

# Telesat

Telesat Canada

a. INTERIM REPORT OF A STUDY  
ON  
THE USE OF ANIK C  
FOR  
DIRECT-TO-HOME AND COMMUNITY  
TELEVISION DISTRIBUTION /

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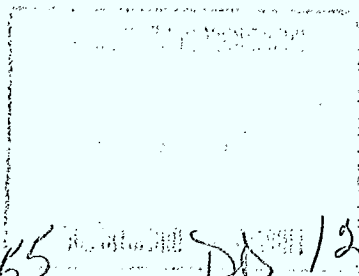
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This planning document is intended to stimulate the discussion of future options, and does not necessarily represent the official viewpoint of Telesat Canada. Due to the speculative nature of the material treated, no commitment for future action should be inferred from the statements contained herein.

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## GLOSSARY OF TERMS

Areal - Locations having fewer than 1 person/sq. mile

Ecumene - The inhabited areas of the country.

Broadcaster/program supplier - The customer who leases the space segment to supply programming to be received by the end-user.

Direct-to-home service - The direct reception of TV and radio signals from a satellite to an individual home.

Direct-to-community - The direct reception of TV and radio signals from a satellite to a community reception terminal and distributed locally to individual homes.

End-user - The customer who receives the satellite signal on a direct-to-home or a direct-to-community basis.

Functional Specifications - The non-technical description of how the equipment should operate by describing the functions which it will perform.

Interim DBS Service - The reception of satellite signals on a direct-to-home and community service basis from a fixed service satellite.

Pure DBS Service - The reception of satellite signals on a direct-to-home or community basis from a DBS satellite of power and frequency temporarily specified by WARC 79.<sup>1</sup>

Regional Coverage - This refers to the coverage by a single beam of Anik-C which covers one-quarter of Canada.

Rural - Areas where the population density lies between 1 and 1000 people/sq. mile

Signal - Refers to a single television signal using any combination of power and bandwidth on the transponder.



## EXECUTIVE SUMMARY

Many revolutionary changes in our methods of communicating with one another have been brought about by new applications of technology. The communications satellite has been able to create another revolution, insofar as distant communications is concerned. The use of Direct Broadcast Satellites (DBS) could be another large step to bridge the gap in communication services between the underserved areas and the large metropolitan areas so that all Canadians alike will enjoy access to the the same entertainment, information and general communication services.

This report presents an initial market evaluation of the use of Anik C as an interim DBS for the distribution of TV and radio signals. There are two main reasons for a DBS service in most countries proposing to implement it. The first is that of making a profit, as for the U.S. Pay TV service proposed by Comsat: the second is to find an economic replacement for present or future terrestrial facilities to extend communication services to all parts of a country. It is this function of a DBS that is attractive to government Postal Telecommunications & Telegraph Agencies (PTT's) in Europe and Asia. In addition, some countries are considering use of a DBS for distribution of a new commercial broadcasting network.

This study addresses the fundamental question as to *Does it.*  
the role of DBS in Canada. Certainly, the perception of this role is different depending on who is expressing the view, but the basis of the view must be considered. On the part of the government, the role is to find a cost-effective means of extending broadcast and other services to underserved areas; while to private companies (including Telesat), the role is to pursue the most promising market in the most expedient manner.

The demand for an interim DBS will greatly depend on the content and cost of delivery of DBS services. How the signals are received and distributed is another major factor affecting the success of the service. The question of whether these signals should be delivered direct to individual homes or to community reception distribution systems is addressed in this study.

The demand curves developed for this study reflect the lack of available broadcasting services in specific areas. Consequently, the number of households used in the demand curves are the number of households not receiving these services.

The demographic and television signal availability data presented point up the diversity of Canadian population distribution and the imbalance in broadcast signal availability. The Prairies and East Central Provinces have wide areas of dispersed households, whereas the Coastal areas have a very large proportion of clustered settlements. The latter type is best served by a community reception system while the former is perhaps a prime market for Direct-to-Home reception. Television services available in these areas, compared to those served to large metropolitan areas, are minimal. Rural dwellers receive an average of 3.85 television signals compared to the 12.6 signals offered their large city counterparts.

Rural and remote areas have become "mentally urbanized", so they want more. This demand for additional TV services has been well documented in the many briefs presented at the April 1980 CRTC "Therrien Committee" public hearing on the extension of services.

The recommendation we have made for the minimum number of signals for an interim DBS service is four TV and radio signals. This quantity we consider a minimum in order to appeal to and gain an end user market. If this market is not sufficiently large to support the supply of this many signals then some means will have to be found to meet the costs of the transmission systems as well as those of the programming to be carried by them.

The recommendation for the maximum number of eight TV and radio signals would permit lower rates due to the full satellite utilization. The programming would be a wider mixture of signals which would have a greater appeal to the viewing audience and an expanded market consisting of both the urban and rural areas of Canada.

This study has developed functional specifications for terminal equipment that are geared to the DBS end user and the program supplier or broadcaster. End user requirements have been developed from experience obtained from DOC Anik B pilot projects. Broadcaster or program supplier technical requirements arise from discussions with the industry and other sources. Indications from these respondents are that there will be resistance to a DBS if it does not take in the concerns of the local broadcaster by proper control and licensing.

We have established our market for a Direct-to-Home or Community service to be the Rural households in Canada, as defined by the DOC, which are 1.72 million. Of this amount almost half a million households in 750 communities are prospects for a community reception service due to the closeness of the homes. The remaining 1.27 million are potential prospects for direct-to-home service. The penetration for direct-to-home service is estimated for the various terminal price levels of the different services offered.

For example, we have estimated that the demand for a terminal costing \$500 will range from 48,000 households for the Basic services of CBC and Educational TV to 298,000 households for a service providing eight TV signals including Pay TV.

The urban and cabled households have not been included in our primary market and it cannot be estimated to any degree of reasonable certainty as to the number of these potential subscribers to a DBS service. For reasons that range from interest in ownership of a satellite terminal to the subscribers' dislike of cable service, some of the urban and cabled households will be interested in subscribing to a DBS service. To illustrate the effect of this market, consisting of some 4 million subscribers, we can see that a penetration of 1% would add 40,000 subscribers to the interim DBS service. A penetration of 5% would increase this to over 200,000 additional subscribers. Referring to the example given above, for a service of eight TV signals including Pay TV, the addition of 5% of the urban households would increase the total DBS market by over 60%.

I.0

## INTRODUCTION

I.1

### Background

The objective of the contracted study is to examine the feasibility of using Anik C as a vehicle for providing interim Direct Broadcast Satellite (DBS) services. This section of the report discusses the effects predicted by a market study of direct-to-home services, and constitutes the initial input upon which the technical and economic studies are based. As such, it represents one element required by DOC for internal purposes, but does not gather up all market-related elements of the overall study. The reader should note that this section does not reflect the results of any primary research, but is a concentrated assessment of studies and analysis already carried out in previous DOC-provided studies.

I.2

### Methodology

The contract with DOC specifies the following methodology for tasks 1.1 through 1.5 inclusive:

- 1.1 Search market literature for present plans for Direct-to-Home satellite services and TV services in general.
- 1.2 Analyze and assess DOC demographic studies as they relate to TV services and Direct-to-Home services.
- 1.3 Examine Anik B Direct-to-Home TV pilot projects to determine their applicability to this study.

- 1.4 Prepare a scenario of the TV and radio signals to be transmitted by Anik C, and determine generally who the program suppliers might be.
- 1.5 Define the functional specifications of user and broadcaster governing user terminal characteristics; define potential users and the proportion of them that would be served by individual and community reception.

I.3

#### Study Approach

The present research relies heavily upon secondary sources obtained from the Department of Communications and the open literature. The study approach was as follows:

- Determine the motives for DBS implementation in other areas of the world and relate them to Canada's situation.
- Establish market size for extended and new services via a Direct Broadcast Satellite.\*
- Determine market demand based on cost of terminals and program variety that could be offered as a DBS service.
- Estimate the effect of community reception systems on DBS market potential.

\* New Services - refers to introduction of Pay TV and superstations across Canada.

Study Limitations

As in any study, the fixed amount of time and money budgeted determined the extent and depth of the study. The aspects of this study which have not been addressed and the limitations of the research design must be included as an integral part of the information presented, and must be remembered by anyone making decisions based upon this study. These aspects are the following:

1. No formal interviews and surveys of a primary research nature were carried on as direct input into the study.
2. Secondary research from published sources and the Department of Communications were used as sole input to its content.
3. The results of some ongoing DOC studies could not be included because they were not available at the time of writing. The material in this report should be treated as a snapshot view at this point in time.
4. The study did not focus heavily on the appropriate marketable programming to make the Interim DBS a viable venture.
5. There was no comprehensive survey of the program suppliers and broadcasters to assess their willingness to support an interim DBS.

## 1.0 DBS PLANS OF OTHER COUNTRIES

The future of DBS around the world is very uncertain owing to constraints imposed by political, economic, regulatory controls and international agreements. Market plans and analyses are rarely published, and the literature is more concerned with the technical and institutional alternatives or regulatory problems attendant to such services.

Most nations differ in their approach to the technology, depending on their level of advancement, geographic conditions, political and telecommunication regulations.

### 1.1

#### U.S.A.

The Communications Satellite Corporation (Comsat) has made announcements as to its intention to apply for a license to offer DBS Pay TV services to U.S. households. Their final application will not be submitted until late in 1980, but some information has been made available through company news releases and presentations given to the industry. The information is based merely on their initial announcement and may not be their final application. The points of greatest interest are as follows:

- A monthly rate of \$20 a month per subscriber per TV channel and a penetration of all U.S. households of 9% would produce a breakeven on an investment of \$2,980 million. The monthly fee would cover both the subscription cost of the service and the cost of the programming.



- At 15 to 20% market penetration, Comsat would realize profits of some \$1 billion a year.
- Cost of an earth terminal receiver would not exceed \$300 including about \$100 for the decoder. This cost objective is critical to guarantee success.
- Transmission of Pay TV signals is most important, so Comsat will be using the best consulting talents in order to identify, produce and broadcast the highest appeal programs. Over 40% of the expected \$6 billion revenue will go to program content production in which Comsat would contract to program suppliers.
- Cost for the satellite system (space segment, uplink and satellite control) will become a very small portion of the total annual expenses (about 5%).
- Comsat will also deliver stereo-audio and data services; the latter being a Teletext service.
- One channel is expected to be dedicated to a pay-per-program system.

#### 1.1.1

##### Market Considerations For Anik C From The Comsat Proposal

Two major points of the Comsat proposal are: a terminal cost less than \$300; and the need for unique premium TV signals. This proposal aims to make DBS a commercially viable venture that will appeal to the well-served urban areas as well as to the underserved markets. Thus Comsat sees a potential market comprising all the 80 million U.S. households. A 12.5% market penetration (10 million households) will make this venture profitable.

Comparing the Canadian situation with that of the U.S., we find:

1. Canada has a larger penetration of cabled areas (78%) than the U.S. (25%).
2. The number of households in Canada is approximately 10% of that in the U.S.
3. Comsat proposes to use \$300, 60 cm terminals, decoders included, and provide 58 dBW EIRP signals. Anik C will deliver approximately 48 dBW EIRP signals at best, and require 1.2 to 1.8 meter diameter terminals. Costs will depend on quantity and will be addressed later in the study.
4. Comsat's transponders will be quite costly, but they will cover the nation with spot beams directed at selected areas of the country. Anik C can offer a saturated TV signal on a full transponder or share a transponder with 2 TV signals. This can be combined with half Canada coverage; either split between two beams or via individual beams to each of four regions.
5. Comsat signals will spill over into the highly populated areas of Canada. This will create a competitive threat for the Anik C DBS market. Although Comsat signals will be coded for security, a tendency toward piracy can be expected owing to the difference in cost of terminals and the potentially attractive program content.

Table 1.1 compares the size and nature of Canadian and U.S. Television markets.

TABLE 1.1

COMPARATIVE ANALYSIS

TELEVISION STATISTICS IN U.S. & CANADA

	<u>U.S.</u>	<u>CANADA</u>
Households population	80 million	7 million
Households receiving no TV signals	1.6 million	86,626
Number of cable systems	4,100	467
Percent of cabled areas	25%	78%
Number of communities served by cable	9,600	1,082
Number of cable households	14.5 million	3.7 million
Penetration by cable of all households in cabled areas	18%	52%

Source: Canadian Cable Television Association, Cablestats.

1.1.2

RCA

Comments by RCA executives indicate that the present trend in satellite-distributed TV and radio signals in the U.S. is to provide the local cable distributors with a large assortment of programming by the most inexpensive means possible.<sup>2</sup>

The demand for specialized TV programming specific to audience tastes will spawn the major requirement for increased capacity. Cable systems are faced with the pressure from local and national regulators to provide as large a choice of programming as they can. Consequently, cable systems are being installed with an average capacity of 50 TV signals. Satellite reception helps these companies fill out their programming excess with minimal investment.

RCA's executives feel that the situation with Direct Broadcasting Satellites is different in several ways:

- A true DBS will be limited by economic trade-offs, where the higher the power of the satellite entails a shorter the expected life span and greater expense.
- A DBS type service will not be able to offer the number of signals available on cable TV.
- The high cost of transponders on a true DBS will limit its use to high-value applications.

Though no announcements have been made by RCA as to its interest in DBS, it is presently studying the technology. Statements from RCA to date, indicate that they feel there would be little displacement of present satellite traffic, since DBS is not estimated as competitive but complementary to it.

### 1.1.3

#### The Viability of a U.S. DBS

The future development of DBS is likely to be shaped by competitive market responses and perhaps, more importantly, by regulatory and political considerations. For the purpose of this report, we shall discuss only the competitive market response and its influence on the other areas.

The present trend of growth of satellite broadcast services in the United States has been fueled by three major factors:

1. The market demand for a greater variety of video programming,
2. The clear economic advantage of satellite versus terrestrial transmission for point to multipoint applications, and
3. Deregulation by the FCC of satellite broadcasting distribution.

The greatest impetus to satellite broadcast-distribution has been cable television. Pay Television offered a means to Cable Systems for gaining additional revenue from subscribers. The addition of commercial and special interest channels is intended to provide more choice of signals to cable subscribers.<sup>2</sup>

Satellite provides two dramatic improvements over conventional terrestrial distribution systems:

1. It immediately extends the reach of pay TV nationwide.
2. It allows the delivery of a substantially better product in terms of quality and, more importantly, in terms of a coordinated package of programming.

The expansion of satellite programming causes the proliferation of earth terminals, thus increasing the demand for satellite distributed services.

1.2

#### Foreign Plans For DBS Services

Many countries are now examining the possibility of DBS service, but from different perspectives. In the U.S., such services are left to private enterprise to implement, whereas in most other countries they are the responsibility of Postal, Telephone and Telegraph (PTT) agencies. The former is primarily interested in the prospect of a profitable venture, while the latter may be more concerned with extending basic communications services at a cost that can be justified.

The following sections illustrate a predominantly government attitude to DBS. The difference in perceived benefits contrasts dramatically with that of Comsat's.

1.2.1

Western Europe

Any analysis of the potential development of the DBS systems in Western Europe must start with the special World Administrative Radio Conference (WARC) on Broadcasting Via Satellite held in Geneva in January-February 1977. A detailed plan was established for Europe, Africa, Asia, Australia and the Pacific region (Region I and III), while planning for the Americas (Region II) was postponed until 1983. The WARC identified two factors which have become important to international debate on the topic of DBS - individual reception and national coverage.<sup>3</sup>

- Individual reception was interpreted to mean the reception of satellite signals by individual antennas without the intervention of a centrally-located earth station. It was agreed that frequency and orbital positions should be assigned with this possibility in mind.
- National coverage was interpreted to mean the reception of a broadcast signal within the borders of a country.

In most cases five television channels (each television channel also useable for about 16 monaural or 8 stereo radio channels) have been allocated to European countries. But viewers in many of these countries will be able to receive more than five channels owing to "spillover", where the signal spreads beyond the national boundaries of a country.

The question arises: Why should countries with already developed television networks be interested in satellite broadcasting? In most countries, satellite broadcasting would be able to take over the broadcasting of national television programs, thus freeing terrestrial transmitters for local, regional or special broadcasting - if the cost of a satellite television network is comparable to that of a terrestrial television system. These costs are difficult to evaluate and vary according to country.

In Western Europe, satellite communications ventures are undertaken by individual nations as well as by cooperative international interests. Different views prevail, depending on each national situation.

Great Britain has examined the use of DBS and has decided it does not suit their situation. TV and radio services now reach 99.5% of their population. The average viewer receives 3 to 5 TV stations. In the opinion of James Redmond, the then Vice-President of the British Broadcasting Corporation, the cost of a DBS to reach the remaining 0.5% of the population is uneconomic and is not being considered as an alternative in the distribution of services.

The West Germans analyzed both the cost of replacing their present distribution facilities and the costs that would be incurred by extending services to remote locations. The analysis included the cost of distribution to future cable and rebroadcast systems as well as direct-to-home service. Not measured in their analysis was the ability of their market to support the manufacturing of their own equipment. They concluded that DBS distribution is the most cost-effective solution to their needs.



The French Government has been active in forming DBS systems, for technical reasons. It has the goal of extending coverage to 100% of the population. To reach this goal without the aid of satellite transmission, it would require 3,250 additional TV relay stations in addition to the 5,300 now in-service. The additional facilities would help service only 1% of the population not served by any signals. The French conclude that DBS is the most cost effective solution to their needs.

The Nordic countries; Demark, Finland, Norway and Sweden, have formed a venture to provide a satellite beam containing eight channels. Their aim is to increase understanding and closeness between the countries.

1.2.2

Australia

Australia has a problem defining its broadcasting structure, which is now providing regional and local programming. It is now establishing a domestic satellite relay system to support local systems. Regional broadcasting is under territorial control. A DBS would compete with the planned domestic satellite system and conflict with territorial authority as it applies to regional broadcasting.

Countries with plans for implementing DBS are listed in Table 1.2, which gives the launch date and status of each system.

TABLE 1.2

STATUS OF DBS DEVELOPMENT WORLDWIDE<sup>4</sup>

<u>COUNTRY</u>	<u>LAUNCH DATE</u>	<u>STATUS</u>
Australia	1984	RFP issued
China	1985	Planning multi-purpose satellite with potential capability to handle DBS, although the primary use will be community reception.
ESA	1984	Multi-operational service approved.
France	1984	Pre-operational service approved.
Germany	1984	Pre-operational service approved.
Japan	1984	Second generation experimental satellite approved for development.
Luxembourg	1983-85	Decision pending
Scandinavia	-	Future in doubt due to limited support.
Switzerland	-	Swiss-British consortium has proposed advertiser-supported system.
United States	COMSAT 1983-85	Application filing pending. Has desire to participate in DBS as carrier.
USSR	1976	UHF downlink system, 5 spacecraft reportedly in use.

Source: A. Curran, DOC.

DOC DEMOGRAPHIC REPORTS

The Rural Communications Program was created to study the problems of the rural areas of Canada in achieving a satisfactory level of communication services. These "rural areas" include both farm and non-farm areas of low density population, where telecommunications services are extensions of urban services. It was found that many communities surrounding the metropolitan areas were greatly underserved compared to those more closely located to urban centers. This imbalance in services was the first concern of the Department of Communications. It sought to determine the best, most cost effective methods to supply better communications services to these outlying areas.

