See Direction to the CRTC Respecting Ineligibility to Hold Broadcasting Licenses, SOR/85-627, C. Gaz., Part II, Vol. 119, No. 14, at 3058. See also Telecom Decision CRTC 94-706, MacKenzie Media Ltd., Performance Communications Corp. & Northwestel Inc., (CRTC August 29, 1994).

telephone calls to television signals become digital. In addition, Bell Canada is arguing that its proposed DBS service is aimed at competing with American DBS services and not with Canadian CATV operators.[26]

On the other hand, Canadian CATV operators, including Cogeco Cable Inc. and CF Cable TV Inc., are upgrading from co-axial to fibre optic cable and examining emerging technologies with a view to delivering multimedia services to the consumer through the information highway. They view their ability to offer new services on the Canadian information highway as a means of competing with American DBS promoters such as Hughes Communications and RCA,[27] which plan to offer the consumer hundreds of channels using 18-inch VSAT dishes. The arrival of American DBS services in Canada,[28] and the possible creation of a Canadian DBS service represents strong competition to Canadian CATV operators and telephone companies in the field of broadcasting.

In the United States, recent developments include announcements in May 1994

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26 Dougherty, supra note 24 at 1.

27 "CF Cable Inc.: A Major Player in the Cable Television Arena", Telecommunications File, published by Deca The (Montreal) Gazette (June 9, 1994) 15.

28 In December 1993, Hughes Communications launched its DBS-1 satellite which became North America's first digital direct-to-home television broadcast satellite using digital compression technology and high-powered K-u band satellites. See Lenorovitz, Jeremy M., "Communications will Drive Space Sectors Growth" Aviation Week & Space Technology, Vol. 140, No. 11 (March 14, 1994) at 83.

by Time Warner Communications, EDS Corporation, and Sprint.[29] Time Warner Communications, a CATV operator, is expected next year to provide local telephone service in the Rochester, New York area and compete with the Rochester Telephone Company using digital fibre optic cable networks. Time Warner announced that it will spend CD$5 billion to upgrade its cable networks in 36 markets by 1998, and is negotiating with several states to provide local telephone service in competition with incumbent telephone companies.[30] Time Warner's fibre optic cable network will be interconnected with the Rochester public telephone system. EDS Corporation, a computer company, and the long-distance telecommunications carrier Sprint are expected to merge before the end of 1994 with the objective of EDS developing innovative services aimed at the NII.[31] Sprint views the merger as enabling it to become a more viable competitor to AT&T and MCI Communications Corporation. EDS and Sprint plan to bundle and cross-sell their services and provide the marketplace with interactive and multimedia services.

3. Competition in Satellite/Cable Transmission Technologies

The market developments discussed above illustrate the market trend towards the expansion of CATV, telephone, and computer companies into interactive digital technologies,

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29 Caldwell, Bruce & Thyfault, Mary E., "Megadeal?" Information Week (May 30, 1994) at 12-13.

30 Wilson, Linda, "Cable TV is Calling: Time Warner to Offer Local Telecom Service" Information Week (May 30, 1994) at 15.

31 Caldwell, supra note 29 at 12.

as well as the competition and partnership between formerly distinct industries for the delivery of innovative services through the information highways. Digital technology makes it possible to transmit voice, data and video through telephony, cable, cellular radio, and satellite systems. These different transmission mediums will all play a role in evolving information highways and the future global ISDN environment. However, fibre optic ISDN systems are expected to be the predominant transmission medium in the future. Long-haul transmission of digital services is expected to be provided by satellite and cable systems, while short-haul transmission is expected to be provided by cable.[32]

According to a report by Datapro, the NII in the United States will be a mix of wireless satellite, co-axial cable, and fibre optic links all leading to personal computers and computerized telephone and televisions or some combination of the three.[33] In Canada, the Stentor group expects fibre optic cables to be the main transmission medium for telecommunications services on the Canadian information highway. In the United States, advanced satellite systems will according to the U.S. Office of Science and Technology Policy be essential elements of the future global ISDN information infrastructure.[34] The role of satellites in the future global ISDN information infrastructure will be discussed in Section A of Chapter III.

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32 Smith, David R., Digital Transmission Systems (New York: Van Nostrand Reinhold Company Inc., 1985) at 528.

33 See report cited in supra note 12 at MIT40-950-302.

34 DalBello, supra note 15 at 52.

C. THE VITAL ROLE OF GOVERNMENT IN THE REGULATION OF TELECOMMUNICATIONS

1. Justification for Regulation in a Competitive Era

Policy makers in many countries recognize the critical importance of telecommunications as an enabling technology. Telecommunications services make it possible for many industries to reach high levels of productivity which is vital in an era of global competition. Government regulation is viewed as necessary to realize the full benefits of telecommunications, and while the public policy objectives for regulation may vary from country to country, the different countries essentially adopt similar regulatory measures to regulate their telecommunications industries.

The most convincing argument in favour of government regulation of telecommunications in a competitive environment is that telecommunications is the modern "nervous system" of countries,[35] and governments should not rely solely on market forces to produce economic results that are critical to their national economic development. Telecommunications like transportation, energy, and broadcasting is of fundamental importance to social and economic development and, in the absence of public ownership, regulation is an alternative control method.[36]

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35 Janisch, supra note 8 at 33.

36 Schultz, supra note 7 at 474.

Traditionally, government regulation of telecommunications was viewed as essential to protect against abuses from monopoly carriers. Regulation was based on underlying public policy goals which include universal service at affordable prices, free flow of information, prevention or correction of abuses of market power by dominant carriers, restriction of market power and monopoly pricing, effectiveness of business transactions, privacy and security of communications, high technical quality of service, support of high technology, and interconnectivity of telecommunications and society at large,[37] as well as support of disadvantaged geographic areas or segments of society.[38]

As the telecommunications industry at large moves towards deregulation,[39] the question arises as to what regulatory environment is needed. One view is that the introduction

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37 Noam, Eli M., "The Next Future of Telecommunications: From the Network of Networks to the System of Systems" (Paper presented at the National Conference on the Future of Telecommunications Policy in Canada, Toronto, April 1, 1993) at 11.

38 ITU, The Changing Role of Government in an Era of Deregulation, Briefing Report: Options for Regulatory Processes and Procedures in Telecommunications, ITU Regulatory Colloquium No. 1 (Geneva: ITU, February 17-19, 1993) at x.

39 Regulation generally refers to governmental policy toward the economic activities of certain industries in the private sector, and involves control of price, rate-of-return, and market entry by regulatory authorities. For the telecommunications sector, regulation also extends to conditions of service, namely, the obligation of universal service, and requirements for cross-subsidization using rate structures, as well as requirements for separated subsidiaries. Deregulation, on the other hand, refers to the global trend to open telecommunications markets to the forces of competition, the erosion of market entry barriers due to the conflict between technological progress and traditional regulatory structures, the privatization of telecommunications facilities and less government ownership, the accommodation by service providers of new technologies and innovative services made available to the user community at cost-based prices, as well as the transition from monopoly to competition. Snow, supra note 2 at 8-13 and 85ff.

of competition does not remove the necessity of public regulation and that, in fact, regulation will be even more necessary in the early stages of competition because of the presence of established dominant carriers. Government involvement is viewed as important for the regulation of the major segments of the industry that operate as monopolies such as the local communications access infrastructure, and for the regulation of competition.[40] According to this view, governments should not rush to introduce market forces into the telecommunications sector, and active government involvement should be a central element of any reform effort if the public policy objectives of economic development and social justice are to be maintained.

The other view is that competition is incompatible with traditional regulation and that in a competitive era, government regulation must be compatible with market conditions.[41] The argument against traditional regulation in an increasingly competitive marketplace is that it hinders the ability of carriers to deliver innovative services which are required in order for them to aggressively compete in domestic and international markets.[42] According to this view, governments should substitute competitive market forces for public regulation as the preferred instrument to pursue their policy objectives in telecommunications.[43]

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40 Townsend, David N., "The Vital Role of Regulation in the Telecommunications Sector", Implementing Reforms in the Telecommunications Sector, ed. by Bjorn Wellenius and Peter A. Stern (Washington, D.C.: The World Bank, 1994) at 506.

41 Bradley, supra note 10 at 96.

42 Courtois, B.A., "Putting the Customer in Charge" (Paper presented at The National Conference on the Future of Telecommunications Policy in Canada, Toronto, April 1, 1993) at 13.

43 Janisch, supra note 8 at 35.

However, regulation in a competitive environment remains important to protect traditional public policy goals, namely, to ensure protection of universal service, protection against anti-competitive behaviour of dominant carriers, prevention of exploitation by dominant carriers of their market power to cross-subsidize competitive services with monopoly revenues, which ultimately undermines the introduction and spread of competition, protection of the free flow of information, promotion of access for competitive entrants across network infrastructures, promotion of the widespread availability of innovative services, harmonization of technical standards for the interconnectivity of future ISDN systems, as well as promotion of the expansion and upgrading of network infrastructures, especially in developing countries.[44]

In a competitive environment characterized by the future interconnection of various transnational telecommunications systems,[45] it will be important to establish regulatory requirements such as open network architecture and quality standards for efficient interconnection between networks.[46] Government regulation for the achievement of traditional public policy goals will also remain important.

It has been suggested that one of the key effects of removing government regulation of telecommunications will be a rebalancing of prices for telephone services which will result in the lowering of long-distance and international rates, and the raising of subsidized

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44 See report cited in supra note 38 at viii-ix.

45 See Janisch, supra note 8 at 10.

46 Noam, supra note 37 at 19.

local charges. Such a policy will lead to an overall increase in revenues for carriers and the creation of new capital which can be used to finance network expansion.[47]

On the other hand, regulation will ensure that telecommunications development is done in an equitable manner so that network expansion is not supported at the detriment of higher prices for essential local services and service in rural and remote areas. In the long term, some form of price regulation will always be required. Also, beyond price regulation, regulatory authorities must play an active role in monitoring and promoting compliance with network expansion agreements. It is believed that in the absence of regulation, telecommunications carriers seeking profit will find means to avoid unprofitable network expansion in rural and remote areas,[48] and cannot be expected to strike a balance between their private interests and social justice. It is the role of the government to balance these conflicting interests.[49]

2. Public Policy Objectives of Regulation

The ultimate objectives of government regulation of telecommunications are similar throughout the world, although the relative priority given to different public policy objectives may vary. In Canada, the public policy objectives include encouraging the

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47 Townsend, supra note 40 at 505.

48 Ibid. at 508.

49 Ibid. at 509.

development of an efficient telecommunications infrastructure, maintaining a basic telephone service that is affordable and universally accessible, and permitting Canadians in all regions to have access to a similar level of telecommunications service. In developing countries where access to telecommunications services is often limited, the policy objectives of rendering telecommunications services universally accessible and expanding the capacity of the public network are especially important. In the United States, notwithstanding the extent to which its economic system is based mostly on private ownership and competition, public policy has consistently provided for regulatory supervision of the telecommunication industry in pursuit of the same objectives as those of the Canadian Government, which are shared by other governments.[50]

The telecommunications industry is being driven towards competition by strong technological and economic forces. In monopoly market segments, government regulation plays an important role in balancing the interests of the carrier, its subscribers, and its competitors. However, competition has chipped away at monopoly market segments and this trend is accelerating with technological progress. Consequently, the guiding principle for government regulation in the future is regulation only where required and only to the extent necessary.[51] In the changing telecommunications environment it has been suggested that regulation should be focused mainly on ensuring the provision of adequate services on reasonable terms, ensuring access to network infrastructures on a non-discriminatory basis, and preventing dominant

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50 See report cited in supra note 38 at 9.

51 Courtois, supra note 42 at 21.

telephone companies from obtaining any unfair competitive advantage.[52]

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[52] Ibid. at 22.

CHAPTER II
THE CANADIAN TELECOMMUNICATIONS ENVIRONMENT

A. THE CHANGING NATURE OF CANADA'S TELECOMMUNICATIONS MARKET STRUCTURE

1. Information Industry Convergence and Market Competition

Recent developments in the Canadian telecommunications market reflect a recognition on the part of policy makers that the industry must become more competitive if Canadian business is to compete successfully in the world market. There is concern in Canada that telecommunications companies lack the economies of scope to compete in an open international market, and that Canada's telecommunications sovereignty will be jeopardized if the industry is deregulated in favour of increased international competition.[53] However, the fact that Canada is a service economy,[54] and that its productivity depends increasingly on telecommunication, means Canada has little choice but to follow the trend in the United States towards deregulation. Canada's concerns over deregulation of its telecommunications industry are legitimate but recent market developments indicate that competitive pressures are overriding these concerns.

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53 See McPhail, supra note 4 at 201.

54 Services account for sixty per cent of the real output of the Canadian economy, two-thirds of which is generated by private sources, namely, finance, insurance, real estate, communications, tourism, and business services, and one-third of which is generated by non-business sectors, namely, education, health, and social services. Ibid. at 5-6.

The nature of the Canadian telecommunications industry is changing. The changes are due to the introduction of emerging technologies, pressures facing telephone and CATV operators to provide new products integrating voice, data and video, the development of the Canadian information highway, as well as competition from U.S. satellite broadcasters. The fact that Canada is in such close proximity to the United States, which has the most deregulated telecommunications market in the world as of 1989,[55] and that telecommunications is becoming increasingly global means that Canada must encourage the competitiveness of Canadian telecommunications both nationally and internationally.

Canada's telecommunications market structure for the year 2001, is forecasted as characterized by competition among domestic carriers in most services, and international competition among domestic and foreign carriers in the provision of innovative services in the Canadian market.[56] In the area of basic local service, regional telephone companies are expected to maintain their monopoly over the public switched network for voice communications. However, monopoly in local transmission will and has begun to be challenged by fibre optics, interactive cable, and cellular radio technology.[57]

In the area of long-distance service, full national competition for voice services and international competition for data and video services is expected. Competition in long-

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55 Ibid. at 147.

56 Ibid. at 77.

57 See Snow, supra note 2 at 176.

distance service is expected from foreign, and particularly U.S. carriers providing the resale of U.S. voice and data services and access to U.S. voice and data services through private networks.[58]

The trend towards increased competition in Canada for long-distance began with the CRTC Telecom Decision 92-12 which decreed full competition in the provision of public long-distance voice telephone services.[59] Prior to the 1992 ruling, Telecom Canada (known today as the Stentor group),[60] had a monopoly in the long-distance public telephone market. Today, Unitel Communications Inc., TelRoute, BC Rail and Sprint Canada offer competitive long-distance services.

In the area of cable delivered services, the replacement of co-axial cable with fibre optic cable will allow CATV operators to expand their services to include voice and data transmission in addition to traditional video, and there will be competition between telephone

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58 Ibid. at 63.

59 Telecom Decision CRTC 92-12, Competition in the Provision of Public Long Distance Voice Telephone Services and Related Resale and Sharing Issues (CRTC June 12, 1992).

60 In January 1992 the Telecom Canada alliance reorganized itself into the Stentor group. The reorganization was a response to greater competition in long-distance service and a means of providing more sophisticated business services nationwide. Member companies include Newfoundland Telephone (Newfoundland), Island Telephone (Prince Edward Island), New Brunswick Telephone (New Brunswick), Maritime Telephone & Telegraph (Nova Scotia), Manitoba Telephone System (Manitoba), SaskTel (Saskatchewan), Alberta Government Telephones (Alberta), BCTel (British Columbia) and Telesat Canada which joined in 1969. See report cited in supra note 14 at 142.

companies and CATV operators for the delivery of innovative services.[61]

In the future, CATV operators and telephone companies will compete to control the delivery of interactive voice, data and video services. Currently, the delivery systems of the two industries are technologically different, namely, telephone services are delivered by means of the public switched telephone network, whereas cable services are delivered by means of the local CATV networks, and the industries generally serve different markets and provide different services.

According to the Local Networks Convergence Committee Report prepared for the Ministry of Communications in 1992 which dealt with convergence of the services and markets of telephone companies and CATV operators:

> "Advances in fibre optics and in digital compression and switching technologies, among others, will make it possible for telephone companies to deliver increasingly higher quality video signals, eventually enabling them to deliver television programs, and thus compete in the core market of the cable industry. Technological advances will also permit cable operators to significantly upgrade their networks, not only to deliver more and better quality television signals, but to provide more data and voice services in competition with the telephone companies".[62]

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61 See McPhail, supra note 4 at 37.

62 See report cited in supra note 14 at 3.

Canadian telephone companies are attempting to convince regulatory authorities that it would be in the public interest to have only one integrated services digital network, and telephone companies would like to be the sole provider of innovative voice, data and video services to Canadian businesses and homes.

The fact that the revenues of telephone companies in Canada are eight times higher than those of CATV operators (i.e. CD$13.3 billion compared to CD$1.6 billion),[63] and that the assets of telephone companies are ten times greater, certainly provide the telephone companies with strength to compete to control the delivery of innovative services.

At present, the CRTC cross-ownership restriction rules[64] do not allow CATV operators and telephone companies to interconnect, however, the Canadian information highway will create a definite link between telephone and television devices.[65] The convergence of these industries is recognized as inevitable, and new policy and regulation will determine whether Canadian CATV operators and telephone companies compete or cooperate in the future.

It is uncertain whether emerging technologies and recent market developments will create a movement toward a single ISDN infrastructure in Canada, or lead to the creation of

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63 "L'Autoroute Electronique: Qui va la contrôler: le téléphone? Le cable?" Revue Commerce (April 1994) at 70.

64 See supra note 25 and accompanying text.

65 "The Electronic Highway: Coming Soon in Your Screen?" Telecommunications File, published by Deca The (Montreal) Gazette (June 9, 1994) at 4.

separate interconnected networks.[66] However, what is certain is that fibre optics is the transmission technology of the future, and Canadian CATV operators are racing to provide the market with voice, data and video services through fibre optic cable networks. Cogeco Cable Inc. views digital compression of images, which makes it possible to broadcast hundreds of channels directly by satellite as a threat. It considers that the future of Canadian CATV operators lies in fibre optic cables which provide bandwidth capacity to carry digital data.[67] Rogers Communications plans to upgrade from co-axial to fibre optic cable at the cost of CD$525 million,[68] and operate a viable alternative national telecommunications network. While few CATV operators in Canada have the financial resources of Rogers Communications, it is expected that they too will upgrade their transmission technologies and diversify their services.

The Canadian telecommunications market structure in Canada will change as the telecommunications and computing industries use digital technologies and fibre optic cable to deliver voice, data and video services through the Canadian information highway. The Beacon Initiative lead by the Stentor group is designed to deliver video on demand, home shopping and banking, to link computers in schools and hospitals, and deliver services to businesses.[69] The

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66 See report cited in supra note 14 at 10.

67 "Cogeco Cable Inc.: Thriving on Competition and the DBS Threat" Telecommunications File, published by Deca The (Montreal) Gazette (June 9, 1994) 15.

68 McPhail, supra note 4 at 67.

69 "Beacon Initiative Will Pump Billions into the Economy" The (Toronto) Globe and Mail (May 13, 1994) C16.

Beacon Initiative will be open to CATV operators, providers of telecommunications services, and multimedia suppliers for the delivery of their services.[70] Videotron Ltd., the second largest CATV operator in Canada, and five partners, recently formed a consortium to deliver a home version of the information highway offering interactive television, video games, home shopping, banking, advertising, and electronic mail via a broadband network.[71] The development of the Canadian information highway will stimulate the demand for innovative services, and it is expected that the different industries will form alliances in order to gain competitive advantages over services offered by competitors.

