Closed

"The Feasibility of Improving Communications Along the Transportation Corridor Between Prince George and Prince Rupert"

Communications Canada
Pacific Region
April, 1975

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I. INTRODUCTION

Although very little is known about the exact role of telecommunications in the socio-economic development process, it is generally agreed that, without a good level of telecommunication services, the development process will be severely hampered. This would appear to be especially true for the remote areas. In these areas, reliable and efficient telecommunication facilities are essential and can enormously reduce the social and economic costs of being isolated.

For the business and government sectors, good point-to-point voice and data telecommunication facilities are required if these organizations are to operate efficiently. Voice and data telecommunication facilities allow for expedient locating/ordering of new materials; for acquiring manpower; for locating and ordering of parts for broken down machinery; for contacting medical and other help in case of staff accidents; in retrieving and furnishing information from/for remote EDP data bases; in furnishing clients with information on the company's products; in obtaining management advice, etc. It would appear then that, without good telecommunication facilities, the economic development of any area would be severely hampered.

For the household sector, good telecommunication services are equally important. Reliable telephone services are needed for social calls, for morale purposes, and for emergency use. Telegraph services should be available for formal personal communications and for emergency purposes. Radio broadcasting facilities are required because they constitute an important tool for dispersion of especially local news. Radio broadcasting is further a valuable source of light entertainment and a good educational and information

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medium. Television broadcasting services are important to the household sector because television has a high entertainment value, is (can be) educational, and an excellent source of national or international news. It would appear, then, that without good telecommunication facilities the social development of any area would be hampered.

In British Columbia, the North Western part of the province has seen substantial economic development in the last ten years. This development has mainly taken place along the "Highway 16 Corridor".† Both the federal government and the provincial government have indicated that they intend to foster further economic development in this area.††

In this paper, then, an analysis of the socio-economic development of the corridor, in relation to the telecommunication services available in the corridor, will be made. The main finding of the first half of the paper is that the level of telecommunication services has been adequate in all areas of the telecommunication field except one. Television facilities are very poor. The second half of the paper, therefore, attempts to ascertain how the poor T.V. facilities might (have) affect(ed) the socio-economic development of the corridor. The costs,benefits, and institutional barriers in upgrading the level of television services are also examined.

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† Highway 16 extends from Prince George to Prince Rupert. The "Highway 16 Corridor" is a 60-70 mile wide strip of land with Highway 16 as the centre line.

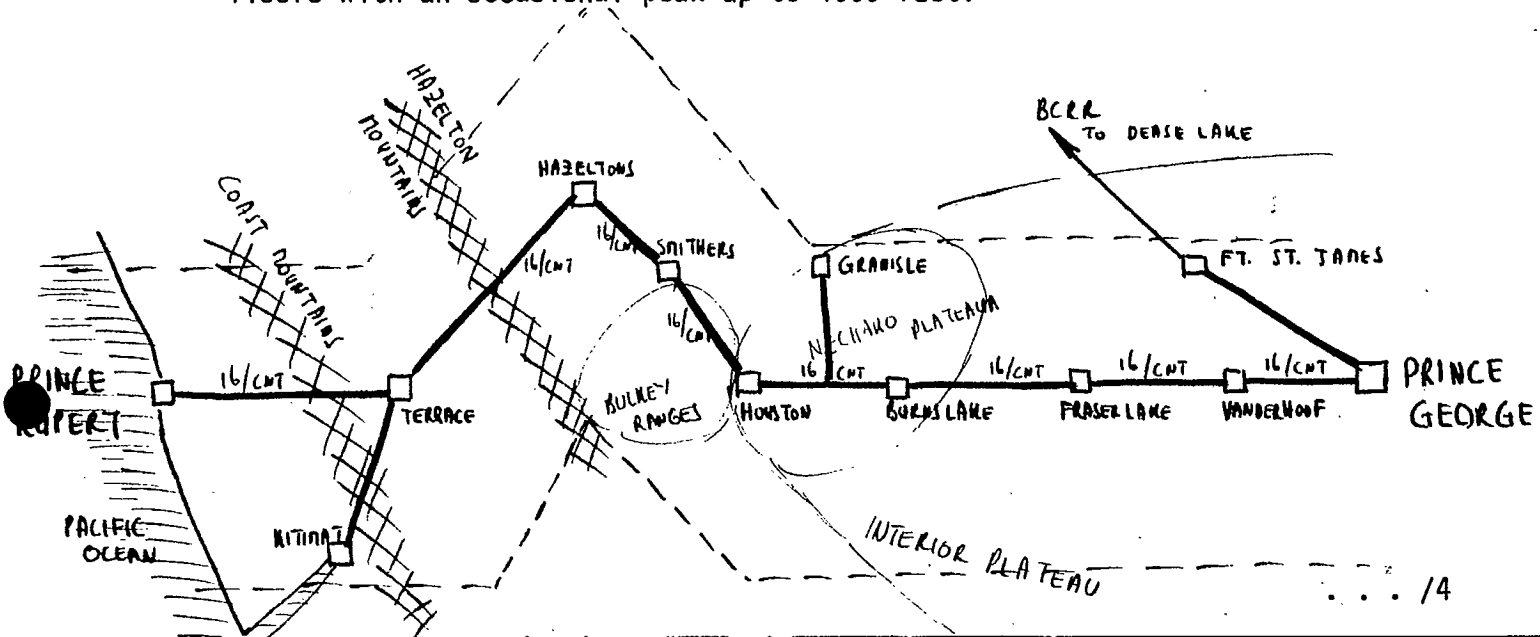
†† See, for example, Evan Atkinson, "$495 Million Benefits Seen in North Developments", Vancouver Sun, July 24, 1973.

II. THE CORRIDOR - AN OVERVIEW

In this section, the following aspects of the corridor are briefly discussed: (i) geography; (ii) industry; (iii) communities; (iv) population; (v) telecommunications.

(i) Geography: The air distance between Prince George in the Interior of B.C. and Prince Rupert on the Pacific Ocean is approximately 330 miles. A natural transportation corridor consisting of the Nechako, Bulkey, and Skeena Rivers connects the two communities. A railroad (CNT) and a highway (#16) have been constructed along the waterway. By (rail)road, the distance between Prince George and Prince Rupert is 466 miles.

The eastern half of the corridor (Prince George-Smithers/Houston) is located on the Interior and Nechako Plateaus (the Nechako Plateau is part of the larger Interior Plateau). This area is relatively flat with a maximum relief in most parts of only several hundred feet. The terrain consists of rolling land with numerous glacial lake basins. In the more western parts of the eastern half of the corridor, the valleys are broad and the divides consist of rounded hills that rise 1500-2500 feet above the valley floors with an occasional peak up to 4000 feet.



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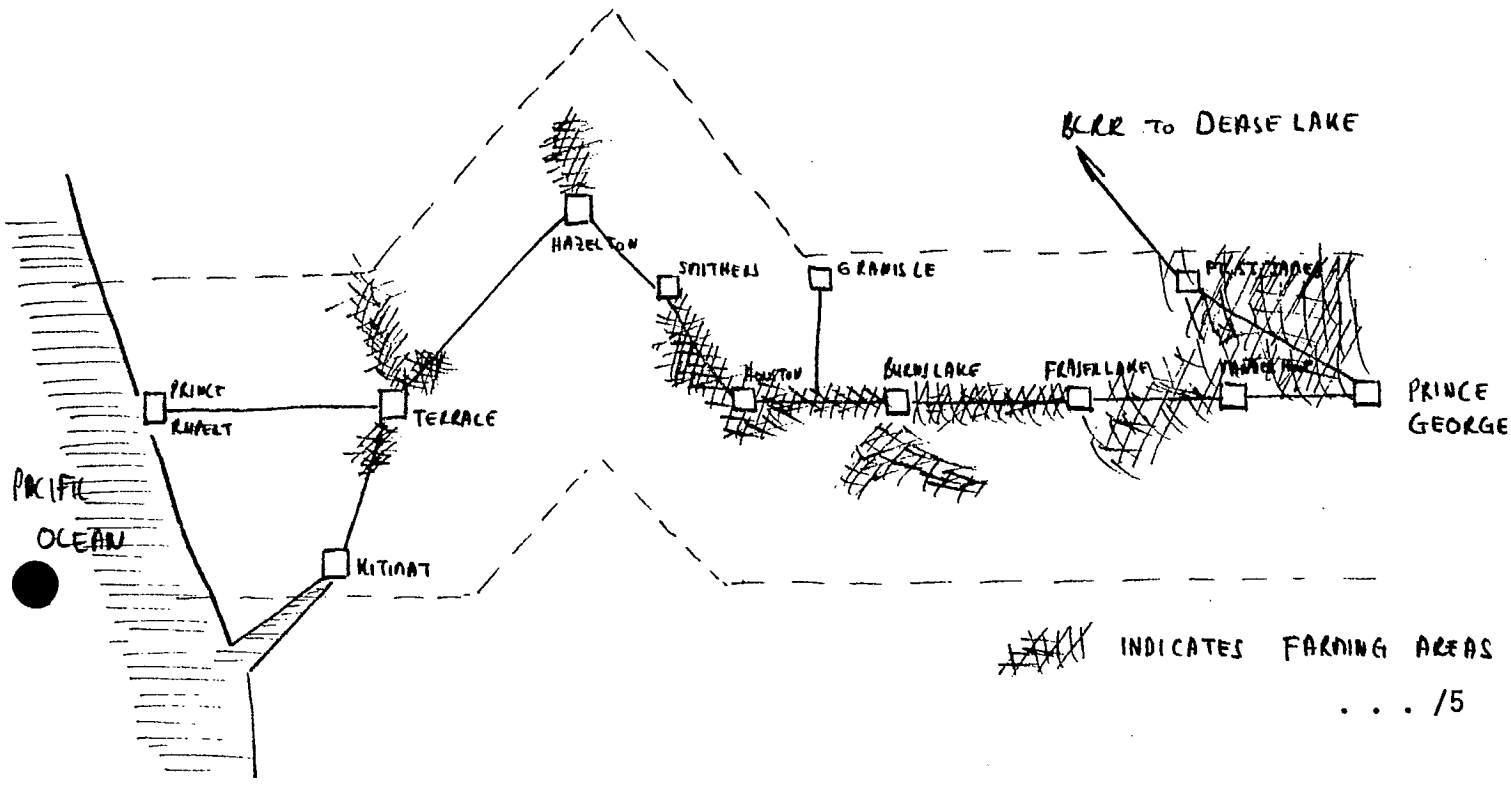
The western half of the corridor (Smithers/Houston-Prince Rupert) is generally mountainous and the topography is dominated by river valleys. Two mountain ranges, the Hazelton Mountains and the Coast Mountains, cross the corridor. South of Highway 16, the Coast Mountains are interspersed with long inlets; this area further consists of mountainous islands separated by narrow channels connecting to the inlets. North of Highway 16, the mountains are high and rugged. Icefields and glaciers are also found in this area.