A 1976 DOC study established the size of the underserved areas. It was found that 24% of the population of Canada, comprising 6 million people, live in rural areas. This percentage was expected to increase owing to the rising importance of the energy and resource industries. Communications technology, they said, had reached a point where cost effective methods could be found to provide communication services on a single infrastructure as opposed to the fragmented approach to servicing rural Canada.<sup>5</sup>

Summary Of Population Trends

The market for Anik C interim DBS service is necessarily affected by changes in Canadian population distribution. The following presents an overview of demographic changes to be expected over the next decade, which is the Anik C service life. Assuming that trends from previous years can be projected into the future, we obtain the extrapolations depicted in Figures 2.1 through 2.8.<sup>6</sup>

- The declining youth population growth affecting the overall population in the future can be seen in the declining percentage distribution of youth in the forecasted years 1986 and 2001. (Figure 2.1)
- An increase of older-age Canadians is expected in both urban and rural areas. (Figure 2.2)
- A continuation of migratory trends between provinces of high rural concentration (Saskatchewan, Manitoba) and provinces with larger urban areas (Ontario, British Columbia). (Figure 2.3)
- A continued increase in the number of people in the work force, especially younger women. (Figure 2.4)
- Leisure time continuing to increase in both rural and urban areas with the decrease in the number of working hours expected for all workers. (Figure 2.5)
- A number of households will continue to increase, with more non-family households (elderly and young singles), and with less people per household. (Figures 2.6, 2.7 & 2.8).

These trends will have their effect on demand for variety and content of TV and radio services, and modify viewer watching habits. Programming will appeal to more targetted audiences demanding specialized channels of entertainment and information services.

The following are some of the effects expected of these population trends:

- an increase in sedentary population wanting more in-home entertainment
- increase of specialized TV entertainment owing to increasing number of non-family households (less general variety content)
- increase of time-convenient entertainment facilities (TV) for larger work force
- increase of entertainment services to both rural and urban areas owing to increase in leisure time

Figure 2.1

: PERCENTAGE DISTRIBUTION OF THE POPULATION BY AGE GROUPS AND SEX, CANADA :  
 1971 (ACTUAL), 1986 (PROJECTED), AND 2001 (PROJECTED)

25

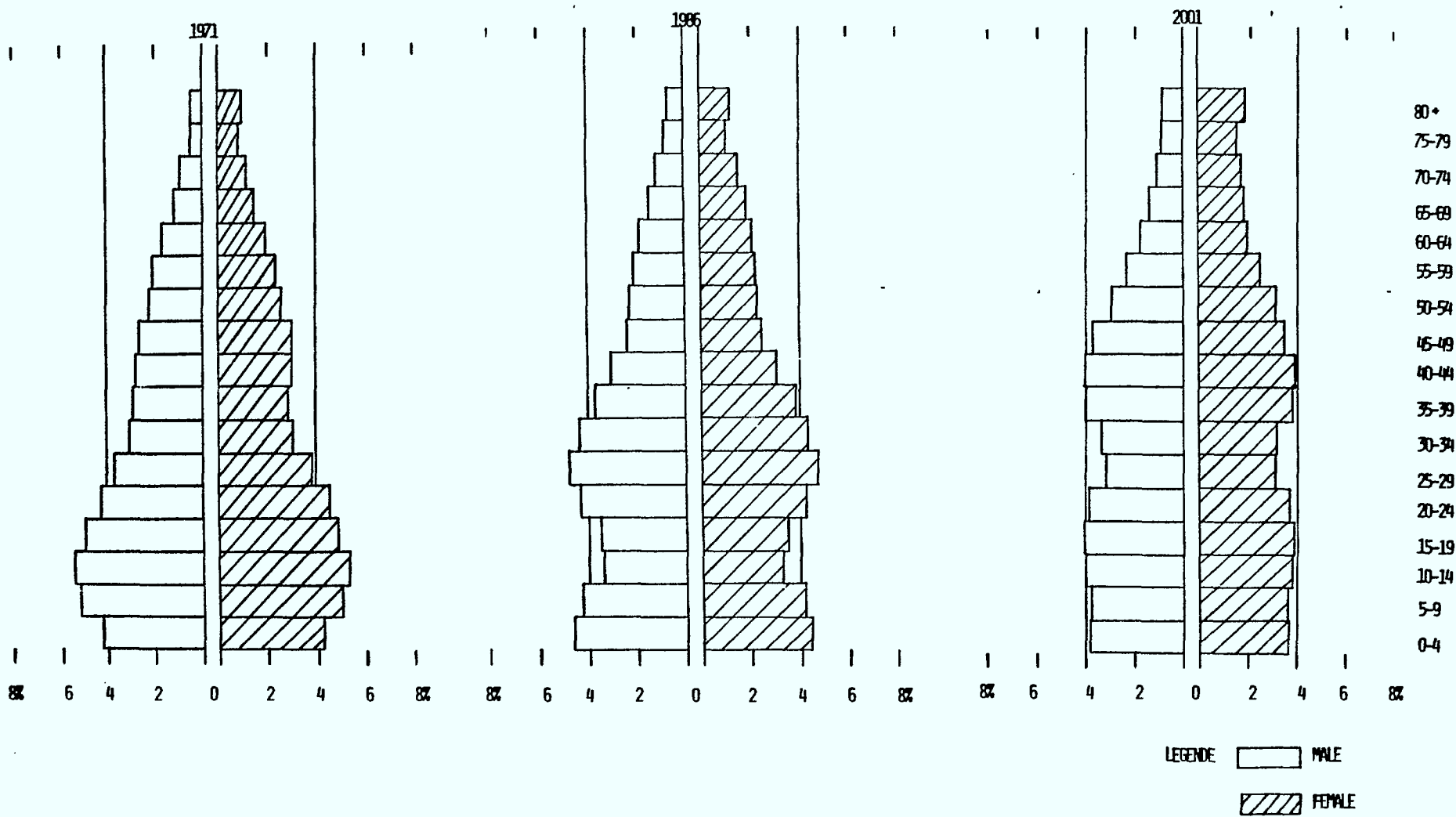


Figure 2.2

: PERSONS 65 AND OLDER, AS PERCENTAGE OF THE POPULATION, CANADA, 1976-2001 (PROJECTION D)

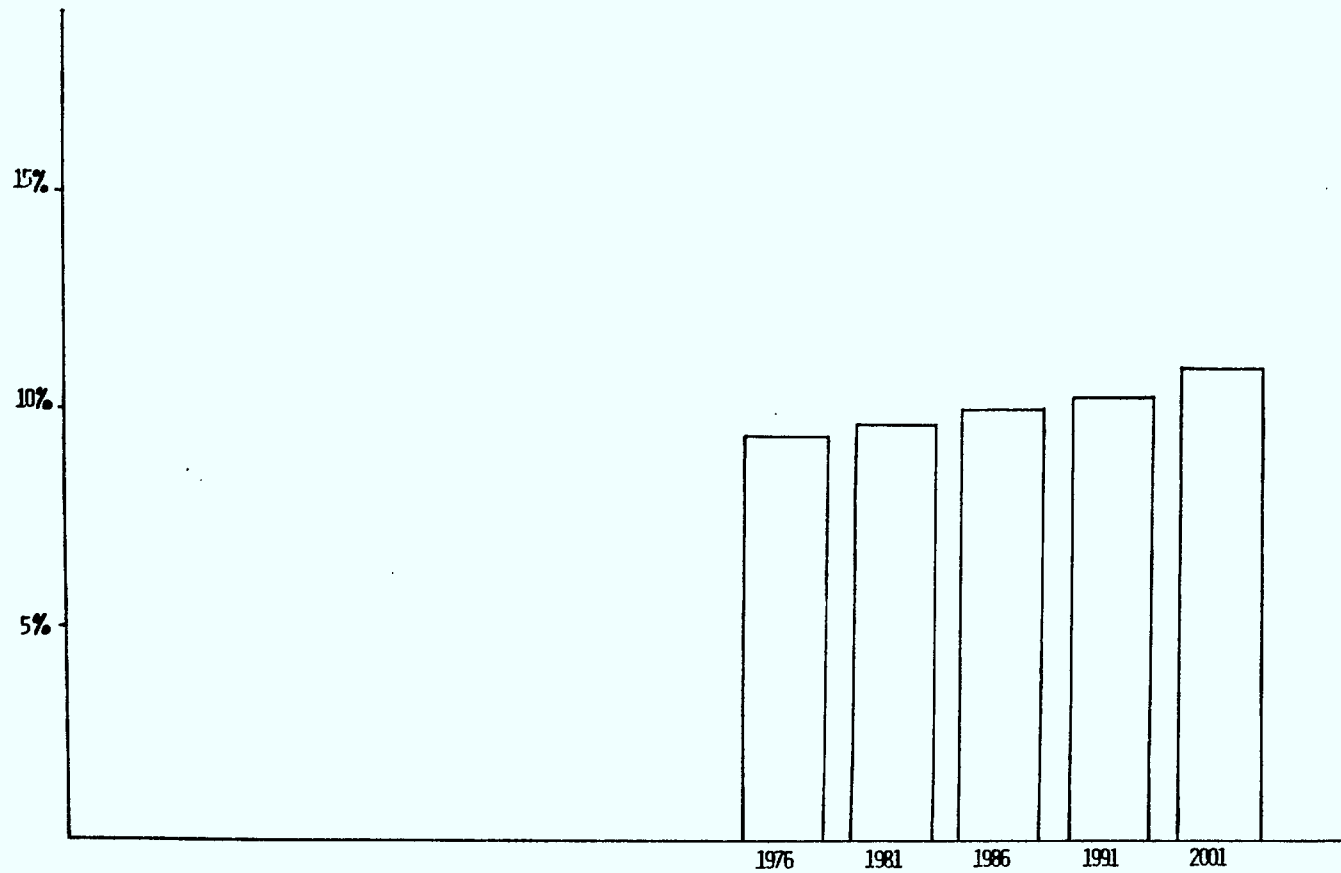




Figure 2.3

OBSERVED AND PROJECTED CHANGES IN THE POPULATION OF CANADA AND PROVINCES,

EVOLUTION DE L'ACCROISSEMENT DE LA POPULATION DU CANADA ET DES PROVINCES,

1966-2001, PROJECTIONS B

1966-2001, SELON LES PROJECTIONS B

PROVINCE OR TERRITORY	PROJECTION B					PROVINCE OU TERRITOIRE					
	1966-1971	1971-1976	1976-1981	1981-1986	1986-2001		1966-1971	1971-1976	1976-1981	1981-1986	1986-2001
	AMOUNT OF CHANGE (IN THOUSANDS)						POURCENTAGE DU CHANGEMENT				
CANADA	1,553.4	1,278.0	1,626.2	1,786.1	4,396.9	CANADA	7.76	5.93	7.12	7.30	16.74
NEWFOUNDLAND	28.7	31.6	38.2	46.2	118.1	TERRE-NEUVE	5.81	6.05	6.90	7.80	18.50
PRINCE-EDWARD ISLAND	3.1	2.9	4.0	5.8	11.0	ILE DU PRINCE-EDWARD	2.85	2.59	3.49	4.89	8.84
NOVA SCOTIA	33.0	13.0	19.7	24.4	31.1	NOUVELLE-ECOSSE	4.36	1.64	2.46	2.97	3.67
NEW BRUNSWICK	17.8	19.8	21.2	24.7	41.6	NOUVEAU-BRUNSWICK	2.88	3.12	3.24	3.66	5.94
QUEBEC	247.0	131.4	218.6	241.9	299.0	QUEBEC	4.27	2.17	3.54	3.79	4.51
ONTARIO	742.2	667.0	817.6	885.7	444.7	ONTARIO	10.66	8.65	9.76	9.64	24.26
MANITOBA	25.1	11.1	20.6	24.9	21.5	MANITOBA	2.60	1.12	2.06	2.44	2.05
SASKATCHEWAN	-29.1	-45.5	-37.7	-35.6	-192.0	SASKATCHEWAN	3.06	4.91	4.28	4.22	23.78
ALBERTA	164.7	140.7	172.6	189.3	509.9	ALBERTA	11.25	8.64	9.75	9.75	23.93
BRITISH COLUMBIA	310.9	296.6	340.5	366.1	1,067.2	COLOMBIE BRITANNIQUE	16.59	13.57	13.72	12.97	33.48
YUKON	4.0	2.7	3.1	3.5	11.1	YUKON	27.77	14.67	14.69	14.46	40.07
NORTHWEST TERRITORIES	6.1	6.7	7.7	9.1	33.9	TERRITOIRES DU NORD OUEST	21.25	19.25	18.55	13.49	58.14

SOURCE : STATISTICS CANADA, POPULATION PROJECTIONS.....2001 (MODIFIED) P.65

Figure 2.4

TOTAL LABOUR FORCE - PERCENTAGE DISTRIBUTION BY SEX

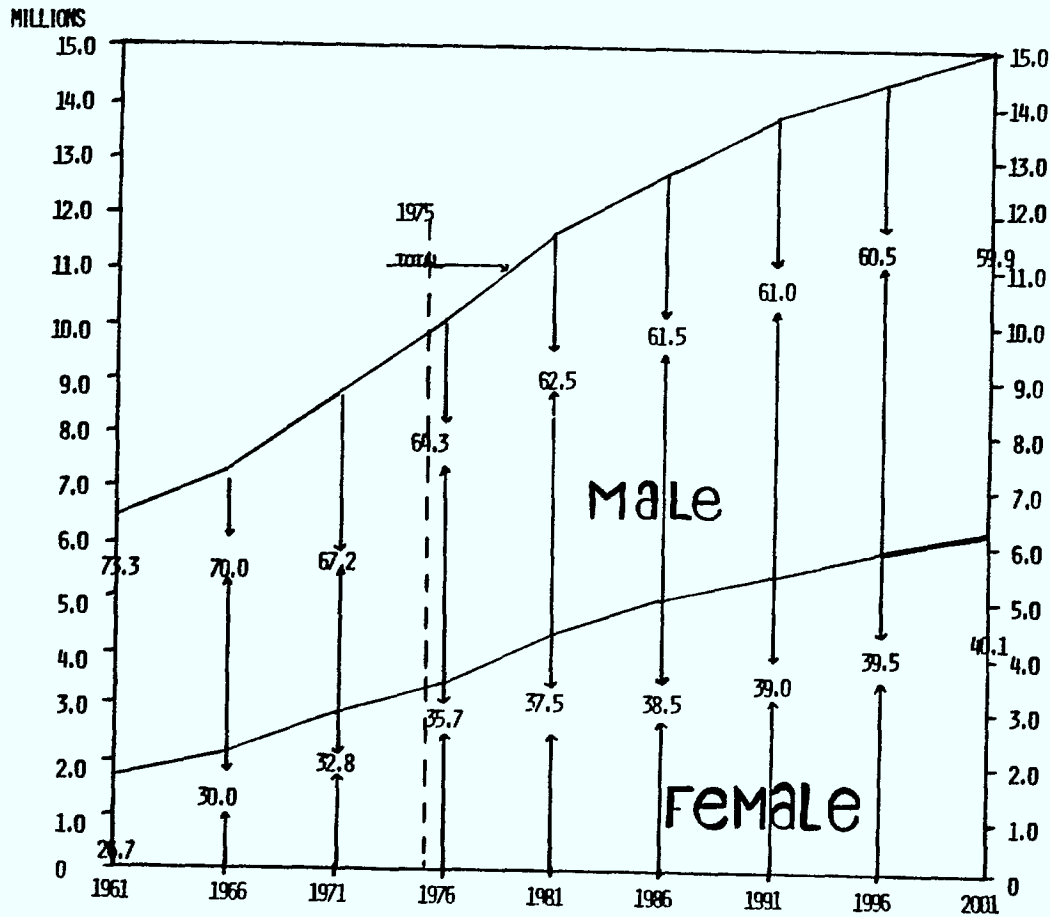


Figure 2.5

STANDARD HOURS OF WORK

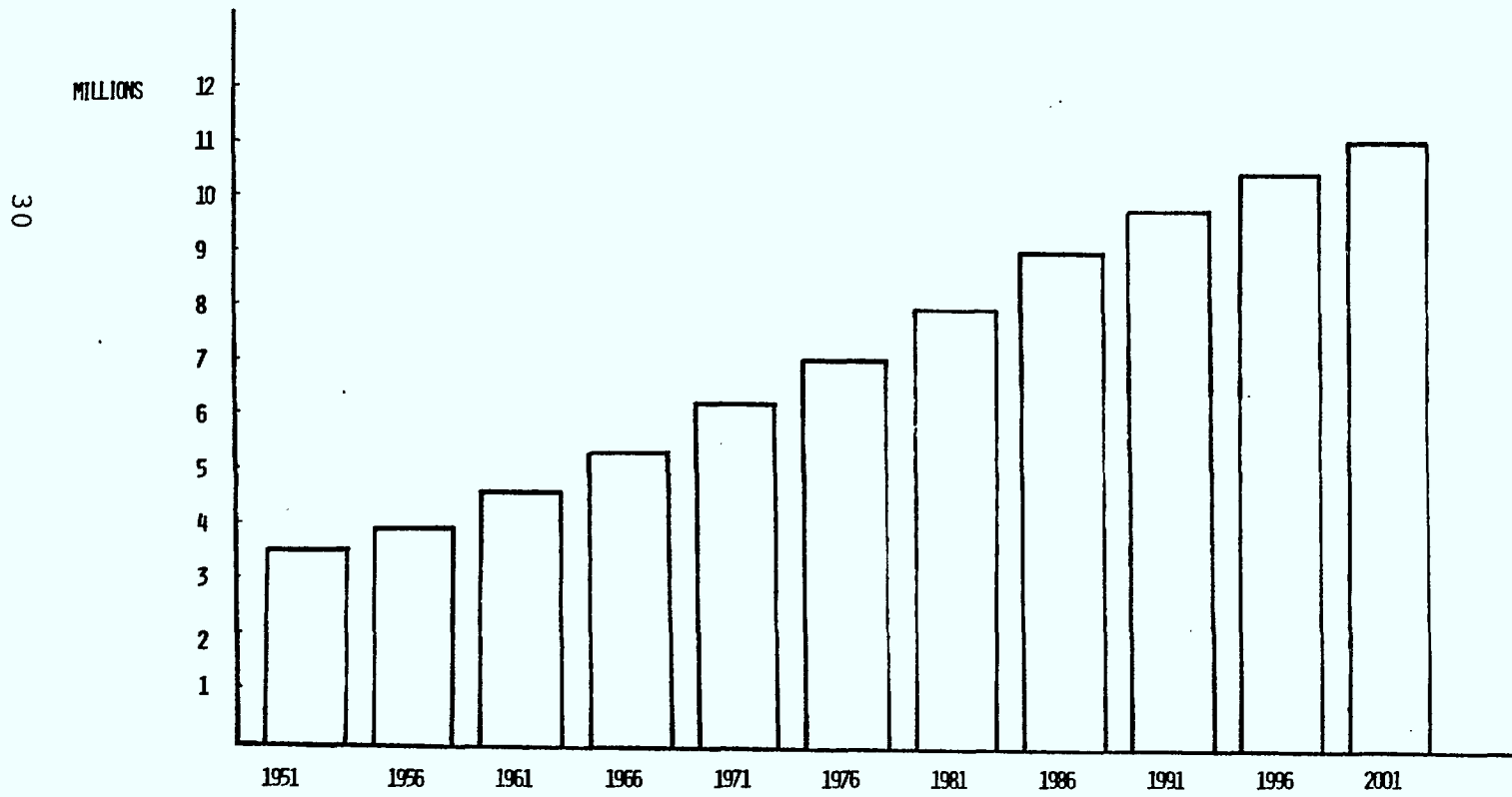
<u>STANDARD WORK WEEK<sup>1</sup></u>	<u>1951</u>	<u>1957</u>	<u>1961</u>	<u>1966</u>	<u>1971</u>
OFFICE WORKERS	38.6	37.9	37.7	37.4	37.6
PLANT WORKERS	43.6	41.6	41.3	41.0	39.3

1) STANDARD WORK WEEK RELATES TO MANUFACTURING. THE STANDARD WORKING HOURS ARE SPECIFIED IN A COLLECTIVE AGREEMENT, OR FIXED BY THE EMPLOYER FOR HIS WORKERS.