In addition to competition from telephone companies, CATV operators may expect competition in the delivery of video services from satellite providers. BCE announced plans for an alliance of Canadian broadcasters, specialty channel providers, pay-TV and interactive television providers,[72] to provide an alternative to the American DBS service offered by

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70 For corporations with private networks, the interconnection with the public information highway will render their private networks more worthwhile. See supra note 19 at 3.

71 The consortium is known by its acronym UBI (Universality Biodirectionality, Interactivity) and comprises Videoway Communications Inc., Videotron's parent company Le Groupe Videotron Ltd., The National Bank of Canada, Hydro-Quebec, Loto-Quebec, Canada Post Corporation and the Hearst Corporation. This broadband network service is planned for Montreal starting in 1996. See "Cable TV leading the Charge Down Super Highway" The (Toronto) Globe and Mail (May 13, 1994) C20.

72 The alliance is comprised of BCE, Astral Communications Inc., Le Groupe Videotron Ltd., CFCF Cable Inc. of Montreal, Rodgers Communications, the JLL Broadcast Group of Toronto, and Shaw Communications of Edmonton. BCE which views the new service as a means of competing with American DBS has been challenged by the Canadian Cable TV Association which is concerned that CANCOM and Telesat Canada will use their monopoly positions to enter a

DirecTV Inc. The alliance plans to use Telesat Canada's Anik E satellite to provide service to remote areas. In areas with cable, the signals will be channelled to homes via the CATV monopolies, and in isolated areas, homes and businesses will be able to hook up to the new services with 24-inch VSAT dishes via CANCOM.[73] In the event that the proposed alliance is licensed to operate the new DBS service, Canadian CATV operators will be faced with competition from a domestic DBS satellite provider.[74]

In the area of satellite delivered services, today to the year 2001, the satellite sector is expected to face new challenges, namely, overcapacity and competition from fibre optics, and the role of satellites is predicted to change from a primary transmission technology to a complementary provider of services.[75] In Canada, CANCOM has responded to the competition from fibre optics by shifting from broadband services to business services, and is attempting to convince corporations to transmit voice, data and video services via satellite, urging that VSAT rates are cheaper than long-distance charges.[76]

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competitive business. At present, all small cable companies are obliged under CRTC regulations to purchase programming from CANCOM. BCE does not view the proposed consortium as being competitive with cable operators. See Dougherty, supra note 24 at 1.

73 Ferrabee, James, "Canadian Cable & Communications Companies Join Forces" The (Montreal) Gazette (May 21, 1994) C3.

74 Ibid.

75 McPhail, supra note 4 at 67.

76 Ibid. at 68.

The trend among multinational U.S. corporations, however, is to bypass the public switched telephone network and build private fibre optic cable networks for intra-corporate transmission of voice, data and video. Some analysts predict that the increase in private networks will in time diminish the status of the public switched telephone network significantly as private corporate networks account for an increasing volume of telecommunications traffic.[77]

According to Unitel, which recently formed an alliance with AT&T,[78] private corporate networks are considered as the wave of the future for multinationals and Canadian companies. The private network phenomenon represents one of the most important challenges facing telephone companies, and the Unitel-AT&T alliance is a response to the competition from private networks. Canadian companies are expected to use VSAT satellite services, but it is also expected that international competition in Canada for innovative services will create competition between ISDN systems, satellites, and the public switched network.

2. Emergence of a Canadian ISDN Information Infrastructure

Canada recognizes that the telecommunications technology of the future is ISDN,

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[77] Ibid. at 69.

[78] Unitel formed an alliance with AT&T as a means of acquiring new technologies since AT&T is the leader in corporate networks. AT&T acquired 20% of Unitel in January 1993. Unitel's alliance with AT&T followed Bell Canada's alliance with MCI Communications Inc. See "The Clash of the Titans" Telecommunications File, published by Deca The (Montreal) Gazette (June 9, 1994) 12.

which will evolve from the public switched network and private networks.[79] While Canadian telecommunications, broadcasting, and computing industries have in the past neither competed nor cooperated, and basically operated in separate markets with little synergy, the integration of voice, data and video will lead to innovative services, as well as strategic alliances and competition between cable, telephone, and satellite service providers.

It is expected that the Canadian information highway will be built on an open network architecture and that public and private networks including existing and planned cable, satellite, and wireless networks will be linked together to create a seamless Canadian telecommunications network.[80] The adoption of international technical standards and an open architecture will ensure proper interconnection between existing and planned networks. Similarly to the NII Initiative in the United States, the Canadian information highway will be developed and designed to be compatible with satellite systems with the goal of achieving a seamless information infrastructure, and eventually to be linked and integrated with foreign ISDN systems.

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79 Engelhart, Kenneth G., "Introduction to Regulatory Matters" Canadian Telecommunications in the Nineties: The Long Distance Competition Debate (Manotick, Ont: Donald J. Cruickshank Associates Inc., 1989) at 25.

80 Ottawa, Spectrum Information Technologies and Telecommunications Sector of Industry Canada, The Canadian Information Highway: Building Canada's Information and Communications Infrastructure (Ottawa: Minister of Supply and Services Canada, April 1994) at 13.

Canada is in a good position to move its telecommunications industry into the 21st Century. There are several federal government laboratories and private companies[81] with expertise in the integration of wireless terrestrial and satellite networks, integration of CATV and telephone networks, and enabling technologies for the delivery of telecommunications services in a multimodal environment. This expertise is expected to assure a place for Canada in the setting of international ISDN standards which must be developed so that advanced satellite systems may carry ISDN traffic.

Until recently, ISDN and multiple interconnected ISDN systems, have been regarded as futuristic. However, Canada, the United States, the European Union, and Japan are building information highway networks which will in a competitive telecommunications market provide the incentive for Canadian CATV, telephone, and computing industries to develop innovative services. The emerging Canadian infrastructure will, together with parallel initiatives in other countries, promote transmission through fibre optic cable leading to greater multimodal competition between satellite systems and future ISDN systems.

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81 Canada has several organisations including MPR Teltech, Mitel, Newbridge, Novatel, SHL Systemhouse, Canadian Marconi, Spar, IBM Canada and COMDEV (Computing Devices) with systems integration and research capabilities in terrestrial and satellite communications, as well as government laboratories with expertise in areas that will be important in the national information R&D program including the National Research Council and the Centre for Information Technologies Innovation. Ibid. at 18.

B. THE REGULATION OF THE CANADIAN TELECOMMUNICATIONS INDUSTRY IN A COMPETITIVE ERA

1. Departure from a Monopoly Era

There have been, since 1989, major changes in the Canadian telecommunications environment. The most significant changes include the 1989 Supreme Court of Canada decision in Alberta Government Telephones v. Canadian Radio-Television and Telecommunications Commission[82] whereby the Court held that Canada's major telephone companies which are members of the Stentor group are all subject to exclusive federal jurisdiction; the reorganization of the major telephone companies which previously operated in a loose alliance through Telecom Canada into Stentor, as a means of providing the market with new services[83] and ensure that Canada's major telephone companies are in a position to face the challenges of global competition in telecommunications; the CRTC's Telecom Decision 92-12[84] allowing Unitel Communications Inc. (previously CNCP Telecommunications) to enter the public long-distance market which, as discussed earlier, decreed full competition in the provision of public long-distance telecommunications service; and finally the transborder alliances between MCI

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82 Alberta Government Telephones v. Canadian Radio-Television and Telecommunications Commission, (1989) 2 S.C.R. 225.

83 Janisch, Hudson N., "At Last! A New Canadian Telecommunications Act" Telecommunications Policy (Toronto: Butterworth-Heinemann Ltd., December 1993) at 691.

84 See Telecom Decision CRTC 92-12, cited in supra note 59.

Communications Corporation and Stentor, as well as AT&T and Unitel Communications Inc.[85]

In addition to these changes, the general trend towards liberalization and competitive entry is evidenced by the privatization of Teleglobe Canada,[86] the overseas carrier which routes traffic between Canadian domestic carriers and over 200 foreign countries via transoceanic cables, as well as INMARSAT and INTELSAT satellites,[87] and the privatization of Telesat Canada,[88] the monopoly domestic satellite carrier which leases satellite capacity to broadcasters, CATV operators, and members of the Stentor group.[89] Teleglobe Canada is

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85 The Stentor group licensed MCI's intelligent network platform at a cost of $150 million which enables it to provide "Advantage V Net" corporate network services, the first seamless international virtual corporate network. In the case of the AT&T-Unitel alliance, AT&T invested equipment and technology in Unitel in exchange for 20% ownership in Unitel. The arrangement provides Unitel with access to AT&T's new service offerings, as well as technical and marketing expertise. See Janisch, Hudson N., "Canadian Telecommunications: The World Turned Upside Down", Canadian Law Newsletter, Vol. XVIII (Summer 1993) at 8.

86 Teleglobe Canada Reorganization and Divestiture Act, S.C. 1987, c. 12.

87 Janisch, supra note 85 at 6.

88 Telesat Canada Reorganization and Divestiture Act, S.C. 1991, c. 52.

89 In 1977, when Telesat Canada sought approval of an agreement to become a member of Telecom Canada (replaced in 1992 by the Stentor group), the proposal was objected to by several intervenors on the basis that the satellite carrier would represent a competitive alternative to the terrestrial networks of the telephone companies, and would place other carriers using Telesat at a competitive disadvantage to the members of Telecom Canada. See Snow, supra note 2 at 182. However, when the Canadian government's interest in Telesat was sold to the members of Telecom Canada, the Director of Investigation and Research at the Bureau of Competition Policy declined to intervene on the grounds that terrestrial telecommunications and satellites operated in entirely separate markets. See also Janisch, supra note 85 at 7.

owned by Memotec Data, a computer company, and BCE which owns a one-third interest in Teleglobe. Telesat Canada is owned by the Stentor group. Teleglobe and Telesat were effectively privatized into the hands of the major telephone companies, as part of the overall privatization policies of the Conservative federal government elected in 1984.[90]

The creation of the Stentor group in January 1992 to replace Telecom Canada represents a determination on the part of telephone companies to face the challenges of the coming era of competition and a change of philosophy. Under the umbrella of Telecom Canada the common concerns of telephone companies included system wide pricing, contributions from long distance to local service and a commitment to universal service.[91] The common concerns of Telecom Canada reflected a monopoly era. The Stentor group has replaced these concerns with new common interests of competition, namely, new corporate services and global competitiveness.

2. CRTC Regulation under the Telecommunications Act of 1993

The changes discussed above mark a departure from an era of monopoly to an era of competition in Canadian telecommunications. In view of these changes Canada's regulatory regime moved from regulated monopoly to regulated competition. Prior to the 1993

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90 Janisch, Ibid.

91 Ibid. at 8.

Telecommunications Act[92] coming into force, the Canadian government appointed a Senate Committee to study the proposed legislation. The Committee concluded that in a rapidly changing telecommunications environment, regulation should be used only "where there is a substantial danger of abuse of residual monopoly power otherwise regulation will smother the benefits of competition".[93]

The 1993 Telecommunications Act resulted from the need to give full effect to federal jurisdiction over telecommunications regulation, to grant the CRTC regulatory forbearance powers, and to address the demand from Canadian business for rates and services similar to those available in the United States.[94] The Act endorses government involvement in the regulatory process in accordance with the principle of regulation only where required and only to the extent necessary.[95]

The Act maintains key regulatory mechanisms including rate regulation[96] and prohibition against unjust discrimination.[97] In addition, the Act introduces new rules requiring

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92 Telecommunications Act, S.C. 1993, c. 38 (hereinafter 1993 Telecommunications Act).

93 Schultz, Richard J. & Janisch, Hudson N., Freedom to Compete: Reforming the Canadian Telecommunications Regulatory System (Ottawa, Ont.: Corporate Public Affairs Dept, Bell Canada, 1993) at 4.

94 Janisch, supra note 83 at 692.

95 See report cited in supra note 14 at 36.

96 See 1993 Telecommunications Act, supra note 92, s. 25.

97 Ibid. at s. 27.

a high level of Canadian ownership of telecommunications common carriers,[98] authorizing regulatory forbearance and exemption from regulation for competitive services,[99]allowing for rate regulation through methods other than traditional rate-of-return regulation,[100] and setting limits for expedient decision-making by the CRTC.[101]

The 1993 Telecommunications Act has been criticized as not providing the CRTC with a clear direction from the policy objectives enumerated in Section 7, as entrenching rate-setting and cross-subsidies in Section 25, and as failing to put forth a regulatory regime which is suitable to a changed competitive telecommunications environment.[102] Under Section 7 of the Act, the government affirms that the Canadian telecommunication policy includes the following objectives: to facilitate the development of a telecommunications system which strengthens the social and economic fabric of Canada, to promote universal service to all regions of Canada, to promote the ownership and control of Canadian carriers by Canadians, as well as to enhance the competitiveness of Canadian telecommunications at both the national and international level, to foster increased reliance on market forces for the provision of services, and to ensure that regulation where required is efficient and effective.

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98 Ibid. at s. 16.

99 Ibid. at s. 34.

100 Ibid. at s. 27(5).

101 Ibid. at s. 26.

102 Schultz, supra note 93 at 5.

While it may be said that the objectives enumerated in Section 7 of the Act are in conflict with one another, Section 7 nevertheless provides a comprehensive statement of Canada's national goals and the challenge is for regulatory authorities to reconcile the conflicts, prioritize the objectives, and find the right mix of regulation and competition. Successful regulation is viewed as requiring a clear legal mandate to regulatory authorities which defines the objectives of regulation, and where the line between monopoly and competitive services is not evident, the regulator must be given discretion to move the line as needed in order to benefit from competition.[103]

The Act introduces, however, no fundamental changes to Canada's public regulatory institutions. The CRTC which has since 1976 regulated Canadian telephone companies,[104] and other common carriers of telecommunications services, including Teleglobe Canada and Telesat Canada, remains responsible for regulating telecommunications within a changed competitive market structure.[105]

According to the Vice-Chairman of the CRTC, traditional CRTC regulation aimed at ensuring that common carriers did not abuse their dominant market position, by seeking to earn more than the overall rate-of-return that investors would require from competitive

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103 Miller, Nicholas P., "Regulation: Reconciling Policy Objectives", Implementing Reforms in the Telecommunications Sector, ed. by Bjorn Wellenius and Peter A. Stern (Washington, D.C.: The World Bank, 1994) at 489.

104 Canadian Radio-Television and Telecommunications Commission Act, R.S. 1985, c. C-22.

105 See Schultz, supra note 93 at 3.

businesses facing similar risks, or by unfairly discriminating between subscribers.[106] In the transition to increased competition, the CRTC's challenge is to ensure that dominant carriers do not unfairly use their dominant market power against competitors, while ensuring at the same time that the regulatory regime does not restrict their ability to compete.

The CRTC supports a Canadian regulatory regime which fosters efficiency, equity, and innovation.[107] In its Public Notice initiating the Review of Regulatory Framework,[108] the CRTC identified certain regulatory objectives. These objectives include universal service, equitable treatment of subscribers in terms of service and price, assurance that telephone companies do not abuse their dominant market power in dealing with competitors, and encouragement of the development and widespread availability of new technology and innovative services which respond to consumer and business needs.[109] The goal of the CRTC is to regulate the telecommunications industry in an efficient manner and to regulate in the public interest. The position of the CRTC is that regulation should focus on protecting subscribers and service suppliers from abuses of dominant market power, and that there is no need to emphasize regulation as a means of protecting the public interest if there is sufficient competition.[110]

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106 Sherman, Louis R., "Review of Regulatory Framework" (Paper presented at the National Conference on the Future of Telecommunications Policy in Canada, Toronto, April 1, 1993) at 3.

107 Telecom Public Notice 92-78, Review of Regulatory Framework (CRTC December 16, 1992).

108 Ibid.

109 Sherman, supra note 106 at 5.

110 Ibid.

With respect to rate regulation under Section 25, although the prevailing view is that regulatory authorities should move to deregulate rates in the new era of competition, the 1993 Telecommunications Act maintains rate regulation based on the principle that rates are to be just and reasonable,[111] and that a telecommunications carrier cannot practice undue discrimination among its subscribers.[112] These provisions uphold traditional regulation, but are not considered as effective as competition in promoting economic efficiency.[113] Also, they are not considered to be in harmony with the CRTC's Telecom Decision 92-12. However, it is important to remember that the purpose of the CRTC 92-12 decision was to promote greater competition in the marketplace, and that it was not a deregulatory decision.[114]

Traditionally, the CRTC used rate-of-return regulation to ensure that telephone company rates were just and reasonable and that they did not earn monopoly service revenues to engage in unacceptable forms of discrimination,[115] or use such revenues to cross-subsidize competitive services and network expansion. The Act provides under Section 27(5) for rate regulation using methods other than rate-of-return (i.e. price-cap method) which provides incentives for telephone companies to reduce their costs, and removes the incentives of cross-

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111 1993 Telecommunications Act, supra note 92, s. 27(1).

112 Ibid., s. 27(2).

113 See Sherman, supra note 106 at 2.

114 See Schultz, supra note 93 at 13.

115 Schultz, supra note 7 at 475.

subsidizing competitive services from monopoly service revenues.[116]

In the context of a changed competitive environment, one argument against any form of price regulation is that rate regulation is a poor substitute for market forces and influences investment decisions by monopoly carriers, which emphasize investments in traditional services to the detriment of new more risky services.[117] Another argument, is that despite the large economies of fibre optic cable networks, other transmission mediums such as radio-based terrestrial networks, cable networks, satellite networks, or a combination of these systems may soon compete with traditional telephone networks in offering access, transmission, and innovative services, and that it would be erroneous to maintain rate regulation in Canada.[118]

On the other hand, rate regulation is recognized as being crucial for major segments of the telecommunications industry that operate as monopolies such as the local communications access infrastructure. In view of emerging technologies and recent market developments, telephone companies will be tempted to increase rates for local service as a means of supporting expansion of networks. It has been suggested that in the long-term some form of rate regulation will always be required, and that regulatory authorities must play an active role

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116 Ibid. at 480.

117 Chairman, Paul, "Regulation and Competition Policy", Implementing Reforms in the Telecommunications Sector, ed. by Bjorn Wellenius and Peter A. Stern (Washington, D.C.: The World Bank, 1994) at 514.

118 Crandall, Robert W., "Managing the Transition to Deregulation in Telecommunications: A Perspective from the United States" (Paper presented at the National Conference on the Future of Telecommunications Policy in Canada, Toronto, April 1, 1993) at 21.

in monitoring and promoting compliance with network expansion agreements.[119] A reliance on market forces for the development of information infrastructures, may meet some of the policy objectives of the Act. However, it would be contrary to the public interest if telephone companies were to increase rates for local service and use revenues generated from monopoly services to monopolize the development of future ISDN infrastructures.

With respect to ownership of telecommunications infrastructures by common carriers under Section 16, the Act limits the foreign ownership of Canadian companies which distribute telephone services to 20%.[120] Broadcasting regulations also impose a strict 80% Canadian ownership requirement on broadcasters and CATV operators.[121] In view of the emerging ISDN environment, Section 16 may be criticized as being ill-fitted in a global competitive market. However, the provision reflects the Canadian government's determination to reinforce Canadian sovereignty and cultural identity through ownership and control of the telecommunications infrastructure and broadcasting system.[122]

In a competitive environment characterized by converging industries and ISDN development, it is argued that the cross-industry ownership restrictions as well as the 80%

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119 See Townsend, supra note 40 at 508.