(ii) Industry: The economic activities of the corridor are agriculture, commercial fishing, forestry, mining and smelting, and transportation. A short note on each of these follows:

(a) agriculture. Farming, and especially crop farming, used to be one of the important economic activities of the corridor. Farming has lately declined in importance; further, a shift from crop farming to cattle farming has taken place over the last 20 years.



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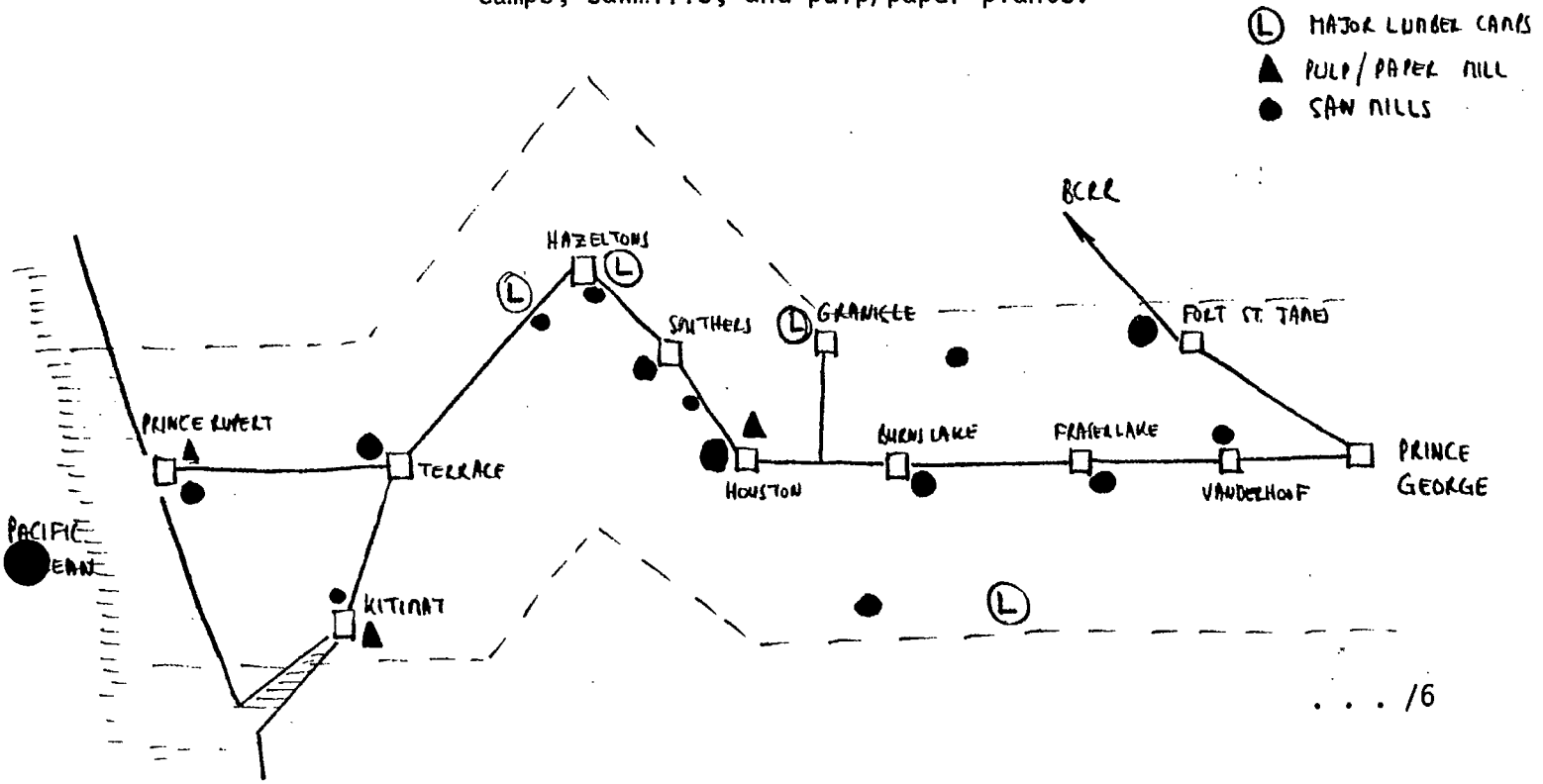
Farming still plays a significant role around and north of Terrace, north of the Hazeltons, in the Bulkey and Nechako Valleys, and south of Burns Lake. Farming activity in the belt close to Prince George has been on the increase in the last number of years.

(b) commercial fishing and fish processing. This is an important economic activity on the Coast and is centered around Prince Rupert. Good salmon runs of the Skeena and Nass Rivers help make this area account for 25-35 percent of B.C.'s total marketed value of fish products.

(c) forest industries. This is by far the most important industry of the corridor. Although the industry is still fairly evenly spread along the entire length of the corridor, there are trends toward more concentration. Fort St. James, Houston, and perhaps Kitimat are the likely growth centers. The diagram below indicates the locations of the larger lumber camps, sawmills, and pulp/paper plants.



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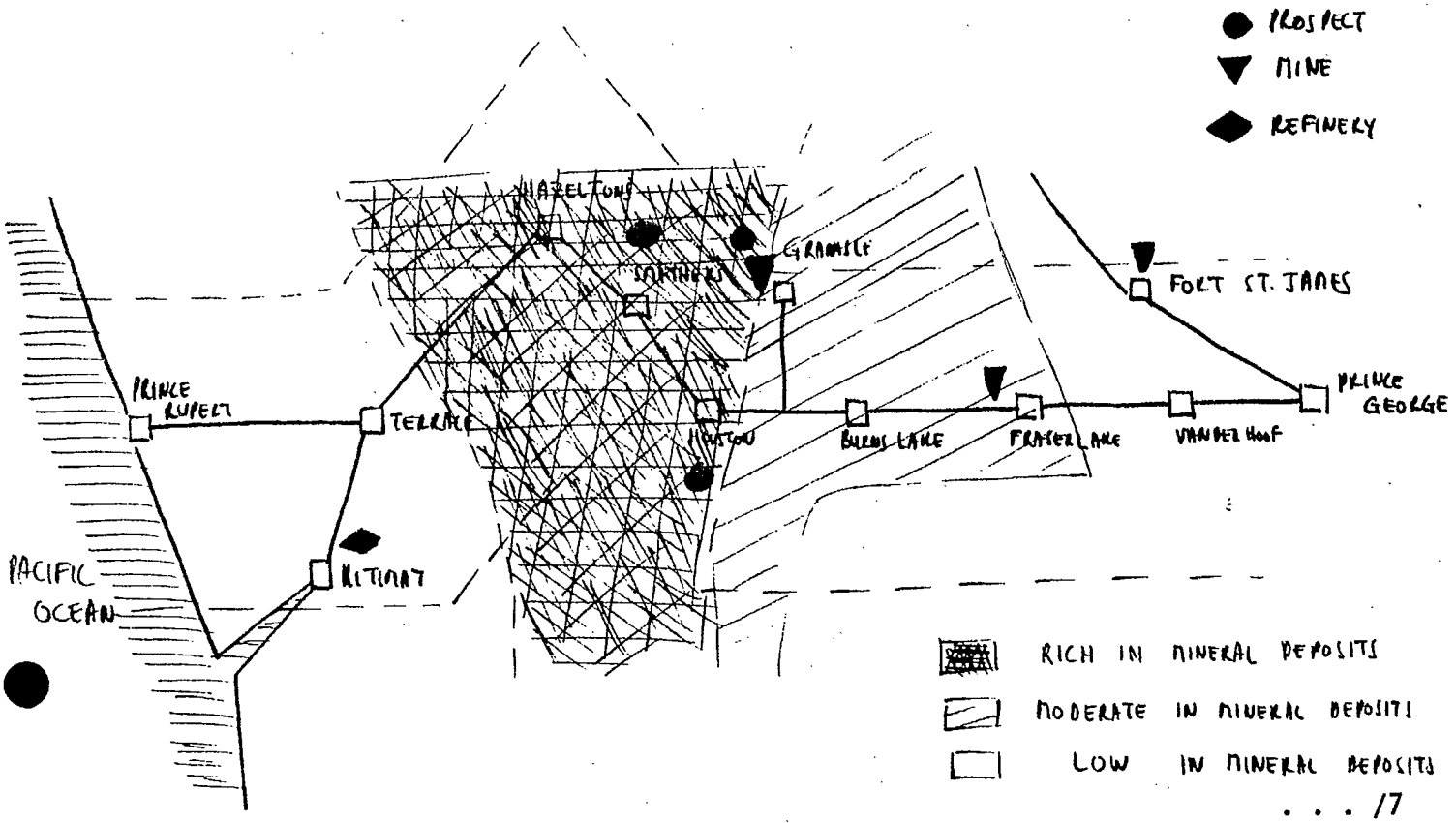
(d) mining and refining. The mineral potential of the corridor can be roughly divided as follows: 1/3 of the area has a high mineral potential, 1/3 of the area has a moderate mineral potential, and the remaining 1/3 has low mineral potential. Mines are presently located near Fort St. James (mercury), Endako (molybdenum, copper), and Granisle (copper, silver, gold).

Kitimat is the location of an aluminum smelter. Although the bauxite for this smelter is imported, the location of the smelter is ideal because of the abundance of hydro-electric power in the region. The diagram below gives some indication of the location of the mineral-rich areas and the mines and prospects of the corridor.



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(e) transportation. Prince Rupert became the site of Canada's 10th National Harbor in 1973. The Government of Canada plans to improve this deep sea port (a $15 million dock project is currently in progress) and ship more export goods to the orient via Prince Rupert (distance to Japan from Prince Rupert is 500 miles less than from Vancouver).

(iii) Communities: The three large communities (population size in excess of 10,000) of the corridor are Terrace, Kitimat, and Prince Rupert. All are located in the western part of the corridor. There are further some 9 centers with population size between 500 and 10,000 and 15 small centers with population levels in the 100-500 bracket. A brief note on each of the communities of size 500 and larger follows (see diagram for location).