SOURCE : PERSPECTIVE CANADA P.99

Figure 2.6

NUMBER OF HOUSEHOLDS, CANADA, 1951-2001



SOURCE: STATISTICS CANADA, POPULATION PROJECTIONS....2001

Figure 2.7

ACTUAL AND PROJECTED AVERAGE SIZE OF HOUSEHOLDS, CANADA, 1951-2001  
 TAILLE MOYENNE DES MENAGES, CANADA, 1951-2001

YEAR - ANNEE	NUMBER OF PERSONS PER HOUSEHOLD NOMBRE DE PERSONNES PAR MENAGE
1951.....	4.18
1956.....	4.07
1961.....	3.98
1966.....	3.85
1971.....	3.56
PROJECTION 1	
1976.....	3.28
1981.....	3.11
1986.....	3.01
1991.....	3.02
1996.....	3.02
2001.....	2.99

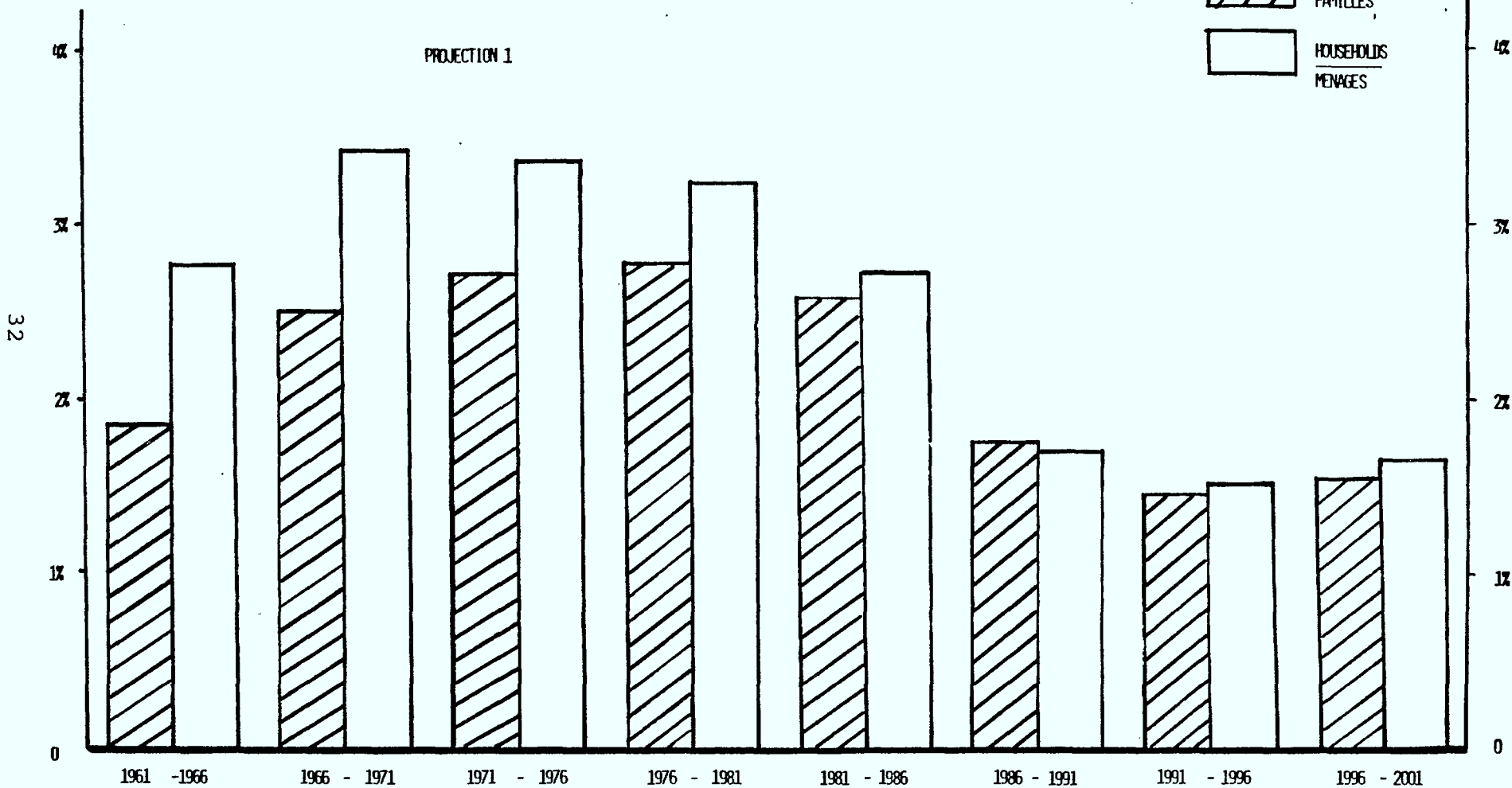
SOURCE : STATISTICS CANADA, HOUSEHOLD AND FAMILY PROJECTION.....2001 P.76 (MODIFIED)

Figure 2.8

ANNUAL PER CENT GROWTH, HOUSEHOLDS AND FAMILIES, CANADA, 1961-2001

POURCENTAGE D'ACCROISSEMENT ANNUEL DES MENAGES ET DES FAMILLES, CANADA, 1961-2001

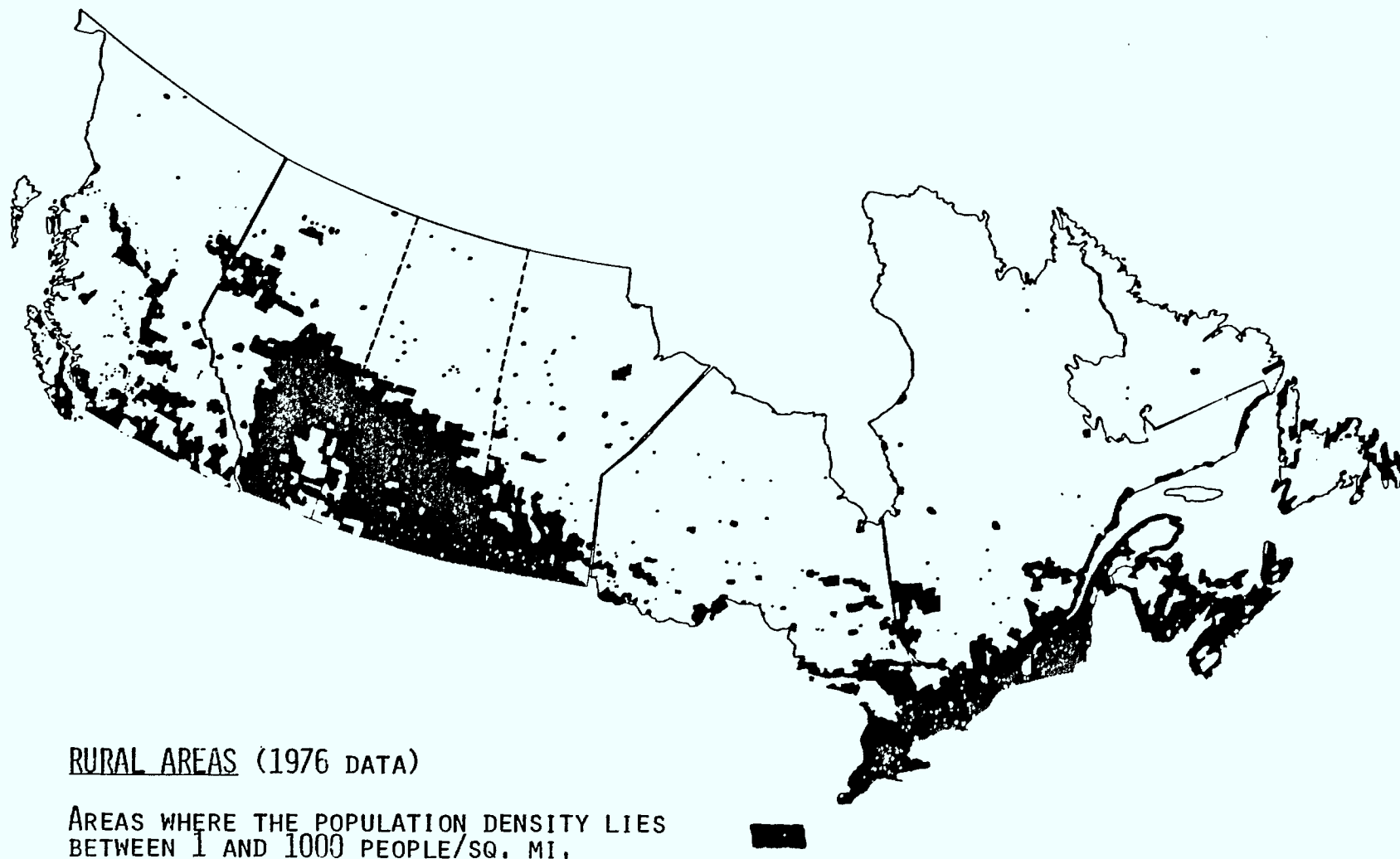
FAMILIES  
FAMILLES  
HOUSEHOLDS  
MENAGES



Another DOC study relating to mobile communications concluded that; owing to "the ever present substitution of capital for labor, the rural areas are being depopulated."<sup>7</sup> Those living in rural areas have become 'mentally urbanized' owing to increased personal mobility and mass media techniques. Thus rural communities now expect to obtain the same level of services enjoyed by urban communities.

Most Canadians live along the American border, while the North remains largely uninhabited. With an area of 3,549,960 square miles, Canada enjoys a population of just over 24,000,000 people. Population density is 6.3 persons per square mile, increasing to 10.7 if one excludes the territories. The latter figure is misleading, since it still includes vast empty areas. Fig. 2.9 shows pictorially the rural Canadian population distribution.

FIGURE 2.9



RURAL AREAS (1976 DATA)

AREAS WHERE THE POPULATION DENSITY LIES  
BETWEEN 1 AND 1000 PEOPLE/SQ. MI.



Table 2.1 provides more detailed population data of the provinces and the territories. In southern Canada the ecumene or inhabited areas of the country is a strip of land coinciding with the agricultural areas and the dense populous zones. The northern ecumene differs from the south in that no appreciable amount of land is used for agriculture. The people in this area tend to live in communities. The Prairie Provinces form 19.1% of the total land area of Canada, and represent 49.2% of the total ecumene.

In 1978 the DOC set out to identify the various types of communities and determine the spatial distribution of households throughout the various regions in Canada. Very distinct topographical, population density and economic characteristics were identified within the four regions of southern Canada:

1. The mountainous and ocean-bound region of British Columbia consists of dispersed settlement <sup>8</sup> patterns comprising 75% of that Provinces' rural population.<sup>9</sup>
2. The Prairie provinces of Alberta, Saskatchewan and Manitoba displayed a high level (75%) of 'areal and dispersed households.' These communities are the most difficult to service because it is uneconomical to cable households or to establish rebroadcast facilities there.<sup>10</sup>
3. Ontario and Quebec contain more than 50% of the rural Canadian population. These areas are evenly split between 'settlement' communities and 'areal and dispersed' communities. In these two provinces there is a large rural population surrounding the urban and large metropolitan areas.

4. The provinces of New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland concentrate their populations in community settlements or according to a linear pattern. Few, if any, areal and dispersed household patterns could be identified in this region.

Some areas are suitable for cabling (East Coast), owing to the density and linear structure of their communities. Other areas, notably in Saskatchewan, Ontario and Quebec are more widely dispersed and would be better serviced by direct-to-home satellite reception. These characteristics are reflected in section 5.0 of this study, and each demand curve is weighted according to its susceptibility for community or individual reception.

Table 2.1

## AREA OF ECUMENE AND REAL POPULATION DENSITY

Province	Land Area in sq. miles	Ecumene* in sq. miles	%	Pop.** '000	Density of Population	
					p. sq. m. of total area	p. Sq. m. of ecumene
Newfoundland	143,045	9,360	6.5	543	3.7	58.0
P.E.I.	2,184	2,184	100.0	117	53.6	53.6
Nova Scotia	20,743	10,320	49.7	813	39.2	78.7
New Brunswick	27,473	16,835	61.3	662	24.1	39.3
Quebec	523,860	60,900	11.6	6134	11.7	100.7
Ontario	333,835	65,507	19.6	8094	24.2	123.5
Manitoba	211,755	36,739	17.3	1011	4.7	27.5
Saskatchewan	220,182	104,610	47.5	907	4.1	8.6
Alberta	248,800	74,722	30.0	1914	7.7	25.6
British Columbia	359,279	31,600	14.4	2395	6.6	75.7
Canada, Excl of Territories	2,091,176	432,777	20.7	22,389	10.7	51.7
Yukon Territory	205,346	1,979	0.9	57	.03	9.3
Northwest Territory	1,253,438	4,144	0.3			
Canada	3,549,960	438,900	12.4	22,446	6.3	51.1

\* Source: Gajda, R.T. (1960) "The Canadian Ecumene - Inhabited and Uninhabited Areas, GEOGRAPHICAL BULLETION, No. 15.

\*\* Canada: 1976  
Statistics Canada

Availability Of Television In Canada

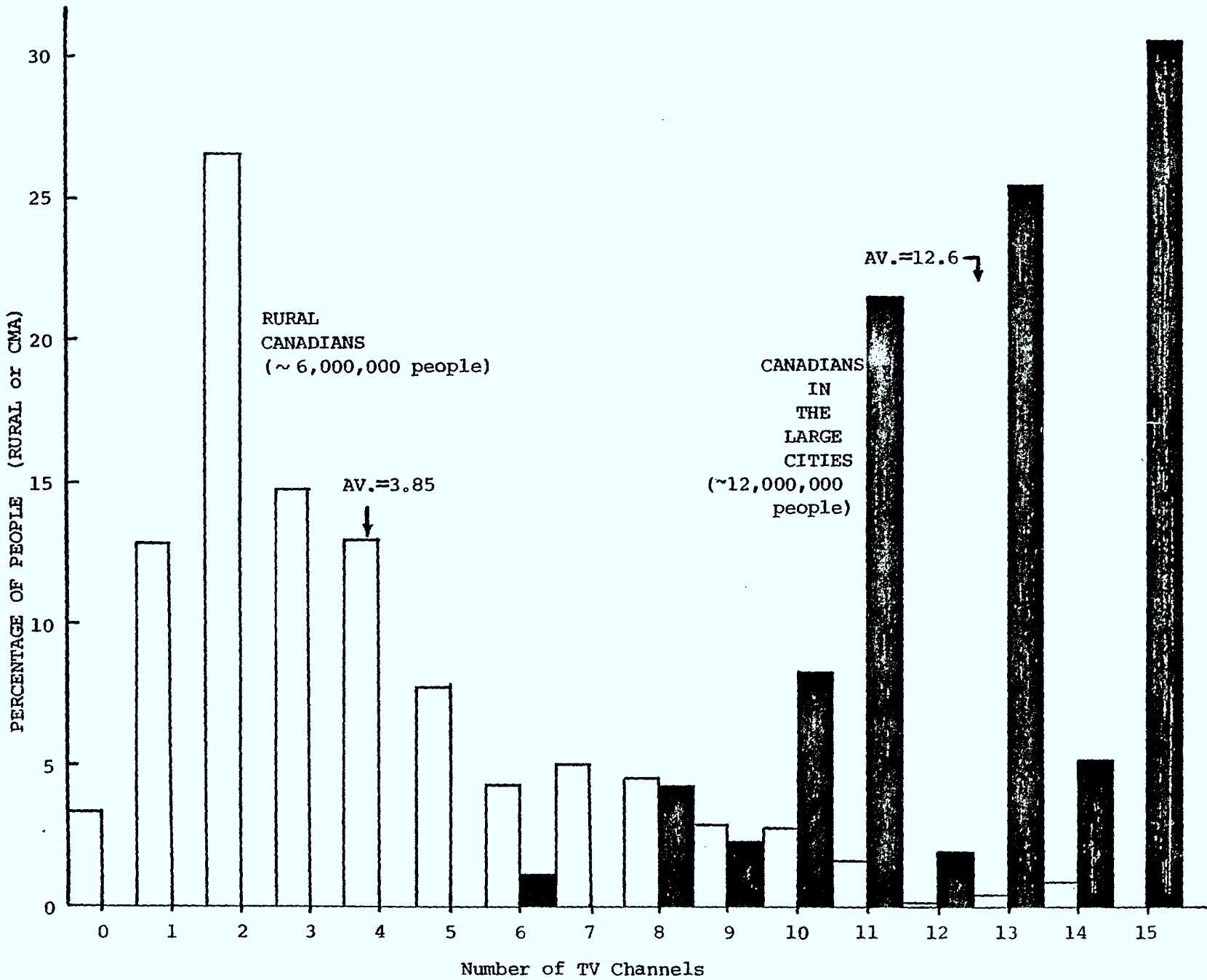
About 25% of the small town and rural population have had programming extended to them by the CBC.<sup>11</sup> Larger cities receive, on average, 3.3 times more distinct and different TV channels than does rural Canada<sup>12</sup>. The rural dweller receives on average, 3.85 distinct TV channels, whereas his city cousin receives 12.6 distinct TV channels, as detailed in Figure 2.10. Cable TV systems serve to accentuate these differences.

There are more cable systems operating in large metropolitan areas, owing to the accessibility of large numbers of potential subscribers.

The present reception patterns for TV signals in Canada (see Fig. 2.11) show how common the reception is of 2 to 4 distinctly different TV channels in most of the provinces. CBC programs reach 98.5% of Canadians. CTV covers 95% of Canadians. Other signals include those of local broadcast stations or signals received from the U.S.

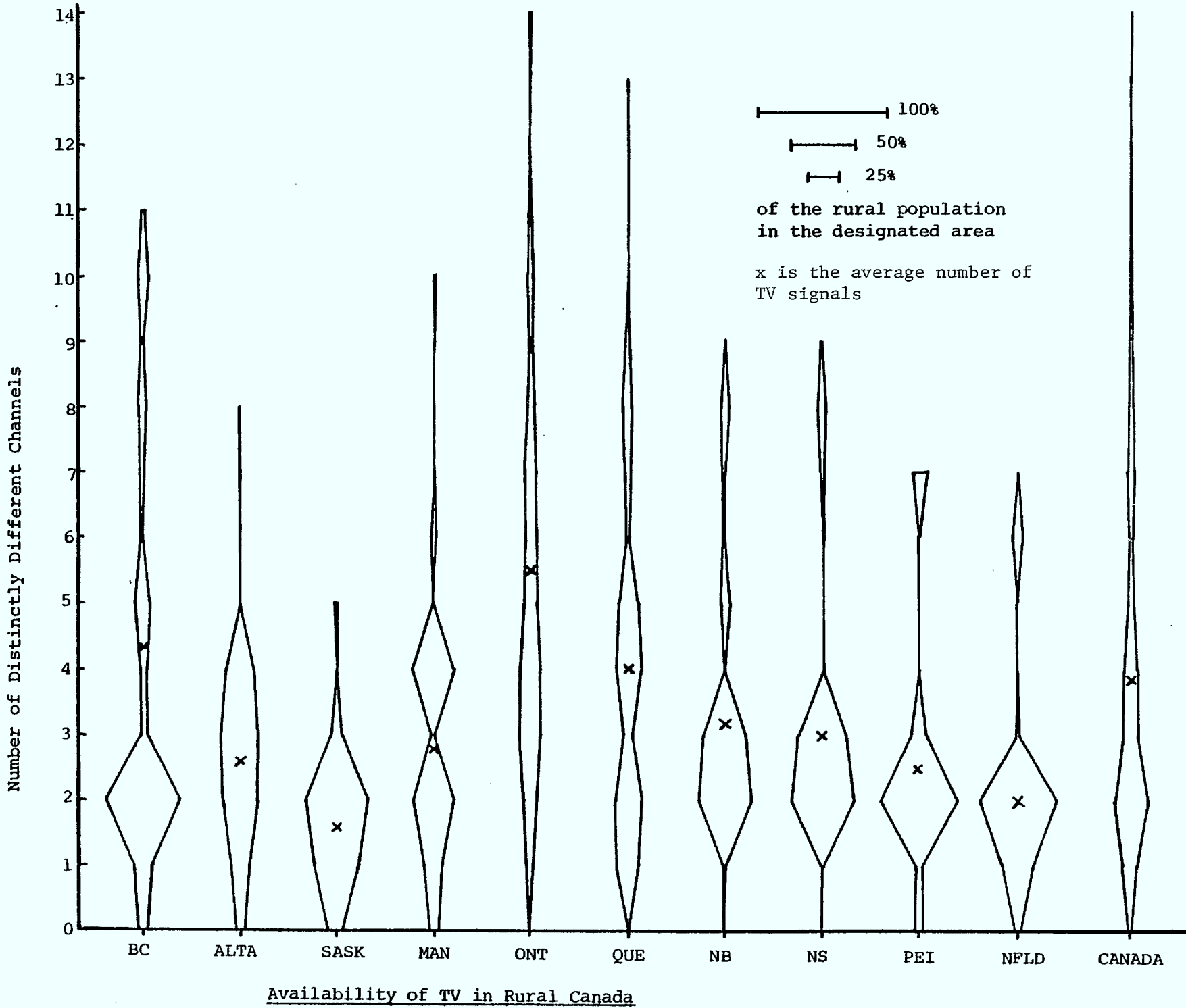
FIGURE 2.10

63



The Canadian Rural/City TV GAP

FIGURE 2.11



The Demand For TV and Radio Services

DOC plans to survey rural Canadians in the future to seek opinions and interests for improved communication services. In preparation for this new study, focus groups<sup>13</sup> were formed to test the survey questionnaire. Many divergent opinions were revealed by this exercise. These survey results cannot be blindly accepted owing to lack of proper sampling.