120 For a definition of a qualified Canadian corporation, see s. 22 of the Canadian Telecommunications Common Carrier Ownership and Control Regulations, SOR/94-667, C. Gaz., Part II, Vol. 128, No. 23 at 3536.

121 See Direction to the CRTC Respecting Eligible Canadian Corporations, C.R.C., c. 376 at 2549.

122 See report cited in supra note 80 at 11.

Canadian ownership and control rule may no longer be appropriate. However, relaxation of these rules for the sake of integration of a market-oriented environment could have the effect of undermining competition and cultural policies.[123] The Canadian government therefore imposes regulation by prohibiting telephone companies from holding broadcasting and CATV licenses,[124] and upholds a system of structural separation and cost allocation. These rules are designed to allow a monopolist to enter the competitive market through separate corporate structures while at the same time allowing regulatory authorities to allocate costs between service categories, as a means of ensuring that competitive services are not subsidized by monopoly services.[125]

With respect to regulatory forbearance and exemption from regulation for competitive services under Section 34 of the Act, which is considered to be the most effective manner of shifting from regulation to selective competition in telecommunications, it is important to remember that forbearance is not a substitute to regulation nor is it deregulation.[126]

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123 Ibid. at 22.

124 See supra note 25.

125 Schultz, supra note 7 at 479.

126 Forbearance provides and results in greater freedom from regulatory intervention in the telecommunications sector by involving a "discretionary decision" with implementation left to the judgment of regulatory authorities. Deregulation on the other hand comes into effect by legislation directly removing the regulator's power to control the industry's conduct and performance. See Schultz & Janisch, supra note 93 at 18.

Prior to the 1993 Telecommunications Act, the CRTC was denied regulatory forbearance power to refrain from regulation based on a discretionary decision that the purposes of the Act are better served by such restraint. The Act, however, grants the CRTC authority to forbear from enforcing a requirement of just and reasonable rates, as well as prohibitions on unjust discrimination and undue or unreasonable preference, on the basis that competition may achieve these same objectives. The CRTC, in fact, may exercise complete discretion in determining whether the level of competition for a particular service justifies forbearance.[127] Regulatory forbearance is therefore a compromise between rate deregulation and traditional monopoly regulation objectives of just and reasonable rates and non-discrimination. It provides a regulatory alternative to market-driven rate structures and may be used with line of business and cost allocation restrictions to protect the interests of subscribers and service providers.

Under Section 47 of the Act, the CRTC must exercise its powers with a view to implementing Canadian telecommunications policy objectives, as well as ensuring that telecommunications carriers provide services at just and reasonable rates and on a non-discriminatory basis. Although the Act does not set forth a clear commitment to open competition as a means of achieving the government's policy objectives, these include greater levels of competition,[128] reliance on market forces, as well as the obligation to ensure that regulation where required is efficient and effective.[129] The emphasis on market forces, which

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127 Ibid. at 19.

128 See 1993 Telecommunications Act, supra note 92, s. 7(c).

129 Ibid., s. 7(f).

implies that rate-setting be guided by costs rather than value of service, may contradict the goal of affordable telecommunications services which may only be possible throughout Canada by way of significant cross-subsidies.[130] In view of Section 47, it is expected that the CRTC will shape Canada's telecommunications policy as it exercises its forbearance powers under the Act. In principle, future CRTC decisions and policy choices should be suitable to a competitive era given the wording of Sections 7(e) and 7(f) of the new Act. In view of Section 34(3) which provides that the CRTC shall not refrain from regulation in situations where "to refrain would be likely to impair unduly the establishment or continuance of a competitive market", it would appear that the new Act is supportive of a competitive environment.

The fact that the nature of the Canadian telecommunications industry is ever-changing will render future legislative reform necessary. According to Professor Janisch "telecommunications is by its nature highly volatile - it is as if we were seeking to regulate quicksilver" and furthermore:

> "One immediate response to this volatility must be in flexibility built right into any legislation. This is very evident in the Canadian legislation. The challenge then is to strike the right balance between rule and discretion, a perennial concern in legislative drafting, but one greatly exacerbated by the critical importance of telecommunications on the one hand, and on the other its ever-changing nature. This mandates highly incremental decision-making processes rather than dispositive principles of long-term application. Yet there needs to be a principled structure within which incrementalism may operate, i.e. a coherent set of weighted policy objectives."[131]

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130 See Janisch, supra note 85 at 15.

131 Janisch, supra note 83 at 697.

It is submitted that the 1993 Telecommunications Act provides a viable regulatory regime for a competitive telecommunications environment, and that we will have to wait and see whether the new legislation is implemented by the Canadian regulatory authorities with the right balance between rule and discretion.

With respect to convergence between cable and telephony, the Act provides some initial responses, namely, the relaxation of the traditional strict separation between content and carriage,[132] the granting to CATV operators of construction powers traditionally granted to telephone companies,[133] and situations in which telecommunications carriers must follow the policy objectives of the Broadcasting Act.[134]

3. Impact of Information Industry Convergence and Competition on Public Interest Regulation

The 1993 Telecommunications Act sets forth Canada's policy goals with respect to the regulation of the telecommunications industry. It establishes that regulation should focus on the safeguards required to protect telecommunications users and service providers from abuses of dominant market power. It also establishes that in the presence of sufficient competition, the marketplace protects the public interest and there is no need to emphasize regulation as a means of protecting the public interest.

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132 See 1993 Telecommunications Act, supra note 92, s. 36.

133 Ibid., ss. 43, 44.

134 Ibid., s. 28.

The role of the CRTC is to regulate in the public interest, which involves regulating the industry in a manner which is appropriate in the new competitive era and which encourages technological progress. Traditionally, the telecommunications market structure was composed of well defined service providers using different technologies to serve different markets. The availability of different transmission technologies such as telephony, cable, cellular radio, and satellite systems as well as the introduction of digitalization, fibre optics, ISDN systems, mobile satellite systems, and the multimedia services which are being developed by service providers to feed the Canadian information highway, are challenging the notion of regulation in the public interest. Technological progress is one of the main reasons for the transition from monopoly regulation to regulated competition, and regulation based on the public interest will weaken as new technologies change the nature of the industry.

According to a policy paper commissioned by Bell Canada, as a contribution to the public debate on telecommunications policy changes, technological progress will render all markets competitive in the near future, and Canadian regulation should not be geared to a monopoly market structure since monopoly providers of telecommunications services will not exist in the future.[135]

Digital technology is at the basis of the profound changes shaping the telecommunications industry in Canada. It is being introduced into the different transmission technologies, and accounts for the proliferation of new communications services. The

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135 Schultz, supra note 93 at 7.

development of digital technology is leading to convergence of the computing and telecommunications industries, and will provide telephone and CATV operators with the ability to deliver virtually identical or similar voice, data and video services through the same digital transmission technologies, namely, fibre optic cables and satellites.[136] Advances in fibre optics, digital compression and switching technologies will make it possible for telephone companies to deliver high quality video signals and eventually television programming, and therefore compete with CATV operators. In turn, CATV operators will be able to deliver HDTV, as well as data and voice services through fibre optic cable networks in competition with telephone companies.

Traditionally, Canadian regulation of telephone companies has been limited to carriage and not the content of signals. The CATV industry, on the other hand, has been regulated as an integral part of the Canadian broadcasting system, governed by broadcasting regulations focused on the content of signals and the protection of Canadian cultural sovereignty.[137] It is submitted that content regulation of CATV operators under the public interest standard should not place them at a competitive disadvantage, and that convergence of the telephone and cable industries resulting from digital transmission technologies will raise the need to re-examine traditional regulation of the two industries.[138]

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136 See Courtois, supra note 42 at 4.

137 See report cited in supra note 14 at 4.

138 Cable operators and other participants in the Canadian broadcasting, video and music industries are concerned about the entry of telephone companies into broadband distribution markets. Their concerns relate to the impact that the distribution of telephone programming by telephone companies could have on the

According to telephone companies, their monopoly position in the market is disappearing as a result of the availability of digital transmission technologies and, as a result, are strongly advocating deregulation of telecommunications. In fact, the telephone companies are looking at information industry convergence in the future on a much larger scale involving wireline and wireless telecommunications, CATV, satellites, data processing and computer networks,[139] all enabled by digital technology to deliver innovative services.

In reality, however, the Stentor group of telephone companies is at the forefront of the development of Canada's information highway and fibre optic cable transmission is expected to be the primary transmission medium in the emerging digital age. With assets in 1990 totalling some CD$30 billion, almost ten times that of cable operators,[140] telephone companies are in a position to dominate the Canadian telecommunications market and the development of future ISDN infrastructures. It has been suggested that important facilities are and will likely remain a monopoly regardless of competition.[141] For this reason, it is crucial that the existing regulatory regime and future regulatory reform proposals respond appropriately.

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ability of the cable industry and the Canadian broadcasting system in general to meet the cultural objectives of the Broadcasting Act, S.C. 1991, c. 11 (hereinafter 1991 Broadcasting Act). For details see report cited in supra note 14 at 106ff.

139 See report cited in supra note 14 at 2-3.

140 Ibid. at 157.

141 Miller, supra note 103 at 492.

It is submitted that the regulatory framework provided by the 1993 Telecommunications Act is appropriate in the transition to increased competition. While it can be said that the best form of regulation of any business is the threat of effective competition in the marketplace, and that competition and regulation are incompatible,[142] it is submitted that the threat of competition is insufficient. The role of the CRTC in regulating the telecommunications industry remains important and will ensure that the development of Canada's ISDN infrastructure is not dominated by the interests of telephone companies. Advocates of deregulation are using technological progress and recent market developments to undermine the need for regulation. However, it is submitted that regulation will remain important to ensure competition between service providers as well as transmission technologies.

a. Rate Regulation

Rate regulation ensures universal access to services and protects subscribers and service providers from unfair business practices.[143] Rate regulation under the 1993 Telecommunications Act opens the door to price caps and other methods which provide the CRTC with flexibility in assessing the reasonableness of rates.[144]

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142 Ibid. at 485.

143 Bell Canada currently subsidizes local telephone service with approximately CD$2 billion from competitive service revenues. According to Bell Canada, in an increasingly competitive global marketplace, such subsidies place a serious burden on the industry's competitive service rate levels and has a detrimental impact on the competitiveness of Canadian business. For details see report cited in supra note 14 at 23.

144 Keenleyside, Anthony, H.A., "Canada does not Need New Comprehensive Telecommunications Legislation" (Paper presented at the National Conference on the Future of Telecommunications Policy in Canada, Toronto, April 1, 1993)

b. Cross-industry Ownership Restrictions

Cross-industry ownership restrictions for Canadian telephone companies and CATV operators uphold competition between the industries and separate regulatory rules although, as will be discussed in Section C, policy proposals have been put forth to relax existing rules while promoting effective competition between the two industries as well as the computer and broadcasting sectors.

c. Cross-border Ownership Regulation

Cross-border ownership regulation is important in view of the global trend towards deregulation and privatization, and serves to protect Canada's telecommunications sovereignty, as well as ensure that the development of innovative services is controlled by Canadian carriers in the spirit of the policy objectives of the 1993 Telecommunications Act. Emerging technologies are leading to cross-border alliances as discussed earlier, and the pressures are great to deregulate the telecommunications sector. In spite of global trends, Canada has nevertheless maintained a foreign ownership rule as a safeguard against foreign monopoly in the presence of numerous national competing carriers. It is submitted that the popularity of cross-border alliances aimed at taking advantage of convergence, as well as new business opportunities presented by the Canadian information highway and ISDN development renders the foreign ownership rule appropriate.

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at 3.

d. Universal Service

The emerging telecommunications environment raises the need for a redefinition of universal service[145] to adjust to the emerging digital age. It is submitted that as innovative services are introduced into the marketplace, the government will have to revise the concept of universal service to ensure that Canadians have access to an adequate range of services at reasonable rates.[146] In the United States, the Clinton Administration is committed to extending the universal service concept to ensure that services are available on the NII to all users, and that the development of networks provides access and connectivity to rural and low-income areas at reasonable rates.[147] In all likelihood, the Canadian government will also adhere to the policy goal of universal service. However, in the absence of cooperation on the part of industry in achieving this objective, government regulation will become important in assuring universal access to innovative service and product offerings.

e. Intellectual Property and TDF Regulation

The emerging global ISDN telecommunications environment raises privacy and

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145 Pursuant to s. 7(b) of the 1993 Telecommunications Act, it is the objective of Canadian telecommunications policy to render reliable and affordable telecommunications services accessible to Canadians in both urban and rural areas in all regions of Canada. In keeping with this objective, the Canadian government is committed to developing an expanded concept of universal service to ensure universal access to essential services on the information highway for all Canadians, since as innovative services are introduced, the range of services considered essential will change. See supra note 80 at 12.

146 Ibid.

147 Washington, Information Infrastructure Task Force, The National Information Infrastructure: Agenda for Action (Washington: U.S. Government, September 15, 1993) at 8.

security concerns, and has the potential of undermining national interests. It will be essential that ISDN development provide users with assurances of transmission security. In Canada, the issues of privacy protection and network security are being studied intensely. The Canadian Advisory Committee on the Information Highway is examining security and encryption devices that will be required to secure the privacy rights of Canadian citizens and businesses, as well as protect the national security, and the informational sovereignty interests of Canada.[148] The free flow of sensitive business information may have serious consequences for Canadian business, and the regulation of TDF both in the private and public sectors will become increasingly important.[149] It has been suggested that the basis for a legal solution exists in the Radiocommunications Act,[150] and the 1993 Telecommunications Act.[151] The recent intrusion of the Pentagon's military network (Milnet) through the Internet by intruders tapping into its unclassified computer system,[152] illustrates the potential security problems which may arise from the lack of appropriate security measures and regulation of TDF.

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148 Cobain, David, "Computer Security is High-Tech Holy Grail" The Financial Post (May 21, 1994) 522.

149 Matte, Nicolas Mateesco & Jakhu, Ram S., Law of International Telecommunications in Canada (Baden Baden: Nomos Verlagsgesellschaft, 1987) at 54.

150 See Radiocommunications Act, S.C. 1989, c. 17, s. 83.

151 See 1993 Telecommunications Act, supra note 92, ss. 7(i), 41.

152 "Pentagon Cannot Track Down Computer System Invaders" The (Montreal) Gazette (July 22, 1994) A10.

The emerging global ISDN telecommunications environment will challenge traditional intellectual property laws in Canada and elsewhere,[153] and will raise the need for effective international regulation in the area of TDF. The development of fibre optics technology and the future interconnection of national information highways, will facilitate the movement of digitized computing and multimedia services across national boundaries. In the area of protection of intellectual property works in digital form, fibre optics and industry convergence will facilitate the alteration of content of digital media (i.e. the presentation, sequence, size, and format of digital media), and make it necessary to adjust protection to cover content modification and distribution of modified content,[154] as well as copyright protection of computer software and databases.[155] In the area of TDF, the linkage of computer technology with telecommunications will make it difficult for Canada and other countries to control what information is available internationally.[156]

International cooperation has lead to soft law resulting from the OECD Guidelines

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153 See Samuelson, Pamela, "Digital Media and the Changing Face of Intellectual Property Law" (1990) 16 Rutgers Computer & Technology Law Journal 323 at 324.

154 Allen, supra note 5 at 38.

155 Motyka, Carol A., "Effects of U.S. Adherence to the Berne Convention" (1990) 16 Rutgers Computer & Technology Law Journal 195 at 196-197.

156 De Sola Pool, Ithiel & Solomon, Richard Jay, "Intellectual Property and Transborder Data Flows" (1980-81) 16-17 Stanford Journal of International Law 113 at 139.

on the Protection of Privacy and Transborder Data Flows of Personal Data.[157] These guidelines state the principle of free flow of information between countries where reciprocal data protection legislation has been enacted, subject to privacy protection of personal data relating to individuals. They are in force but are not legally binding on member countries. Effective regulation of TDF requires appropriate rules to resolve legal issues related to computer fraud, illegal use of computer facilities at a distance, contract enforcement, copyright, and other legal issues which may arise from the global use of ISDN technology.

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157 OECD, Directorate for Science, Technology and Industry, Guidelines on the Protection of Privacy and Transborder Data Flows of Personal Data (Paris: OECD, 1980).

C. COMPREHENSIVE CANADIAN POLICY AND REGULATION IN THE EMERGING ISDN ENVIRONMENT

1. Regulated Competition Approach to Regulation

Traditionally, the rationale for regulating the Canadian telecommunications industry involved the policing of monopoly power and broad policy objectives such as sovereignty, universality, and regional development.[158] The rationale for regulation of telephone carriers by the CRTC is that the government is concerned with the market position of telephone companies and has sought to introduce safeguards against abuses of dominant market power. Policy makers are, however, arguing that the traditional objectives of telecommunications policy are no longer suitable due to advances in transmission technologies which allow non-telephone companies to provide telecommunications services, challenging the notion that telephone companies operate under conditions of natural monopoly.

The arguments in favour of deregulation are very strong on the part of telephone companies. The arguments are that regulation is ill-fitted for a changed competitive market and, that if the Canadian telecommunications industry is to strive, and if sovereignty over its telecommunications infrastructure is to be maintained, then all Canadian carriers should compete equally in the market and, finally, that Canadian regulatory and policy makers should deregulate the industry since Canada cannot afford in an increasingly competitive and open global marketplace to regulate the industry. On the other hand, many Canadian market analysts have

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158 See McPhail, supra note 4 at 202.

taken the position that deregulation is not a desirable option,[159] and the question which remains is whether the existing Canadian regulatory regime prevents or supports the emergence of a national telecommunications policy capable of meeting the challenges of international competition, and moving Canada's technological potential into the 21st Century.

It is submitted that the changes introduced in the 1993 Telecommunications Act support the emergence of such a policy. While competition is incompatible with regulation,[160] the existing regulatory regime of regulated competition reflects a move on the part of Canada to substitute competitive pressures for government regulation as the preferred means of pursuing its telecommunications policy objectives. Ultimately, the objective of Canada may well become full deregulation of the telecommunications sector depending on the competitive pressures of the global marketplace.

However, until the structure and conditions prevailing in the marketplace are such that competition can be sustained, it is submitted that Canada's regime of regulated competition is appropriate during the transition to full and effective competition. According to one author:

> "Although regulated competition certainly has its drawbacks, it seems both naive and disingenuous to propound the feasibility of unregulated competition immediately upon the heels of a Century dominated by a regulated monopoly, at least without first modifying the structure of the market to strip the traditional

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159 Janisch, supra note 8 at 34.

160 Schultz, supra note 93 at 20-21.

> telephone companies of their dominant positions in the industry."[161]

It is submitted that the regulated competition approach[162] which the Canadian government has adopted serves the public interest and will continue to do so, provided that the CRTC regulates the industry in a manner which does not prejudice the future development of the telecommunications infrastructure. The government's policy objectives confirm that competition is viewed as the means of promoting the public interest,[163] especially in view of the policy objectives of the 1993 Telecommunications Act.[164] The Canadian government is basically committed to ensuring that the industry services the public interest without hindering technological progress.