(a) Vanderhoof (1653)† is the distribution/service center for the extreme eastern part (Fraser Lake-Prince George) of the corridor. A number of sawmills are located in the village and farming activity in the surrounding area is increasing.

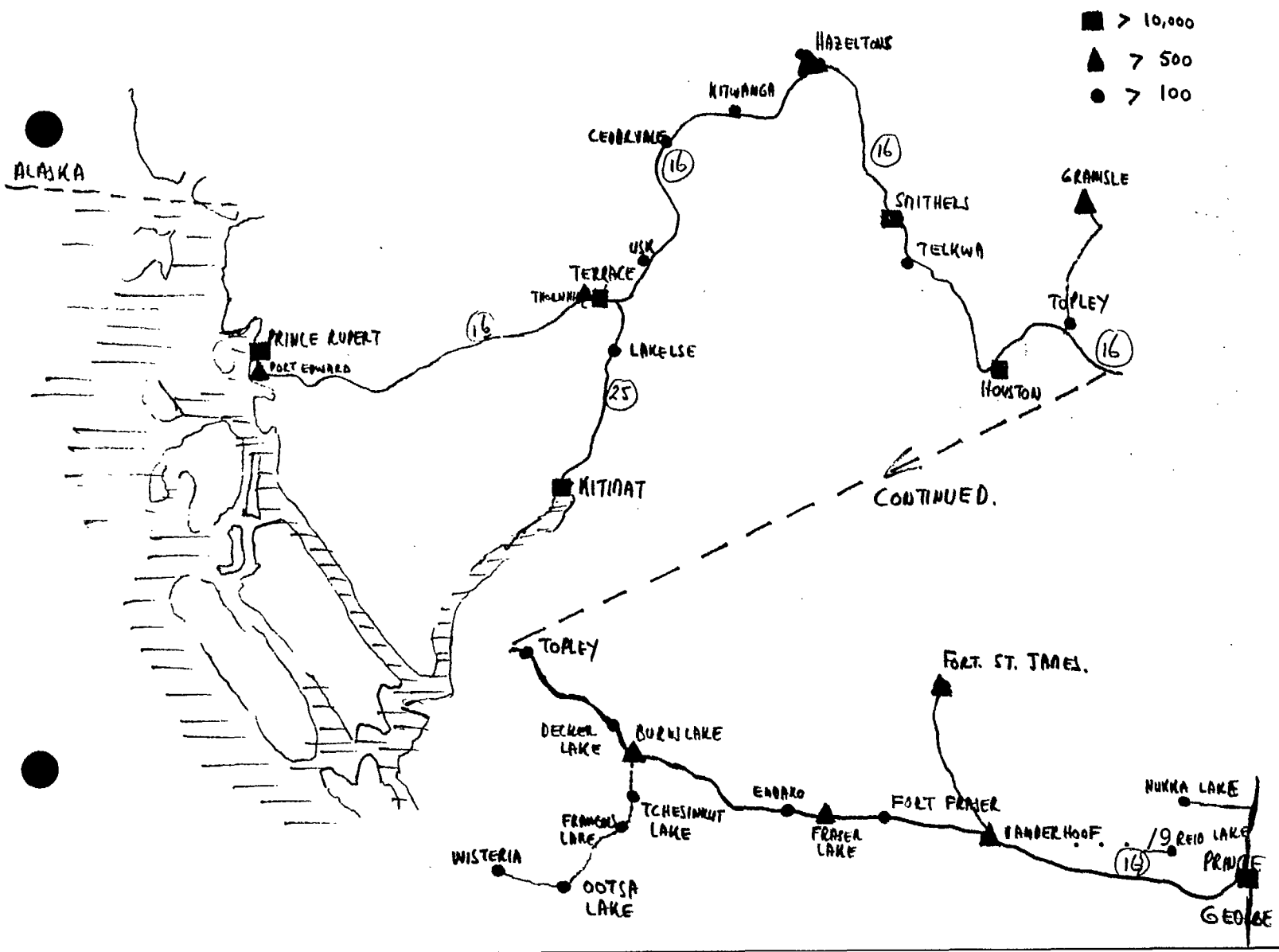
(b) Fort St. James (1483) is located some 30 miles north of Highway 16, but on the B.C. Railroad right-a-way. Fort St. James is the location of a veneer plant, some large sawmills, and a mercury mine. The northward extention of the BCRR now in progress will ensure further growth of Ft. St. James.

(c) Fraser Lake (1292) was created in 1966 as an instant town to house employees of the Endako molybdenum mine. The mine is located 15 miles west of Fraser Lake and is estimated to have 15 years of life remaining.

† Population figures are shown in brackets. All population estimates are obtained from 1971 census data.

(d) Burns Lake (1259) has a diversified economic base. Forest industries, ranching, mining, and the service sector all support the community. Burns Lake, however, does not have strong ties with any particular industry.

(e) Houston (2232) has encountered substantial growth in the last decade. Houston is the location of a large forest industry complex which produces lumber, plywood, pulp, and paper. More intensive exploitation of the forest resources north (Babine Lake/Granisle) and south (Ootsa Lake) of Houston will ensure the continued growth of this community.

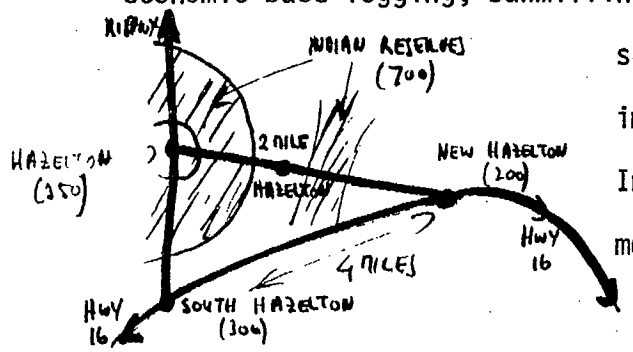


(f) Granisle (973) was constructed in 1966 to house employees of the Granisle copper mine. A major logging camp is being constructed in the vicinity of Granisle which will aid further growth of this community.

(g) Telkwa (752) has seen very little growth in the last 20 years. Telkwa remains a service centre for the farming community, although the forest industry contributes more to the economic base of the community.

(h) Smithers (3864) is the main administrative, distribution, and service centre for the Bulkey Valley (Hazelton-Houston). Forestry, agriculture, and mining contribute to the town's economy, as do transportation, government, and trade.

(i) The Hazeltons (area population around 2000) have as main economic base logging, sawmilling, and agriculture. The service industry is also important with the Ksan Indian Village attracting more tourists every year.



(j) Terrace (9991)/Thornhill (3909) is the major transportation centre for Kitimat and Prince Rupert. Thornhill is an unincorporated residential area north of the Skeena and adjacent to Terrace. Forestry, agriculture, and the service industry form the economic base for the Terrace/Thornhill area.

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(k) Kitimat (11803) is located 37 miles south of Terrace on the Douglas Channel. The Douglas Channel connects to the open sea some 90 miles away. Kitimat's main economic activity remains aluminum smelting, although a large forestry complex has given Kitimat a diversified economic base.

(l) Prince Rupert (15747)/Port Edward (1019) is the western terminal of the corridor. Port Edward is located 4 miles south of Prince Rupert. The Prince Rupert/Port Edward area has a diversified economy based on fish production and processing, transportation, and the forestry industry (two pulp/paper mills).

(iv) Population: It is estimated that some 80,000 people live in the corridor and that about 12 percent of this total is of native origin. As can be seen from the following table,† approximately 70 percent of the Indian population of the corridor live on reserves.

Agency	Total Pop.	Live On Reserves	Live Off Reserves
Babine	2956	2296	660
Burns Lake	981	546	435
North Coast	2364	1465	899
Stuart Lake	426	272	154
Terrace	2495	1855	640
TOTAL	9222	6434	2788
%	(100)	(70)	(30)

† Source: DIAND, Pacific Region. List of Indian Agencies and bands British Columbia and Yukon Region, January 1, 1969.

The corridor is administratively divided into four regional districts (Fraser/Fort George, Bulkey Nechako, Kitimat/Stikine, and Skeena A) and 7 school districts (Prince George, Vanderhoof, Burns Lake, Smithers, Skeena/Cassiar, Kitimat and Prince Rupert). By using a combination of regional district and school district published data, we can get fairly good estimates of some interesting social statistics. Below, estimates of the following indicators are calculated: (a) male/female ratio; (b) age distribution; (c) educational attainment level. Together, these three indicators give us a fairly good idea of the social development of the corridor.

(a) Male/female ratio. This data is available by school district.† However, the Prince George and Skeena/Cassiar school districts lie only partially in the corridor. A reasonable estimate of the Prince George and Skeena/Cassiar school district population who do reside in the corridor has been made. As is clear from the table, 53.4% of the corridor population is of the male gender; 46.6% of the corridor population, female gender. The calculated M/F ratio is, therefore, 1.15 : 1.00.

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† Age Group Distribution of British Columbia's Population by School District as of June 1, 1971. Government of British Columbia. Department of Industry, Trade, and Commerce. Parliament Buildings, Victoria, B.C.

School District	Total	Male	Female	M/F Ratio
Prince George†	2,630	1,408	1,223	1.15 : 1.00
Vanderhoof	10,985	5,910	5,085	1.16 : 1.00
Burns Lake	5,830	3,090	2,740	1.13 : 1.00
Smithers	10,110	5,350	4,765	1.12 : 1.00
Skeena/Cassiar††	18,646	9,906	8,755	1.13 : 1.00
Kitimat	13,745	7,405	6,350	1.17 : 1.00
Prince Rupert	17,945	9,625	8,320	1.16 : 1.00
TOTAL %	79,891 (100)	42,694 (53.4)	37,238 (46.4)	1.15 : 1.00

(b) Age distribution. Table A gives the population breakdown in 5 age groups. Again, school district data was used and the same estimating procedure for the two school districts not wholly within the corridor (Prince George, Skeena/Cassiar), which was used in (a) above, was employed here. It is interesting to note that fully 56% of the corridor population is less than 25 years old and that nearly 16% of the population is older than 45 years.

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† Shown total population of Prince George is 10% of the actual unincorporated population of the Prince George School District. The M/F ratio for this (10%) part has been assumed to have the same value as the complete (100%) unincorporated school district population.