Ten focus groups were surveyed in various rural areas across Canada. Beginning with a general quality of life inquiry, the questioning moved to communication services, levels of satisfaction, and improvements needed. A summary of the comments received follows: <sup>14</sup>

- "Quality of life is much better in a rural environment".
- "Telecommunications would seem to play a less important role" as a disadvantage of living in a rural environment.

- "programming seemed to be a major source of disappointment while reception was perceived to be unsatisfactory. Typically, reception is good on one channel, mediocre or unacceptable on the others."
- "Rural residents' needs seem to center on obtaining more local news and better programming."
- "Most of them were also reluctant to acquire any new TV reception equipment owing to cost factors, no perceived change in programming, and a certain mistrust in such a system actually delivering the promised service."
- In reference to FM radio programming, many of the participants said, "they enjoyed it and would appreciate getting more of it."
- "The available selection of radio stations was not seen as a problem."
- "The radio fills, or should fill, the need for: local, regional and national news (with perhaps more local content)."
- "The most relevant attributes of a radio broadcasting service are: 1) quality of reception, 2) number of stations received, and 3) amount of local vs. regional vs. national programming."

These comments are not based on any proper sampling method and the survey results should be better indicators of the extent of these attitudes. Should these comments be confirmed by the survey, it would seem to indicate a poor rural demand for DBS, owing to the following:



- DBS reception would entail additional terminal costs.
- DBS would probably carry either national or regional programming, but not local programming.
- DBS would be limited in the number of channels being offered and may deliver channels that are already being received by the viewer.

Full time use of the Anik B 14/12 GHz channels by DOC began in March, 1979. The pilot project operations started in April 1979, with the Ontario Educational Communications Authority's pilot project to broadcast its TVO programming to various locations in Northern Ontario.

In August 1979, Vancouver affiliates of both the CBC (CBUT) and CTV (CHAN) began distributing their programming via Anik B. They used 1/2 transponder each to serve a number of receive terminals distributed across B.C., the Yukon, and the Mackenzie Valley area of the N.W.T. Other Educational TV projects were executed by the B.C. Ministry of Education, involving a number of their ministries. Project coordination was the responsibility of the B.C. Institute of Technology. The Alberta Educational Communications Authority and the Quebec Ministry of Education also carried out ETV projects. These programs were largely concerned with institutional or instructional TV, which is different from the OECA concept of enrichment programs, offering an entertainment element in the material.

Most of these projects are still active or at the point of completion, so the literature detailing results of these programs is largely unavailable.

Project descriptions and interim reports used are listed in the attached References 19-27 in Appendix B.

Table 3.1 presents a summary of broadcast and ETV projects and the results obtained from interim reports or private discussions with experimenters.

Other projects, including three relating to native programming, and another to put three video carriers on one satellite transponder in the West beam, were to begin September 1980.

TABLE 3.1

ANIK B PROGRAM DELIVERY PILOT PROJECTS

	<u>BROADCASTERS</u>	<u>PROVINCIAL GOVERNMENTS AND ETV</u>
<u>PROJECT DESCRIPTION</u>	<p><u>CBC/CTV (B.C.)</u> Each feeding standard broadcast day of (approximately 22 hrs.) into RF channel via west beam.</p> <p><u>OECA (Ont.)</u> Feeding approx. 87 hrs./week of TVO programming into a full 1/2 RF channel of the central east beam.</p> <p>Main purpose was to demonstrate feasibility and to gain experience/user feedback of direct-to-home and community television.</p>	<p><u>B.C.</u> An interactive ETV project coordinated and uplinked by BCIT into an RF channel of the west beam.</p> <p><u>Alberta</u> ETV programming, taped and uplinked with BCIT signal for 10 hrs./week.</p> <p><u>Quebec</u> An ETV project linking a school in Radisson with Quebec Dept. of Education studios in Montreal using the east beam.</p> <p><u>Ontario</u> ETV (Tele-Academies) uplinked by TVO into east central beam.</p> <p>Main purpose was to test effectiveness and create awareness of ETV potential delivered to remote locations.</p>
<u>TEST MARKET</u>	<p><u>CBC/CTV</u> Approx. 20 terminals in individual homes, cable headends and institutions. Terminals located in B.C., Yukon and N.W.T.</p> <p><u>OECA</u> Over 40 terminals at individual homes, cable headends, schools, motels, a prison and one low power rebroadcast transmitter in Northern Ontario.</p>	<p><u>B.C.</u> Terminals located in colleges and training centres in B.C., Yukon and the Mackenzie Valley area of N.W.T.</p> <p><u>Alberta</u> A number of terminals located in remote communities of the province.</p> <p><u>Ontario</u> Four of the 40 plus Ontario locations were used for the ETV courses via local cable distribution.</p> <p><u>Quebec</u> The initial project used video for teleconferencing link to the one school with the ministry studios.</p>

TABLE 3.1 (CONT'D)

BROADCASTERS

PROVINCIAL GOVERNMENTS AND ETV

GENERAL RESULTS TO DATE

In all cases, the projects have met a very positive response from both the communities and the user groups conducting the projects. The broadcasting projects especially have been very well received. The users are now requesting the 'experimental' service not be terminated.

SIGNAL QUALITY

In all projects to date, the video and audio signal quality has been perceived as ranging from very acceptable to good or excellent compared to existing off-air signal reception. This viewer judgement has been achieved with the DOC system parameters of 40-42 dB S/N and a C/N 2 to 4 dB above threshold. The west beam carries two video signals in one RF channel and 1.8 M antennas are used. The east central beam carries the TVO signal via a full RF channel to 1.2 M antennas in the primary coverage area, 1.8 M terminals at the band edge and 3 M terminals in out-of-band areas or to cable headends.

OPERATION AND MAINTENANCE  
OF TERMINALS

Operation and maintenance evaluation of the terminals has been hampered owing to numerous initial equipment failures. These should be overcome with time to give a better assessment of O&M performance. To date, the users report operating problems have been less than expected. Individual users have had no problem operating the indoor units. Need for antenna repointing after winter has been less than expected. There have been interface problems mainly with MATV and rebroadcast locations rather than with cable systems. This could be a continuing problem unless the interface is standardized for community systems. Some users are concerned about equipment reliability and the time it might take to get repairs done in remote areas.

USERS FUTURE  
SATELLITE PLANS

CBC  
CBC are interested in using Anik C for regional distribution if satellite rates are competitive with existing terrestrial distribution costs.

CTV  
CTV have stated they cannot afford satellite distribution costs.

CHAN (CTV affiliate)  
They would like to use satellite distribution both to improve rural coverage and to greatly improve signal quality by replacing cascaded rebroadcast transmitters, but say they cannot afford it. They can see no additional revenue accruing from increased coverage to remote areas.

B.C.  
Government has publicly stated it wants to use Anik C for ETV and for other government applications but rates are too high.

Alberta  
Planning to use Anik C for provincial ETV, including radio and other multiplexed services such as slow scan video, Telidon, etc.

Ontario  
No definite plans other than the OECA service. They are still looking at tele-health and tele-conference use for various departments and branches in the province.

TABLE 3.1 (CONT'D)

BROADCASTERS

PROVINCIAL GOVERNMENTS AND ETV

USERS FUTURE  
SATELLITE PLANS (cont'd)

OECA

They have definite plans to go on Anik C in 1983. They feel DBS satellite is the only practical method of reaching all Ontario population.

Quebec

No firm plans for satellite use. Their ETV system is regionalized with local sub-area programming and distribution which would be difficult for satellite to replace.

The provinces have committed themselves to provide better communication and broadcast services to underserved areas.

PERCEIVED ROLE OR  
NEED FOR DBS

Public and private broadcasters are opposed to DBS unless tightly regulated. They feel it would further fragment their markets. If the use of DBS could be regulated to have minimum negative impact and if it could generate additional revenue then they would certainly use DBS to increase coverage and improve signal quality

Provincial governments like the regional coverage of Anik C and plan to use DBS to provide ETV coverage to all residents. Feel generally that satellite facilities to date have been underutilized and overpriced. They state more services and extension of services would be put on the satellite if satellite rates were more reasonable.

CONCLUDING OBSERVATIONS ON PROGRAM DELIVERY PILOT PROJECTS

As most projects are still ongoing or just starting and since very little has been reported on results of the experiments, no substantive conclusions can be drawn at this time. However, the following interim conclusions can be drawn:

The projects are largely funded by the DOC, so no hard market data is available as to what the pilot project program suppliers would pay to use a DBS delivery system, if in fact they would use it at all, or what the home viewer would pay for a receive terminal and what program content he would expect or want to be delivered.

Surveys now underway by the DOC and pilot project users will provide considerable data on received signal quality, terminal reliability, operation, maintenance, etc. Initial results in these areas are detailed in the preceding Table.

In the areas where broadcast signals are being received, the desire for additional TV and Radio channels has certainly been confirmed, with users requesting that the service not be terminated.

The quality of the signal received by the home viewer has been found to be very acceptable and would indicate that an interim DBS service using Anik C could also provide acceptable quality signals via a low cost receive terminal.

Of the various pilot project users, only the Provincial ETV's have indicated firm plans to use Anik C if the satellite channel costs are "reasonable". OECA has stated that they will use Anik C to distribute their TVO programming to provide coverage over the entire province.

As detailed in a DOC Focus Group study<sup>14</sup> the cost of a home terminal may not be as critical to the user as the number of channels received, the quality of the programming, the quality of the signal received and the assurance that the system will deliver the promised service. People in the remote/rural areas will spend money for entertainment and leisure activities if they feel they are getting their money's worth.



The DBS system must satisfy the needs of two basic user groups or markets.

- 1) an intermediate market - the broadcaster, program supplier
- 2) an end-user market - the viewing audience

To meet the broadcasters' needs, the DBS system must enable him to attain the largest possible viewing audience at the lowest possible distribution cost. The DBS system costs will be partially offset by the replacement of some existing terrestrial distribution facilities. This aspect will be addressed in marketing activity 1.6 of this study, 'Develop Conceptual Market Model', included in the final study report.

To meet the viewers' needs, the DBS must provide a variety of broadcast signals sufficient to satisfy his entertainment and information needs. In so doing, a large enough market may be created to offer economies of scale and a competitively-priced home/community terminal.

Telesat will be primarily involved in the intermediate market, through its selling effort to the program suppliers. To be viable, the DBS service must offer a mix of programming which combines public and educational services with higher appeal entertainment programming. The success of the interim DBS end-user market relies heavily on Telesat meeting the various broadcaster and program supplier needs and, again, in the quality of programming available.

TV and radio signals have been grouped into three categories to reflect their priority in providing essential Canadian broadcasting services:

BASIC SERVICES: publicly funded services provided by the CBC and the provincial educational authorities;

EXTENDED SERVICES: the advertiser-supported private broadcasters and networks of up to four TV signals;

PAY SERVICES: subscriber-supported services.

To provide competitive distribution costs, maximum usage of Anik C is required. Included in our market demand study in section 5.0 of this study is a Fully Extended Service which is the same as extended services but with an increased number of signals. Fig. 4.1 illustrates the reduction in satellite channel rates with increased utilization.

The intermediate market can be measured as to its interest in an Interim DBS service based on the cost for each additional potential household. This can be calculated by dividing the cost of a DBS TV signal by the number of additional potential households.

Since the cost for an interim DBS TV signal is unknown at this time, we will normalize to an arbitrary cost of \$1 Million per year to simplify the cost differences. The lower the cost per potential household, the more a program supplier would gain in household viewing audience.

Table 4.1 illustrates this point.

Figure 4.1

Satellite Distribution Costs

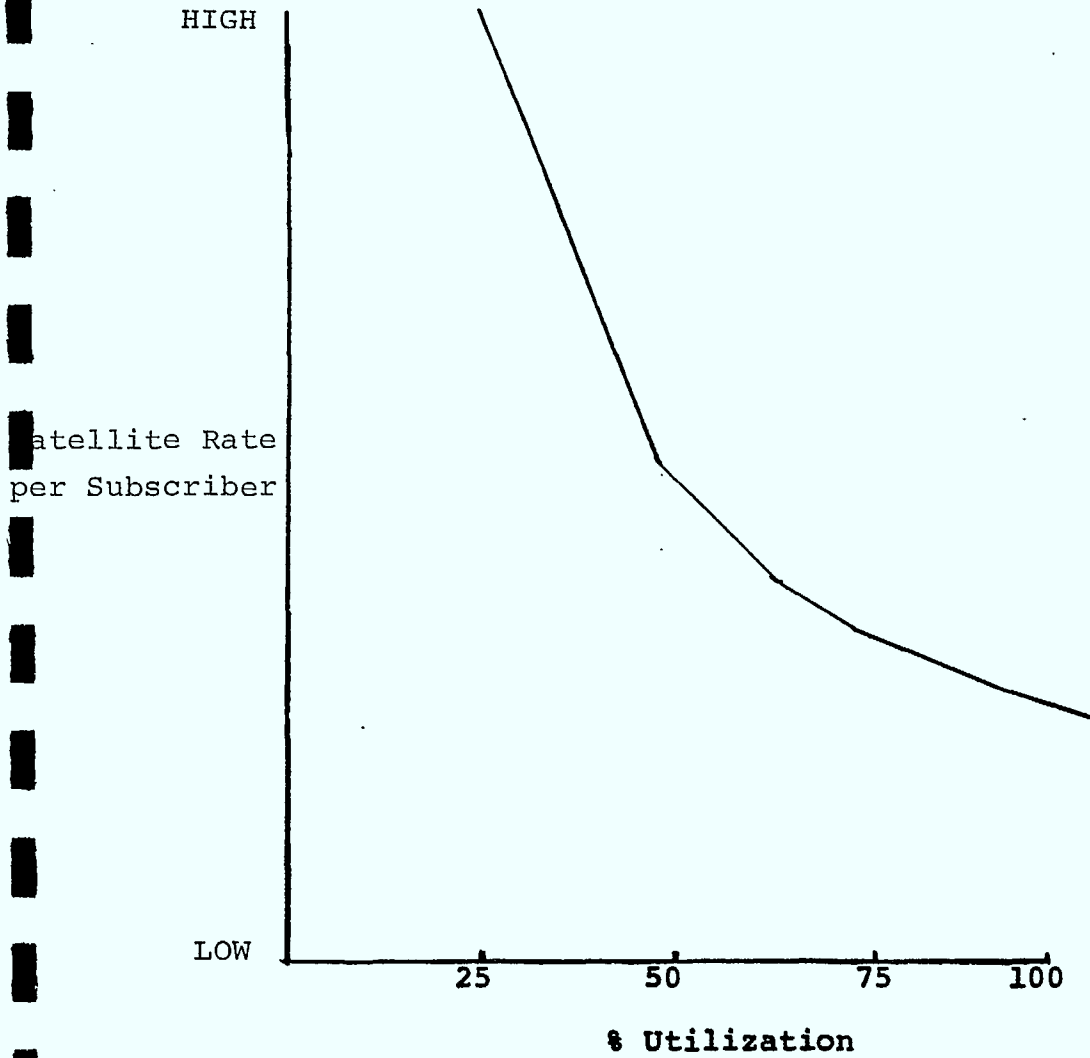


TABLE 4.1

COST PER POTENTIAL HOUSEHOLD

NORMALIZED - PER MILLION DOLLARS PER TV SIGNAL

<u>PROGRAM SUPPLIER/ BROADCASTER</u>	<u>% OF ALL CANADIAN H.H.'s</u>	<u>NO. OF HOUSEHOLDS</u>	<u>COST PER HOUSEHOLD/YEAR</u>
National Public Broadcaster	1%	72,000	\$ 13.89
National Private Broadcaster	5%	360,000	\$ 2.78

The potential viewers for all other services will include households that are not presently passed by Cable TV services.

Private Broadcaster	22%	2.8 million	\$ .357
Pay TV (outside of Cable areas)	22%	2.8 million	\$ .357

The potential households for a unique Pay TV signal (similar to Comsat's DBS) which would be exclusive to DBS distribution service.

Pay TV (all households)	100%	7.2 million	\$ .14
----------------------------	------	-------------	--------

Public broadcasting services have government mandates to effectively serve the entire population in their region of interest. The DBS can uniquely fill this need but the distribution cost must still be judged cost-effective. A recent consideration of the distribution of CBC Regional TV and Radio (carried out by Telesat) showed that demand for satellite RF channels was price sensitive to other competitive forms of distribution.

There is little confirmed indication at this time that private broadcasters and Pay TV entrepreneurs have a strong interest in using Anik C as an Interim DBS, while there is a higher level of confidence with the public broadcasting services. However, demand is expected to improve as the Anik C in-service date approaches. There will be a competitive situation with existing distribution systems and the extension of basic broadcasting services to underserved areas. The Anik C market may be further dampened by the introduction of Pay TV before Anik C becomes available for service. In addition, comments expressed by the members of the Canadian Association of Broadcasters (Future Policy Committee) have demonstrated a reluctance by independent broadcasters to accept a DBS service unless the the problem of negative effects on the local broadcaster have been resolved.

If only Basic Services are offered on a DBS system, indications are that it will not be able to attract the number of users required to make it a viable service. Extended Services must therefore be included. It will achieve viability if it can provide the private broadcaster with a larger viewing audience at a competitive distribution cost. New Pay TV Services, in addition to what may already be existing, must be offered to both a cable subscriber and home/community terminal market. Some possible new Pay Services are:

- regional networks of sports events, concerts, etc.
- regional or national Teletext, Telidon-type services
- specialized national pay services
  - i.e., - All-News channel
  - All-Sports channel
- regional or national religious networks

Past submissions to the CRTC on broadcasting services, particularly from native people's groups have stressed the need for improved radio services. Both public and private radio broadcasting signals have been assumed to be included with the TV signals to be carried by the interim DBS system.

4.2

#### End-User Viewpoint

The prime market for home or community DBS terminals are the rural/remote areas of Canada that now receive three or less TV channels. This is a market comprising some 1.7 million households.

To meet the end-user needs for a diversity of TV and radio programming and create sufficient demand for the DBS terminal, a minimum number of broadcast signals must be distributed. Public CBC and educational programming is viewed as essential. Since 98.5% of the Canadian population already receives some form of CBC programming and as ETV is a specialized service not having general entertainment appeal, additional entertainment channels are required to provide an attractive package.

#### 4.3

##### Signals To Be Carried

As part of the study objectives, we have set out two scenarios as to the number of TV and radio signals to be transmitted over an Interim DBS system. One scenario details the minimum number of signals which we feel are required in order to attract an end-user market. The second scenario details the maximum number of signals which can be carried in any one Anik C beam. The number and variety of signals available in this second scenario opens up the possibility of an urban as well as a rural market.

##### 4.3.1

##### Minimum Signals Transmitted

Table 4.1 postulates a regional DBS system with 4 TV and Radio signals as a minimum content in each of four regional spot beams.