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161 Watson, Robert, "What Implications does the New Telecommunications Legislative Have for Resellers", Profiting from Canada's Telecommunications Act: New Rules for a Dynamic Industry (Toronto: Insight Press, 1993) at 5.

162 Regulated competition has come to be part of the telecommunications vocabulary to describe what at least from an economist's perspective is the marriage of regulation and competition - two incompatible and diametrically opposed behavioural constructs. It involves a policy shift from monopoly to competition, and the promotion of competition without the elimination of government regulation. The regulated competition which Canada is experiencing in the telecommunications sector will continue during the transition to full and effective competition, namely, until the market structure has been modified to strip telephone companies of their dominant position in the industry. The purpose of regulation during the transition to competition is basically to achieve effective and sustainable competition in the telecommunications marketplace. Ibid. at 4-5.

163 See Butler, Dale, "Implications of the New Telecommunications Act", Profiting from Canada's Telecommunications Act: New Rules for a Dynamic Industry (Toronto: Insight Press, 1993) at 14.

164 See 1993 Telecommunications Act, supra note 92, subs. 7(c), (f), (g).

2. Policy and Regulation for the Converging Industries

Emerging technologies and convergence will lead to greater competition in the Canadian telecommunications industry, reducing the need for regulation as the preferred means of pursuing policy objectives. In the absence, however, of full and effective competition, Canada's regulatory regime should continue to uphold social policy goals and correct abuses of dominant market power. While there was much pressure to remove social policy goals from the regulatory regime, the 1993 Telecommunications Act upholds them. It is submitted that although regulation must be appropriate for the technology of the industry and should not hinder technological progress or competition, the solution is not to remove social policy goals or the protection of universal service.

Regulatory forbearance under the Act reflects Canada's policy to promote the public interest through competition and restraint of regulation. The forbearance power of the CRTC under the Act is critical, as it provides the CRTC with the ability to gradually reduce regulation and promote competition of telecommunications in Canada. By virtue of Section 34, the CRTC is able to refrain from regulation in matters relating to conditions of service, approval of rates, reasonableness of rates, approval of working agreements, and unjust discrimination in relation to services provided by Canadian carriers. While rate-setting and social subsidies which uphold the principle of universal service at affordable prices appear entrenched by the CRTC 92-12 regulatory decision and Section 25 of the Act, the CRTC may in the future, given its forbearance powers set aside these traditional social policy objectives, if there is full and

effective competition in the marketplace.

The convergence of telephone and cable transmission technologies and markets, will raise the need to re-examine the legal rules traditionally applied to the two industries since technological progress will make it possible for cable and telephone companies to provide identical or similar services over their separate local networks. As discussed earlier, traditional regulation of these industries is distinct. Telephone companies have been regulated pursuant to the 1993 Telecommunications Act,[165] as common carriers, and where the use of the radio frequency spectrum is involved, they are regulated pursuant to the Radiocommunication Act.[166] CATV operators, on the other hand, have been regulated since 1968 pursuant to the Broadcasting Act,[167] with a focus on the content of signals transmitted and the protection of Canada's cultural sovereignty.

According to the Report of the Co-chairs of the Local Networks Convergence Committee, while government policy and regulation should not promote the full integration of local network infrastructures for the delivery of telephone and CATV services, regulations and policies will need to be reviewed occasionally.[168] Such reviews will ensure that these industries adopt a cooperative approach, despite the competitive environment, if required for

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165 Ibid., ss. 2, 16, 22.

166 See ss. 2, 5 of the Radiocommunications Act, S.C. 1989, c. 17, as amended by ss. 91, 92 of the 1993 Telecommunications Act, supra note 92.

167 See 1991 Broadcasting Act, supra note 138, ss. 2, 4.

168 See report cited in supra note 14 at 55.

efficient and cost-effective integration and interconnection of their network facilities.

The Committee Report recommended that government policy and regulation should not prevent cooperative arrangements between telephone companies and CATV operators for the sharing of support structures such as fibre optic cable networks.[169] The fact that telephone companies may very well take the lead in upgrading to fibre optic cables has raised concern in the CATV industry over the potential anti-competitive conduct of telephone companies should they be allowed to own cable facilities. The CATV industry is also concerned that telephone companies will monopolize the local network infrastructure. While it is not clear which industry will own and control the evolving ISDN infrastructure, regulatory intervention will be required to uphold competition in local infrastructures and ensure that the objectives of the 1991 Broadcasting Act are not frustrated.[170]

With respect to the cross-subsidization and non-discriminatory principles discussed earlier, the regulation of cross-subsidies and discrimination will become increasingly important

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169 Ibid. at 65.

170 In anticipation of cable companies leasing systems from common carriers and sharing the fibre optic facilities of telephone companies, the 1991 Broadcasting Act adopted a technology neutral regulation which allows the CRTC to regulate regardless of the fact that CATV operators use telephone company facilities to provide cable service. Section 9(1)(f) of the Act will ensure that Canadian broadcasting objectives are met for the distribution of programming to the public over the telephone network infrastructure. If and when the delivery of programming services over the telephone network infrastructure poses a threat to the objectives of the Act, it will be possible to adequately regulate providers of programming services that use the telephone networks or other means of telecommunications to transmit such services. Ibid. at 70.

in the regulation of competition in the local broadband market. The regulation of the upgrading of telephone company networks will also be important in order to prevent abuses of dominant market power in the local telephone market, as well as prevent subsidization of innovative services.[171] Given the interest of telephone companies in innovative services aimed at the Canadian information highway, it will be important to enforce CRTC prohibitions against unjust discrimination in order to ensure that telephone companies continue to provide competitors with non-discriminatory access to local networks for the distribution of competitive services on the information highway,[172] and do not grant to themselves preference in relation to the distribution of services.

As a safeguard against the potential dominant position of telephone companies, the Committee Report recommended that telephone companies not be allowed to hold majority ownership interest or de facto control over service providers, and that their investment interests in affiliated multimedia service providers should be regulated.[173] Ownership restrictions and separate affiliate requirements will ensure that telephone companies deliver information services of unaffiliated service providers on a non-discriminatory basis, and without cross-subsidy from monopoly local telephone service revenues. The Committee further recommended that investments in programming and information services by the telephone and CATV industries be

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171 The CRTC through its annual Construction Program Review process examines the reasonableness of plans by Canadian telephone companies to install fibre optics facilities which will permit increased broadband capabilities to be introduced in their networks. Ibid. at 37.

172 Ibid. at 120.

173 Ibid.

done through separate affiliates in the future.[174] It has been suggested that these ownership and line of business regulatory safeguards will eliminate abuses of dominant market power, and serve to maintain a competitive marketplace.

3. The Need for a Flexible Policy and Regulatory Regime

A flexible policy and regulatory regime is recognized as essential for the development of Canada's information highway, and the interconnection between networks allowing for the introduction of innovative services. Regulatory safeguards aimed at fostering competition between industries will ensure that the local telecommunications network infrastructure evolves in a manner which is compatible with Canada's telecommunications policy of regulated competition and which supports a competitive market structure.

Comprehensive regulation and policy will support the competitiveness of Canada's telecommunications industry with respect to American DBS, and enable the Canadian cable and telephone industries to cooperate and integrate their network facilities, if necessary, to ensure more efficient and cost-effective networks. The regulatory and policy position which Canada takes with respect to upgrading of network infrastructures should serve to maintain a competitive market structure.

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[174] Ibid.

Canada's telecommunications regulatory policy for the future should promote universality of service, foster a competitive environment, be aimed at efficient regulation, and support the development of innovative services and a national ISDN information infrastructure. In view of the Canadian information highway and ISDN development, CATV operators will upgrade their networks using fibre optic cables and digital compression technologies, and telephone companies will seek to use new technologies such as B-ISDN, digital switching, and multimedia applications in order to meet the demands of a competitive marketplace.

It is expected that the Canadian government will stimulate technological innovation and market competition through the adoption of an open network architecture policy allowing the entry of new network operators and service providers.[175] It is also expected that the Canadian government will promote the development of a flexible regulatory environment that will stimulate private sector investment while at the same time ensuring the protection of Canada's traditional broad policy objectives of sovereignty, universality, and regional development.

It is submitted that a policy and regulatory environment which establishes a balance between regulation and competition and which ensures that regulation serves the public interest, will serve Canada's national interests economically, socially and culturally, and is the best way of moving Canada's technological potential into the 21st Century.

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[175] Engelhart, supra note 79 at 25.

CHAPTER III
THE INTERNATIONAL TELECOMMUNICATIONS ENVIRONMENT

A. THE ROLE OF SATELLITES IN THE EMERGING GLOBAL ISDN ENVIRONMENT

1. Integration of Satellite/Cable Transmission Technologies

The development of fibre optic cables, new wireless technologies, digital compression, and switching techniques allowing communication of digital information across wireline and wireless networks is moving telecommunications into the 21st Century. As discussed earlier, these developments are creating a demand for broadband capabilities for transmitting advanced voice, data and video services, and it is expected that public and private networks including existing and planned telecommunications, cable, satellite, and wireless networks will be linked together to eventually create a seamless global ISDN information infrastructure.

The introduction of digital fibre optic cables and ATM technology[176] means that satellites and fibre optic ISDN systems will become interchangeable for many

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[176] ATM is the basic building block for B-ISDN to handle voice, data, and video traffic. ATM technology is the basis for integrating networks of all kinds: local area networks, metropolitan area networks, wide area networks, and later nationwide and worldwide information highways which will propel the telecommunications industry and the overall telecommunications infrastructure into the 21st century. Hancock, Ellen M., "Asynchronous Transfer Mode - The Coming Revolution" World Communications and Technology (Mitek, 1994) at 101.

telecommunications services.[177] In view of the market trends and developments discussed earlier, the question arises as to what will be the role of satellites in the future global ISDN environment.

Some analysts predict that the advent of the global ISDN information infrastructure could, in the future, drive satellites into marginally profitable niche markets or confine them to the role of emergency backup for terrestrial systems. Such predictions are based on the delays which are intrinsically part of satellite transmission links.[178] The time delays in satellite transmission initially led the ITU-T to place restrictions on the use of satellite links for international ISDN communications. However, national interests in a reliable network in times of natural catastrophes, manmade disasters, or war, render space-based communications attractive in an ISDN configuration,[179] and may dictate particular architectures.

Digital information highways will not drive away satellites because satellites have the advantages of ubiquity, mobility, distance insensitivity, and resiliency. The fact that satellites deliver reliable voice, data and video communication services to moving terminals such

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177 Sarreals, supra note 9 at 295.

178 Because the orbit of a geostationary satellite is 36,000 kilometres from the earth, the return time for a signal received by satellite to be retransmitted to Earth is approximately 0.275 seconds. The time delay is significant and means that satellite channels require access techniques. Pujolle, G., Seret, D., Dromard, D., Horlait, E., Integrated Digital Communications Networks, Vol. 2 (New York: John Wiley & Sons, 1988) at 183.

179 Rutkowski, A.M., "The Integrated Services Digital Network: Issues and Options for the Future" (1983) 24-25 Jurimetrics Journal 19 at 37.

as ships, planes, and space vehicles,[180] as well as to locations that terrestrial communications networks either do not or cannot reach,[181] renders satellite technology essential to the future global ISDN information infrastructure.

The U.S. Government promotes the use of satellites in the future ISDN environment and gives them a role in the NII. As part of the NII Initiative, the Clinton Administration is committed to transferring broadband spectrum currently used by the U.S. Government to the FCC for subsequent auctioning and licensing to the private sector.[182] Wireless service providers which currently provide narrowband communications view the new spectrum which will be auctioned by the Clinton Administration as an opportunity to move into broadband services and compete with CATV, telephone, data processing, and other service providers. The broadband spectrum to be auctioned will be the wireless equivalent of terrestrial

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180 Pooch, Udo W., Machuel, Denis & McCahn, John, Telecommunications and Networking (Boca Raton, Fl.: CRC Press, 1991) at 122.

181 DalBello, supra note 15 at 50.

182 On July 25, 1994 the FCC initiated the first of a series of radio spectrum auctions. The items auctioned were ten nationwide narrowband (i.e. 901 to 941 Mhz) Personal Communications Services (PCS) licenses for delivery of advanced cordless telephone, pager, portable facsimile machine, and wireless data network services. On October 26, 1994 the FCC auctioned another thirty such regional narrowband licenses. In the coming months, the FCC will auction 3,312 narrowband PCS licenses of various geographic sizes and 2,071 broadband (i.e. 1850 to 2200 Mhz) licenses for delivery of advanced services. The first two auctions generated over US$1 billion, and it is estimated that the upcoming broadband auctions will generate over US$10 billion for the U.S. Treasury. See Bykowsky, Mark M. & Ledyard, John O., "The Assignment of Public Assets: Spectrum Auctions in the United States", Office of Policy Analysis and Development, National Telecommunications and Information Administration, U.S. Department of Commerce, November 21, 1994, {unpublished article}, at 3ff.

fibre optic ISDN systems.[183]

It is recognized that the NII Initiative and the development of a global ISDN information infrastructure will require improvement of the spectrum allocation process, encouragement of compatibility between terrestrial and space-based systems, as well as support for competition in the marketplace. The position of the Clinton Administration is expected to be one whereby traditional support for open markets and fair competition is maintained, whereby traditional support is given to private global and regional service providers, and whereby technical standards are developed and applied to fibre optic ISDN systems, as well as satellite systems. Such a position by the U.S. Government will ultimately lead to the seamless integration of satellites operating in the future global ISDN environment.

2. Configuration of the Global ISDN Information Infrastructure

Notwithstanding the position of the Clinton Administration, it is believed that the future global ISDN information infrastructure is destined to be largely a terrestrial configuration with satellite backup[184] given the optimal transit rate and other attractive features of fibre optic links for transmission in an ISDN environment. Basically, it is expected that a very reliable B-ISDN fibre optic cable transmission system implemented on a worldwide basis will characterize the future global ISDN environment, and that fibre optic ISDN systems will be complemented

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183 Anderson, supra note 12 at MIT40-950-306.

184 See Rutkowski, supra note 179 at 37.

by a global advanced satellite system. It is also expected that satellites will provide fixed links to rural and remote areas where it is not economical to install fibre optics, as well as links to moving terminals.

3. Initiatives for the Development of Advanced Satellite Systems

Several initiatives for advanced high-powered digital satellites have been taken by the private sector, NASA, and INTELSAT in response to the broadband capacity of fibre optic ISDN systems.

a. Private Sector

In March 1994, Microsoft Corporation, the computer network giant in the United States, unveiled plans to branch into global telecommunications through a US$5 million investment in Teledesic Corporation, a venture to build a US$9 billion[185] global communications network of 840 LEO satellites to deliver digital voice, data and video services ranging from high-quality voice channels to broadband channels supporting videoconferencing, interactive multimedia and real-time two way digital data services. Teledesic Corporation plans

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[185] The branching out from computers to global telecommunications systems, through Teledesic Corporation, by the founder of Microsoft Corporation is strategic. Microsoft Corporation is moving to control as large a share as possible of the limited supply of satellite slots which are to be auctioned by the FCC. It is considered that the orbital slots to be acquired by auction for the Teledesic proposed network of 840 LEO satellites will grow in value as the global information infrastructure is built. Castro, Janice, "Is Bill Gates Getting Too Powerful?" Time Magazine (April 4, 1994) at 46.

to begin fixed telephone and broadband data service in the year 2001, providing switched digital connections between users of the network and via gateways to users of other networks. The proposed Teledesic LEO satellite system will use ATM technology for delivery of voice, data and video services to foreign markets without antenna restrictions or other terrestrial infrastructures in place.[186]

b. NASA

In May 1992, NASA launched its Advanced Communications Technology Satellite (ACTS) system which is designed to respond to the telecommunication needs of the 21st Century.[187] NASA's ACTS experiment program will demonstrate how future satellite systems can be seamlessly merged with terrestrial fibre optic B-ISDN systems and will pioneer communications technologies such as Ka-band communications, and narrowband and broadband ISDN communications.[188] It is believed that future ACTS-like satellite systems will be competitive with fibre optic ISDN systems in capacity, cost performance, and reliability

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186 Brown, Patricia, "Choice of ATM in Teledesic Initiative Gives Technology New Prestige: But is it Too Much, Too Early?", Broadband Networking News, Vol. 4, No. 7 (Phillips Business Information Inc., April 5, 1994) at 1.

187 Olmstead, Dean A., "NASA's Advanced Communications Technology Satellite (ACTS): The Future of Broadband Satellites", INTER COMM 90: Global telecommunications Congress and Exhibition, Congress Proceedings, ed. by Peter J. Booth and Clara M. McEachern (Vancouver, October 23-26, 1990) at 136.

188 Current technology allows communications satellite systems to exploit the spectrum resource across a wide array of frequencies. The C, K-u, and K-a bands have desirable signal characteristics, and it is expected that most new satellite systems will use these bands to satisfy the communication needs of the future. Rothblatt, Martin A., "Satellite Communication and Spectrum Allocation" (1982) 76 American Journal of International Law 56 at 57.

especially in rural and remote areas,[189] and that advanced broadband satellite links will merge with fibre optic ISDN systems to expand communications in areas which would be without access to innovative services were it not for such satellite links. The ACTS program is expected to lead to the goal of seamless B-ISDN transmission throughout the global network.

c. INTELSAT

In 1992, INTELSAT announced that it would examine non-terrestrial optical LEO satellite systems accessed from the ground at optical frequencies that would interconnect with other satellites by optical inter-satellite links and downlink to earth at optical frequencies, extremely valuable for high-speed broadband digital transmission. INTELSAT is investigating new technologies for application in the next generation of satellites to be launched around the year 2000, and is investigating non-terrestrial optical systems.[190]

In response to the competition represented by fibre optic B-ISDN systems and advanced private satellite systems, INTELSAT will have little choice but to complement its geostationary system by introducing new advanced satellites. INTELSAT satellites currently carry about 50% of all international telecommunications traffic, and provide domestic communications services to some 40 developed and developing nations.[191] Forecasts provided by INTELSAT users substantiate positive growth and demand for INTELSAT services.

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189 Olmstead, supra note 187 at 138.

190 Hampton, John D., "INTELSAT in the 1990s", Communications Technology International (Mitek, 1992) at 36.

191 Ibid. at 35.

However, the global trend towards deregulation and privatization of international telecommunications combined with competition from ISDN systems, will have a great impact on the patterns of INTELSAT traffic,[192] and it is expected that there will be important changes in the distribution of international traffic carried on satellite and fibre optic cables for certain routes. Following INTELSAT's 1991 Global Traffic Meeting, an overall positive growth rate was projected for a few years while the cable/satellite ratios adjust on heavy traffic routes with subsequent increases in the growth rate after the adjustment process is completed.[193]

It was, however, acknowledged that for the next years to come much of the future traffic growth on heavy routes will be secured by fibre optic ISDN systems, and that patterns of traffic carried on the INTELSAT system are likely to change. Nevertheless, INTELSAT expects that overall demand for its services will increase over the years, and it is determined to offer competitive services.[194]

Ultimately, the role of satellites in the future global ISDN information infrastructure will be determined by their technological and economic competitiveness relative to fibre optic ISDN systems. The potential impact of multimodal competition from future fibre optic ISDN systems and advanced private satellite systems on the INTELSAT system will be discussed in Sections C and E of this Chapter.

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192 Ibid.