†† Shown total population for Skeena/Cassiar consists of the populations of Hazelton, Terrace, plus 70% of the unincorporated population of the Skeena/Cassiar school district. The M/F ratio for the 70% of the unincorporated population has been assumed to be the same as that of the complete (100%) unincorporated school district population.

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Table A

School District	0-14	15-24	25-44	45-64	65+
Prince George†	1,041	459	760	309	63
Vanderhoof	4,275	2,085	2,790	1,415	420
Burns Lake	2,205	1,030	1,450	915	255
Smithers	3,860	1,880	2,630	1,445	310
Skeena/Cassiar††	7,211	3,597	5,534	2,245	731
Kitimat	5,130	2,515	4,290	1,680	120
Prince Rupert	5,880	3,445	5,095	2,740	785
TOTAL (100)	29,602 (37)	15,011 (19)	22,549 (28)	10,749 (13)	2,684 (3)

(c) Educational attainment. Information on this indicator is available by regional district only. Because the corridor contains only parts of any of the four regional districts, estimates in each case based on school district information, had to be made. Table B shows the results. It is interesting to note that a full 37% of the "non-full time attending" population has completed less than 9 years of education and only 8% of this population attended university.

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† Population for Prince George based on 10% of the unincorporated population of School District Prince George. Distribution of the shown population is the same as that of the unincorporated population of the Prince George School District.

†† Population for Skeena/Cassiar based on the populations of Terrace, Hazelton, plus 70% of the unincorporated population of the Skeena/Cassiar School District. The age distribution of the 70% of the unincorporated population has been taken to be proportional to that of the (100%) unincorporated population of this school district.

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Table B†-1

	Total	Grade 5⁻	Grade 5 - 8	Grade 9 - 13	Some University	University Degree
Fraser/Ft. George†-2	1,590	161	387	903	90	49
Bulkey-Nechako†-3	15,685	1,855	4,505	8,090	850	390
Kitimat-Stikine†-4	18,550	2,026	4,677	10,244	994	607
Skeena A†-5	9,780	943	2,337	5,642	561	297
TOTAL	45,605 (100)	4,985 (11)	11,906 (26)	24,879 (55)	2,495 (5)	1,343 (3)

†-1 Based on Statistics Canada Catalogue 92-764 (AP-13) Sept. 1973.

†-2 Based on 10% of the unincorporated population of the Prince George School District. Distribution proportional to that of the regional district.

†-3 Based on 100% of the population of the Bulkey-Nechako regional district.

†-4 Based on the entire population of the Kitimat School District + the following components of the Skeena/Cassiar School District: (a) Terrace, (b) Hazelton, (c) 70% of the unincorporated population. The distribution of this population (32,391) is in the same proportion as that of the complete regional district.

†-5 Based on the population of the Prince Rupert School District. The class distribution of this population component is assumed to be the same as that of the entire Skeena A regional district.

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(v) Telecommunications: Two common carriers (B.C. Telephone and Canadian National Telecommunications) and two telephone companies (B.C. Tel and the City of Prince Rupert Telephone Company) provide telecommunication services in the corridor. The infra-structure that supports the point-to-point telecommunications consists of: an open wire carrier system along the railroad (CNT), a microwave radio system supplemented by cable carrier systems (BCT), telephone exchanges at Terrace, Kitimat, Kitwanga, Hazelton, Smithers, Telkwa, Houston, Topley, Granisle, Tchesinkut Lake, Burns Lake, Fraser Lake, Fort Fraser, Vanderhoof, and Fort St. James (BCT) and Prince Rupert (City of Prince Rupert Telco).

Figure 1 shows the point-to-point communication facilities of the corridor. The following communication services are provided in the corridor:

(a) Telegraph Services. Canadian National Telecommunications maintains telegraph offices in Prince Rupert, Kitimat, Terrace, and Smithers. These offices are staffed from 0800-1700 (Monday-Friday) and provide telegraph services for the four communities during these hours. Off hours telegraph services for the four communities and telegraph services for all other communities of the corridor are provided via toll free telephone facilities from Edmonton.

(b) Teletype/telex services are provided by B.C. Telephone and CN Telecommunications to all communities in the corridor.

(c) Telephone Services. Dial telephone service is provided to all communities in the corridor of size 100 and over, except Cedarvale. Cedarvale is a toll station and is serviced from Terrace. All/most communities,

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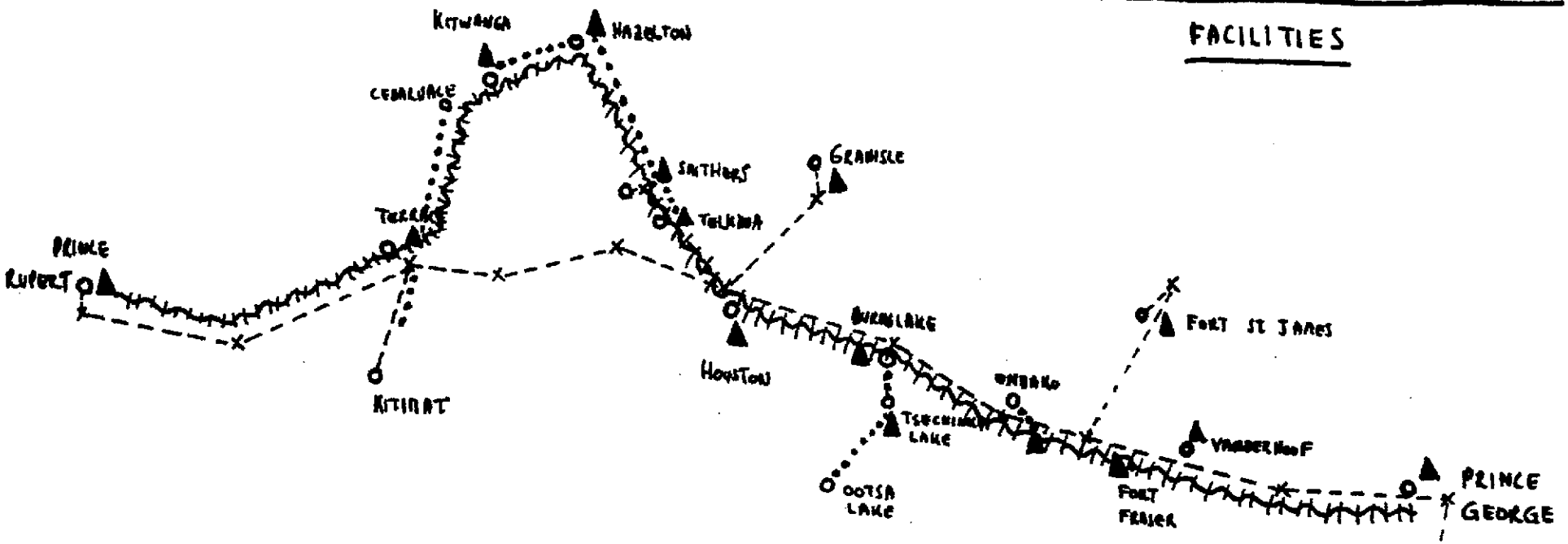
POINT-TO-POINT COMMUNICATION FACILITIES



X MICROWAVE SITE

O COMMUNITY

▲ TELEPHONE EXCHANGE

---- MICRO WAVE TRANSMISSION FACILITIES (BC TEL)