It would be almost unthinkable that any new Canada-wide direct-to-home satellite television program delivery system would be put in place without including a strong CBC component in its Basic program package.<sup>16</sup> Therefore, a channel has been so designated by name. In the case of other program material, it is not possible at this point in time to be as specific as to the supplier. However, Telesat has designated projected channel requirements generically (e.g., "Private Network - English or French") to establish bounds on requirements while preserving future flexibility.

CBC's existing Regional TV and Radio Distributions System consists of eight distinct areas; the provinces of B.C., Alta., Sask., Man., Ont. and Que.; plus the Maritime Region and the Newfoundland/Labrador Region. Obviously a minimum number of signals on an interim Anik C DBS could not carry the full CBC regional system, but there is a requirement to distribute both the French and English CBC services in at least the East Beam.

Cooperative ventures among the provinces could provide an ETV system with one or more signals per beam. This scenario assumes an ETV distribution of one TV and radio signal per beam with reception by various local distribution systems in addition to direct-to-home terminals.

The extended service of a private English or French language network is seen as a regional service provided by affiliated stations. At least the East Beam must be provided with a French language service.



The pay channel service, whether national or regional in scope, is shown uplinking a TV and radio signal in each beam, with a market potential that includes CATV head-ends and direct-to-home or community terminals.

In the words of the Therrian Committee Report, "Whether or not the present and projected rates for the use of satellite capacity can be justified, they are so high as to be an impediment to plans for the extension of broadcasting services".

However, Telesat's rates do in fact reflect the real costs of satellites and earth stations, whether provided by Telesat or by others. Obviously, some means will have to be found to meet the costs of the transmission systems as well as those of the programming to be carried by them. A cost sharing arrangement which would include Municipal, Provincial and Federal governments could be a solution to this dilemma.

TABLE 4.1

MINIMUM NUMBER OF SIGNALS TRANSMITTED PER BEAM

<u>SERVICE</u>	<u>TV/RADIO SIGNALS</u>
A) BASIC	
1) Regional CBC - (English or French)	1 TV + 1 FM Radio
2) Provincial Ed. -	1 TV + 1 FM Radio
B) EXTENDED	
1) Private Network English or French	1 TV + 1 AM Radio
C) <u>PAY</u>	
1) English or French channel	1 TV + 1 FM Radio
	<hr/>
TOTAL	4 TV + 4 Radio

- Note (1) For Extended and Pay Services, it is assumed that Private Broadcasters would provide the radio signal originating from the same source as the TV signal.
- (2) The Regional CBC service must provide both French and English signals in the East Beam.
- (3) The Extended Service of a private network must provide a French affiliated station service in the East Beam.

4.3.2

Maximum Signals Transmitted

If two TV signals were transmitted in each RF channel, this would offer a total of 8 TV signals that could be received by the end-user in each beam. This would increase the market potential owing to the variety of programming offered, to include not only the direct-to-home or community reception in the rural areas, but also distribution to cable head-ends.

Table 4.2 presents the case where a maximum number of signals is carried. The TV signals are shown originating from and transmitting to a given region.

The CBC service is shown to expand to provide one English and French signal in each beam.

The number of ETV signals remains the same as for the minimum signal configuration.

Extended Services are expanded to include an English and French private network. These networks comprise affiliated stations and private broadcasters who also offer a regional service with one signal per beam.

A maximum loading of 8 signals per beam as presented by this scenario would minimize distribution costs and provide a desirable service for the end-user. Two TV signals per RF channel would likely require larger receive terminal antennas.

TABLE 4.2

MAXIMUM NUMBER OF SIGNALS TRANSMITTED PER BEAM

<u>SERVICE</u>	<u>TV/RADIO SIGNALS</u>
A) BASIC	
1) Regional CBC - English	1 TV + 1 FM Radio
2) Regional CBC - French	1 TV + 1 FM Radio
3) Provincial Educational	1 TV + 1 FM Radio
B) EXTENDED	
1) Private Network English	1 TV + 1 FM Radio
2) Private Network French	1 TV + 1 FM Radio
3) Private Broadcaster	1 TV + 1 AM Radio
C) PAY	
1) English Channel	1 TV + 1 FM Radio
2) French Channel	1 TV + 1 FM Radio
	<hr/>
TOTAL	8 TV + 8 Radio

Note (1) Radio signals from private broadcasters originate from the same source as do TV signals.

If the intermediate market of broadcasters and program suppliers are not effectively convinced of the merits of Interim DBS service, then only basic services could be offered, and they require government subsidization. Pay TV would offer an effective impetus to the market. Carriage of the U.S. networks would be attractive to the end user, but raises the question as to whether the regulator would approve and who would pay the distribution costs.

4.4

#### Impact of 6/4 GHz Satellite Services

The number and type of broadcast signals which the CRTC may soon authorize for extension of services to northern and remote areas and for Pay TV may tend to reduce, in direct proportion, those signals which would otherwise be available for distribution via a 14/12 GHz DBS system. This problem is further aggravated by the fact that more research and development work, by various entrepreneurs, is now being expanded to improve and lower the price of 4 GHz TVROs.

4.5

#### Cross Impact on Existing Satellite System

The impact DBS would have on the existing satellite system is very difficult to predict at the moment owing to the uncertainty of what broadcast services Anik C will carry, what regulatory changes may be made, and what effect the different market forces will have over the next few years.

Some possible scenarios, put forward by potential program suppliers, are noted below:

- With the possible exception of public broadcasting services, only message services would be carried on the 14/12 GHz satellites. The 6/4 GHz satellites would distribute all other broadcast and Pay TV services.
- One Anik C would be dedicated as an interim DBS, leading to a full scale DBS carrying public and extended broadcasting services. The 6/4 GHz satellites would lose some broadcasting signals to 14/12 GHz, but would become the carrier of all premium services to cable head-ends.
- The Anik C satellites would provide broadcast distribution on a regional basis only. National broadcast distribution would remain on the 6/4 GHz satellites.

#### 4.6

##### Competitive Reaction to DBS

#### 4.6.1

##### Cable TV Industry<sup>15</sup>

The cable operators do not see an interim DBS on Anik C with the carriage of public broadcast signals and some private broadcasting as a threat or competition to cable. However, a full-scale DBS carrying perhaps six or more channels of attractive entertainment programming would become a competitive threat to cable markets.

The cable operator will use satellite distribution to cable head-ends as a means of increasing the number and variety of programming channels carried by cable. As increased satellite distribution is authorized and TVRO terminals come down in cost, new markets may become economical for cable in communities not presently cabled. Also, in the eyes of the cable industry, satisfaction of the extension of services requirements will make possible a more permissive government attitude toward new-service development (e.g., Pay TV).

#### 4.6.2 CBC

The extension of coverage to complete the CBC mandate to provide service to all Canadians will require some DBS capability.<sup>16</sup> Anik C could be used to provide regional distribution of radio and TV signals, but only if cost is competitive with existing terrestrial distribution.

#### 4.6.3 Canadian Association of Broadcasters<sup>17</sup>

Some of the members of CAB are concerned about the plans for a lower powered DBS system as compared to systems being planned in the U.S. and other countries. The lower powered DBS would require larger, more expensive earth stations, making it less attractive to both the broadcast industry and the public.<sup>17</sup>

Their concerns are in reference to future U.S. higher powered DBS signals which will have considerable spillover into Canada. The Canadian viewer would be able to purchase a smaller, less expensive terminal to receive U.S. programming.

CAB feels that the Canadian DBS system should be designed to serve both the urban areas as well as the rural, remote and poorly-served areas of the country.

They are opposed to the concept of superstations for the following reasons:

- It may fragment the viewing audience
- The programming will not meet the needs of the northern and remote areas.
- Since there is limited satellite capacity (6/4 GHz satellites) now, it is unfair to other private broadcasters if one station were able to broadcast as a superstation.

At a Telesat/DOC briefing to the C.A.B. on this study, some broadcasters said that Telesat should be exploring systems for the delivery of Canadian programming to U.S. Markets.<sup>18</sup>



## 5.0 THE DEMAND FOR AN INTERIM DBS SERVICE

### 5.1 Potential Market

Factors considered in analyzing interim DBS service demand are detailed below:

1. TV signals now available to underserved areas of Canada and the different types of programming that would be provided by an interim DBS. Table 5.1 details five different combinations of services and the potential market for each. These are derived from the three categories described in Section 4.0; i.e. Basic, Extended and Pay Services. A maximum of two to three signals are available with the Basic Services; the Extended Services add one or two private networks or broadcaster signals to the Basic Services; the Fully Extended Service adds additional private network or broadcaster signals to what is available in the Extended Services up to a maximum of six or seven TV signals. The last two combinations add one or two Pay Services to either the Extended Service or the Fully Extended Services. For each combination, a potential market is identified, based on the number of TV signals already available.
2. The cost of an interim DBS service, exclusive of a Pay TV subscription fee, is correlated to the cost for a cable subscription fee. Table 5.1.2 shows a comparative cost per month for a range of terminal prices. This is the monthly cost of the terminal over a three-year period amortized at 12% per annum.

3. The number of TV signals available with an interim DBS service is one function of demand. We have estimated a demand curve as shown in Figure 5.3, for an Anik C supplied service. The demand would be low for one or two TV signals, and would increase quite rapidly as more signals are added, until a saturation point is reached where demand slackens off. For the Direct-to-Home service we have estimated this point to be at 6 or 7 signals.
4. Disposable income figures for the various provinces were used to help determine the user's ability to pay for the service. This data is detailed in Table 5.14.
5. Household distribution was obtained from the 'Clustering of Households'<sup>8</sup> study to locate the potential community reception vs direct-to-home terminal markets.

Demand tables have been developed according to the above factors. Table 5.2 details the potential market for Direct-to-Home terminals for each of the five combinations of service offerings and then the probable market penetration for a range of terminal prices.

Table 5.2a assumes a community size of 300 or more households as the criteria for a Direct-to-Community market. It provides the number of communities and total households involved for each of the Anik C beams. This table further identifies the number of communities of 21 to 300 households.

These households form part of the potential market for Direct-to-Home terminals detailed in Table 5.2. They offer a potential shared-use or small community reception market where a number of homes might share a common distribution system from one satellite terminal.

Fig. 5.1 depicts the potential market for Direct-to-Home terminals, detailed in Table 5.2. Although the potential market for the two service combinations including Pay TV is the same, the penetration is higher for the Pay and Fully Extended services as shown in Table 5.2.

Table 5.7 uses the probable market figures for Direct-to-Home terminals from Table 5.2 and the community reception market detailed in Table 5.2a and shows what percentage of the total Rural Market of 1.7 million households these figures represent.

A set of demand curves for the 5 different service combinations, using the market penetration figures from Table 5.2, are shown in Fig. 5.2.

The following equation describes the factors used in deriving the demand curves:

$$\begin{aligned} \text{DEMAND} = & \text{DISPOSABLE INCOME} + \text{HOUSEHOLD DISPERSITY} + \\ & \text{TV SIGNALS AVAILABLE} + \text{COST OF DBS TERMINAL} + \\ & \text{SERVICE OFFERED} \end{aligned}$$

Appendix C includes demand Tables 5.3, 5.4, 5.5 and 5.6 which break down the total potential and probable market figures of Table 5.2 into each beam of Anik C; in Tables 5.8, 5.9, 5.10 and 5.11 the market figures of the above tables are expressed as a percentage of the Total Rural Market in each beam.

TABLE 5.1  
ESTIMATE OF POTENTIAL MARKET

<u>SERVICE OFFERING</u>	<u>POTENTIAL MARKET</u>
<u>Basic Services</u>	
CBC national or regional	Households not receiving TV signals (86,626)
<u>Extended Services</u>	
Basic services plus one or two private networks up to 4 or 5 TV signals	Households receiving less than 2 TV signals (298,271)
<u>Fully Extended</u>	
Basic Services extended services plus private broadcasters and super-stations up to 7 or 8 TV signals	Underserved households of less than 3 TV signals (360,831)
<u>Pay TV &amp; Extended Services</u>	
	All non-cabled households, less households in areas able to distribute on a community basis (1,277,649)
<u>Pay TV &amp; Fully Extended Services</u>	
	All non-cabled households, less households in areas able to distribute on a community basis (1,277,649)

Table 5.12

MONTHLY PAYMENTS  
TO AMORTIZE A TERMINAL  
COST OVER 3 YEARS  
AT 12%

<u>TERMINAL PRICE</u>	<u>MONTHLY PAYMENTS</u>
\$2,000	\$66.43
\$1,800	\$59.79
\$1,600	\$53.14
\$1,400	\$46.50
\$1,200	\$39.86
\$1,000	\$33.21
\$ 900	\$29.89
\$ 800	\$26.57
\$ 700	\$23.25
\$ 600	\$19.93
\$ 500	\$16.61
\$ 400	\$13.29
\$ 300	\$ 9.96
\$ 200	\$ 6.64
\$ 100	\$ 3.32

NOTE: Calculated monthly payments for terminal financed  
at 12% for 3 years.

TABLE 5.14

PER CAPITA

PERSONAL DISPOSABLE INCOME  
BY PROVINCE, 1979 - 1980

	<u>1979</u>	<u>1980</u>	<u>1981</u>
NEWFOUNDLAND	677	733	831
ALBERTA	5,052	5,736	6,716
SASKATCHEWAN	2,148	2,356	2,658
MANITOBA	2,345	2,580	2,874
ONTARIO	21,500	23,701	26,717
QUEBEC	12,618	13,845	15,420
NEW BRUNSWICK	1,060	1,153	1,304
NOVA SCOTIA	1,482	1,644	1,864
P.E.I.	177	197	221
CANADA	51,180	56,487	63,899

Personal disposable income is obtained by using related information to allocate the quarterly components of personal disposable income for Canada to the provinces. The annual personal disposable income estimates by province are published in Statistics Canada, #13-201 National Income and Expenditure Accounts, Table 37. These are seasonally adjusted at annual rates, millions of dollars.

SOURCE: Conference Board Quarterly Provincial Forecast,  
November 1980.

TABLE 5.2

Direct-To-Home Terminal Market Penetration  
ALL CANADA

TERMINAL COSTS	BASIC %	BASIC NUMBERS	EXTENDED %	EXTENDED NUMBERS	FULLY EXTENDED %	FULLY EXTENDED NUMBERS	PAY TV & EXTENDED %	PAY TV & EXTENDED NUMBERS	PAY TV & FULLY EXTENDED %	PAY TV & FULLY EXTENDED NUMBERS
<u>DBS reception for clusters of 20 hh and less</u>										
PROBABLE MARKET										
\$ 100	74	64,103	50	149,137	71	256,190	16	206,072	26.5	338,719
200	71	61,504	46	137,205	67	240,084	15.7	201,334	25.9	330,991
300	67	58,039	42	125,274	59	211,264	15.2	194,228	25.2	321,975
400	62	53,707	35	104,395	52	188,112	14.5	184,754	24.4	311,672
500	56	48,509	29	86,095	44	158,355	13.5	172,911	23.3	298,074
600	50	43,311	20	59,654	36	130,860	12.4	158,699	21.1	269,740
700	43	37,249	17	50,706	29	104,714	11.3	144,487	19.9	254,286
800	35	30,319	13	38,775	23	83,002	10.6	135,012	18.9	242,134
900	25	21,657	10	29,827	19	68,591	9.8	125,617	17.9	229,253
1000	15	12,994	5	14,914	16	58,488	8.5	108,958	16.1	206,072
1200	6	5,197	3	8,948	13	47,459	7.3	92,686	12.4	158,699
1400	3	2,599	2	5,965	10	36,740	6.1	78,165	10.6	135,012
1600	2	1,733	.8	2,386	7	26,084	5.2	66,321	7.3	92,686
1800	1	866	.6	1,789	5	19,065	4.4	56,847	5.2	66,321
2000	.8	693	.5	1,491	2	9,010	3.7	47,372	4.4	56,847
POTENTIAL MARKET	100	86,626	100	298,271	100	360,831	100	1,277,649	100	1,277,649

Note: Estimated from the CRTC Statistics on Service Availability



Table 5.2A

All Canada

## Prospective Households for Community Reception

COMMUNITY RECEPTION

Households that are within communities that are highly capable of being served on a community reception basis.

	<u>WEST BEAM</u>	<u>WEST CENTRAL BEAM</u>	<u>EAST CENTRAL BEAM</u>	<u>EAST</u>	<u>ALL CANADA</u>
<u>SIZE OF COMMUNITY</u>					
<u>300 or more hh</u>					
# of communities	88	250	102	310	750
# of hhs	73,374	134,325	72,076	166,940	446,715

CLUSTERED HOUSEHOLD RECEPTION

The households in these communities can be served in a variety of ways. The use of a small community reception system with distribution among households done privately as opposed to being cabled commercially. These households were not used to separate the potential market for community reception and are still included in the market potential for an Interim DBS service.

<u>21 hh - 300</u>					
# of communities	2,469	1,152	1,070	3,621	8,312
# of hhs	172,696	78,103	71,049	244,628	566,476

Note: Estimated from the CRTC Statistics on Service Availability to communities in Remote and Rural Areas.