193 Ibid.

194 Ibid. at 36.

B. INTERNATIONAL REGULATION OF MULTIMODAL TELECOMMUNICATIONS UNDER THE INTELSAT AGREEMENT

1. Objectives of INTELSAT

The International Telecommunications Satellite Organisation (INTELSAT) was established in 1964 as an international cooperative to provide global satellite communications. INTELSAT was formed following passage by U.S. Congress of the Communications Satellite Act of 1962, which provided that the United States would participate in the creation of an international satellite organisation[195] designed to pool international resources and provide for sharing among countries of the costs and risks involved in the development of satellites for international communications.

INTELSAT is unique among international telecommunications carriers in that it is a cooperative composed at present of 135 signatories to the 1971 INTELSAT Agreement,[196] which created the organisation and which defines the rights and obligations of member States.[197] INTELSAT has its basis in Resolution 1721 (XVI) adopted by the United Nations General Assembly on December 20, 1961 which provides that satellite communications should

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195 Burch, Dean, "Emerging Competitive Forces in International Communications: Satellites and Cables" (1985) 54 Antitrust Law Journal 227 at 227.

196 Agreement Relating to the International Telecommunications Satellite Organisation (hereinafter 1971 INTELSAT Agreement) reproduced in Karl-Heinz Bockstiegel & Marietta Bendo, eds., Space Law: Basic Legal Documents, Vol. 2. (Boston, Mass.: Martinus Nijhoff Publishers, 1992) at Chapter V.I.

197 Leive, David M., "INTELSAT in a Changing Telecommunications Environment" (1983-85) 24-25 Jurimetrics Journal 82 at 85.

be available to all countries on a global and non-discriminatory basis.[198] Pursuant to this resolution, the countries of the world whether members or non-members of INTELSAT, are connected into the global INTELSAT system.

The Preamble of the INTELSAT Agreement sets forth the objectives of INTELSAT, namely, to achieve a single global commercial telecommunications satellite system which provides expanded telecommunications services to all areas of the world, to contribute to world peace and understanding, and to ensure that satellite communications are organized so as to permit all countries to have equitable access to the global system, by making the most equitable use of the spectrum/orbit resource. By virtue of the INTELSAT Agreement, member States have committed themselves to the global distribution of satellite channels and, in practice, equitable access to the scarce spectrum/orbit resource is guaranteed under Article 44 of the 1992 International Telecommunications Convention, taking into account the special needs of developing countries and the geographical situation of particular countries.[199]

The main objective of INTELSAT is the management of the space segment required for reliable delivery of public international telecommunications services[200] on a non-

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198 Several provisions of the 1971 INTELSAT Agreement provide that INTELSAT services are to be available on a non-discriminatory basis, namely, Preamble, Articles III(a), III(c), VI(c), V, and VIII(b)(v)(C), supra note 196. Also, see Rodriguez, Paul. R., "International Telecommunications and Satellite Systems INTELSAT and Separate Systems: Cold War Revisited", International Business Lawyer, Vol. 15, No. 7 (International Bar Association: July/August 1987) at 322.

199 See 1992 International Telecommunications Convention, supra note 1, art. 44.

200 See 1971 INTELSAT Agreement, supra note 196, arts. III(a), I(h), I(k), V(d).

discriminatory basis to all areas of the world, and the challenge of INTELSAT in the future is in dealing with the changing international telecommunications environment. The regulation and management of international satellite communications by INTELSAT is important in order to ensure equitable access to the spectrum/orbit resource by developing countries. In the absence of regulation of the resource, there would be no subsidization of the poorer parts of the INTELSAT system, and this would negatively affect developing countries.

Regulation of the resource is in keeping with the common heritage of mankind principle contained in the Outer Space Treaty of 1967,[201] which establishes the legal rule that outer space must be explored and used in the common interest of all countries without discrimination, on the basis of equality, and in accordance with international law, and that outer space is not subject to national appropriation or to any claim of sovereignty either by means of use, occupation, or otherwise. Contracting parties to the Outer Space Treaty of 1967 are legally obliged to exercise their freedom of use and exploration of outer space in a manner which does not infringe the common heritage of mankind principle. The fact that the common heritage principle has the status of a norm of jus cogens,[202] reinforces the importance of INTELSAT's role in the regulation and management of international satellite communications.

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201 See Articles I and II of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies (hereinafter 1967 Outer Space Treaty) reproduced in Milde, Michael, ed., Annals of Air & Space Law, Vol. XVIII, Part II (Paris: A. Pedone, 1993) at 615ff.

202 Christol, Carl Q., "The Jus Cogens Principle and International Space Law", Proceedings of the Twenty-Sixth Colloquium on the Law of Outer Space (IISL, October 10-15, 1984) 1 at 7.

2. Article XIV Coordination in the Context of Intermodal Competition

Article XIV of the INTELSAT Agreement sets forth the rights and obligations of member States, which are not precluded from establishing separate systems to meet domestic and international needs. Member States are, however, required to consult with INTELSAT prior to implementing separate systems in order to ensure technical compatibility and avoidance of significant economic harm to the INTELSAT system. The purpose of the coordination requirement under Article XIV of the INTELSAT Agreement is to preserve the integrity and economic viability of the INTELSAT space segment for international public telecommunications services,[203] as well as to achieve the objective of equitable use of the spectrum/orbit resource for the benefit of all countries as set forth in the Preamble of the Agreement.

The success of INTELSAT over the years can be attributed to the flexibility of the INTELSAT Agreement which allowed for the establishment of separate regional satellite systems such as INMARSAT to serve maritime needs, EUTELSAT for the European Union, ASIASAT for the Asian countries, ARABSAT for the Arab countries and, PALAPA which began as a domestic satellite service to serve Indonesia, and which presently provides regional public international telecommunications services to Malaysia, Singapore, Thailand, and the Philippines.[204] In addition, several U.S. private satellite systems have been authorized since

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203 Leive, David M., "International Telecommunications and Satellite Systems II: INTELSAT", International Business Lawyer, Vol. 15, No. 7 (International Bar Association, July/August, 1987) at 317.

204 Burch, supra note 195 at 236.

the mid-1980s by the FCC to provide service across the North Atlantic, following the U.S. Presidential Directive issued in November 1984 which decreed that private systems would be in the national interest.[205]

The INTELSAT Agreement has the flexibility to accommodate varying degrees of competition through the coordination requirement of Article XIV, and to offer service and acquisition arrangements though the mechanisms provided under Article III of the Agreement. Article III of the Agreement sets forth INTELSAT's scope of activities. It specifies how the INTELSAT space segment will be used and sets forth general principles pursuant to which INTELSAT may make its space segment capacity available. In accordance with these principles, INTELSAT may provide satellites and associated facilities separate from the INTELSAT space segment for other domestic public telecommunications services.[206] The flexibility of the INTELSAT Agreement has been used in the development and implementation of INTELSAT's planned domestic service offering which provides users the possibility of purchasing space segment capacity from INTELSAT to meet domestic needs. Once purchase arrangements are completed and agreed upon, the capacity sold is no longer considered part of the INTELSAT space segment.[207]

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205 Logue, Timothy J., "U.S. Decision on Pacific Telecommunications Facilities: Letting a Million Circuits Bloom" (1986) 27 Jurimetrics Journal 65 at 71.

206 Art. III(c) of the 1971 INTELSAT Agreement establishes that to the extent that INTELSAT's main objective is not impaired, the INTELSAT space segment is also available for other domestic public telecommunications services on a non-discriminatory basis. See supra note 196.

207 Leive, supra note 203 at 317.

Under the INTELSAT Agreement, member States are obliged to avoid allowing the establishment of alternate communication satellite services which may cause significant economic harm to the INTELSAT system. However, Article XIV provides the possibility for INTELSAT members to enter into a coordination process with INTELSAT, provided that one or more foreign Parties to the INTELSAT Agreement agree to take part in the process, and authorize the use of the proposed separate satellite system by its nationals.

The coordination requirement under Article XIV establishes whether a non-INTELSAT satellite system intended for use by a member State is compatible with its commitment to protect the interests of INTELSAT. The coordination ensures the economic viability of the INTELSAT system, and secures INTELSAT's priority use[208] of the spectrum/orbit resource. While Article XIV may appear contrary to the principle of freedom of outer space under the Outer Space Treaty of 1967[209], which includes the freedom to use telecommunications, in reality the Article XIV requirement establishes an international agreement among INTELSAT members, including States party to the Agreement, their authorized signatories, and other entities within their jurisdiction, to limit their freedom of use of the resource in the interests of INTELSAT.[210] Some of the arguments in favour of maintaining economic and technical coordination under Article XIV include the fact that telecommunications

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208 Jakhu, Ram S., "International Regulation of Satellite Telecommunications", Space Law Applications: Course Materials" (Montreal: McGill University, January 1992) at 100.

209 See 1967 Outer Space Treaty, supra note 201, art. I, para. 2.

210 Jakhu, supra note 208 at 103.

is a public utility, that coordination ensures that the objectives of INTELSAT are upheld, that INTELSAT offers uniform standards and non-discriminatory rates and, also that it is in the public interest to safeguard the INTELSAT system.

Notwithstanding the above, the coordination requirement under Article XIV of the INTELSAT Agreement has inherent weaknesses. Firstly, Article XIV only applies to member States of the INTELSAT Agreement.[211] If a State is not a member of INTELSAT, it need only coordinate its use of the spectrum/orbit resource with the ITU, which implies that new satellites of non-INTELSAT States may be approved solely by the ITU. Secondly, member States of the INTELSAT Agreement are free to withdraw from the Agreement should they wish to do so.[212] Thirdly, the obligation to refrain from establishing alternate separate systems which cause significant economic harm to the INTELSAT system are moral in nature given that Article XIV coordination findings are in the form of recommendations, and not legally binding upon INTELSAT signatories,[213] which means that in essence the right to establish separate systems is based on the sovereign right of each country. Fourthly, the concept of significant economic harm under the INTELSAT Agreement lacks a definition,[214] and INTELSAT has not quantified the degree of economic harm which would be considered significant. In view of

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211 Matte, Nicolas M., Aerospace Law: Telecommunications Satellites (Toronto: Butterworth & Co. (Canada) Ltd., 1982) at 123.

212 See 1971 INTELSAT Agreement, supra note 196, art. XVI.

213 McKnight, Lee, "The Deregulation of International Satellite Communications: U.S. Policy and INTELSAT Response" (1985) 3 Space Communication and Broadcasting 39 at 51.

214 Matte, supra note 211 at 134.

the pattern of approval of separate satellite systems on the basis that they do not cause significant economic harm, and the fact that there is virtually complete absence of negative Article XIV recommendations, the concept of significant economic harm remains vague.

In addition, Article XIV does not provide a mechanism to limit competition from terrestrial ISDN systems. The INTELSAT Agreement, in fact, accommodates any particular degree of competition in the internal arrangements of member States,[215] and they are free to determine the degree of internal competition which is in their national interests in terms of earth station and terrestrial infrastructures, as well as to determine how INTELSAT's international communication satellite services are to be distributed.

3. INTELSAT's Response to Multimodal Competition

In response to the competitive challenges posed by advanced separate satellite systems, INTELSAT has proposed to change the consultation process and assess the economic impact of separate satellite systems on the INTELSAT system on an incremental or cumulative basis. Under such a proposal INTELSAT would assess the impact of future separate satellite systems in conjunction with the impact on INTELSAT of all previously authorized separate systems.[216] In other words, only in the event that the total economic impact of all systems scheduled to be in operation during the period for which coordination of a new separate system

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215 Leive, supra note 197 at 89.

216 Rodriguez, supra note 198 at 322.

is sought, is determined to not be significant, would a positive coordination determination be issued.

In response to the changing telecommunications environment characterized by multimodal competition, INTELSAT continues to develop new rates and services. Under Article V(d) of the INTELSAT Agreement, the Board of Governors has considerable discretion to set rates on the basis of operational parameters such as voice, television, data, power, bandwidth, type of satellite capacity, degree of protection, and other specifications.[217] Flexible and competitive rates as well as effective enforcement of restrictions on new proposed systems may enable INTELSAT to remain viable, and are imperative to INTELSAT in a competitive environment.

Over the years, the United States has encouraged intramodal competition. The rationale behind positive Article XIV coordination determinations of several U.S. private satellite systems was that the separate systems benefited telecommunications users since they provided innovative services which were different from the range of services provided by INTELSAT,[218] and did not cause significant economic harm to INTELSAT since they did not have as their main purpose to carry traffic which was either already carried or planned to be carried by INTELSAT.

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217 Leive, supra note 203 at 318.

218 See McKnight, supra note 213 at 51.

INTELSAT has limited the impact of separate satellite systems on the INTELSAT system, by barring interconnection of separate satellite systems with the domestic public switched network in the United States and foreign countries, which represents a substantial part of INTELSAT's core business.[219] In so doing, INTELSAT is protecting its future viability. However, these restrictions have been challenged as being anti-competitive.[220]

4. The Need for Regulation of ISDN Development

It is submitted that the nature of the obligation of member States under Article XIV of the INTELSAT Agreement should be analyzed within the framework of ISDN development. The enforcement of Article XIV coordination as discussed earlier, has the objective of upholding a viable INTELSAT. However, the coordination requirement under Article XIV of the INTELSAT Agreement is undermined by technological progress and multimodal competition. INTELSAT has only dealt with coordination of satellite systems under Article XIV, and has not dealt with policy issues as to what should be the appropriate international communications mix of facilities between cables and satellites. Moreover, the

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219 Burch, supra note 195 at 237.

220 In July 1990, Lyracom Space Communications which operates PANAMSAT launched a $1.5 billion antitrust suit against COMSAT and petitioned the FCC to abolish the public switched network restriction on separate satellite systems, on the basis that the PSN restriction is anti-competitive in a deregulated environment and that communications systems are increasingly interrelated in the modern information environment. Asker, James, R., "Upstart Satellite Companies Press for New Telecommunications World Order", Aviation Week & Space Technology, Vol. 135, No. 14 (October 7, 1991) at 50-51.

INTELSAT Agreement limits the activities of INTELSAT to satellites, and does not provide a means by which decisions as to the proper international communications mix of facilities could be made, nor is INTELSAT involved in the authorization of fibre optic ISDN systems, and there is no multilateral mechanism for dealing with planning capacity.[221]

The challenge of INTELSAT in the future is in dealing with multimodal competition. It is believed that the advent of advanced satellite systems, ISDN systems, and the new generation of INTELSAT VI satellites will lead to an imbalance of supply over demand of 11 to 1.[222] The problem of excess capacity is said to be building up and raises the question as to what is the right balance between competition and the preservation of INTELSAT. Although, the FCC is involved in the authorization of transAtlantic and transPacific fibre optic cables, it has not balanced competition between satellite and cable transmission systems in the provision of international telecommunications services.

In addition, although INTELSAT ensures reliable international satellite communications services, it does not control the international telecommunications market since cables are outside the INTELSAT framework. Fibre optic ISDN systems provide strong competition to INTELSAT as will be discussed later in this Chapter, but the INTELSAT Agreement does not address the issue of intermodal competition between cables and satellites,

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221 See Boone, Robert E. Jr., "The Shape of Things to Come: New Proposals, New Technologies, New Competition, Antitrust Implications, and Some of the Players" (1985) 54 Antitrust Law Journal 259 at 272.

222 Burch, supra note 195 at 243.

which means that member States are free to determine the degree of competition in their domestic provision of communication services offered through INTELSAT. Under the INTELSAT Agreement member States may have very different domestic communications policies, all of which can co-exist within the INTELSAT framework.

The fact that cable transmission media is outside the INTELSAT framework poses a problem, in terms of controlling the international telecommunications market, since there is no forum in which INTELSAT Member States may deal with the issue of intermodal competition and the impact of intermodal competition on the INTELSAT system.[223] It is recognized that the development and use of fibre optic ISDN systems has the potential of seriously eroding INTELSAT's market base, and although INTELSAT's Board of Governors makes decisions regarding new satellite systems based on future traffic growth forecasts submitted by member States, and those decisions are essentially based on decisions of members concerning the desired mix of cable and satellite facilities, cable transmission media remains unregulated.

The fact that cables are not subject to any form of multilateral international control is considered to be a product of history, of international regulatory inertia, and of the speed of technological change. The intermodal competition to INTELSAT created by fibre optic technology is said to present policy makers with a choice between the serious impairment of the INTELSAT system, and the expansion of existing international regulatory arrangements to encompass the development and use of fibre optic ISDN systems.

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[223] See Boone, supra note 221 at 282.

It has been suggested that a policy decision is required to extend international regulation of telecommunications to the development and use of fibre optic ISDN systems. The regulation by INTELSAT of fibre optic cables is viewed as a rational adjustment of INTELSAT's constitutional mandate and consistent with the guiding principle of INTELSAT, namely, the exploitation of technological progress for the provision of telecommunications services to all countries with due regard to their present and future needs.[224] The potential impact of multimodal competition on the INTELSAT system resulting from the increased use of fibre optic ISDN systems will require INTELSAT and the international community to address the issue of the scope of INTELSAT's mandate, as well as the issue of regulation of ISDN development.

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224 Potamitis, Smathis, "Satellite Telecommunications Services" (1986) 44 University of Toronto Faculty of Law Review 33 at 56.

C. THE IMPACT OF MULTIMODAL COMPETITION ON THE INTELSAT SYSTEM

1. Non-INTELSAT Satellite Systems

In view of the trend towards global deregulation of the telecommunications industry in the United States and elsewhere, the ever-increasing competition from non-INTELSAT systems, and the introduction of fibre optic ISDN systems, the future viability of the INTELSAT consortium is questionable. It is, in fact, believed that INTELSAT has replaced AT&T as the new deregulatory target.[225]

The challenge to the INTELSAT system began in the mid-1980s, with the authorization of several private satellite systems under the Presidential Directive issued by President Reagan on November 28, 1984.[226] While most satellite traffic was until the mid-1980s routed through INTELSAT via COMSAT which serves as the U.S. signatory to the INTELSAT Agreement, the pattern in the United States has been to authorize private U.S. satellite systems to operate international satellite telecommunications facilities.

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225 Sarreals, supra note 9 at 268.

226 The Presidential Directive was strongly objected to by INTELSAT, COMSAT, as well as from many INTELSAT members (governments party to the Intelsat Agreement) and signatories (national operating entities). However, following a prolonged review by the Senior Interagency Group on International Telecommunications, President Reagan issued a Presidential Directive on November 28, 1984 which decreed that private satellite systems would be in the national interest. Logue, supra note supra 205 at 71.

RCA American Communications Inc. (RCA) was authorized to provide voice, data and video transmission between the United States, the European Union, and Africa; International Satellite Inc. (ISI) was authorized to provide the same services as RCA between the United States, the European Union, and as far east as the Adriatic Sea; Orion Satellite Corporation was authorized to provide voice, data and video services using digital technology between Eastern United States and Western Europe; Cygnus Satellite Corporation was authorized to provide digital communication services including video teleconferencing, high-speed facsimile, computer-to-computer communications, remote printing, teletext, videotext, and data collection and distribution services between the United States and Western Europe.[227] In addition, more recent separate systems viewed as challenging the INTELSAT system include PANAMSAT for service in Latin America, as well as the TONGASAT and PACIFIC STAR systems for service in the Pacific.[228]

Over the years, the United States has favoured the introduction of private U.S. satellite systems and has encouraged technological progress through the allowance of competition. The authorization of new U.S. satellite systems for international service has been rationalized as being in the national interest, and has been supported by the argument that the public interest is served by competition which promotes the development and availability of advanced satellite services not provided by INTELSAT. The economic impact of intramodal

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227 Sugar, Eva M., "The Deregulation of Comsat: Will Competition Alone by the Answer?" (1986-87) 13 Syracuse Journal of International Law & Commerce 185 at 185.