•••• CABLE " " (")

~~~~ OPEN-WIRE " " (CNT)

FIGURE 1

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moreover, are provided with direct distance dialing (DDD) capability. Mobile radio telephone services are also provided along the entire corridor.

(d) Private line teletype, telephone, and data services are offered by both common carriers (BCT, CNT) to all communities in the corridor.

(e) Radio Broadcasting Services. AM radio (re)broadcasting stations are located in Vanderhoof (CBC, private), Fraser Lake (CBC, private), Fort St. James (CBC, private), Burns Lake (CBC, private), Granisle (CBC, private), Houston (CBC, private), Smithers (CBC, private, Hazelton (CBC, private), Kitwanga (CBC), Terrace (CBC-French, CBC-English; private), Kitimat (CBC, private), and Prince Rupert (CBC, private). Studio facilities are available in Vanderhoof, Burns Lake, Smithers, Terrace, Kitimat, and Prince Rupert. All stations are on the air 24 hours a day and are being furnished with the network feeds (via CNT O.W. facilities) when the local studios are not staffed.

(f) Television Broadcasting Services. There is one T.V. station located in the corridor, CFTK-Terrace operated by Skeena Broadcasters. CFTK's signal is re-broadcast by 12 satellite transmitters to most of the western population of the corridor. Two re-broadcast transmitters (Ft. St. James, Fraser Lake) are satellites of Prince George's CKPG station.

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Both CFTK and CKPG are CBC-affiliated stations. It should be noted that only Prince George, Terrace, and Prince Rupert are "protected" VHF stations, the remainder are small ($\leq$ 5 watt), unprotected, inexpensive re-broadcast transmitters. Of the 12 CFTK satellites, 7 are owned and maintained by Skeena Broadcasting and five are operated and maintained by T.V. societies of those communities. The quality of the signal is generally poor, with a mean signal quality of 3.2 and median signal quality of 3.3†.

Besides the off-air signals available, Skeena Broadcasters operates CATV plants in Terrace, Kitimat, and Prince Rupert. These plants distribute CTV and KCTS programs which have been taped 1-2 weeks earlier in Vancouver, closed-circuit information (weather, time, etc.), and one movie daily on a separate "movie channel".

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† As measured by a DOC survey team in the summer of 1973. The rating is based on an article by Fredenall and Behrand "Picture Quality-Procedures for Evaluating Subjective Effects of Interference", published in the IRE proceedings, vol. 48, #6, part 1, page 1031. Fredenall & Behrand use the following grading: 1-excellent; 2-fine; 3-passable; 4-marginal; 5-inferior; 6-unusable.

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III. THE CORRIDOR - TELECOMMUNICATIONS AND SOCIO-ECONOMIC DEVELOPMENT

In the previous section we presented an overview of the corridor in terms of geography, industry, communities, population, and telecommunications. In this section, we will attempt to ascertain how telecommunications have helped or hindered the socio-economic development of the corridor. We will examine three aspects of this relationship as follows: (a) telecommunication facilities and economic development; (b) telecommunication facilities and social development; (c) television, social development and economic development.

(a) Telecommunications and Economic Development

Perhaps the easiest way to determine if telecommunications are hindering the economic development of the corridor is by attempting to ascertain if business is provided with all the telecommunication services it needs to function efficiently.

It would appear that this is the case. B.C. Telephone offers its complete line of services to the corridor, as does CNT. Standard tariffs apply to all these service offerings: telex, teletype, telephone, data, and private line services are provided at a level which compares favorable to that supplied in other parts of the province. There does not appear to be any reason to presume that the economic development of the corridor has suffered because of poor point-to-point telecommunications.

(b) Telecommunications and Social Development

Social development has a more intuitive than exact meaning, and clearly means different things to different people. In this section, we will look at two aspects of social development: (i) the development stage of social overhead capital (infra-structure) such as radio broadcasting stations, television

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broadcasting stations, point-to-point microwave facilities, etc. (in other words, the hardware); (ii) the development stage of the population in terms of educational attainment and other demographic indicators.

(i) Social Overhead Investment in Telecommunications.

-- Earlier sections have indicated the extent of radio relay (microwave) systems, open wire facilities, and telephone exchanges in the corridor. These facilities allow the carriers to provide an adequate level of point-to-point telecommunication services. The remaining O.W. facilities into Hazelton will be replaced by cable facilities in 1976. The investment in point-to-point facilities appears adequate.

-- In the radio broadcasting field, we ascertained earlier (p.17) that 24 (re)broadcast transmitters provide private and public (CBC) AM broadcasting service throughout the corridor. This level of service is adequate and at par with that provided for similarly circumstanced areas. The investment in radio broadcast facilities also appears to be adequate.

-- In regards to television broadcasting, we have seen that only one broadcast station operates in the corridor (CFTK), and that, although this signal is repeated via 12 low-power relay transmitters (LPRT), the quality and quantity of television provided to the corridor is poor. Two DOC studies[†-1] have found the north-western parts of British Columbia (i.e. the corridor) to be the poorest T.V. serviced area in all of B.C. The investment in television broadcast facilities is inadequate.[†-2]

[†-1] (i) "B.C. Vision" A comparative analysis concerning the availability and quality of television reception within communities of British Columbia and the Yukon. Communications Canada, Pacific Region, August, 1973.
(ii) "T.V. Reception in the Pacific Region" A comparison of DOC survey data and CBC's Accelerated Coverage Plan. Communications Canada, Pacific Region, June 1974.

[†-2] Appendix A contains some letters further illustrating the point that T.V. reception in the corridor continues to be poor.

(ii) Social Development of the Population of the Corridor

In Section II, we examined three social indicators pertaining to the "development" of the population of the corridor. We will now compare these statistics with those for the urban areas of B.C. and with B.C. as a whole.

-- The male to female ratio of the corridor was calculated as 1.15 : 1 (see page 11). This compares with a 1.00 : 1.00 ratio for all of British Columbia and with .96 : 1.00 for the Vancouver School District and .90 : 1.00 for the Greater Victoria School District.† The high male/female ratio for the corridor is typical of a frontier type area.

-- The age distribution of the corridor's population was earlier discussed on page 12. Figures 2 and 3 compare this population with that of British Columbia and the Vancouver and Greater Victoria School districts."

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† See "Age Group Distribution of British Columbia's Population by School Districts", op cit.

FIGURE 2

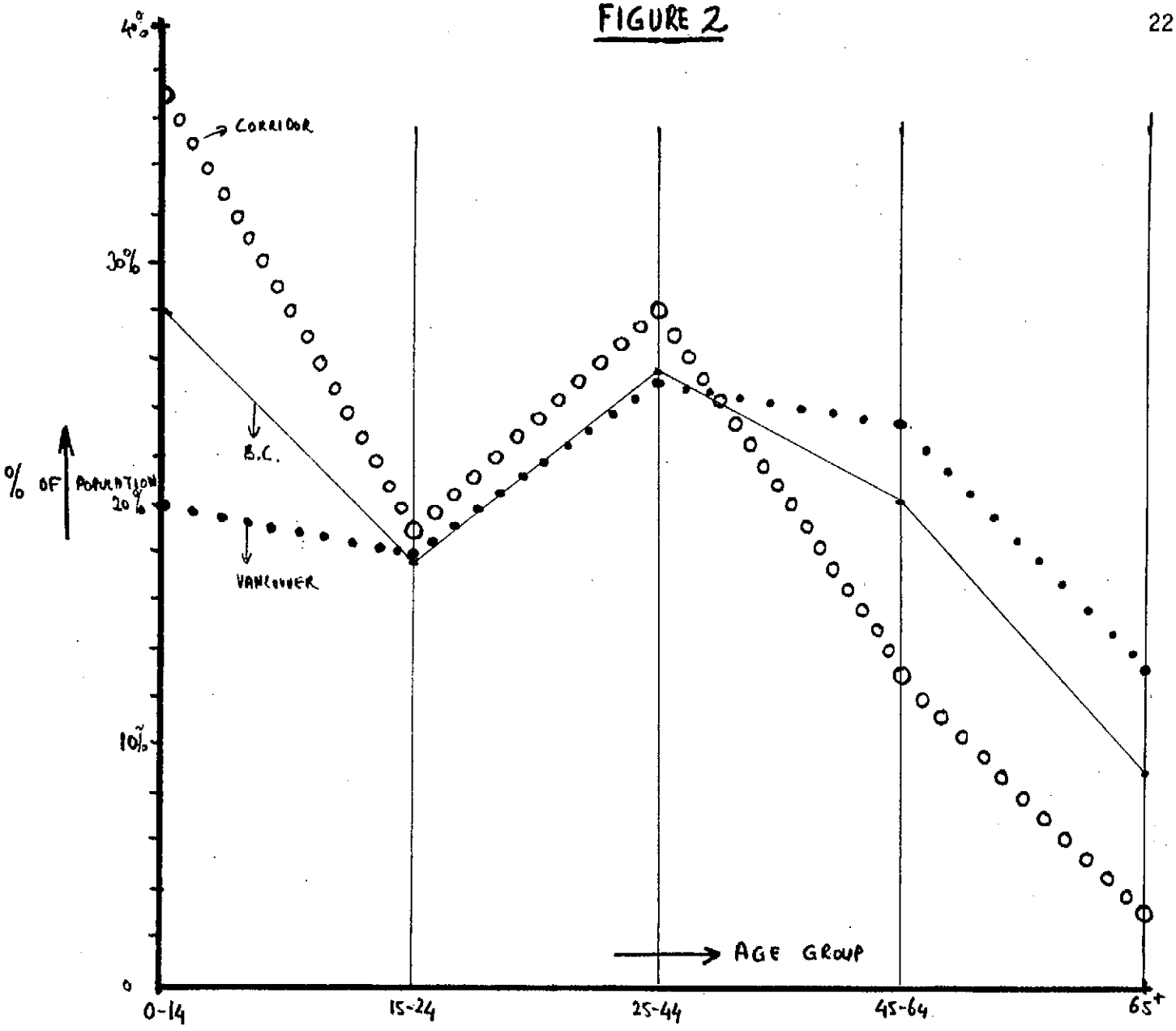
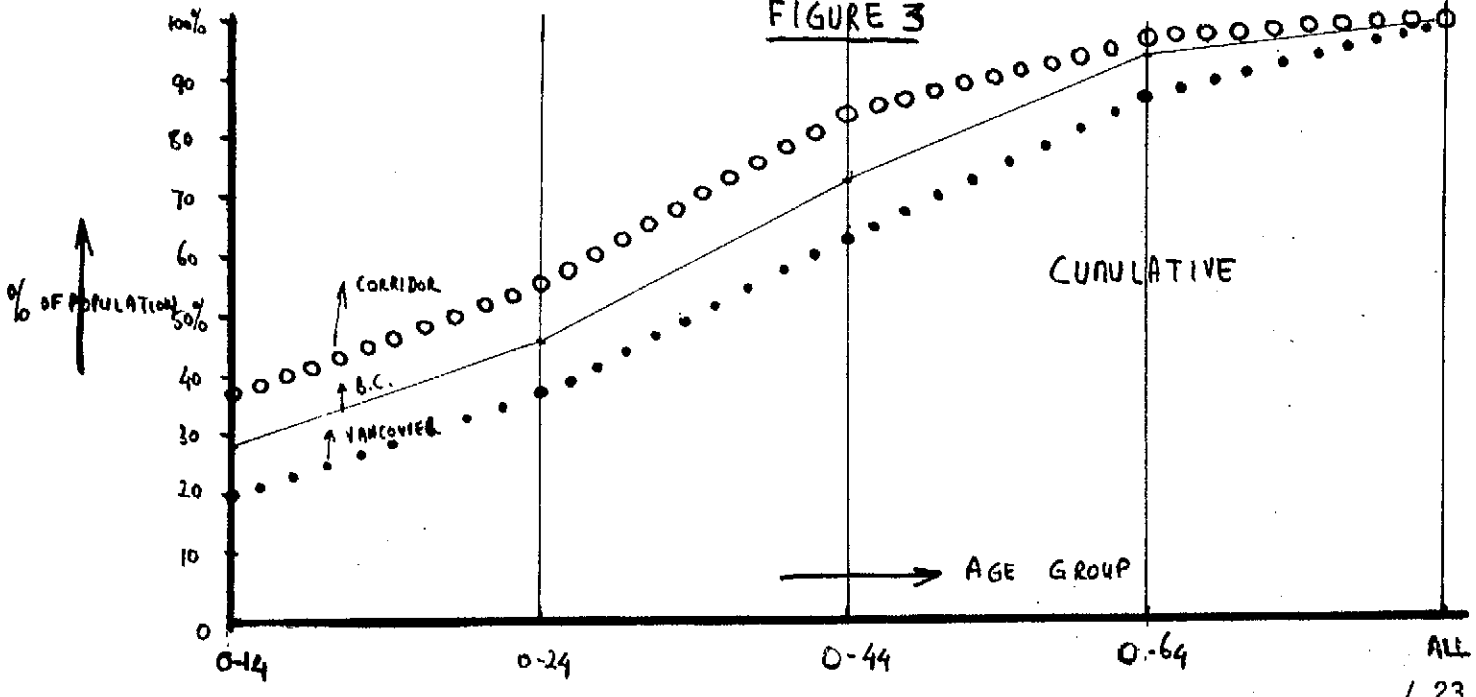


FIGURE 3



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It is clear that the corridor's population is more skewed toward the lower end (younger age groups). Very few older working people and retired people choose the corridor as a place to live. Again, this distribution is typical of that of a frontier-type area where only the young are strong enough to withstand the place.

-- The educational attainment levels of the corridor are compared with that of B.C. and with the Greater Vancouver Regional District in Figure 4.† Again, the distribution of the corridor is skewed to the left with more corridor people having less education than B.C. or the Greater Vancouver Regional District. Again, this would appear to further the idea of the corridor being a frontier-type environment.

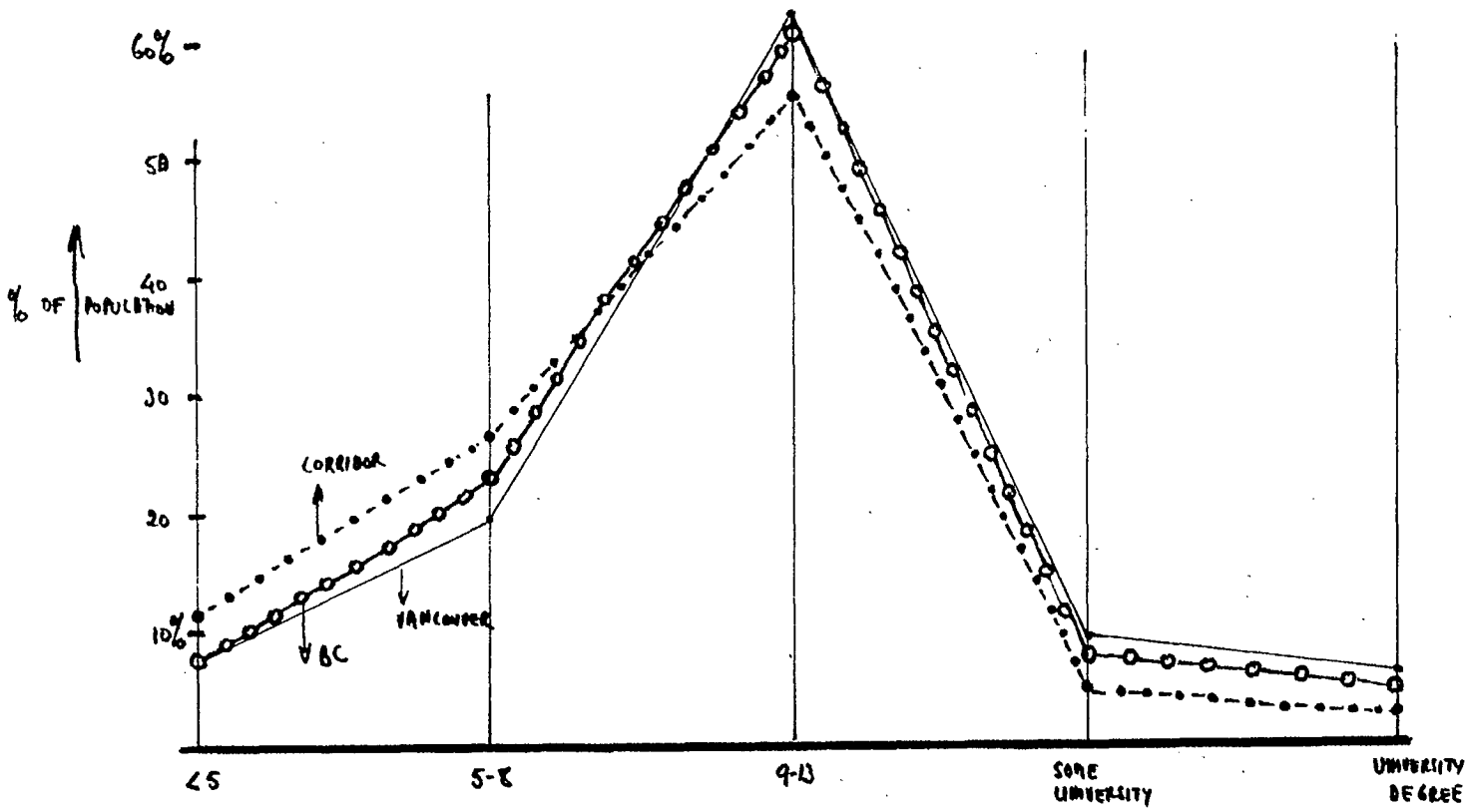

FIGURE 4

† Data for B.C. and GVRD obtained from Statistics Canada catalogue 92-764 (AP-13), Sept. 1973.