Fig. 5.1

ALL CANADA

POTENTIAL MARKET

DIRECT-TO-HOME TERMINAL

RURAL  
HOUSEHOLDS  
(MILLIONS)

100% 1.7

75% 1.27

50% .85

25% .42

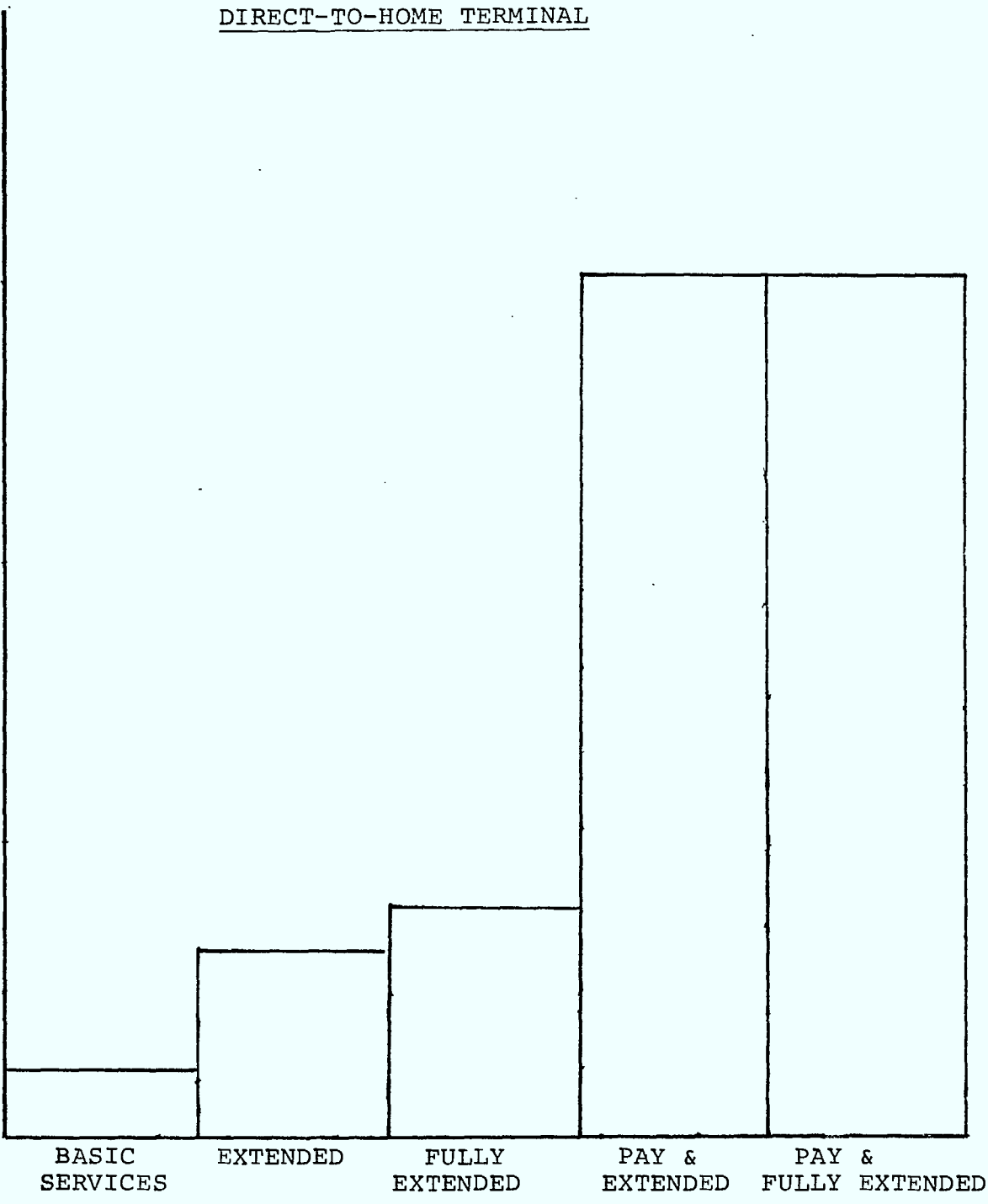


TABLE 5.7

## ALL CANADA

## DIRECT-TO-HOME AND COMMUNITY MARKET PENETRATION

TERMINAL COSTS	BASIC %	EXTENDED %	FULLY EXTENDED %	PAY TV & EXTENDED %	PAY TV & FULLY EXTENDED %
----------------	---------	------------	------------------	---------------------	---------------------------

## PROBABLE DBS MARKET FOR CLUSTERS OF 20 HH AND LESS - PERCENT OF TOTAL RURAL MARKET FOR ALL CANADA

\$ 100	3.7	8.7	14.8	8.9	19.6
200	3.6	8.0	14.0	11.6	19.2
300	3.4	7.3	12.3	11.3	18.7
400	3.1	6.1	10.8	10.7	18.1
500	2.8	5.0	9.2	10.0	17.3
600	2.5	3.5	7.5	9.2	15.6
700	2.1	2.9	6.1	8.4	14.8
800	1.7	2.3	4.0	7.9	14.0
900	1.2	1.7	3.9	7.3	13.3
1000	.7	.9	3.3	6.3	12.0
1200	.3	.52	2.7	5.4	9.2
1400	.15	.35	2.1	4.5	8.0
1600	.1	.14	1.5	3.9	5.4
1800	.05	.11	1.0	3.2	3.6
2000	.04	.09	.4	2.7	3.3

## Percentage of Households Using Community Reception

	WEST BEAM	WEST CENTRAL BEAM	EAST CENTRAL BEAM	EAST	ALL CANADA
SIZE OF COMMUNITY					
<u>300 or more hh</u>					
# of communities	88	250	102	310	750
% of hhs	4.23%	7.8%	4.2%	9.7%	25.9%
<u>21 hh - 300</u>					
# of communities	2,469	1,152	1,070	3,621	8,312
% of hhs	10%	4.5%	4.1%	14.2%	32.9%

Fig. 5.2

DEMAND FOR SERVICE  
VS  
COST OF DBS TERMINAL

No. of  
Households  
(000's)

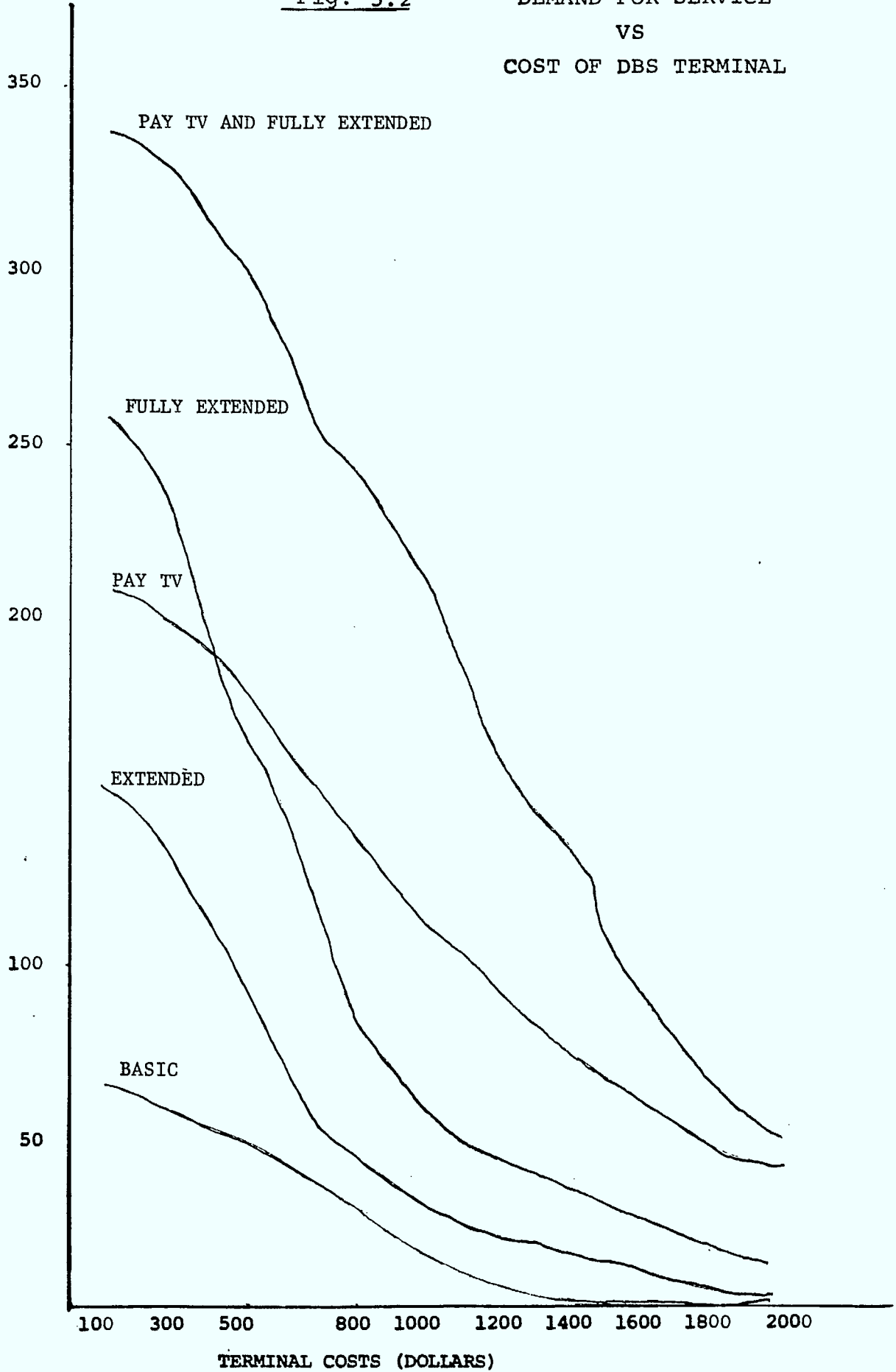
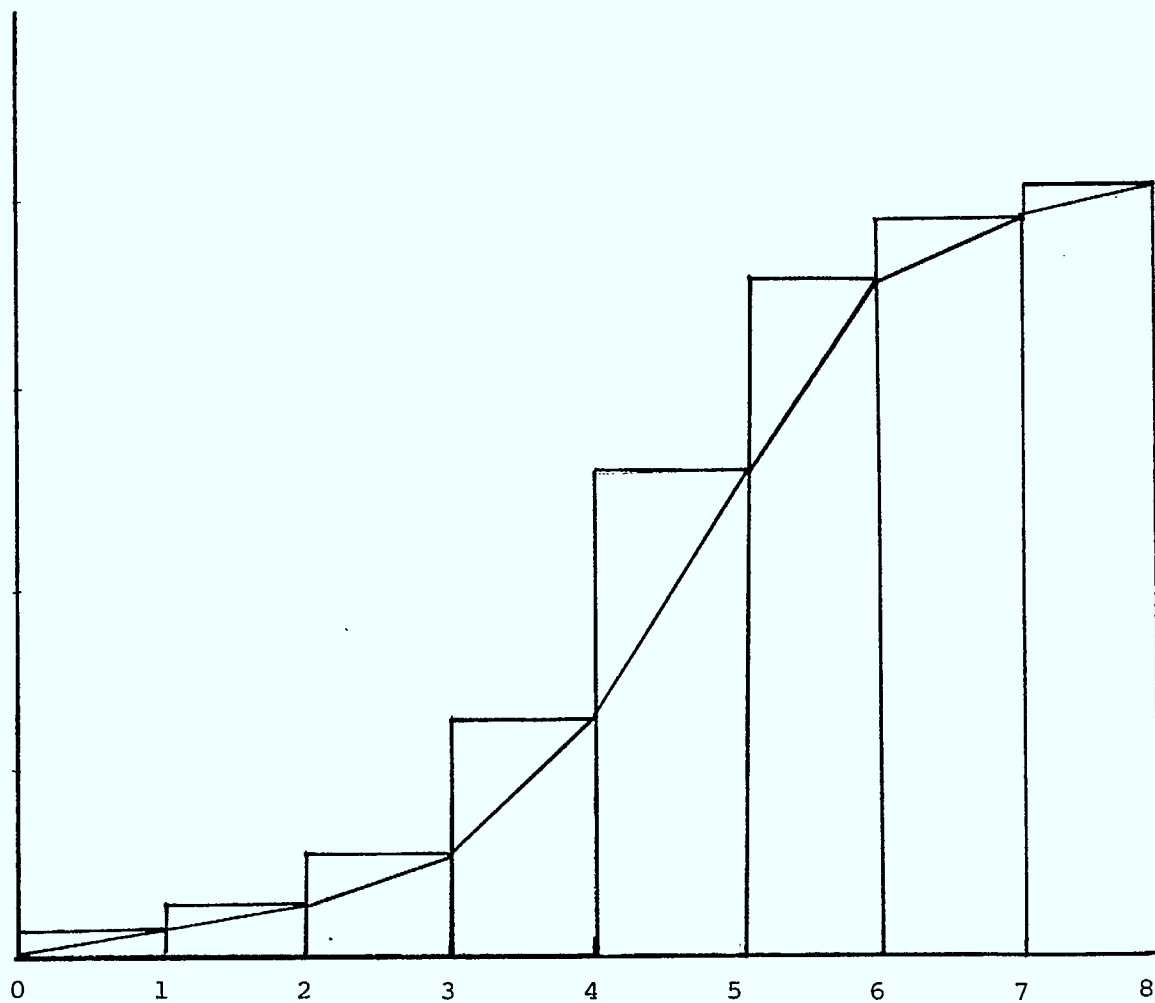


Fig.5.3

ESTIMATED  
DEMAND CHANGE BY NUMBER OF TV SIGNALS

POTENTIAL  
MARKET



Number of Broadcast Signals (In addition to existing service)

5.2 Northern Coverage of Anik C

The Anik C satellite antenna could be tilted to improve northern coverage. The households in this area tend to be closely clustered, allowing for a higher demand for community reception systems as opposed to individual DBS reception.

The following population data refers to all people living above the 55th parallel except for Ontario and Quebec, where the 50th parallel is selected. The Market Potential for DBS in this area is calculated by subtracting the potential for community reception from total population. The Market Penetration is estimated as being 70% of the potential market.

The magnitude of underserved population in this area is as follows:

	<u>WEST</u>	<u>WEST</u> <u>CENTRAL</u>	<u>EAST</u> <u>CENTRAL</u>	<u>EAST</u>
Total Pop.	153,352	58,770	53,980	45,912
<u>LESS</u>				
Potential for Community Reception	95	47	60	36
- Population	46,646	17,200	15,959	10,831
Potential for DBS Reception				
- Population	106,801	41,570	38,021	35,081
MKT. Penetration for DBS (People)	74,760	29,099	26,615	24,557
- Households	18,690	7,274	6,654	6,139
	=====	=====	=====	=====

### 5.3 User Terminal Requirements

Certain desirable terminal and service requirements were identified from the experience gained by Anik B pilot project users:

The equipment must be easy to install for a television repairman or technician; this especially applies to:

- cabling,
- setting antenna direction,
- securing the antenna to a firm but non-permanent foundation
- installation instructions,
- telephone assistance for special problems during installation

Equipment circuitry should be modular for quick replacement of parts in case of electronic failure.

Equipment should be designed for minimum repair and maintenance at remote sites subject to severe environmental conditions, where repair facilities are primitive and may be at a distance.

The terminal should be both modular and expandable to accommodate technological change:

- frequency changes
- changes in size of antennas
- improved performance with higher quality LNA

Shared use among several households may be a most desirable feature, especially for high cost terminals.

Signal quality should be such as to provide a 40dB signal-to-noise ratio at the home terminal.

The terminal must be able to capture both radio and television services.

#### 5.4 Uplink Terminal Requirements

For the "Minimum Number of Signals Transmitted" given in Table 4.1 of Section 4.3, we show TV and Radio Signals provided on a regional basis to derive maximum profit from local programming and to minimize time zone differences. An uplink is required in each beam for each TV signal transmitted. To provide both French and English CBC service in the East Beam, different methods of distribution should be studied, including two TV signals in one RF channel for some services.

For the Maximum Number of Signals Transmitted, detailed in Table 4.2 of Section 4.3, the Basic Services comprise regional programming. One uplink per TV signal in each beam would be needed.

For the Extended and Pay Services, however, a mix of both regional and national distribution should be studied.

For an interim DBS service using Anik C, maximum advantage should be taken of regional uplinking of broadcast signals to minimize the possible detrimental effect to local broadcasters and to maximize the local programming content. This scheme will have to be weighed against the cost of additional transmit earth stations.



CONCLUSION

The initial market study provides data for use in other aspects of this study and will be elaborated in the market model required by Task 1.6.

Preliminary conclusions can be drawn as follows:

- The broadcasters and program suppliers represent a very important element in the success of an interim DBS service. Their use of this service and the program content appeal will largely determine the end-user demand.
- In the study, potential market size for an interim DBS is a function of the service being offered and the segment of rural Canadian households to which this service would be of interest. Basic Services offer minimal interest, while Extended and Pay TV service has much greater appeal.
- Interest in DBS services stems from the profit motive (meeting a market demand) or from political motives (extension of services to underserved areas of a country). The Comsat proposal in the U.S. illustrates the importance of offering this service with a highly attractive Pay TV program package. This will enable them to command a very broad potential market. Other countries considering DBS systems are politically motivated to extend TV services to underserved areas.

- The Direct-to-Home and Community experiments undertaken by the DOC using the Hermes and now the Anik B satellites have, by and large, proven the technical feasibility of a DBS system. Signal quality offered the home viewer in these broadcast pilot projects show that an interim DBS service from Anik C would provide acceptable quality signals via low-cost receive terminals.
- The extension of broadcast signals to rural/remote areas and the introduction of Pay TV, using the 6/4 GHz satellites, may tend to reduce the number of signals which otherwise would be available for distribution via an interim DBS using Anik C.
- Presently, there is guarded interest in the use of a DBS by the broadcasters or most program suppliers. The private broadcasters see a limited potential market and the local broadcasters fear fragmentation of their markets. Most potential Pay TV program suppliers are planning to use the 6/4 GHz satellites for distribution to cable system head-ends, although this probably stems from the immediate availability of the 6/4 GHz service.

APPENDIX A  
Bibliography

ANNOTATED BIBLIOGRAPHY

FOR

DOC-DBS STUDY

R. Fannin  
August 20, 1980

Rural Communications Program

CRTC

Statistics Canada Sources

Telecommission Reports

DOC Papers

Journals and Reports

RURAL COMMUNICATIONS PROGRAM

Department of Communications, April 1976.

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TITLE: Social Forecast, Working Group, Direct Broadcast Satellite.

ABSTRACT: Develops conclusions as to demographic trends through to the year 2001. It takes these trends and summarizes them as to their affect on D.B.S. Data is presented in graphic form with descriptive summaries for each category.

Inter-Branch Working Group on Rural Communications, Department of Communications, July 1976.

---

TITLE: Present Status of Rural Communications in Canada.

ABSTRACT: Describes the current situation in the rural areas by defining the nature and the magnitude of problems in the rural context. It also identifies the order of magnitude costs involved in the application of presently used technologies directed towards overcoming some of these problems which are identified.

Inter-branch Working Group on Rural Communications, Department of Communications, July 1976.

---

TITLE: Present Status of Rural Communications in Canada.

ABSTRACT: Provide DOC management with an appreciation of telecommunications in rural areas of Canada by describing the current situation in these areas, and by defining the nature and magnitude of problems in the rural context. It is also intended to identify order of magnitude costs involved in the application of presently used technologies directed towards overcoming some of those problems which are identified.

## RURAL COMMUNICATIONS PROGRAM

Rural Communications Program, Department of Communications,  
Chang, K.Y., November 1978.

---

TITLE: Integrated Distribution of Broadband and Narrowband  
Communications Services in Rural Areas with Coaxial Cable.

ABSTRACT: The implementation of a stand-alone distribution facility, whether broadband or narrowband, becomes a very costly undertaking and, because of the relatively small revenue base, becomes economically unviable in many cases. As a result, while most city dwellers have access to ten or more distinct television channels through a broadband cable TV system, cable TV services are virtually non-existent in rural areas. In this document, the technical, economic and operational feasibilities of using a single coaxial cable based broadband distribution network for the provision of broadband and narrowband communication services in rural areas are examined.

Rural Communications Program, Department of Communications, Ottawa,  
Canada, Billowes, C.A., May 1977.

---

TITLE: Rural Broadcasting, A Preliminary Analysis and Review of the  
Issues and Considerations of Some Future Options.

ABSTRACT: The primary purpose of the report is to build on the July report and to give a specific orientation to the Rural Program which the July report did not undertake. This report analyzes the growth in broadcasting between 1969 and 1975 and finds that although growth in a number of TV stations, capital invested and revenue was in the order of 100%, coverage increase was much more modest. Private broadcasting profits did not keep pace with this growth and consequently are not adequate to make significant advances in second and third television services coverage.

RURAL COMMUNICATIONS PROGRAM

The Bureau of Management Consulting, Agency of the Department of Supply and Services, Project No. 1-1793, May 1977.

---

TITLE: Levels of Choice in Canadian Off-Air Television Viewing

ABSTRACT: Identification of the levels of choice or number of program schedules in Canadian off-air television viewing available to the Canadian public. Consists of maps indicating the areas of service by various number of networks.

The Bureau of Management Consulting, Agency of the Department of Supply and Services, Project No. 1-1793, May 1977.

---

TITLE: Areas and Communities in Canada Without Off-Air Television Reception - A Survey.

ABSTRACT: Identification of those communities in Canada which do not receive any off-air television service other than by communications satellite and compilation of a data base specifying certain characteristics of these communities such as location, area and population.

A Study for the Rural Communications Program, Communications Canada, Ottawa, MacLean, L.C. and Weldon, K.L., April 1978.

---

TITLE: Household Distribution in the Rural Areas of the Atlantic Provinces.

ABSTRACT: To provide information on household distribution relevant to the costing of broadcast and CATV delivery options. To present certain geographic factors, combination of geographic factors, and present detailed maps displaying household locations. To determine what portion of the Atlantic region each geographic type occupies. To provide general formulas for estimating certain parameters for the Atlantic Region as a whole, based on the estimation of calculating the total households in the rural part of Atlantic Canada.



## RURAL COMMUNICATIONS PROGRAM

Communications in Rural Areas Program - Federal Department of Communications, Ottawa, Regional Development Research Centre, University of Sherbrooke, Lacasse, Pierre, June 1978.

---

TITLE: Study of the Distribution of Households in Rural Areas, Quebec - Ontario Region.

ABSTRACT: The main objectives of this study were:

1. to identify the various types of spatial distribution of households throughout the Quebec - Ontario Region;
2. to determine a cell which was representative of each type of spatial distribution; and
3. to determine, for each typical cell selected, the distribution of households.
4. to transpose data from the typical cell to other cells of this type.
5. to check whether the proposed model may be generalized and whether it gives an accurate and reliable representation of the distribution of households throughout the entire tract.