228 Asker, supra note 220 at 50-51.

competition from the separate domestic and regional systems including EUTELSAT, ARABSAT, ASIASAT, PANAMSAT, and TONGOSAT is not easily assessable. However, the decline in INTELSAT revenues over the last few years is attributed to the competition created by these non-INTELSAT systems.[229]

2. Emerging ISDN Terrestrial Systems

Although separate satellite systems and traffic diversion to alternative private satellite operators are forces which will weaken INTELSAT's future ability to fulfil its mandate,[230] it is believed that the real challenge to the INTELSAT system in the future is intermodal competition from fibre optic ISDN systems.[231] The future availability of interchangeable ground and space-based transmission systems for voice, data and video services made possible by the development of digital fibre optic ISDN systems, will lead to increased competition between cable and satellite transmission systems. Ultimately, intermodal competition will have a negative impact on the INTELSAT system, and unless INTELSAT responds to the demand for innovative products and services, alternative private satellite and cable operators will serve the market.[232]

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229 Ibid.

230 Sarreals, supra note 9 at 296.

231 Asker, supra note 220 at 51.

232 See Glassie, Jefferson C., "Analysis of the Legal Authority for Establishment of Private International Communications Satellite Systems" (1984-85) 18 George Washington Journal of International Law & Economics 355 at 360.

The market trend globally is leaning towards full international competition for voice, data and video services. With respect to competition in cable delivered services, CATV operators are being challenged as discussed earlier, by telephone companies and DBS service carriers. With respect to satellite delivered services, the trend is towards cellular mobile and DBS services. However, the advanced services which will be made available through the use of cable, satellites, cellular mobile systems, telephony, and computers are expected to a large extent to use fibre optic ISDN systems.

The fact that public policy has been technology neutral[233] leaving it up to service providers to chose the most appropriate transmission media, is one factor which encourages intermodal competition. Other factors include the advantages of fibre optic ISDN systems, namely, the greater quantity of transmission, wide bandwidth, better protection of privacy, potentially lower costs, as well as the fact that fibre optics are not affected by electromagnetic interference, and that the life expectancy of cable is 25 years as opposed to 10 years for satellites.[234] In addition, fibre optic cable transmission is free from international legal regulation to which satellite use is subject through INTELSAT and the ITU, and may be more appealing to private investors for this reason.[235]

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233 See report cited in supra note 80 at 22.

234 Potamitis, supra note 224 at 39.

235 Ibid.

There will inevitably be greater competition between satellite and cable operators as emerging technologies and new service providers enter the telecommunications market. As stated by Christopher J. Vizas, a founding partner of Orion Satellite Corporation which was the first private U.S. satellite operator to file with the FCC for authorization to provide voice, data and video services using digital transmission technologies, new competition is inevitable:

> "As new technological solutions to problems - which may not be attractive to the existing operators in a market - are recognized, then those solutions will be applied. Whether they are applied by alternative satellite systems, by new fibre optic cables, or by technology that we don't even know about today, they are going to be applied. And because the new applications of technology and meeting of new market demands is going to occur, it is inevitable that there is going to be competition both between cable and satellite operators and between satellite operators, based on the space segment design and market approach, and finally between combination networks and carriers in the existing consortia - and by that I mean configurations such as those that cable and wireless are developing - with a monopoly or a duopoly United Kingdom carrier, half ownership in a transAtlantic cable, and multiple carriers in the United States, and facilities ownership interests in the United States."[236]

Although little has been written about the impact of intermodal competition on INTELSAT, and the focus has been on the impact of separate systems on the INTELSAT system, it is submitted that there will be growing concern in the years ahead due to the development of the Global Information Infrastructure. The concern should probably begin with AT&T, which is the largest user of the INTELSAT system (i.e. 90% of COMSAT's traffic is

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[236] Boone, supra note 221 at 262.

from AT&T).[237] AT&T also loads traffic over the TAT-8 fibre optic transAtlantic cable which is capable of carrying voice, data and television. The TAT-8 cable is fully substitutable for satellite systems, and should AT&T decide to reroute a portion of its future traffic over cable, the reduction on INTELSAT's traffic volume would have a significant impact on the INTELSAT system.

There is some speculation to the effect that competition risks the destruction of INTELSAT,[238] which is the only effective international organisation servicing the global need of the telecommunications industry for coordination and cooperation in the future development of telecommunications. The dismantling of INTELSAT would mean that governments would lose the only collective tool serving this purpose.

In view of the fact that one of the objectives of the Clinton Administration for the NII is to streamline the procedures for the allocation and use of the spectrum resource to ensure access to the NII, and that it plans to auction broadband radio frequency spectrum to the private sector, INTELSAT will face the challenge of keeping apace of technological progress. As the private sector moves into B-ISDN satellite services, INTELSAT will be faced with the challenge of providing competitive services to those which are developed by alternative private satellite

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237 Sarreals, supra note 9 at 299.

238 See Potamitis, supra note 224 at 54.

such as Teledesic Corporation[239] as well as cable operators, seeking profit from the development of information highways and the future global ISDN information infrastructure.

In the United States, the OTA has begun a study into the implications of satellite and wireless technologies for the NII. The OTA study will focus on new LEO satellite and personal communications services, standards development, interconnection, and economic arrangements. The OTA final report, expected to be published in June 1995, will set policy options for the entry of satellite communications into the NII, including the removal of barriers which limit the efficient use of the radio frequency spectrum.[240]

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239 The constellation of 840 LEO satellites proposed for launch by Teledesic Corporation in the year 2001, will operate in the K-a band and will apparently use much of the same technology that was developed for the U.S. Strategic Defense Initiative Program. See "LEO Project News Update", Satellite Communications (May 1994) at 10.

240 "NII Study News Update", Satellite Communications (June 1994) at 9.

D. ITU REGULATION OF MULTIMODAL TELECOMMUNICATIONS IN THE EMERGING GLOBAL ISDN ENVIRONMENT

1. Objectives of the ITU

The International Telecommunications Convention[241] represents the legal basis for the ITU which has almost worldwide membership. The Preamble of the Convention sets forth that the ITU was established with the objectives of facilitating peaceful relations, international cooperation among peoples, and economic and social development by means of efficient telecommunications services having regard to the growing importance of telecommunications for the preservation of peace, as well as the social and economic development of all countries.

The ITU provides a uniform regulatory regime with respect to the use of the spectrum/orbit resource which is essential to the successful operation of international telecommunications. The administrative regulations and principles adopted by the ITU conferences and treaties foster international cooperation and enable the ITU to fulfil its constitutional mandate in accordance with the objectives set forth in the Preamble of the International Telecommunications Convention.

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241 See 1992 International Telecommunications Convention, supra note 1, arts. 1, 7, 8, 31.

The primary function of the ITU is to regulate the equitable sharing and efficient use of the radio-frequency by all radiocommunication services, including those using the geostationary satellite orbit, subject to the provisions of Article 44 of the Convention, through international agreement on standards for the use of radio frequencies and orbital positions.[242] This regulatory function of the ITU is critical because while the spectrum/orbit resource is part of the common heritage of mankind and as such accessible to all countries under space law principles, it remains a scarce resource.

2. Common Heritage of Mankind Principle

The common heritage of mankind principle establishes both freedom to exploit the spectrum/orbit resource and equitable distribution of the benefits. It enables the ITU regulatory regime to accommodate both technological and geopolitical trends in satellite communications, and is viewed as an optimal solution to the problem of allocating the scarce resource.[243] The international regulation of the spectrum/orbit resource through allocation of radio frequency bands and orbital positions under Article 44 of the 1992 International Telecommunications Convention ensures that satellite communication links are delivered free of harmful interference, and that the competition for use of the resource is managed taking into account the rights of developing countries.

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242 See 1992 International Telecommunications Convention, supra note 1, art. 12.

243 Rothblatt, Martin A., "ITU Regulation of Satellite Communication"(1982-83) 18-19 Stanford Journal of International Law 1 at 24-25.

3. ITU Regulatory Regime for ISDN Development

a. Spectrum Resource Regulation

The ITU's role in spectrum/orbit resource regulation finds full support in Articles I and II of the Outer Space Treaty of 1967, which declares the spectrum/orbit resource to be the province of all mankind, free for exploration and use by all countries, and neither subject to national appropriation nor to any claim of sovereignty whether by means of use or occupation or by any other means. The equitable allocation principle found at Article 44 of the 1992 International Telecommunications Convention is thus consistent with the principles established under the Outer Space Treaty and the United Nations Resolution 1721 of December 1961 on the uses of outer space.[244]

As discussed earlier, one of the objectives of the U.S. NII Initiative is improvement of the radio frequency spectrum. The Clinton Administration places a high priority on streamlining procedures for the allocation and use of the spectrum resource to ensure access to the NII at any time anywhere in the United States. The Clinton Administration supports policies that place a greater reliance on market principles in distributing the spectrum, especially in the assignment process to apportion the scarce resource among the differing wireless services which will be part of the NII.[245] Current technology allows satellite systems to exploit the resource across a wide array of frequencies, however, most new advanced satellite systems

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244 See Hampton, supra note 190 at 59.

245 See report cited in supra note 147 at 10.

designed to carry ISDN traffic with the goal of seamless high bandwidth transmission, will use the C, K-u, and K-a band technology being developed by NASA to satisfy the communication needs of the future.[246] The involvement of the ITU and INTELSAT is important in ensuring that the allocation and use of these frequency bands is managed in the best interests of all countries, and in accordance with the fundamental common heritage of mankind principle of equitable access. The role of the ITU is also important in developing terrestrial standards to ensure that national ISDN systems are designed to be compatible with advanced satellite systems.

b. Technical Standards Regulation

The ITU is also involved in planning and establishing international computer communication facilities and its planning, standard-setting, and coordinating functions[247] extend to telephone, telegraph, broadcasting and data communications which is increasingly important since computers can be integrated with telecommunications networks. The ITU deals with the international network consisting of various means of transmission including cable, microwave, and satellite radio links interconnecting the countries of the world.

The ITU through its ITU-T recommendations deals with data transmission over networks, the requirements for new data networks and the evolution of digital systems, as well as standards enabling closed user networks or restricted access arrangements between particular

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246 Rothblatt, supra note 188 at 57.

247 See 1992 International Telecommunications Convention, supra note 1, arts. 17, 18, 19.

users and their data banks.[248] The International Telecommunications Convention governs the regulation not only of telephone networks, but also the technical regulation of digital network systems which are evolving from the application of computer technology to telecommunications.[249] The goal of the ITU-T is to ensure that the ITU remains the pre-eminent global telecommunications standardization body and one of its priorities for the period 1995-1999 is to harmonize the development and implementation of global telecommunications standards required to manage increasingly complex telecommunications networks, which incorporate new technologies and services.[250]

The ITU has an important role in setting uniform technical standards for international computer communication facilities and in establishing a framework for terrestrial ISDN systems. The technical uniformity of evolving terrestrial networks is important for their future integration with satellite systems. It is expected that the telecommunication networks of

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248 Butler, Richard E., "The International Telecommunications Union", Transborder Data Flows & Protection of Privacy (Paris: OECD, 1979) at 199.

249 Ibid. at 198.

250 The priorities for the ITU-T for the period 1995-1999 are to develop global standards for incorporating new technologies, services, and capabilities in telecommunications networks, namely, intelligent networks (IN), broadband integrated services digital network (B-ISDN), asynchronous transfer mode (ATM), universal personal telecommunication (UPT), multimedia communication systems (MCS), future public land mobile telecommunication systems (FPLMTS) and mobile-satellite systems (MSS), and global virtual network service (GVNS). See annex to Resolution 1 adopted by the Plenipotentiary Conference (Kyoto, 1994) relating to strategic policies and plans for the ITU during the period 1995-1999, Final Acts of the Plenipotentiary Conference (Kyoto, 1994) Instrument Amending the Constitution and the Convention of the International Telecommunications Union, ITU, 1995, ISBN 92-61-05521-4.

the future will be more effective as a result of digitalization, wide bandwidth, and the worldwide use of ISDN standards.[251]

Many countries are establishing digital fibre optic networks enabling nationwide ISDN systems to be realized, and progress towards ISDN is occurring rapidly.[252] In fact, the development of networks which integrate networking and ISDN access are being rapidly deployed especially in the United States, Canada, the European Union, and Japan.[253] It is expected that fibre optic networks will unlock the power of ISDN,[254] and that technological and market developments will lead to a global ISDN environment characterized by the interconnection and interoperability of computers and telecommunications systems through a common network model, required for universal networks and complete services.[255]

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251 See Elbert, Bruce R., International Telecommunications Management (Boston, Mass.: Artech House Inc., 1990) at xix.

252 See Keiser, Bernhard E. & Strange, Eugene, Digital Telephony and Network Integration (New York: Van Nostrand Reinhold Company, 1985) at 422.

253 See Lyer, Raju, Parker, Jerry & Sood, Prem, "Intelligent Networking for Digital Cellular Systems and the Wireless World", INTER COMM 90: Global Telecommunications Congress and Exhibition, Congress Proceedings, ed. by Peter J. Booth and Carla M. McEachern (Vancouver, October 23-26, 1990) at 101.

254 Farrell, John H., "Canada's Place in the Global Village", INTER COM 90: Global Telecommunications Congress and Exhibition, Congress Proceedings, ed. by Peter J. Booth and Carla M. McEachern (Vancouver, October 23-26, 1990) at 54.

255 Rutkowski, supra note 179 at 20.

Given the trend towards globalization of trade and competition in telecommunications services, new competitive services are emerging, and this presents a situation in which a variety of services and protocols are co-existing.[256] ISDN will standardize network-to-network communications,[257] and allow countries to develop separate national ISDN systems that have compatible international connections on a global scale.

The ITU-T's definition of ISDN is "a network evolved from the telephone IDN, that provides end-to-end digital connections to support a wide range of services, including voice and non-voice, to which users have access by a limited set of standard multipurpose customer interfaces."[258] Essentially, ISDN is an evolutionary technology and is an emerging standard of the ITU-T for signalling, network interfacing, and protocols.

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256 See Saito, Tadao, "How Interconnectivity May Evolve - A Preview", USERCOM 89: Global Interconnectivity, Proceedings of the Third International Telecommunication User Conference (Geneva: ITU, March 1989) at 238.

257 The primary goals of ISDN are to provide for a worldwide homogeneous digital network that supports numerous services and uses the same standards of access at any point in the network, as well as to provide for uniform standards of digital transmission across all ISDN networks and supply a standard user interface. ISDN focuses on three specific themes, namely, standardization of services to the user with the intent of a global standard, standardization of user-to-network interfaces with the intent of defining standards for network devices, standardization of network capabilities for user-to-network and network-to-network communications. Pooch, supra note 180 at 437.

258 ITU-T, Integrated Services Digital Network (ISDN) General Structure; Vocabulary of Terms for ISDNs, Recommendation I.112 (Geneva: ITU, 1993) at 1ff.

In November 1980, the Plenary Assembly of the ITU-T approved studies to devise common worldwide strategies and standards for ISDN thereby asserting that it is essential to develop uniform standards[259] in all countries for the global ISDN information infrastructure of the future, and that the success of ISDN depends on widespread standardization and acceptance of the ITU-T's recommendations in the different countries. The authority of the ITU-T to study and issue such technical and operating standards, is based on Article 17 and 19 of the 1992 International Telecommunications Convention.

In 1984, the ITU-T approved a series of ISDN standards and achieved international agreement on such standards. There is a need, however, to develop further standards for high-capacity B-ISDN,[260] and the ITU-T continues to work on the development of a common model for all countries in order to maximize the efficiency of interconnected ISDN systems. It is considered that the efforts of the ITU-T may determine the structure of future ISDN systems worldwide, at both the national and international level.[261]

The ITU-T recommendations relating to standardization and interconnectivity of ISDN systems are based on the open systems interconnection (OSI) model, which is a policy

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259 The development of international standards for ISDN development is important in that they enable effective integration of networks, facilitate use and maintenance, promote economies of scale for products, and facilitate hardware and software techniques and development. Snow, supra note 2 at 3.

260 Keiser, supra note 252 at 54.

261 Rutkowski, supra note 179 at 26.

designed to encourage equal access for the supply of international telecommunications services.[262] While the ITU Convention acknowledges the sovereign right of countries to regulate their telecommunications, there is a need for devising common ISDN standards and operating protocols, and the role of the ITU-T is important in terms of promoting interconnectivity which will be required for the development of a global ISDN environment.[263]

The general objective of the ITU regulatory framework has been to establish rules to ensure the interconnection of national networks, and international cable and satellite facilities across national borders. The ITU rules were developed during a period when national telecommunications networks were operated as a government owned or regulated public service. Traditionally, international interconnectivity involved ensuring connections between geographically defined public networks and user groups. In the emerging ISDN environment, the ITU is under challenge to facilitate connections among private, public, and quasi-public networks to provide a range of services across national borders.[264] As these transborder

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262 Saito, supra note 256 at 238.

263 See Tritt, Robert, "The Regulatory Framework Today - Does it Promote Interconnectivity?", USERCOM 89: Global Interconnectivity, Proceedings of the Third International Telecommunication User Conference (Geneva: ITU, March 1989) at 39. See also, Resolution 24 of the Final Acts adopted by the Plenipotentiary Conference (Kyoto, 1994), supra note 250 at 165ff, which clarifies the role of the ITU in the development of world telecommunications in view of the pace of development of technology and need for worldwide compatibility of telecommunications systems which resolves that the ITU should continue to work for the harmonization, development, and enhancement of telecommunications throughout the world.

264 See Terol-Miller, Luis, "Open Network Provisions", USERCOM 89: Global Interconnectivity, Proceedings of the Third International Telecommunication User Conference (Geneva: ITU, March 1989) at 193.

networks are developed, the ITU will be essential in establishing rules for structuring technical and operating arrangements for the provision of international telecommunications services.

4. ITU Public Policy Objectives under the Buenos Aires Declaration of 1994

The challenge for the ITU is to ensure that terrestrial networks continue to meet public policy objectives, and that the future global ISDN environment is designed to ensure the interconnection and interoperability of telecommunications facilities and services. The challenge of the ITU may be significant given that it will remain the right of individual countries to determine operating arrangements allowing interconnection with foreign public or private network operators in the global ISDN environment. The international regulatory framework is currently flexible. It allows each country to determine how it wishes to exchange international telecommunications services, subject to minimal technical rules designed to ensure the interconnection and interoperability of telecommunications facilities and services.

In order to ensure interconnectivity and interoperability, the ITU responded by adapting its international standard-setting process, accelerating its standards approval process, restructuring its standardization study groups to adapt to the changing technologies, and initiating cooperation with regional and national standard-setting organisations, as well as with interested parties such as operators, manufacturers, private service providers and users.[265] These

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[265] Seguin, Robert J., "The Continuing Relevance of Collaboration and Cooperation in International Telecommunications", INTER COMM 90: Global Telecommunications Congress and Exhibition, Congress Proceedings, ed. by

initiatives of the ITU are aimed at ensuring a common understanding among the different parties with respect to its standards-setting process and a commitment to global interconnectivity, interoperability, and market access.