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In the social development area, then, we have found on the one hand that investment in T.V. broadcast facilities is poor, and on the other hand that the population of the corridor resembles in many ways the population of a "frontier community", with high M/F ratio, many young and few older people, and relatively low educational levels. In the next sub-section (c), we will examine possible relations between the hardware, the "frontier population", and economic development.

(c) Television, Social Development, and Economic Development

Perhaps we have given the impression that socio-economic development can be neatly separated into social development and economic development. This, of course, is not the case. Social development and economic development are integral parts of socio-economic development, and social development and economic development impact on each other in a variety of ways. This being so, it is clear that "telecommunications" impact on economic development not only directly [as discussed in III, (i)], but also indirectly via social development. In this sub-section, therefore, we will discuss in somewhat more detail how "television" might affect the socio-economic development of the corridor.

That television is an important entertainment and information† source is plain from a number of surveys dealing with mass media.†† Some idea of the value of T.V. services may be obtained by estimating the yield that the

† Information here is educational material (such as university courses), documentaries, public affairs programming, and news services.

†† See, for example, "The People Look at Television", Gary A. Steiner, Albert A. Knopf, New York, 1963, and "Emerging Profiles of Television and Other Mass Media: Public Attitudes 1959-1967", Burns A. Roper, Television Information Office, New York,

average household obtains from an investment in a T.V. set. If we assume that the average viewer watches two hours of television per day, and that the viewer values this entertainment/educational at $1.00 per hour, then the yield on the outlay of a T.V. set is in the order of 100 percent. † It should be noted that this high yield figure is a conservative estimate; most surveys (Steiner, Roper, Environics) indicate that, on the average, a viewer watches 3-4 hours of T.V. time per day (this figure has been increasing over time) and, further, the entertainment cost of alternatives (movies $3-$4; spectator sports $4-$10; concerts and "live show" $5-$10) suggests that the entertainment value of T.V. viewing is likely to exceed the $1/hour figure substantially. The yield of an investment in a T.V. set might, therefore, well be in the order of 300 percent. Clearly, T.V. is an important item to the average household.

Within the household, two things of interest ought to be noted. In the first place, television appears to be more important to women than to men; in the second place, T.V. appears to be of great importance to older people. BBM data†† for 1973 indicate, for example, that women 18 years of age and older watch television for 4 hours and 12 minutes on the average per day, while men in this age group watch for 3 hours and 24 minutes on the average day.

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†Annual viewer satisfaction 365 * 2 * $1.00 or $730.
Annual cost: electricity $20; depreciation $120; net annual return $730-$140 = $590. This is about the same as the cost of a fairly large color T.V. set.

†† B.B.M. Radio and Television Data, 1973.

Thus, women watch television some 25 percent more than do men. In regards to older people, a number of studies† have indicated the importance of television for this age group. The Environics†† Study, for example, found that T.V. was considered the more relaxing, more entertaining, and a better companion than any other medium. Further, T.V. was considered the most important medium to this group of people.

T.V. is not important just to the individual household, it's also important to the community as a whole. That this is so is clear from the fact that there are some 75 community T.V. societies incorporated in B.C.††† These societies are usually found in areas with poor T.V., and the objectives of the society are to improve the T.V. reception circumstances of that community. It attains its objectives by selling subscriptions to members of the communities. The revenues are used to purchase hardware which improves the quantity of T.V. signals available to the community. If we estimate that each community television society operates one low-power relay transmitter (LPRT) at a cost of $6,000 - $20,000, then the total voluntary investment in B.C. on community-owned re-broadcast facilities is $300,000 to $1,500,000. This sizeable amount becomes even more impressive if one realizes that most community television societies service communities of small (200-300 people) size.

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† See, for example, Steiner, op cit.

†† Reaching the Retired: A Survey of Media Habits, Preferences, and Needs for Senior Citizens in Metro Toronto", prepared by Environics Research Group Limited, September 1973. Information Canada catalogue BC 92-9/1974, Ottawa, 1974.

††† "List of Broadcast Stations in Canada (as of April 1, 1974), Canadian Radio-Television Commission, Ottawa, 1974.

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Not only have the household and the community recognized the entertainment value and information value of T.V., some employers and businesses, too, have recognized it. The low-power T.V. rebroadcast transmitter at Ootsa Lake, for example, is owned and operated by the Eurocan Company. Eurocan apparently found it difficult to attract labor without this amenity. In a number of other instances, employers/companies† have made contributions to the Community T.V. Society in order that better T.V. services might be provided in the community and labor retained in the area.

It is thus clear from the foregoing that T.V. is an important amenity to the community and that it relates to the economic development of the community (importance of T.V. to the employer/firm) as well as to the social development of the community (importance of T.V. to the household and the community). In this regard, it might be wise to look at some more detail on the relationships between social and economic development.

Social development appears to be much like economic development. Below a certain level, a vicious circle exists where the lack of social development itself hampers further social development. In the corridor, for example, the lack of amenities, such as a good quality/quantity of T.V. reception, makes the area an unattractive place to live. Older people do not retire to the corridor; on the contrary, they retire from the corridor. Young people go to the corridor to "make a stake" and return to the south as soon as they have attained their goal. Women avoid the corridor. The transient population is not eager to make outlays for social amenities since they (the transients)

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† Endako Mines.

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feel that most of the benefits of such outlays will not accrue to them. This large transient population thus votes against referendums on better school facilities, sewer projects, roads, parks, etc. Consequently, the area remains unattractive in this sense and the population composition will remain to be of a highly transitory nature.

In this regard, then, there is a direct link between social development and economic development of an area. When social development is lacking, women, the retired, and the unemployed leave the area. The area is thus deprived of the spending power of these groups. Since the spending power of these groups consists mainly of transfer payments, the area is deprived of a very stabilizing income source.† Further, the economic base of the area is narrowed and the area has less of an opportunity to build up a social infrastructure.

A second, and perhaps more important, way in which social development affects economic development relates to the implicit high labor cost in areas which have a low level of social development. The two major employers in Kitimat, for example, Eurocan and Alcan, experienced labor turnover rates of 40 percent and 45 percent respectively during 1973. Alcan's personnel director has labelled this a "$2 million problem"†† and further feels that this estimate is on the conservative side. That this high turn-over rate