Department of Communications, Ottawa, Fairbairn, K.J., July 1978.

---

TITLE: Characterization of Typical Areas of Household Distribution in the Rural Portion of the Prairie Provinces.

ABSTRACT: Objective is to assist DOC in costing various potential communication systems to serve rural Canada. This study is concerned with the distribution of households in the rural portion of the prairie provinces and specifically its objective is to determine typical cells representing the household distribution in large regions of the prairies.

## RURAL COMMUNICATIONS PROGRAM

The Department of Communications, Rural Communications Program,  
Denike, Dr. Kenneth G., University of British Columbia, July 1978.

---

TITLE: Geographic Distribution of Households Within Rural British  
Columbia

ABSTRACT: To Conduct a research study of the geographic  
distribution of households within rural British  
Columbia. The objectives of the assignment were the  
following:

- (1) Identify the number of different types of cells and  
the number of cells of each type in rural British  
Columbia.
- (2) Determine a representative cell for each cell type.
- (3) Determine the geographic distribution of the  
households.
- (4) Discuss how the information presented in (3) can be  
modified to provide an applicable model for similar  
cells.
- (5) Provide a fairly reliable picture of the rural  
population throughout British Columbia.
- (6) Discuss the relationship between population and  
household densities in rural British Columbia.

Miller Communications Systems Limited, Department of Communications,  
Bowen, Dr. R., August 1978.

---

TITLE: A Feasibility Study of a 12/14 GHz SCPC Satellite  
Communications System to Meet Telephony Requirements in  
Rural Areas

ABSTRACT: The purpose of this study is to investigate the  
feasibility of using 12/14 GHz SCPC (single channel per  
carrier) earth stations to provide thin route telephony  
service to rural areas of Canada on the Anik C satellite.

## RURAL COMMUNICATIONS PROGRAM

Telecommunications Research Group, Simon Fraser University,  
Burnaby, B.C., August 1, 1978.

---

TITLE: The Extent of Television Network Coverage in Rural Canada

ABSTRACT: This report is a summary of the information collected and synthesized concerning the distribution of television services throughout rural Canada for the Rural Communications Program of the Department of Communications in Ottawa. The object of this project is to ascertain the numbers of people in rural areas who could receive different numbers of TV network services, depending on where they live.

Rural Services, Department of Communications, Cormack, G.,  
August 1978.

---

TITLE: Television Network Coverage in Rural Canada Compared with that in the Census Metropolitan Areas (CMA).

ABSTRACT: The disparity of coverage in the rural areas of Canada relative to the CMA's is independent of language. English language TV gap is 2.6 and for French language it is a TV gap of 2.8 programs. The average large city dweller has access to 3.3 times more channels of distinctly different TV programs than the rural inhabitants.

Rural Communications Program, Department of Communications,  
Cormack, G.D. and Mougeot, L.T., 15 August 1978.

---

TITLE: The Availability of Television in the Census Metropolitan Areas.

ABSTRACT: The approximately twelve million people living in Canada's 24 largest cities have, on average, access to 12.6 channels of distinctly different television. They have access to 5.8 channels of distinctly different English-language Canadian TV, 2.5 channels of distinctly different French language Canadian TV and 4.4 channels of distinctly different American TV.

## RURAL COMMUNICATIONS PROGRAM

Rural Communications Program, Department of Communications,  
Cormack, G.D. and Brown, S., December 1978.

---

TITLE: The Clustering of Households in Rural Canada

ABSTRACT: The cost of new communication facilities for rural Canada depends upon where people live. This report summarizes and interprets the results recently obtained by four university researchers on this subject. The location of households throughout rural Canada is given through a set of maps of typical cells and appropriate scale-up factors that permit generalization to the whole of rural Canada. The data could be considered as an extension of present Statistics Canada information on population of settlements.

Richardson, K and Brown, S., December 1978.

---

TITLE: Regional Demographic Studies for the Rural Communications Program, Summary Report and Analysis.

ABSTRACT: This report summarizes the data collected during the course of the four regional demographic studies conducted for the Rural Communications Program. These studies of the Atlantic Provinces (1), Quebec and Ontario (2), the Prairies (3), British Columbia (4) had the following:

- (a) Document where the rural population and settlement is.
- (b) Determine the major factors associated with current levels of telephone service.
- (c) To identify a small number of typical areas which may be used for further technical, economic and social studies.

## RURAL COMMUNICATIONS PROGRAM

Interim Report No. 1, de Camprieu, Prof. R., Faculty of Management Sciences, University of Ottawa, Bourgeois, Prof. J.C., School of Commerce, Carleton University, January 8, 1979.

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TITLE: Demand for Rural Communication Services in Canada -  
A Literature Review

ABSTRACT: The identification of the needs of rural people and of the existing facilities to satisfy them has been proposed as the overall objective of this project. "To survey the needs of rural domestic and business subscribers for existing and proposed communication services and to forecast short and long term demand for these services."

Study performed for Rural Communications Program Branch, Department of Communications, Comdat Telecommunications Inc. formerly L. Lee Associates, Ottawa, Canada, March 1979.

---

TITLE: A Feasibility Study of Rural Radio Communications.

ABSTRACT: Overall index of Feasibility Study of Rural Radio Communications.

Volume 1 - Executive Summary

Volume 2 - Existing Services and Available Alternatives  
Contains a discussion on the use and value of existing radio services in Canada and the United States, as well as an assessment of available alternatives.

Volume 3 - A High Technology Solution  
The feasibility study proposes a high technology solution to the communication needs of rural Canadians.

RURAL COMMUNICATIONS PROGRAM

Rural Communications Improvement Program, Doucet and Associates for  
Department of Communications, July 1979.

---

TITLE: Cable TV Systems for Newfoundland, Technical and Economic  
Study, Final Report.

ABSTRACT: A technical and economic study for cabling rural  
communities with Cable TV services. Feasibility of  
cabling communities of population 500 or more with 25  
households or more per road mile in province of  
Newfoundland and Labrador.

Rural Communications Improvement Program, Belanger, D.,  
28 August 1979.

---

TITLE: Cable Television Systems in Newfoundland, Technical and  
Economic Study.

ABSTRACT: The growing need for providing unserved urban and rural  
communities with cable television service is an important  
social issue.

Lack of cable television service to these areas is due to  
the relatively high investment cost required to establish  
the local distribution system and to the cost of bringing  
to these distribution systems a suitable range of  
television signals.

D.G.B. Consultants for Department of Communications, September 1979.

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TITLE: Multi-channel Rebroadcast Stations for use in Rural Areas in  
Canada.

ABSTRACT: A study looking at servicing rural areas by the use of  
rebroadcast systems. It develops a number of models of  
multichannel rebroadcasting stations able to deliver  
radio and TV services based on the geographical  
characteristics of these communities.

CRTC

Report of the Committee on Extension of Service to Northern and Remote Communities, CRTC.

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TITLE: The 1980s: A Decade of Diversity, Broadcasting, Satellites, and Pay TV

ABSTRACT: These are the recommendations by the Therrien Committee as to how TV and radio services should be extended to remote and rural locations in Canada. This report was the result of the public meetings held by the CRTC in April 1980.

Volume 1 and Volume 2, CRTC, Minister of Supply and Services Canada, 1979.

---

TITLE: Special Report on Broadcasting in Canada, 1968-1978.

ABSTRACT: Detailed statistics prepared by the research staff of the CRTC from all the available sources; they present, generally, the figures for the years 1967 and 1977, although in some cases comparative figures are given for the mid-year 1972, and in others for all the years in this period. Coverage statistics relate to the availability to the Canadian public of Canadian and foreign television and radio stations. The statistics on audience patterns are related to category and source of program, and to the preferences of Canadian audiences for Canadian and foreign broadcasting stations.

CRTC, March 1978.

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TITLE: Report on Pay-Television.

ABSTRACT: The present report examines the issue of the possible introduction of a pay television system in Canada. The report outlines the historical context in which the current discussions on pay-television must take place. It also describes and examines the most recent submissions for a pay-television system for Canada; sets forth the Commission's conclusions on the issues at this time; and provides an indication of possible guidelines for the future introduction of pay-television.

CRTC

A Report on the 1978 CRTC Survey, CRTC, March 1979.

---

TITLE: Cable Television, Survey of the Community Channel.

ABSTRACT: The survey was designed to meet three objectives:

- 1) to gather data on state-of-the-art cable programming.
- 2) to assess the influence of the Cable TV Policy and Regulations on the evolution of the channel.
- 3) to attempt to determine trends and factors likely to influence the future development of the channel.



STATISTICS CANADA SOURCES

Statistics Canada, 1976.

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TITLE: Computer Run Municipalities in Decreasing Population Order 1976.

ABSTRACT: Ranks the municipalities and incorporated villages and towns in 2 ways:

- 1) By highest to lowest population down to the level of 1 person. Gives name of town, type of village, province and population and a ranking number.
- 2) Alphabetic list of municipalities with population, rank and province.

Statistics Canada, November 1978.

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TITLE: Culture Statistics, Recreational Activities.

ABSTRACT: Frequency of participation in exercise, sport and physical recreation activities, the context of the participation, the facilities used, and the reasons why they took part in these activities. The responses to these questions can be combined with the considerable socio-economic, demographic, and attitudinal information collected to produce profiles of the participants and non-participants in sport or exercise.

Statistics Canada, February 1979.

---

TITLE: Population Projections for Canada and the Provinces.

ABSTRACT: They reflect the future growth trends, the emerging age-sex structure and the population distribution across the country under the stated assumptions. Four alternative sets of projections are included in this report to cover the plausible range of variation in the factors governing the future growth of population.

STATISTICS CANADA SOURCES

Statistics Canada, 1977.

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TITLE: Telecommunications Statistics.

ABSTRACT: This report deals with telecommunication carriers involved in international telecommunications including Telesat Canada. It provides industry statistics on Telegraph and Cable Systems with financial and operating data on telecommunications carriers other than telephone systems. It aims at monitoring the growth and changes in this area of the telecommunications industry.

Statistics Canada, April 1979.

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TITLE: Market Research Handbook.

ABSTRACT: A convenient source of information and reference for all those who are engaged in analyzing the many aspects of Canadian markets on the local, provincial, regional and national level.

Statistics Canada, November 1976.

---

TITLE: Consumer Prices and Price Indexes, July-September 1976.

ABSTRACT: This report presents a synopsis of current consumer price index movements for each of the three months in the reference quarter, at both the urban Canada and the regional cities' level. This is presented in the form of descriptive analysis supported by tabular and graphic information.

Provides a detailed historical summary of monthly consumer price index movements in recent years.

Place-to-place comparative retail price information forms.

Appendices serving as sources of reference for the statistical data presented in the preceding segments of the report.

STATISTICS CANADA SOURCES

Statistics Canada, November 1978.

---

TITLE: Radio and Television Broadcasting 1977.

ABSTRACT: Data are compiled on the broadcasting year from annual returns received from CRTC licensees.

The survey covers all commercial broadcasting stations, the regional television network. Cable television, Pay TV and non-commercial broadcasting stations operated by religious groups, educational institutions and provincial governments are not included.

Statistics Canada, April 1978.

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TITLE: Dwellings and Households, Dwellings, Private Households and Families.

ABSTRACT: Final counts from the 1976 Census on dwellings, private households and families as well as total persons and average number of persons per private household and per family, for Canada and provinces.

TELECOMMISSION REPORTS

Department of Communication by University of Toronto, Study 2 (bXi)  
1970.

---

TITLE: Communications in Canada, A Statistical Summary.

ABSTRACT: Statistical summary of telecommunications sector in  
Canada by:

1. Time series on revenue, prices and income and demand for telecom services.
2. Estimated production functions for all telecom services, estimated input requirements for telecom services.
3. Estimating investment functions for telecom.
4. Demand for telecom and communications equipment.

Department of Communications, Project Team Approach, Study 4 (a),  
1971.

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TITLE: The Future of Communications Technology.

ABSTRACT: The following method was used:

1. the future environment was defined.
2. the basic technologies were laid out.
3. the impact of new technological developments.
4. advances and their affects on the overall systems.
5. conclusions are drawn from technical considerations.

TCTS, CNCP Telecommunications, Study 2(e), March 1970.

---

TITLE: Telecommunication Carriers, Market Projection and Analysis.

ABSTRACT: This study presents the projections and analysis of the telephone and telecommunication companies in Canada. The forecast period is from 1970's through the 1980's and inputs population and economic data to project the demand on Telecommunications Services and new services to be introduced.

TELECOMMISSION REPORTS

The Department of Communications, Study 8(d), Ottawa 1971.

---

TITLE: Multiservice Cable Telecommunication Systems - The Wired City.

ABSTRACT: This particular study investigates the present state of cable telecommunication systems in Canada. It explores the probable evolution from existing systems to future systems that could provide "total" telecommunication for Canadian cities. In addition the study considers the impact of multiservice cable telecommunication systems on urban areas.

DOC PAPERS

Day, J, CRC/DOC, IAF 30th Congress, September 1979.

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TITLE: The Application of Lower Power Satellites for Direct Television Broadcasting.

ABSTRACT: Discusses the use of Anik B for low powered DBS reception. Gives technical data with tables, maps and charts on the performance of Anik B and the quality of reception.

Davies, N.G., CRC/DOC, IAF October 1978.

---

TITLE: CTS/Hermes - Experiments to explore the application of advanced 14/12 GHz communications satellites.

ABSTRACT: Hermes was a high powered (59 dBW) satellite 15 technical experiments and 21 social experiments. Technical description of Hermes with beam pattern. Experimentors listed with their applications.

Davies, N.G., Department of Communications, Ottawa, Ontario, 1978  
IEEE.

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TITLE: The Transition from CTS/Hermes, Communications Experiments to Anik-B Pilot Projects.

ABSTRACT: The Department of Communications in Canada and NASA in the U.S.A. cooperated to build and then launch the Communications Technology Satellite (CTS), now named Hermes. The objectives of the program were to develop 14/12 GHz spacecraft technology and to explore possible future services. 39 experiments will have been carried out by the end of 1978. These experiments have technical and social objectives to explore new services in telemedicine, tele-education, community communications, broadcasting and administrative services.

DOC PAPERS

Department of Communications, May 1980.

---

TITLE: A Satellite Delivered Direct-To-Home Television Pilot Project.

ABSTRACT: The primary purpose of the proposal is to test and evaluate in a field setting a reasonable quantity of Canadian manufactured terminals which will be located in small communities and private homes in poor service areas.

Day, J.W.B., Davies, N.G. and Douville, R.J., Communications Research Centre, Department of Communications.

---

TITLE: The Application of Lower Power Satellites for Direct Television Broadcasting.

ABSTRACT: The use of 12 GHz satellites for TV broadcasting directly to individual homes and small communities has been the subject of analysis and design study by groups in many countries. Accumulated experience in Canada with 12 GHz operation and the evolution of technology are leading to changes in the concept of direct broadcasting such that lower power satellites may be capable of meeting the requirements.

JOURNALS AND REPORTS

Smith, Delbert D., Satellite Communications, May 1980.

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TITLE: The Impact of Space Policy on Direct Broadcast Satellites.

ABSTRACT: The implementation of DBS systems for the United States is dependent not only upon communications policy, but space policy as well.

In a general strengthening of private sector research and development capabilities since it would encourage investment in space related systems which in turn would increase the revenue potential for future operational DBS systems. The need for federal expenditures to compensate for deficiencies in private sector research and development activities would be reduced.

Seaman, L.T., Acts Astronautics, Vol. 5, 21 September 1977.

---

TITLE: Japanese broadcast satellite.

ABSTRACT: The Japanese domestic broadcast satellite, "Medium-Scale Broadcasting Satellite. It is an experimental system capable of evaluating new concepts in satellite TV systems that promises advancement in the economic coverage of a large, well-defined geographical area and in high quality TV reception in all sectors of the broadcast area.

Collette, R.C. and Fromm, H.H., European Space Agency, Direct Satellite Broadcastings, August 1977.

---

TITLE: Individual and Collective Reception - Technological and Financial Aspects.

ABSTRACT: The minimum antenna aperture must be around 0.8 m for directivity and gain reasons.



JOURNALS AND REPORTS

NASA - Lewis Research Centre - 1979 13p.

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TITLE: Telecommunication Service Markets Through the Year 2000 in Relation to Millimeter Wave Satellite Systems.

ABSTRACT: NASA is currently conducting a series of millimeter wave satellite system market studies to develop 30/20 GHz satellite system concepts that have commercial potential. Four contractual efforts were undertaken: two parallel and independent system studies and two parallel and independent market studies. The marketing efforts are focused on forecasting the total domestic demand for long haul telecommunications services for the 1980-2000 period. Work completed to date and reported in this paper include projections of geographical distribution of traffic: traffic volume as a function of urban area size: and user identification and forecasted demand.

NASA - Washington, D.C., July 1977.

---

TITLE: Analysis of Economics of a TV Broadcasting Satellite for Additional Nationwide TV Programs.

ABSTRACT: The influence of a TV broadcasting satellite, transmitting four additional TV networks was analyzed. It is assured that the cost of the satellite systems will be financed by the cable TV system operators. The additional TV programs increase income by attracting additional subscribers. Two economic models were established: (1) each local network is regarded as an independent economic unit with individual fees (cost price model) and (2) all networks are part of one public cable TV company with uniform fees (uniform price model). Main results of the study are: the installation of a TV broadcasting satellite improves the economics of CTV-networks in both models; the overall coverage achievable by the uniform price model is significantly higher than that achievable by the cost price model.

JOURNALS AND REPORTS

European Space Agency, Paris (France) Rosetti, C. - 1975 5p.

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TITLE: Satellite Video and Sound Broadcasting. Technico-Economic Considerations for Industrialized and Developing Countries.

ABSTRACT: Reasons are given for introducing broadcasting satellites in industrialized and developing countries. Choice of the frequency band is discussed from a systems economics viewpoint. National coverage is seen as the most probable coverage. Possible ground receivers are reviewed with regard to performance and costs. The importance of international co-operation is underlined.

Mitre Corp., McLean, Va. Office of Telecommunications Policy, Washington, D.C. (402 364) - July 1974.

---

TITLE: Cable Television Financial Performance Model. Description and Detailed Flow Diagram.

ABSTRACT: The cable television financial model consists of a set of computer programs intended to aid policymakers in the evaluation of the financial and economic ramifications of various policy alternatives. The program that comprise the model can be used in examining cable television at three levels: the individual cable television system, the multiple system operator (MSO), and the entire cable television industry. The model is also capable of being used at several levels of policymaking: the local level, the state level, and the Federal level including the Office of Telecommunications Policy, the Office of Telecommunications (DOC), and the Federal Communications Commission.

## JOURNALS AND REPORTS

Stanford Research Inst., Menlo Park, California, Office of Telecommunications Policy, Washington, D.C., Panko, R.R., Edwards, G.G., Penchos, K., Russell, S.P., May 1975 37p.

---

TITLE: Analysis of Consumer Demand for Pay Television Executive Summary.

ABSTRACT: Demand for pay cable television and broadcast pay (subscription) television is analyzed. Data from current pay cable operations are studied as are data from live attendance at spectator events, television viewing, consumer surveys and early pay television experiments. An upper bound on current demand is estimated, as are upper bounds on subscribership and revenue growth over time. Demand parameters of particular interest in the assessment of economic interactions.

MITRE Corp., McLean, VA. MITPEK Div. National Transportation Policy Study Commission, Washington, D.C.

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TITLE: The Impact of Telecommunication on Transportation Demand through the Year 2000.

ABSTRACT: This report analyzes the interactions of transportation and telecommunication as they exist today and in the future, especially as regards the effects of telecommunication on transportation demand. It analyzes the development of four major telecommunication services -- voice, video, data and interactive cable television -- and reports estimates of their substitutability for transportation service. It reports present and possible future impacts on government investment and regulation.

JOURNALS AND REPORTS

Weinhouse, Norman, Hughes Aircraft, 1980.

---

TITLE: Required Signal/Noise Ratio for Satellite Feed to Cable TV Systems.