The convergence of transmission technologies leading to the creation of innovative services, was one of the main reasons why the ITU restructured its standardization study groups in 1992.[266] Technology convergence created a demand for global networks capable of simultaneously transmitting voice, data and video, and the ITU adapted to the emerging technologies by creating a Telecommunications Standardization Sector which is a Strategic Policy and Planning Unit, responsible for gauging developments in the area of convergence of telecommunications to ensure that the international regulatory framework remains appropriate.

Global ISDN terrestrial standards will strengthen the telecommunications potential of ISDN on an international basis,[267] and encourage market access and competition in keeping with a deregulated environment. It is considered that the work of the ITU-T in the development of global standards constitutes the common basis upon which the international community can

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Peter J. Booth and Carla M. McEachern (Vancouver, October 23-26, 1990) at 58.

266 See report cited in supra note 60 at 286-287; see also annex to Resolution 1 adopted by the Plenipotentiary Conference (Kyoto, 1994) relating to strategic policies and plans for the ITU for the period 1995-1999, supra note 250.

267 Ungerer, Herbert, "What is Going to Take the Barriers Down", World Communications and Technology (Mitek, 1994) at 176.

rely on for the development of a global ISDN environment.[268]

The challenge for the ITU as earlier stated, is to ensure that terrestrial networks will meet public policy objectives, and that the future global ISDN environment is designed to ensure the interconnection and interoperability of telecommunications facilities and services. In an effort to meet these challenges the ITU held the first World Telecommunications Development Conference in Buenos Aires in March of 1994 and approved the Buenos Aires Declaration on Global Telecommunications Development for the 21st Century.[269]

The ITU in its World Telecommunications Development Report for the development of the Global Information Infrastructure refers to the principle of the right of connection between countries and networks under the Clinton Administration's slogan "one world one network". According to the ITU Report, this will require working for standards which are global and for equitable network development strategies. The prevailing view is that the gap may widen between developed and developing countries as developed countries build and interconnect their information highways and wide range of innovative services while poorer developing countries do not. According to the Report an estimated US$250 billion will be required in order to build the networks of developing countries according to ITU-T global ISDN

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268 See Frieden, Robert M., "Open Telecommunications Policies for Europe: Promises and Pitfalls" (1991) 31 Jurimetrics Journal 319 at 320.

269 In order to secure the implementation of the Buenos Aires Declaration on Global Telecommunications Development, the ITU passed Resolution 23 in support of the implementation of the Buenos Aires Action Plan. See Final Acts of the Plenipotentiary Conference (Kyoto, 1994) cited in supra note 250.

standards.[270] In an effort to close the potential gap between developed and developing countries, the ITU committed to target 70% of its development effort towards the least developed countries.

With a view of setting goals and objectives for the future, the Buenos Aires Declaration on Global Telecommunications Development for the 21st Century declares that:

(a) Telecommunications is an essential component of political, economic, social and cultural development and promotes better understanding between people globally. Therefore ITU members have the duty to provide for communications to be made available to all peoples.

(b) New technological developments in telecommunication and information technologies have the potential of closing the development gaps between developing and developed countries.

(c) Any strategic cooperation for the development of telecommunications must recognize the varying levels of development in developing countries and there is a need to pay special attention to the requirements of the least developed countries.

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270 Winsbury, Rex, "Who Will Pay for the Global Village?", InterMedia, Vol. 22, No. 3, (1994) at 23.

(d) Given that the requirements of most developing countries are vast and the resources available to meet them limited, governments should establish appropriate telecommunications policies and regulatory structures.

(e) The development of telecommunications may be fostered by liberalization, private investment and competition, and such a restructuring should include a regulatory system which will create a stable environment to attract investment, facilitate access to service providers to the network with a framework that promotes competition while protecting network integrity, ensure the provision of universal service which helps to achieve integrated rural development as well as promote innovation and the introduction of new services and technologies, and guarantee the rights of users, operators and investors. Restructuring should take into account the interests of developing countries.

(f) The ITU has a special role to play in advising policy makers on the options available in tailoring policies and regulatory structures to fit a country's particular requirements. The ITU is encouraged to work in cooperation with regional and international telecommunication organisations.

(g) the ITU must play an important role in the development of telecommunications in developing countries where resources available through multilateral cooperation will not be sufficient to meet the requirements of developing countries.

(h) Development strategies should encompass sound and television broadcasting via terrestrial and satellite systems as one of the key factors in promoting social and cultural development. The new broadcasting technologies being developed will provide opportunities including those of distance learning for a greater contribution to development.[271]

The Buenos Aires Declaration adopted by the Conference establishes a program of assistance to developing countries to enable the least developed countries to reach a threshold of sustainable telecommunications development for the 21st Century.[272] The Buenos Aires Declaration upholds the traditional role of the ITU and the objectives of the Preamble of the International Telecommunications Convention.

Although the common heritage of mankind principle of equitable access and distribution of the benefits of satellite communications does not apply to terrestrial telecommunications systems, the Buenos Aires Declaration demonstrates an intent on the part of the ITU to extend the principle of equitable access to the future global ISDN information infrastructure, and to extend its regulatory regime to accommodate the emerging technological trends in international telecommunications.

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271 Ibid. at 30-31.

272 Ibid. at 29.

5. The Need for TDF Regulation in the Emerging Global ISDN Information Infrastructure

It is submitted that the comprehensive regulation of international telecommunications in the future global ISDN environment will require an extension of the role of the ITU and its regulatory regime. The interconnection of national ISDN systems raises the legal issue of TDF by means of computer-to-computer communications using telephone lines or satellite communications, as well as the issues of privacy and national security. Under Article 37 of the 1992 International Telecommunications Convention member States have the right on the one hand to use international communication channels, and the obligation on the other hand to ensure secrecy of the information transmitted except for the interception of satellite and cable transmissions in the interests of national security.[273] The ITU through its ITU-T recommendations deals with the technical and operational standards for terrestrial computer communication facilities with the goal of technical uniformity of terrestrial networks, which will be important for their future integration with wireless satellite systems. However, the ITU does not deal with content regulation or user conduct for data transfers, and has traditionally not been involved with content regulation issues.[274]

These issues are under study by the OECD, the Council of Europe, and the International Chamber of Commerce since it is recognized that critical steps must be taken if a global ISDN information infrastructure is ever to become a reality. In general, it is the OECD

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[273] See Butler, supra note 248 at 197.

[274] Ibid. at 199.

which formulates guidelines for policy-making in the field of information, computers, and communications.

The development of a global ISDN information infrastructure raises the need for comprehensive regulation of transmissions in the areas of content regulation and user conduct relating to data transfers. It is submitted that the interconnection and interoperability of computers and satellites in the future ISDN environment, will render comprehensive international regulation of content and data transfers critical for privacy and security reasons.[275] National legislators realize that it is impossible to solve all the problems resulting from TDF by national legislation, and that the problem cannot be solved by the national legislator whose range of action is limited by the sovereignty of other countries.[276] In view of the multimodal character of the future ISDN environment and the potential national security implications[277] of a global

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275 See Rankin, Murray T., "Business Secrets Across International Borders: One Aspect of the Transborder Data Flow Debate" (1985) 10 Canadian Business Law Journal 213 at 213.

276 See Stadler, G., "From National to International Legislation on Information Flow and Data Protection", Transborder Data Flows and the Protection of Privacy (Paris: OECD, 1979) at 45.

277 The integration of terrestrial ISDN networks with satellite systems which will carry ISDN traffic with the goal of seamless high-bandwidth transmission as proposed for the NII Initiative by the U.S. and envisioned for the global information infrastructure raises national security considerations. The petition of Alpha Lyracom Space Communications, which operates PANAMSAT, to the FCC in July 1990 to lift the public switched network restriction on separate non-Intelsat satellite systems raised high-level national security concerns which reached the White House and the National Security Agency. The network of high-powered satellites for digital networking services planned by Alpha Lyracom raised national security concerns because the proposed communication system was viewed as impacting negatively on the surveillance work of the National Security Agency in the U.S. Asker, supra note 221 at 50.

interconnected telecommunications system, it would be in the interests of the international community to expand the role of the ITU to address or participate with the OECD in addressing these issues.

E. THE FUTURE OF INTELSAT IN THE EMERGING GLOBAL ISDN ENVIRONMENT

1. Mandate of INTELSAT under the INTELSAT Agreement

INTELSAT was established under U.S. leadership in 1964, and was until the mid-1980s the only viable international satellite system. It remains an important provider of international satellite communications despite competition from separate satellite systems, and provides an important backbone for satellite transmission of voice, data and video.

INTELSAT unites member States with different cultural, economic, and political traits and achieves common goals. Its purpose is essentially to promote non-discriminatory access to the global system by all countries, as a means of furthering world peace and understanding.[278] Under Article II of the INTELSAT Agreement, INTELSAT was established with full regard for international principles requiring expanded telecommunications services to all areas of the world on a non-discriminatory basis, the use of the most advanced technology available for the benefit of all mankind, and the establishment of the most efficient and economic facilities possible consistent with the best and most equitable use of the radio frequency spectrum and orbital space resource.

INTELSAT has been successful in fulfilling its mandate in accordance with these principles by providing international communications services on a non-discriminatory basis,

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[278] See Glassie, supra note 232 at 390.

domestic communications services to some 40 nations, specialized digital business applications and network services, as well as cost-effective global satellite links for voice, data and video.[279] INTELSAT's membership and user base has been a major source of its strength. However, competitive market trends and technological progress will continue to challenge INTELSAT's ability to maintain its user base, and fulfil its mandate in accordance with international principles.

2. Importance of Upholding INTELSAT in View of Multimodal Competition

There are several reasons for upholding INTELSAT. Firstly, INTELSAT represents the only collective tool for cooperation in global telecommunications development and coordination. It promotes efficiency in the routing of international satellite traffic and provides all member States with a voice in the operation of the global system.[280] Secondly, INTELSAT protects the interests of developing and poorer countries, and is committed to providing universal affordable service to all countries. However, in view of multimodal competition from separate satellite and cable systems and the focus of service providers on profit margins as opposed to universal service, INTELSAT's ability to fulfil its mandate as protector of the interests of developing countries is expected to be weakened in the future.

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279 See Burch, Dean, "Responding to the Changing Marketplace", INTER COMM 90: Global Telecommunications Congress and Exhibition, Congress Proceedings, ed. by Peter J. Booth and Carla M. McEachern (Vancouver, October 23-26, 1990) at 22.

280 See McKnight, supra note 213 at 41.

The ITU regulatory framework, on the other hand, upholds the principle of common heritage of mankind and ensures that the spectrum/orbit resource is accessible to all countries through the allocation of the resource. The ITU maintains that in using the spectrum/orbit resource, member States must bear in mind that it is a scarce resource to be used efficiently in order to ensure that all countries have equitable access in conformity with the Radio Regulations according to the needs and technical facilities at their disposal. It is INTELSAT, however, which implements the principle of equitable access by making available satellite services to developing and poorer countries which do not have the means of establishing their own systems, and which would otherwise not have access to satellite links at affordable rates and on a non-discriminatory basis.

Although multimodal competition promises all the advantages of competition, the diversion of traffic from separate satellite and cable systems may force INTELSAT to increase its rates significantly in the future, which will place a financial burden on member States which can least afford it.[281] In view of intramodal competition, it is believed that INTELSAT may have to cease subsidizing access rates to developing and poorer countries, in order to maintain its position as the single global satellite communications provider. The intermodal competition from emerging fibre optic ISDN systems will only deteriorate service to these countries.

Upholding INTELSAT is critical to ensuring that technological improvements are available to developing and poorer countries on a non-discriminatory basis in accordance with

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281 Leive, supra note 203 at 318.

the Preamble of the INTELSAT Agreement. The competitive pressures facing INTELSAT in the future bring the danger of the development of a two-tiered system which preserves the most recent technologies and services for the most highly developed countries,[282] in substitution of the global INTELSAT system. Competition is considered to have three important effects on INTELSAT's ability to protect the interests of developing and poorer countries. Firstly, competition will make cross-subsidies for these countries more difficult and perhaps impossible. Secondly, it will affect the existing level of interconnection and create inequalities in the service provided to different parts of the INTELSAT system. Thirdly, it will force the impact of technological advances on the more profitable parts of the system.[283]

3. Impact of ISDN Development on the INTELSAT System

The trend towards global competition and ISDN development is changing the international telecommunications environment. It is submitted that ISDN development will likely lead to inefficient use of the INTELSAT system and traffic diversion, and undermine the INTELSAT system which was designed to make international satellite communications services available on an efficient, economic, and non-discriminatory basis to all countries. Efficient use of the INTELSAT system ensures that all countries share the cost benefits. However, if the system is not used efficiently or if traffic is diverted, INTELSAT users bear the burden of increased rates.[284]

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282 Potamitis, supra note 224 at 42.

283 Ibid. at 45.

284 Leive, supra note 203 at 317.

The question arises as to whether INTELSAT is well positioned to respond to the changing telecommunications environment of the 21st Century, and survive in view of the competitive pressures it will face in the future. Although INTELSAT is considered to have proven its ability to adapt to changing times,[285] it is submitted that it faces serious challenges in the future, and as suggested by David Leive, Legal Adviser to INTELSAT, "as we move into the 21st Century, it is important that we step with care".[286]

While INTELSAT with the support of the United States and other foreign governments may be able to limit the competition from separate satellite systems to the INTELSAT system through the coordination procedure under Article XIV of the INTELSAT Agreement, its future remains questionable given the move towards the development of a global ISDN information infrastructure.

a. Traffic Diversion

Prior to fibre optic cables, copper wire cables were used but had limited bandwidth, and did not compete with satellites. The operation of fibre optic cables in the Atlantic, Pacific, and Indian Oceans delivering broadband digital capacity for use in private

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285 INTELSAT's International Business Service (IBS) introduced in 1983 for the digital transmission of voice, data, and video using VSAT dishes located near the premises of end users, was INTELSAT's first response to the changed market opportunities for international satellite communication services presented by advances in satellite and earth station technologies. INTELSAT's IBS service facilitates application of the INTELSAT system to private telecommunication networks. See McKnight, supra note 213 at 45.

286 Leive, supra note 203 at 319.

networks began in 1988 with the TAT-8, which is the first fibre optic cable completed across the Atlantic Ocean. Fibre optic cables now link the United States to the European Union and the Far East. Currently, cable systems compete with satellites for long-haul transAtlantic and transPacific voice and data traffic, and eventually will compete also for video traffic. Although future digital fibre-based information infrastructures on a global basis will not replace satellite systems, the two mediums are interchangeable for broadband services transmission.[287]

In a deregulated environment, the threat of fibre optic ISDN systems to INTELSAT is considered to be based on pricing and the cost advantages which fibre optic cables may have over the INTELSAT VI generation of satellites, and future advanced INTELSAT satellites. Accordingly, if the issue of pricing flexibility is not resolved, fibre optic ISDN systems will pose a greater long-term threat to INTELSAT than will separate international satellite systems.[288] Ultimately, pricing will be a controlling consideration, however, there are other conditions which will also influence INTELSAT's future viability.

The challenge INTELSAT faces in the future is serious in that the nature of INTELSAT's competition, and the deregulated ISDN environment in which INTELSAT will operate in the years to come, will affect the patterns of growth and demand for INTELSAT services. The competition will change from a few submarine cables to a proliferation of digital

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287 See Sarreals, supra note 9 at 295.

288 Snow, supra note 2 at 105.

fibre optic cables,[289] and the emergence of private advanced satellite systems, such as Motorola's recent mobile satellite system,[290] and Teledesic Corporation's fixed-satellite system proposed for the year 2001. As earlier discussed in Section C of this Chapter, it is likely that there will be significant changes in the distribution of international traffic that will be carried on satellite and cable systems for heavy traffic routes. INTELSAT users acknowledge that the patterns of traffic on the INTELSAT system are likely to change, and that fibre optic ISDN systems will secure the growth in traffic for a few years until the cable/satellite ratios adjust. Nevertheless, they are forecasting overall growth and demand for INTELSAT services after the adjustment process is completed.[291] It is submitted that such a forecast may be somewhat optimistic in view of the conditions which threaten the efficient use of the INTELSAT system.

According to a study commissioned by COMSAT in 1987, aimed at evaluating the competitive characteristics of advanced high-powered satellite systems and digital fibre cable technologies in the 1995-2005 period, the role of satellites in the future Global Information Infrastructure will depend on their technological and economic competitiveness in relation to fibre optic cables.[292] The conclusions reached were that current satellite systems are cost effective with fibre optic cables in the Atlantic Ocean Region although satellite circuits are less

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289 See Crockett, B.L., Future Satellite Systems Study (Washington, D.C.: Communications Satellite Corporation, 1989) at 4.

290 See Nordwall, Bruce D., "Mobile Communications to Capture Consumer Market", Aviation Week & Space Technology, Vol. 138, No. 22 (May 31, 1993) at 40.

291 Hampton, supra note 190 at 35.

292 Crockett, supra note 289 at 4.

expensive than cable circuits in the Pacific Ocean Region due to long distances, and that the most competitive satellite system alternatives are the Ku-band satellites with a projected 45% lower cost than fibre optic cables and the C-band satellites with a projected 27% lower cost than cable systems.[293]

While the COMSAT study is an expert forecast of future traffic based on models that combine historical data, current and projected trends worldwide and user-generated forecasts, it was acknowledged that the market and regulatory changes that are occurring and predicted to occur have no precedent. These changes include the manner in which competitors earn returns (i.e. alternatives to rate-of-return regulation), the fact that future traffic distribution will be determined by market and cost as opposed to FCC traffic loading policies, and the fact that currently competitors are limited to offering non-public switched traffic, but that in the future such competitors will aggressively seek changes to regulations which prohibit competition in the larger public switched network market. These changes lead COMSAT to acknowledge that establishing mathematical correlations between these and other market developments, and future traffic demand for the INTELSAT system could lead to misinterpretations about likely traffic growth.

For the 1995-2005 period, forecasts for future international traffic indicate a decrease in demand for public switched network telephone services, and project that the demand for non-public switched services will double over the same period, explained by the future global

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293 Ibid.

demand for broadband voice, data and video services.[294] According to the COMSAT study traffic loading projections represent the major factor influencing the cost of satellite and cable systems. However, the study concluded that there is uncertainty with respect to traffic loading projections due to the fact that AT&T's commitment to route an average of 33% of its growth in traffic over the INTELSAT system ends in 1994. Also, COMSAT projected distribution of traffic between satellite and cable systems based on the assumption that AT&T will continue to route the same level of its growth traffic over satellites until 2005, and did not take into account private cable construction investment interests nor the capacity of fibre optic cable which create an incentive to maximize cable loading at the expense of satellites.[295] In addition, although COMSAT projected that satellites will carry approximately 50% of the traffic for broadband voice, data and video services to be introduced during the 1995-2005 period, it concluded that other new services will be introduced but that their growth and development is not currently understood well enough to include them in total traffic projections.[296]

In essence, the COMSAT study concluded that forecasting future demand for INTELSAT services based on past models is difficult both in terms of overall demand and the distribution of traffic between satellite and cable systems. The study failed to take into account the full impact of global ISDN development, the abolishment of FCC traffic loading restrictions, and AT&T traffic diversion from satellites to fibre optic ISDN systems. The real impact of

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294 Ibid. at 16.