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† See J. Vanderkamp, "The Effects of Out-Migration on Regional Employment" Canadian Journal of Economics, 1968, Vol. 1, p. 595-608.

†† "How Frontiers Are Fighting Staff Turnover", The Financial Post, 29 Sept. 1973, p. 11.

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is related to the lack of amenities if further illustrated in the following excerpt from that Financial Post article †.

"One candidate for a top white-collar job at Aluminum Company of Canada's smelter here (Kitimat, B.C.) admitted to being a television addict.

He had been asked during the interview about his hobbies. The interview ended soon after the prospective employee realized that T.V. was one small vice in which, in Kitimat, he could not indulge. There is only one television channel available to this 20-year old community of 15,000 on the rain-soaked British Columbia coast, 400 miles north of Vancouver.

The lack of live T.V. channels by itself would be minor. It becomes significant as one of a range of irritants, minor and major, behind the serious turn-over faced by many employers in the more remote areas of B.C.

'The government talks about developing the North, but forgets about bringing in cable T.V.', says D.W. Jebbink, manager of the Eurocan Pulp and Paper Company mill here."

In summary, then, we have seen in this section that television is an important amenity, especially to older (retired) people and to women, and further, that it is precisely these two population groups which are scarce in the corridor. The scarcity of these two groups narrows the economic base of the corridor and also is a de-stabilizing force in regards to community development. In the following section we will explore some of the benefits and costs involved in improving T.V. services to the corridor population.

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† Financial Post, 29 September 1973, page 11.

IV. Costs & Benefits of Improving T.V. Services in the Corridor

In this section we will: (A) describe in detail the existing facilities for T.V. delivery and examine the shortcomings of these facilities; (B) describe three plans which might serve to improve and augment T.V. delivery in the corridor; (C) enumerate the costs of each of the three plans; (D) detail the benefits of each of the three plans; (E) analyze the costs/benefits of each plan.

A. Existing T.V. Facilities

Before discussing the existing T.V. facilities of the corridor, it might be wise to briefly discuss the techniques presently in use for the carriage and distribution of T.V. signals.

General -- Television signals are transmitted "over the air" in the frequency bands of 54-88 (VHF channels 2-6), 174-216 (VHF channels 7-13), and 470-890 MHz (UHF channels 14-83).* Each T.V. channel occupies a bandwidth of 6 MHz. The basic T.V. information generated in the studio is contained in the 0-6 MHz frequency band. This is called the baseband. The baseband T.V. information is converted (or modulated) to any of the VHF or UHF channels in the T.V. broadcast transmitter. The broadcast transmitter radiates the VHF or UHF signal "over the air" for distribution to households in the vicinity of the T.V. station. The household's T.V. receiver converts the VHF or UHF signal back to baseband (demodulates the signal) for display on the picture tube.

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* VHF ≡ very high frequency UHF ≡ ultra high frequency

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Distribution -- Television signals can be distributed to the households either "over the air" or via cable facilities. Both techniques have advantages and disadvantages.

In the "over-the-air" technique, the number of households reached depends on the power of the radiated signal, the topography of the terrain, and the sensitivity or gain of the T.V. receive antenna. The area around the broadcast transmitter in which the T.V. signal is strong enough to be received by an ordinary T.V. set and antenna, is called the contour of the broadcast transmitter. Households outside the contour only receive an impaired T.V. picture unless special measures are taken. These measures might consist of the construction of large, highly directional, high gain receive antennas and/or the construction of very sensitive electronic "receive" equipment.

The "cable distribution" technique involves the distribution of the T.V. signal over coaxial cable facilities which have been especially constructed for this purpose. The cable plant's "head-end" facilities consist of high gain receive antennas and sophisticated electronic gear which allow for the reception of very weak, distant, T.V. signals which are then amplified and distributed over the cable plant. One coaxial cable can carry up to 30 T.V. channels.

Carriage* -- Two commonly used modes for transporting T.V. signals between distribution points are "off air" (or "over the air") and microwave facilities.

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* By "carriage" is meant the transportation of T.V. signals from one distribution point to another distribution point; whereas by "distribution" is meant the transportation of T.V. signals from a distribution point to the households.

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The "off-air" technique uses radio frequencies normally used for the distribution of T.V. signals (54-88, 174-216, 470-890 MHz). Thus, the T.V. signals transmitted by a T.V. broadcast transmitter are picked up by a distant (> 30 miles) rebroadcast station. This rebroadcast station consists of an elaborate "receive" segment (which could be as sophisticated as a CATV's head-end equipment) tied to a broadcast transmitter. The rebroadcast station thus receives very weak T.V. signals (these signals are too weak to be received directly by the local household receivers), amplifies these signals, and re-transmits them for local distribution.

The microwave technique involves the carriage of signals at frequencies 10-20 times higher than used in the "off-air" technique. In this technique, the T.V. baseband signals (0-6 MHz) are converted (modulated) to special frequency bands (> 2 GHz)* used for "point-to-point" telecommunications. The converted R.F. signals (radio frequency) are transmitted via highly directional antennas which "beam" the signal to another microwave site located 30 or more miles away. At the receive site, the signal is converted-down (demodulated), amplified, and converted-up (modulated) for transmission to the next microwave site.

The microwave technique is expensive, but allows for the carriage of signals over thousands of miles with little signal impairment. The "off air" technique is less expensive, but causes significant signal quality deterioration after 2-3 rebroadcast links.

Facilities in the Corridor -- Figure 5 shows the T.V. facilities which presently exist in the corridor. As can be seen, Prince George's CKPG receives T.V. signals via (B.C. Telephone) microwave facilities from Vancouver. The CKPG signal is broadcasted (on VHF channel 2, 54-60 MHz) "over the air" for local distribution. The population within the shaded circle (the contour) are

* GHz - giga Herz = 1,000 MHz

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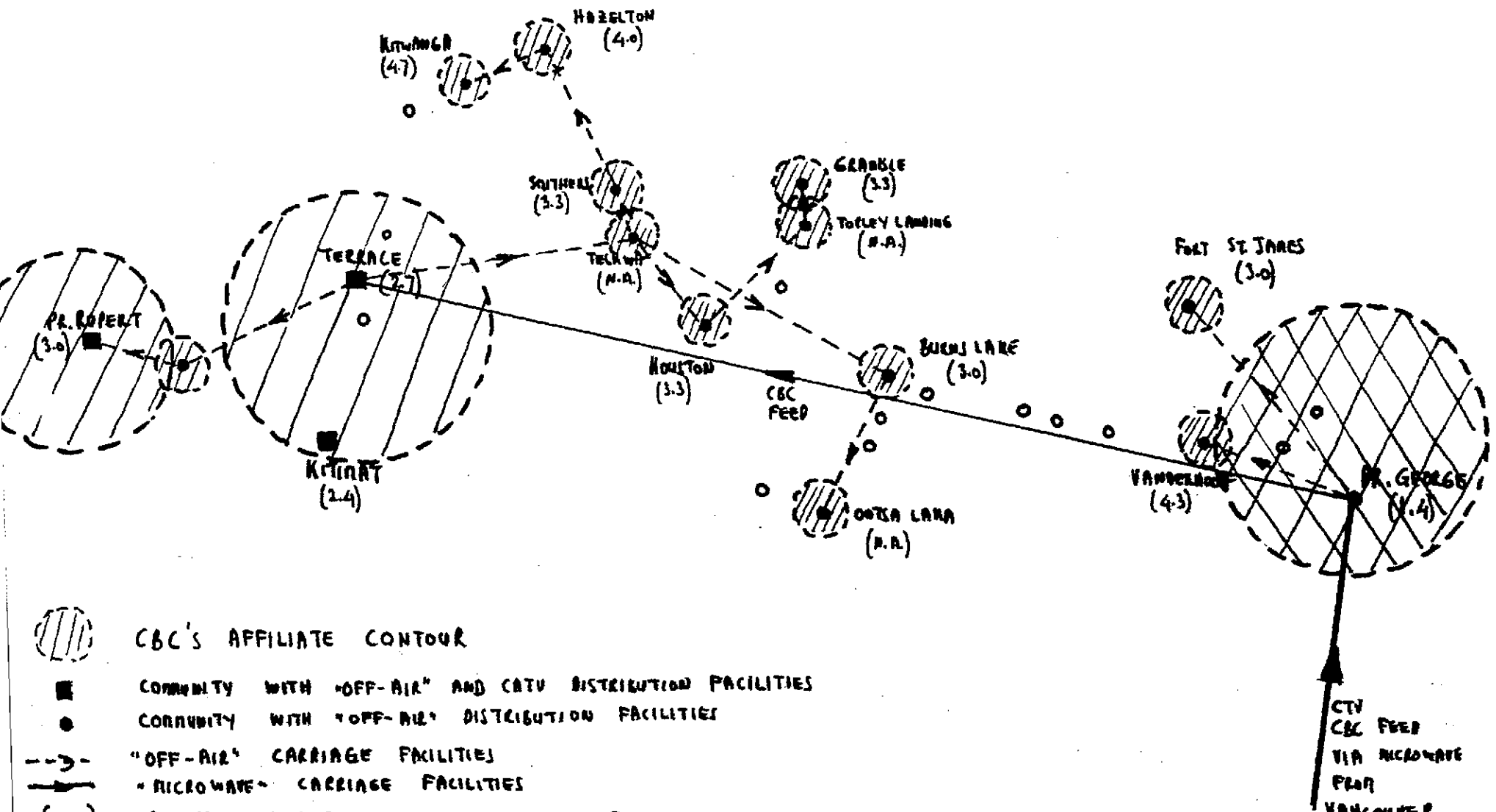
PRESENT T.V. FACILITIES



CBC'S AFFILIATE CONTOUR

■ COMMUNITY WITH "OFF-AIR" AND CATV DISTRIBUTION FACILITIES

● COMMUNITY WITH "OFF-AIR" DISTRIBUTION FACILITIES

--> "OFF-AIR" CARRIAGE FACILITIES

——→ "MICROWAVE" CARRIAGE FACILITIES

( ) RECEPTION QUALITY INDEX WEIGHTED AS FOLLOWS:

1 EXCELLENT 2 FINE 3 PASSABLE
4 MARGINAL 5 INFERIOR 6 UNUSABLE

FIGURE 5

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able to receive CKPG directly "off air". Households outside the contour are ordinarily unable to receive a good CKPG signal. Thus, Vanderhoof and Fort St. James residents are unable to receive CKPG directly. However, rebroadcast stations installed in these two communities allow the reception of a CKPG's signal indirectly by Vanderhood and Fort St. James residents via an LPRT.* The special receive gear of the LPRT allows for the detection of the very weak CKPG signal. This weak signal is then amplified and rebroadcast for local distribution. Households within the shaded areas around Fort St. James and Vanderhoof will thus be able to receive the rebroadcasted CKPG signal. The dotted line in Figure 5 between CKPG and CKPG-5, CKPG-3 indicates the "off-air" T.V. carriage path between the distribution points.