ABSTRACT: Confusion over S/N ratio for CATV is due to the fact that cable operators measure noise performance at VHF (C/N) at a subscriber drop and the satellite feed is measured at baseband (S/N). Also, satellite signals are FM of a microwave carrier while cable systems utilize vestigial sideband modulation of a VHF carrier.

First Report on Prospects for Additional Networks, FCC Network Inquiry Special Staff, Besen, Stanley M., January 1980.

---

TITLE: Direct Broadcast Satellites: Legal and Policy Options.

ABSTRACT: This report looks at alternative networks for TV communication.

FCC by Network Inquiry Special Staff.

---

TITLE: Interconnection of Broadcasters: Technology Costs and Regulatory Policies.

ABSTRACT: Describes existing methods of providing nationally distributed programs to local broadcasters, the rates charged for these services and FCC regulation of rate structures and entry in terrestrial microwave and satellite interconnection.

JOURNALS AND REPORTS

Smith, D., May 1980.

---

TITLE: The Impact of Space Policy on DBS Satellite Communications.

ABSTRACT: Short 3 page article on DBS. Quotes political sources for the push for space activities. States 5 objectives for U.S. involvement in Space R&D.

British Broadcasting Corp., Redmond, James, SERT Journal, July 1977.

---

TITLE: Direct Broadcasting to the Home Via Satellite.

ABSTRACT: The BBC will not benefit from the use of DBS due to the fact that they believe there is little demand for additional TV channels and that the present coverage of 99.5% of the population does not warrant it. The quality of the BBC system is much higher with 625 line PAL colour system as opposed to a 405 NTSC line standard available with a DBS.

FCC, NTIS, Das, A., July 1975.

---

TITLE: Present Status of Broadcasting Satellites.

ABSTRACT: Describes the technical advances in DBS and discusses the applications and use of this technology as planned by various countries.

JOURNALS AND REPORTS

Hupe, H.

---

TITLE: The Coming "Broadcast" satellites: Where They Should and Should not be used in Delivering Education Services.

ABSTRACT: The use of satellites should be predetermined and thereby utilize them as economically as possible.

Ministry of Posts and Telecommunications, April 1978.

---

TITLE: Space Program in Japan, BSE Project.

ABSTRACT: Describes the technical aspects of Japan's BSE Direct Broadcast Satellite Project. A high powered 12 GHz band satellite transmitting 2 channels of signals.

Satellite Communications, Le Duc, D., February 1978, p 34.

---

TITLE: DBS Service for Western Europe: A Hidden Barrier.

ABSTRACT: A review of what European countries are doing to utilize DBS and how it will help them reduce their communication costs.

Blackman, N., NTIS, 12 July 1977.

---

TITLE: Direct Satellite Broadcasting.

ABSTRACT: Discusses the issues involved with DBS and describes how this service would be applied.

JOURNALS AND REPORTS

Federal Ministry for Research & Technology, West Germany,  
Becker, D., June 1974.

---

TITLE: Analysis of Economics of a TV Broadcasting Satellite for  
Additional Nationwide TV Programs.

ABSTRACT: The use of a TV broadcasting satellite transmitting 4 TV  
programs is analyzed as to the economics and influence on  
the development of cable TV networks. The results show  
an improvement economically for Cable TV and that the  
overall coverage achievable is significantly higher by  
the use of uniform pricing of space segment to all local  
networks.

Federal Communications Commission, Network Inquiry Special Staff,  
Besen, Stanley M., January 1980.

---

TITLE: First Report on Prospects for Additional Networks. Direct  
Broadcast Satellites: Legal and Policy Options.

ABSTRACT: Direct Broadcast Satellites: Consultants are working  
with the Network Inquiry Special Staff, preparing a  
report which, together with the report on Interconnection  
of Broadcasters, will describe the technology available  
to broadcast television signals directly to home  
receivers from satellites and how much satellite  
broadcast services might be offered to the American  
public.

Federal-Provincial Conference of Communications Ministers, Toronto,  
Ontario, 1979.

---

TITLE: A Federal Discussion Paper on Satellite Distribution of  
Television Programming and Pay-Television.

ABSTRACT: The overriding goal underlying the implementation of the  
proposed initiatives is to make more quality Canadian  
television program productions available and acceptable  
to more Canadians over time.

APPENDIX B  
References



REFERENCES

- 1 Proceedings of the 1979 WARC, footnote 3787A.
- 2 Interview with Harry Rice, VP of TV Distribution, RCA Americom
- 3 "Western Europe: The Development of DBS Systems" by Roberto Grandi, Journal of Communication, Spring 1980.
- 4 Presentation by O. Roscoe at the International Institute for Communications, September 1980.
- 5 "Present Status of Rural Communications In Canada," July 1976, DOC
- 6 "Social Forecast", Working Group, Direct Broadcast Satellite, DOC, April 1976.
- 7 "Man on the Move," 1976, DOC
- 8 A settlement is defined as a cluster of some 175 or more households within a closely dispersed area averaging 4 square miles. "Clustering of Households in Rural Canada", DOC, December 1978.
- 9 "Geographic Distribution of Households Within Rural British Columbia" July 1978, DOC
- 10 "Rural Canada Models of Multichannel Broadcasting Stations" by DGB Consultants for DOC, September 1979.
- 11 "Demand for Rural Communication Services in Canada - A Literature Review", DOC, January 8, 1979.

- 12 "The Availability of Television in the Census Metropolitan Areas", DOC, August 15, 1978.
- 13 In a Focus Group, a professional moderator introduces a study theme to a small group of consumers.
- 14 Demand for Rural Communication Services in Canada - Focus Groups and Research Instruments, DOC, December 1979.
- 15 DOC/Telesat meeting with CCTA, October 3, 1980.
- 16 CBC Brief to the Therrien Committee on the Extension of Services and Pay TV.
- 17 CAB Brief to the Therrien Committee on the Extension of Services and Pay TV.
- 18 Telesat/DOC Meeting with the CAB, October 30, 1980.
- 19 Ontario Educational Communications Authority Satellite Program, Anik B Conference, Public Archives, June 12, 1980.
- 20 Interactive Instructional Television Project, Dept. of Distance Education, BCIT, ACCC Conference, Wolfville, N.S., May 29, 1980.
- 21 Inukshuk News, May 1980.
- 22 The Inukshuk Project Inuit Tapirisat of Canada.
- 23 Low-Power Broadcasting Satellite Trials in Canada, C. Billowes/DOC; P. Bowers of OECA; E. Rose/BCTV.

- 24 Interim Evaluation Report on the Anik B Direct  
Broadcasting Field Trial. C. Billowes, DOC, June 1980.
- 25 The Application of Lower Power Satellites for Direct  
Television Broadcasting. J. Day, N. Davies and  
R. Douville, DOC, September 1979 DOC reference 79-226.
- 26 A Satellite-Delivered Direct-to-Home Television Pilot  
Project. DOC, May 1980.
- 27 Trip Report. Visit to Anik B Pilot Project Terminals,  
Northern Ontario, D. Umbach, Sept. 1980.

APPENDIX C

Demand Tables

Tables 5.3 to 5.6 & 5.8 to 5.11

TABLE 5.3

## Direct-To-Home Terminal Market Penetration

EAST BEAM

TERMINAL COSTS	BASIC %	BASIC NUMBERS	EXTENDED %	EXTENDED NUMBERS	FULLY EXTENDED %	FULLY EXTENDED NUMBERS	PAY TV & EXTENDED %	PAY TV & EXTENDED NUMBERS	PAY TV & FULLY EXTENDED %	PAY TV & FULLY EXTENDED NUMBERS
<u>DBS reception for clusters of 20 hh and less</u>										
PROBABLE MARKET										
\$ 100	64	7,970	45	50,010	54	120,222	13	76,781	21.3	126,689
200	57	7,128	41	45,565	51	109,488	12.6	75,016	20.8	123,810
300	50	6,199	37	41,120	45	96,607	12.2	72,368	20.2	120,451
400	43	5,386	30	35,563	40	85,873	11.6	68,838	19.6	116,612
500	38	4,807	23	25,561	34	72,992	10.8	64,426	18.7	111,333
600	32	3,910	15	16,670	27	57,965	9.9	59,130	16.9	100,776
700	25	3,042	14	15,988	20	42,937	9.1	53,835	15.9	95,017
800	21	2,535	12.9	14,447	14	30,056	8.5	50,304	15.2	90,218
900	16	1,913	9	11,312	11	23,615	7.9	46,775	14.3	85,419
1000	12	1,480	2	2,223	9	19,321	6.8	40,597	12.9	76,781
1200	5	617	1.5	1,741	8	17,175	5.8	34,419	9.9	59,130
1400	2	247	1	1,114	7	15,028	4.9	29,124	8.5	50,304
1600	1	123	.3	333	6	12,881	4.2	24,711	5.8	34,419
1800	.8	98	.2	222	5	10,734	3.7	21,181	4.2	24,711
2000	.4	49	.1	111	2	4,293	3	17,651	3.6	21,181
POTENTIAL MARKET	100	12,453	100	111,134	100	222,633	100	594,122	100	594,784

TABLE 5.4

## Direct-To-Home Terminal Market Penetration

EAST CENTRAL BEAM

TERMINAL COSTS	BASIC %	BASIC NUMBERS	EXTENDED %	EXTENDED NUMBERS	FULLY EXTENDED %	FULLY EXTENDED NUMBERS	PAY TV & EXTENDED %	PAY TV & EXTENDED NUMBERS	PAY TV & FULLY EXTENDED %	PAY TV & FULLY EXTENDED NUMBERS
<u>DBS reception for clusters of 20 hh and less</u>										
PROBABLE MARKET										
\$ 100	63	3,631	38	14,172	54	23,595	7.7	25,767	12.6	42,355
200	56	3,247	34	12,680	52	22,721	7.5	25,174	12.3	41,389
300	49	2,828	30	11,189	44	19,225	7.2	24,286	12.0	40,261
400	42	2,454	24	8,951	38	16,604	6.9	23,101	11.6	38,973
500	38	2,190	18	6,713	28	12,234	6.4	21,620	11.1	37,201
600	31	1,791	14	5,221	24	10,487	5.9	19,844	10.0	33,658
700	24	1,386	9	3,729	19	8,302	5.4	18,066	9.4	31,726
800	20	1,155	6	2,238	15	6,554	5.0	16,881	9.0	30,276
900	16	932	4	1,591	11	4,807	4.7	15,697	8.5	28,665
1000	10	574	2	746	8	3,495	4.1	13,624	7.7	25,767
1200	3	172	1	373	6	2,622	3.5	11,860	5.9	19,844
1400	1	57	.8	298	5	2,185	2.9	9,773	5.0	16,881
1600	.8	46	.5	186	4	1,748	2.5	8,293	3.5	11,860
1800	.5	29	.4	149	3	1,311	2.1	7,108	2.5	8,293
2000	.3	11	.2	75	.1	437	1.8	5,923	2.1	7,108
POTENTIAL MARKET	100	5,763	100	37,295	100	43,694	100	335,734	100	335,734

TABLE 5.5

## Direct-To-Home Terminal Market Penetration

WEST CENTRAL BEAM

TERMINAL COSTS	BASIC %	BASIC NUMBERS	EXTENDED %	EXTENDED NUMBERS	FULLY EXTENDED %	FULLY EXTENDED NUMBERS	PAY TV & EXTENDED %	PAY TV & EXTENDED NUMBERS	PAY TV & FULLY EXTENDED %	PAY TV & FULLY EXTENDED NUMBERS
<u>DBS reception for clusters of 20 hh and less</u>										
PROBABLE MARKET										
121 \$ 100	82	18,156	59	49,492	66	56,868	34.6	57,955	56.9	95,262
200	80	17,712	55	46,137	64	55,145	33.8	56,622	55.6	93,089
300	77	17,038	51	42,781	56	48,252	32.6	54,624	54.1	90,553
400	73	16,163	45	37,748	50	43,082	31.0	51,959	52.4	87,655
500	68	15,056	39	32,715	43	37,050	29.1	48,629	50	83,671
600	63	13,949	30	25,165	37	31,881	26.7	44,632	45.2	75,703
700	53	11,935	24	14,260	32	27,573	24.3	40,635	42.6	71,357
800	45	9,921	16	10,905	27	23,264	22.7	37,970	40.7	68,097
900	38	8,414	12	10,216	23	19,818	21.1	35,306	38.5	64,475
1000	21	4,650	7	5,872	21	18,094	18.3	30,643	34.6	57,955
1200	8	1,771	5	4,194	16	13,786	15.5	25,980	26.7	44,632
1400	5	1,107	4	3,355	13	11,201	13	21,983	22.7	37,970
1600	3	664	1.5	1,258	9	7,755	11.1	18,652	15.5	25,980
1800	1	221	1	839	6	5,170	9.6	15,987	11.1	18,652
2000	.7	155	.9	778	4	3,447	8.0	13,323	9.6	15,870
POTENTIAL MARKET	100	22,141	100	83,885	100	86,164	100	167,345	100	167,345

TABLE 5.6

## Direct-To-Home Terminal Market Penetration

WEST BEAM

TERMINAL COSTS	BASIC %	BASIC NUMBERS	EXTENDED %	EXTENDED NUMBERS	FULLY EXTENDED %	FULLY EXTENDED NUMBERS	PAY TV & EXTENDED %	PAY TV & EXTENDED NUMBERS	PAY TV & FULLY EXTENDED %	PAY TV & FULLY EXTENDED NUMBERS
<u>DBS reception for clusters of 20 hh and less</u>										
PROBABLE MARKET										
\$ 100	74	34,346	54	35,463	60	55,505	25.3	45,569	41.2	74,412
200	72	33,417	49	32,342	57	52,730	24.7	44,521	40.3	72,703
300	69	31,974	45	29,681	51	47,180	22.7	42,950	39.2	70,710
400	64	29,704	39	25,723	46	42,554	22.6	40,854	37.9	68,432
500	57	26,455	32	21,106	39	36,078	21.2	38,236	36.5	65,868
600	50	23,671	24	15,830	33	30,528	19.4	35,093	33.0	59,604
700	42	21,350	18	11,213	28	25,902	17.7	31,951	31.4	56,187
800	35	16,708	13	8,574	25	23,127	16.5	29,855	29.6	53,544
900	22	10,398	9	5,936	22	20,352	15.4	27,760	28.1	50,694
1000	14	6,290	4	2,640	19	17,577	13.4	24,094	25.3	45,569
1200	6	2,637	2.7	1,785	15	13,876	11.3	20,427	19.4	35,093
1400	3	1,188	2	1,320	9	8,326	9.6	17,285	16.5	29,855
1600	2	900	1	609	4	3,700	8.1	14,666	11.3	20,427
1800	1	518	.9	579	2	1,850	7.0	12,571	8.1	14,666
2000	.9	478	.8	527	.9	832	5.8	10,475	5.8	12,571
POTENTIAL MARKET	100	46,414	100	65,957	100	92,508	100	180,448	100	180,448



TABLE 5.8

## EAST BEAM

DIRECT-TO-HOME TERMINAL MARKET PENETRATION

TERMINAL COSTS	BASIC %	EXTENDED %	FULLY EXTENDED %	PAY TV & EXTENDED %	PAY TV & FULLY EXTENDED %
DBS reception for clusters of 20 hh and less - <u>Percent of Rural Market in East Beam</u>					
PROBABLE MARKET					
\$ 100	1.0	6.6	15.8	10.2	16.6
200	.9	6.0	14.9	9.8	16.2
300	.8	5.4	13.1	9.5	15.8
400	.69	4.4	11.7	9.1	15.3
500	.61	3.4	9.9	8.4	14.6
600	.51	2.2	7.9	7.7	13.2
700	.41	2	5.8	7.1	12.4
800	.34	1.9	4.1	6.6	11.9
900	.26	1.3	3.2	6.2	11.2
1000	.19	.3	2.6	5.3	10.1
1200	.08	.2	2.3	4.5	7.7
1400	.03	.15	2.0	3.8	6.6
1600	.02	.04	1.8	3.3	4.5
1800	.01	.03	1.5	2.9	3.3
2000	.01	.01	.6	2.3	2.8
POTENTIAL MARKET	1.6	27.8	29.2	78.1	78.1

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TABLE 5.9  
EAST CENTRAL BEAM

DIRECT-TO-HOME TERMINAL MARKET PENETRATION

TERMINAL COSTS	BASIC %	EXTENDED %	FULLY EXTENDED %	PAY TV & EXTENDED %	PAY TV & FULLY EXTENDED %
DBS reception for clusters of 20 hh and less - <u>Percent of Rural Market In East Central Beam</u>					
PROBABLE MARKET					
\$ 100	.9	3.5	4.4	6.3	10.4
200	.8	3.1	4.2	6.2	10.1
300	.7	2.8	3.6	5.9	9.9
400	.6	2.2	3.1	5.6	9.5
500	.5	1.7	2.3	5.3	9.1
600	.4	1.3	1.9	4.9	8.2
700	.3	.8	1.6	4.4	7.7
800	.28	.6	1.2	4.1	7.4
900	.22	.4	.9	3.9	7.0
1000	.1	.2	.7	3.4	6.3
1200	.04	.1	.5	2.9	4.9
1400	.01	.07	.4	2.4	4.1
1600	.01	.05	.3	2.1	2.9
1800	.01	.04	.2	1.7	2.1
2000	.01	.01	.08	1.5	1.7
POTENTIAL MARKET	1.4	9.2	10.7	82.3	82.3

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TABLE 5.10  
WEST CENTRAL BEAM

DIRECT-TO-HOME TERMINAL MARKET PENETRATION

TERMINAL COSTS	BASIC %	EXTENDED %	FULLY EXTENDED %	PAY TV & EXTENDED %	PAY TV & FULLY EXTENDED %
DBS reception for clusters of 20 hh and less - <u>Percent of Rural Market In West Central Beam</u>					
PROBABLE MARKET					
\$ 100	6.0	16.0	18.9	19.2	31.6
200	5.8	15.3	18.3	18.8	30.8
300	5.6	14.2	16.0	18.1	30.0
400	5.3	12.5	14.0	17.2	29.1
500	5.0	10.8	12.3	16.2	27.7
600	4.6	8.3	11.0	14.8	25.1
700	3.9	6.7	9.2	13.5	23.6
800	3.3	4.4	7.7	12.6	22.6
900	2.8	3.3	6.6	11.7	21.4
1000	1.5	1.9	6.0	10.2	19.2
1200	.6	1.4	4.6	8.6	14.8
1400	.4	1.1	3.7	7.2	12.6
1600	.2	.4	2.6	6.1	8.6
1800	.1	.3	1.7	5.3	6.1
2000	.05	.25	1.1	4.4	5.3
POTENTIAL MARKET	7.3	27.8	28.6	55.5	55.5

TABLE 5.11

WEST BEAMDIRECT-TO-HOME TERMINAL MARKET PENETRATION

TERMINAL COSTS	BASIC %	EXTENDED %	FULLY EXTENDED %	PAY TV & EXTENDED %	PAY TV & FULLY EXTENDED %
DBS reception for clusters of 20 hh and less - <u>Percent of Rural Market In West Beam</u>					
PROBABLE MARKET					
\$ 100	13.5	14.0	21.8	18.0	29.2
200	13.2	12.7	20.7	17.6	28.7
300	12.6	11.7	18.6	16.1	27.9
400	11.7	10.1	16.7	16.0	26.9
500	10.4	8.3	14.2	15.1	25.9
600	9.2	6.2	12.0	13.8	23.5
700	7.7	4.7	10.2	12.6	22.3
800	6.4	3.4	9.1	11.7	21.0
900	4.0	2.3	8.0	10.9	20.0
1000	2.6	1.0	6.9	9.5	18.0
1200	1.1	.7	5.5	8.0	13.8
1400	.55	.5	3.3	6.8	11.7
1600	.4	.3	1.5	5.7	8.0
1800	.2	.2	.7	5.0	5.8
2000	.16	.2	.3	4.0	4.1
POTENTIAL MARKET	18.3	26	36.4	71.1	71.1