295 Ibid. at 43.

296 Ibid. at 24.

multimodal competition on the INTELSAT system is, therefore, still to be determined. It is submitted, however, that the potential regulatory changes discussed earlier, combined with increased multimodal competition create uncertainty with respect to the future viability of INTELSAT. The uncertainty is reinforced by the fact that cables are outside the INTELSAT regulatory framework, and that INTELSAT has no effective control over the construction of cable systems. As stated by one author:

> "Despite the greater attention and regulatory effort devoted to separate satellite systems, well-informed individuals are virtually unanimous in their view that fibre-optic submarine cables pose a greater threat to INTELSAT's long-term financial and institutional viability. An entirely different technology is involved, and INTELSAT agreements do not oblige its signatories to coordinate submarine cable systems, or any other systems using non-satellite transmission modes, to ensure that technical or economic harm to INTELSAT is avoided.[297]

Traditionally, the FCC has promoted the use of fibre optic cables to compete in the international telecommunications market, and has demonstrated a non-concern with traffic diversion from satellite to cable systems. There are currently several private fibre optic cables operated by Tel-Optik Ltd. between North America and Western Europe which serve the same routes as those of satellite services to transmit voice and data.[298] In addition, there are three operational cable systems which are fully substitutable for satellites,[299] allowing for carriage of voice, data and video services, namely, the TAT-8 which was completed across the Atlantic

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297 Snow, supra note 2 at 102.

298 Leive, supra note 197 at 84.

299 Sarreals, supra note 9 at 299.

Ocean in December 1988, the HAW-4/TPC-3 Pacific fibre optic cable completed in April 1989, and the CANTAT-3 transAtlantic fibre optic cable completed in November 1994.[300]

These cable systems and the proliferation of fibre optic ISDN systems in the future for transmission of voice, data and video services for multimedia communications[301] will create greater competition for INTELSAT in the future. It is submitted that the movement towards the development of a global ISDN information infrastructure, and diversion of traffic to fibre optic ISDN systems is incompatible with the concept of a single global system, and the commitment of member States to INTELSAT. However, this is a policy issue which has not yet been fully resolved, and there has not been a full consultation on the issue between the United States and other INTELSAT members.[302]

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300 Although the TAT-8 cable system cost an estimated US$335 million and the HAW-4/TPC-3 system cost US$633 million as opposed to the cost of US$180 million for INTELSAT VI, it is considered that future fibre cables will offer increased capacity at lower cost, and that advances in fibre optic technology may undermine the economic rationale for INTELSAT's concentration on high density routes, threaten the economic viability of alternative international satellite systems intending to compete on these routes, and slow the growth in demand for radio frequency spectrum and orbital slots. See Crockett, supra note 289 at 45. The CANTAT-3 cable system linking North America with the European Union cost approximately US$400 million. This latest fibre optic cable system spearheaded by Teleglobe can carry narrowband and broadband transmissions to support a wide range of innovative voice, data and video services including multimedia conferencing. See Teleglobe Annual Report (Teleglobe: 1994) at 9.

301 See Elbert, supra note 251 at 323.

302 See Boone, supra note 221 at 271.

b. Abandonment of FCC Traffic Loading Policies

The problem of multimodal competition lead to the FCC's traffic loading policy[303] which required AT&T, the largest user of the INTELSAT system, to use an approximate equal number of satellite and cable circuits to complete its overseas links. The policy has its rationale in the belief that AT&T as a rate base regulated company has an economic incentive to use its own cables rather than COMSAT's satellite circuits, and has the market power to control a substantial portion of international telecommunications traffic. According to the COMSAT study, future traffic loading and distribution over cable and satellite circuits will be based on price, performance, and ownership. The fact that AT&T owns 37% of TAT-8[304] which is fully substitutable for satellite communications, provides AT&T with an incentive to bypass COMSAT and INTELSAT. Since 90% of COMSAT traffic originates from AT&T,[305] such diversion to cable would have a destabilizing effect on INTELSAT.

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303 In an inquiry into the policies to be followed in the authorization of common carrier facilities to meet North Atlantic telecommunications needs during the 1985-1993 period, the FCC focused on AT&T's provision of international service and released on August 22, 1985 an order prohibiting AT&T from shifting more than 2% of its satellite traffic to cable per year during the period up to a 60% limit. The rule under the FCC Report and Order of August 1985 reflected a concern on the part of the FCC that a sudden shift of 10% of AT&T's traffic from satellite to cable would cause economic harm to COMSAT and INTELSAT. The effect of the rule was to promote the use of the INTELSAT system. However, the FCC indicated its intention in the future to rely more upon competition to determine the relative use of the cable and satellite mediums and to grant carriers greater discretion in making circuit loading decisions. Sarreals, supra note 9 at 287.

304 Johnson, Leland L., Excess Capacity in International Telecommunications: Poor Traffic Forecasting or What? (Santa Monica: The Rand Corporation, 1986) at 34.

305 Snow, supra note 2 at 271.

It is fully recognized that AT&T is the dominant carrier in international transmission services. It is the principal owner of cable facilities, dominant supplier of transmission facilities needed by all carriers to access international facilities, and dominant user of all international transmission facilities.[306] In an increasingly deregulated ISDN environment, AT&T and other common carriers may be tempted to divert traffic from INTELSAT thereby causing economic harm to the INTELSAT system. For many years, the FCC has regulated AT&T's loading of international traffic between satellite and cable systems, in an attempt to create a balance between cable and satellite communications and provide predictability in circuit distribution. Such a policy has provided security to other carriers in instances where actual demand varied from forecasted demand, and has promoted the use of the INTELSAT system.

Deregulation and the FCC's pro-market forces direction is expected to result in the gradual abandonment of the traffic loading policy which, in turn, is expected to result in a significant diversion of traffic from satellites to fibre optic cables.[307] In a deregulated ISDN environment, the question will be whether it is in the public interest to enforce FCC traffic loading rules. Regulatory authorities in the United States may decide that it would better serve the public interest to abandon traffic loading requirements. However, as suggested by David Leive, Legal Advisor to INTELSAT, care must be taken to ensure that the INTELSAT system

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306 See Sarreals, supra note 9 at 297.

307 Potamitis, supra note 224 at 39.

is not fatally harmed in the process:

> "It would be disastrous to depart from balanced satellite/cable loading policies without simultaneously adopting measures to negate the artificial incentives that encourage carriers to allocate international traffic to cables instead of satellites. The imbalance would have the effect of favouring international cables, public and private at the expense of satellites".[308]

In view of ISDN development, and fact that AT&T considers ISDN to be its future[309] and has taken the lead in shaping ISDN development in the United States, it is most likely that AT&T will, especially in view of its heavy investment in the TAT-8 cable facility, divert traffic from satellite to fibre optic ISDN systems in the absence of traffic loading rules.

Furthermore, although the United States and all member States party to the INTELSAT Agreement agreed to avoid allowing the establishment of alternate satellite services, and reaffirmed their commitment to the INTELSAT system by agreeing to refrain from actions which would imperil the viability of the global system,[310] through the 1983 resolution passed by the Assembly of member States, the trend has been to approve most applications for separate regional and private satellite services.

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308 Leive, supra note 203 at 319.

309 Rutkowski, supra note 179 at 27.

310 See Leive, supra note 197 at 84.

The intramodal competition trend which began in the mid-1980s was contained by the fact that President Reagan's Directive in favour of separate systems protected the INTELSAT system by way of a restriction on the interconnection of private systems with public switched networks. Although the restriction has limited the negative economic impact of separate systems on INTELSAT by reserving public switched message service for the INTELSAT system, the future provides uncertainty given the current drive to abolish the public switched network restriction,[311] and the fact that in an increasingly deregulated environment such a restriction may not be appropriate.

According to the Rand Report of 1986, while INTELSAT served a critically important role in its early years by establishing a global satellite network, its pricing and investment policies are becoming increasingly inappropriate given the attractiveness of separate satellite systems and emerging fibre optic cables. In addition, INTELSAT's global cost averaging policy for rate-setting encourages member States to overestimate their facility needs since they are billed for costs only in proportion to their actual use of INTELSAT facilities. Finally, global average-cost pricing encourages new possibly uneconomic entry on heavily used routes despite excess INTELSAT capacity.[312]

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311 See Straubel, Michael S., "Telecommunication Satellites and Market Forces: How Should the Geostationary Orbit Be Regulated by the FCC?" (1992) 17 North Carolina Journal of International Law & Commercial Regulation 205 at 225.

312 Johnson, supra note 304 at ix.

c. Excess Capacity

It is considered that cable systems and new separate systems will lead to a serious excess capacity problem which will have a profound and negative effect on INTELSAT. Excess capacity has raised the question of how to deal with the problem whether through the expanded role of the ITU or policy role of INTELSAT, or through bilateral agreements between countries. Neither the ITU nor INTELSAT are involved in the question of excess capacity. However, it represents a serious problem, because it may lead to increased costs to INTELSAT users. According to a study conducted by Future Systems Inc. in 1978, unlimited competition from separate satellite systems could lead to a significant loss of INTELSAT traffic to competing systems, as well as a significant increase in INTELSAT circuit prices by the year 2003.[313]

Excess capacity has been a persistent problem in the Atlantic and Pacific Ocean Regions.[314] According to the COMSAT study, during the period 1970-1985 fewer than 50% of satellite circuits were used while cable use was typically 60-70%. The combined use remained generally below 50%.[315] The problem of excess capacity is expected to grow with the development of ISDN systems, and the entry of new competitors into the market. In view of the uncertainty of traffic loading patterns and pricing flexibility in a deregulated ISDN environment, it is possible that excess capacity will lead to increases in circuit prices.

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313 McKnight, supra note 213 at 56.

314 Johnson, supra note 304 at v.

315 Crockett, supra note 289 at 36.

4. INTELSAT's Future Viability

INTELSAT's programs for the years ahead will have to meet high standards of quality, reliability, economy and flexibility in order to successfully combat the challenge of future multimodal competition. In response to the competitive challenge, INTELSAT has developed a program comprising three major strategic goals, namely, to secure the commitment of member States to the INTELSAT system by making it in their economic interests to continue to use it, to provide reliable and affordable prices so as to assist members to be stronger competitors and more attractive sources of services for customers, and to implement incentive pricing and long-term commitment policies so as to maximize the use of the INTELSAT system by member States.[316]

INTELSAT has responded to advances in digital technology by launching advanced INTELSAT VI satellites in 1992. The new generation of INTELSAT VI spacecraft is in response to requests by member States for high-powered Ku-band satellites. It has also provided rate incentives in an effort to assist users in converting to digital operation.[317] By offering high-speed advanced services, INTELSAT is positioning itself to combat proposed alternative systems.[318] INTELSAT essentially has little choice but to continue providing competitive rates and services to meet the competitive challenge of separate systems and

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316 See Burch, supra note 279 at 22.

317 Ibid. at 23.

318 Snow, supra note 2 at 269.

emerging fibre optic ISDN systems.[319] The move to advanced satellites in 1992 is consistent with its obligation under the Preamble of the INTELSAT Agreement, to provide the most efficient and economic facilities possible through the most advanced technology available. Consequently, INTELSAT will be obliged to bring into the INTELSAT system future technological improvements in order to remain viable.[320]

Unless INTELSAT is able to provide advanced services in competition with the services proposed by existing non-INTELSAT service providers and new entrants in the future, it will have no choice but to endorse new satellite systems, in accordance with the benefit of all mankind principle. It is submitted that INTELSAT's proposal to assess the economic impact of future separate systems on the INTELSAT system on an incremental or cumulative basis will not be acceptable to member States unless INTELSAT provides the services and rates offered by proposed separate systems.

In the event that competition in the years ahead from separate systems and fibre optic ISDN systems render INTELSAT non-viable, policy choices will have to be made to either privatize or dismantle INTELSAT. If INTELSAT were to be dismantled, it has been suggested that it could be replaced with a more limited international organisation whose primary mission would be to oversee technical coordination of systems and maintain interconnectivity between

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319 Leive, supra note 203 at 318.

320 See Potamitis, supra note 225 at 41.

regional satellite systems.[321] It is submitted that the privatization or dismantling of INTELSAT may be inevitable in the evolution of international telecommunications, given the competitive services which will be made available through terrestrial ISDN systems and private advanced satellite systems.

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321 See Rodriguez, supra note 198 at 323.

CHAPTER IV

CONCLUSION

The telecommunications sector is key for the economic development of national economies, as well as the social and cultural development of mankind. In a society which is moving to an era in which national economic growth depends on information exchange, governments are supporting the development of digital technologies and the development of national information highways through a relaxation of regulation. The trend towards a global world economy affects the attitude of governments towards competition and technological progress in telecommunications. Essentially, governments view a competitive telecommunications market as a prerequisite for successful competition in the world market, and therefore encourage competition in telecommunications as a means of fostering their national economic goals.

It is submitted that technological progress is moving telecommunications into the 21st Century, and that ISDN development will increase competition in the global marketplace. The movement towards the development of national information highways in different countries, and the future transnational interconnection of existing and planned cable and satellite systems to create a seamless Global Information Infrastructure means telecommunications itself will become increasingly global.

Technological progress is one of the main reasons for the transition from monopoly regulation to regulated competition in Canada, and it is recognized that public interest regulation will weaken as emerging technologies change the nature of the Canadian telecommunications market structure through information industry convergence, and cross-industry and cross-border alliances. The trend globally is towards deregulation and privatization in telecommunications, and the challenge to national governments in the future will be to ensure that the telecommunications sector continues to serve the public interest without hindering technological progress.

While digital technologies and convergence will lead to greater competition in the telecommunications sector globally, and undermine the necessity for regulation as the preferred means of upholding social policy objectives, it is submitted that government regulation will remain important for ensuring the development of telecommunications for the benefit of mankind. National governments will face the challenge of finding the right balance between open market competition and regulation, and establishing regulatory policies which will meet the challenges of global competition while, at the same time, maintaining sovereignty over their telecommunications infrastructures. In Canada, a flexible policy and regulatory regime is recognized as essential for the development of the Canadian information highway. However, the Canadian Government is committed to ensuring that telecommunications infrastructures evolve in a manner which upholds public policy objectives. Canada's regulated competition approach to regulation of the telecommunications sector aims at establishing a balance between regulation and competition. It is submitted that similar regulatory approaches in other countries

will serve the world's interests economically, socially, and culturally, and is the prudent way of moving towards a global ISDN environment.

The movement towards the development of national information highways has begun and will lead to a Global Information Infrastructure. These developments are very promising for mankind since the applications are limitless for home entertainment, cooperative research, distance education, business, tourism, and health care.[322] According to a report prepared by Anne McKague & Associates for Industry Canada:

> "The potential of the information highway is considered unlimited and in its ultimate form can link every man, woman and child around the world in a virtual, continuous and limitless information exchange. Databases containing the sum of the world's knowledge can be accessed instantly, with subscribers adding to that knowledge daily as well as accessing it.[323]

However, ISDN development raises several regulatory challenges and it is submitted that since telecommunications is vital to the economies of the world, it is critical that existing regulatory regimes and future regulatory reform proposals respond appropriately. In the area of universal service, regulation will be important in assuring universal access to innovative telecommunications services. In the area of security and privacy, regulation of TDF will be required for the protection of privacy and network security in order to secure the privacy

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322 Ottawa, Tourism Canada Sector of Industry Canada, Technology in Tourism: Literature Review, (Ottawa: Industry Canada, December 1994) at 11.

323 Ibid.

rights of citizens and businesses, as well as the national security and informational sovereignty of countries. It is recognized that the linkage of computers with telecommunications networks will make it extremely difficult for countries to control what information is available internationally, and there will be a need for effective international regulation in the area of TDF. In the area of intellectual property, laws will need to be revised to ensure that legislation is appropriate in the digital age, since existing legislation does not adequately protect intellectual property works in digital form.

In addition, ISDN development will raise challenges in the area of multimodal competition since the coordination requirement under Article XIV of the INTELSAT Agreement, which has the objective of upholding a viable INTELSAT, does not apply to cable and there is no international regulatory mechanism to limit competition to the INTELSAT system from terrestrial ISDN systems. In fact, there is no international forum in which INTELSAT Member States may address the issue of the impact of global ISDN development on the INTELSAT system. It is submitted that the development and increased use of fibre optic ISDN systems will raise the need to address the issue of the role of the ITU and INTELSAT in the regulation of global ISDN development, as well as the issue of INTELSAT's future viability.

The future viability of INTELSAT will depend mostly on the political will of governments to uphold the international organisation in contradiction with the trend towards global competition in international telecommunications and ISDN development. Although INTELSAT's viability may be sustainable, it will be difficult in the future to control the outcome

because of the decreased ability of governments in an increasingly deregulated ISDN environment to control the business choices of privately held satellite and cable operators.

It is submitted that public regulation of telecommunications will remain vital in the emerging global ISDN environment and should be maintained in spite of the strong market forces of competition and technological progress. It is further submitted that the issue of INTELSAT's future should be examined in light of the competitive impact of global ISDN development on the INTELSAT system. Technological progress and competition undermine the coordination process of Article XIV of the INTELSAT Agreement. In the absence of the political will of governments to ensure the regulated development and expansion of the Global Information Infrastructure, ISDN development will undermine INTELSAT's purposes of ensuring equitable use of the spectrum/orbit resource as well as the use of the most advanced technology for the benefit of all mankind, which serve as means of furthering world peace and understanding.

In addition, it is an opportune time to examine the recent decision by the Clinton Administration to streamline procedures for the allocation and use of the radio frequency spectrum resource aimed, supposedly, at ensuring access to the NII at anytime and anywhere in the United States, and to auction broadband spectrum currently used by the U.S. Government to the private sector, for the integration of advanced U.S. satellite systems with the NII. It is submitted that advanced satellite systems to form part of the future Global Information Infrastructure should be developed and managed within the framework of INTELSAT for the

benefit of all mankind, and that the auctioning of radio frequency spectrum by the U.S. Government, to the private sector, sets a questionable precedent.

As discussed earlier, U.S.-based Teledesic Corporation plans to acquire broadband spectrum by auction through the U.S. Government in late 1994. It was reported that the constellation of 840 LEO satellites proposed by Teledesic Corporation for international service in the year 2001 will be based on SDI technology, which raises the question of whether the proposed system will have strategic uses. This question is difficult to address more fully in the absence of published information on the matter. However, irrespective of whether this proposed satellite system will have strategic uses, the fact remains that other countries may in the future be tempted to follow the precedent set by the U.S. Government. It is submitted that the development and use of advanced satellite technology should be operated within the INTELSAT framework and that irrespective of the existence of any strategic uses for B-ISDN satellite systems, the unprecedented initiative of the U.S. Government in 1994 to auction spectrum/orbit resources to the private sector undermines international public policy, the purposes of INTELSAT and the ITU, and may compromise the cause of world peace in the future.

It is further submitted that the United States should present to the world the benefits of new satellites, communications, and computer technology. In so doing, the U.S. Government should provide a comprehensive plan detailing how these new technologies can operate within the INTELSAT framework, instead of promoting private U.S. economic interests which run contrary to international public policy. INTELSAT as the only effective organisation

servicing the global need for coordination and cooperation in the future development of telecommunications should not be weakened by unilateral U.S. technological expansion but instead strengthened by U.S. leadership.

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