The corridor's other main broadcast transmitter is located at Terrace. CFTK also receives a T.V. network feed from Vancouver via (B.C. Tel) microwave facilities. The CFTK signal is distributed directly on VHF channel 3 to households in Terrace, Kitimat, and other communities within the station's contour (shaded area). As can be seen in Figure 5, "off-air" transmission technique and LPRT's further extend CFTK's signal to Mt. McLean (rebroadcast as CFTK-TV VHF channel 12) and then onto Prince Rupert (rebroadcast as CFTK-1, VHF channel 6) in the westerly direction. Similarly, in the easterly direction the CFTK signal is extended via "off-air" facilities to Telkwa (CFTK-11, channel 7), Smithers (CFTK-2, channel 5), Hazelton (CFST-1,, channel 9), Kitwanga (CFST-2, channel 13), Houston (CFTK-10, channel 2), Topley Landing (CHTL-1, channel 9), Granisle (CHTL-2, channel 6), Burns Lake (CFTK-3, channel 4), and Ootsa Lake (n/a , channel n/a). The broadcast transmitters, ownership, and quality of delivered signal for all stations of the corridor is shown in Table C.

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* Low-Power Rebroadcast Transmitter

Table C

Location	T.V. Station	Channel	Reception Quality*	Ownership
Prince George	CKPG-TV	2	1.4	CKPG T.V. Ltd.
Fort St. James	CKPG-TV 5	5	3.0	CKPG T.V. Ltd.
Vanderhoof	CKPG-TV 3	6	4.3	CKPG T.V. Ltd.
Terrace	CFTK-TV	3	2.7	Skeena Broadcasters
Mt. McLean	CFTK-TV	12	n/a	Skeena Broadcasters
Prince Rupert	CFTK-TV-1	6	3.0	Skeena Broadcasters
Telkwa	CFTK-TV-11	7	n/a	Skeena Broadcasters
Smithers	CFTK-TV 2	5	3.3	Skeena Broadcasters
Hazelton	CFST-TV 1	9	4.0	Skeena T.V. Association
Kitwanga	CFST-TV 2	13	4.7	Skeena T.V. Association
Houston	CFTK-TV 10	2	3.3	Skeena Broadcasters
Topley Landing	CHTL-TV-1	9	n/a	Fulton River Recreation Comm.
Granisle	CHTL-TV 2	6	3.3	Fulton River Recreation Comm.
Burns Lake	CFTK-TV 3	4	3.0	Skeena Broadcasters
Ootsa Lake	n/a	n/a	n/a	Eurocan Pulp & Paper Co.

The "reception quality" column of Table C shows that the received signals are generally of a poor quality. This low reception quality is due to the extensive use of the "off-air" carriage technique and, moreover, the overextension of this technique. The "off-air" paths are often too long and/or obstructed; the received signal is, therefore, too weak for the rebroadcast station to properly detect and amplify. Delivered signals are consequently marginal at best. Because of the network design, the next station's signal depends on the quality of the last station's signal. If the latter is poor, the former can only be poorer. Thus, the signal transmitted to households in the Ootsa Lake area

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* As measured by DOC survey team in summer of 1973. Rating as follows: 1 - excellent; 2 - fine; 3 - passible; 4 - marginal; 5 - inferior; 6 - unusable

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depends not only on the signal received from Burns Lake, but also on the transmission paths between Burns Lake and Telkwa and Telkwa and Terrace. If any of these paths is poor, or if any of the Telkwa, Burns Lake, or Ootsa Lake rebroadcast stations is functioning poorly, the delivered signal in Ootsa Lake suffers.

To remedy the above, it is necessary: (i) to decrease the number of "off-air" links and replace some by microwave; (ii) to properly design any remaining "off-air" links; and (iii) to use rebroadcast equipment of better quality than presently in use. In the following sub-section, three plans will be presented which will improve the reception quality of T.V. signals in the corridor, and will also augment the quantity of T.V. signals delivered in the corridor.

B. Plans for Improvement of T.V. Reception in the Corridor

Three plans, the Basic, the Standard, and the Full Coverage Plan will be discussed which will augment and improve T.V. reception quantity and quality in the corridor. The plans will involve construction of additional T.V. carriage and distribution facilities. The scope of the three plans is indicated in Table D, while Table E indicates how this translates into services to the various communities.

Table D

Plan	T.V. Channels	
Basic*	CBC, CTV	"off-air" to all communities > 2,000
	CBC, CTV, CBS, PBS	on CATV to all communities > 10,000
Standard*	CBC, CTV	"off-air" to all communities > 500
	CBC, CTV, CBS, PBS	on CATV to all communities > 2,000
Full*	CBC, CTV	"off-air" to all communities > 100
	CBC, CTV, CBS, PBS	on CATV to all communities > 2,000

* In addition, CBC-French to be distributed per CBC's Accelerated Coverage Plan (to Terrace, Kitimat, and Prince George).

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Table E

RECEPTION QUALITY and QUANTITY*

	PRESENT		BASIC**		STANDARD**		FULL**	
	"Off-Air"	CATV	"Off-Air"	CATV	"Off-Air"	CATV	"Off-Air"	CATV
1. Burns Lake	A (3.0)		A (2.0)		B (1.5)		B (1.5)	
2. Cedarvale	A (5.0)**		A (3.5)		A (3.0)		B (2.5)	
3. Decker Lake	A (3.0)**		A (2.0)		B (1.5)		B (1.5)	
4. Endako	A (4.0)**		A (4.0)		B (2.0)		B (2.0)	
5. Fort Fraser	A (3.5)**		A (3.5)		B (1.5)		B (1.5)	
6. Fort St. James	A (3.0)		A (3.0)		B (1.8)		B (1.5)	
7. Francois Lake	A (4.0)**		A (3.0)		B (2.0)		B (2.0)	
8. Fraser Lake	A (3.5)**		A (3.5)		B (2.0)		B (2.0)	
9. Granisle	A (3.3)		A (2.5)		B (1.8)		B (1.8)	
10. Hazelton	A (4.0)		A (2.5)		B (2.0)		B (2.0)	
11. Houston	A (3.3)		B (1.5)		D (1.5)	D (1.5)	B (1.5)	D (1.5)
12. Kitimat	A (2.4)	A (2.0)**	C (1.8)	E (1.5)	C (1.8)	E (1.5)	C (1.8)	E (1.5)
13. Kitwanga	A (4.7)		A (3.0)		A (2.5)		B (2.0)	
14. Lakelse	A (3.0)**		C (2.0)		C (2.0)		C (2.0)	
15. Nukka Lake	B (2.0)**		B (2.0)		B (2.0)		B (2.0)	
16. Ootsa Lake	A (4.0)**		A (3.0)		A (2.5)		B (2.0)	
17. Pr. Rupert/Pt. Edward	A (3.0)	A (3.0)	B (1.5)	D (1.5)	B (1.5)	D (1.5)	B (1.5)	D (1.5)
18. Reid Lake	B (2.0)**		B (2.0)		B (2.0)		B (2.0)	
19. Smithers	A (3.3)		B (1.8)		B (1.8)	D (1.5)	B (1.8)	D (1.5)
20. Telkwa	A (3.0)**		B (2.0)		B (2.0)		B (2.0)	
21. Terrace/Thornhill	A (2.7)	A (1.0)	C (1.5)	E (1.5)	C (1.5)	E (1.5)	C (1.5)	E (1.5)
22. Tintagel	A (3.2)**		A (2.2)		B (2.0)		B (2.0)	
23. Topley	A (3.5)**		A (2.5)		B (2.0)		B (2.0)	
24. Tsechinkut Lake	A (3.2)**		A (2.5)		B (2.0)		B (2.0)	
25. Usk	A (3.0)**		C (1.5)		C (1.5)		C (1.5)	
26. Vanderhoof	A (4.3)		A (4.3)		B (2.0)		B (2.0)	
27. Wistaria	A (4.0)**		A (3.0)		A (2.5)		B (2.0)	

* Following key is used:
A = CBC-E only
B = CBC-E & CTV
C = CBC-E, CBC-F, CTV
D = CBC-E, CTV, CBS, PBS
E = CBC-E, CBC-F, CTV, CBS, PBS

** Denotes *estimated values*; all values for Basic, Standard, and Full Coverage Plans are estimates.

Reception quality given in brackets on following scale:
1-excellent 3-passable 5-inferior
2-fine 4-marginal 6-unusable

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The scope of the Basic Plan is shown in Figure 6. Four T.V. signals (CBC, CTV, CBS, PBS) will be extended by microwave facilities from Prince George to Prince Rupert, and the fifth signal (CBC-F) will be extended as far West as Terrace. The CBC-E and CTV feeds will be "broken-out" at Houston, Terrace, and Prince Rupert for "off-air" distribution. CBC-F will be broken-out at Terrace only; CBS and PBS will be broken-out at Terrace and Prince Rupert and extended via microwave to Kitimat. CBS and PBS will be distributed on CATV plants only at these three locations. New LPRT's for "off-air" relaying and rebroadcasting of the CBC-E and CTV networks are further installed in Smithers. The other communities will be served with existing equipment. Improvements in T.V. reception in nearly all (except Vanderhoof and Fort St. James) communities will occur as a result of the elimination of a number of "off-air" transmission paths presently in use.

The scope of the Standard Plan is shown on Figure 7. This plan is an extension of the Basic Plan. Further microwave break-outs are constructed at Fort Fraser (to serve Vanderhoof, Endako, Fraser Mountain) and Burns Lake for the CBC-E and CTV feeds. The microwave spur between Houston and Smithers is expanded to carry CBS and PBS and a microwave break-out at Houston (for CBS and PBS) is added.

Further, CATV distribution plants are constructed at Houston and Smithers, and new "off-air" distribution facilities (LPRT's) are installed at Hazelton, Granisle, and Fort St. James. The other communities will be served with existing gear; however, the reception quality in all locations will further improve because of the additional elimination of marginal "off-air" transmission paths.

The scope of the Full Coverage Plan is shown in Figure 8. This is a further extension of the Standard Plan and involves the installation of new LPRT's at Ootsa Lake and Kitwanga.

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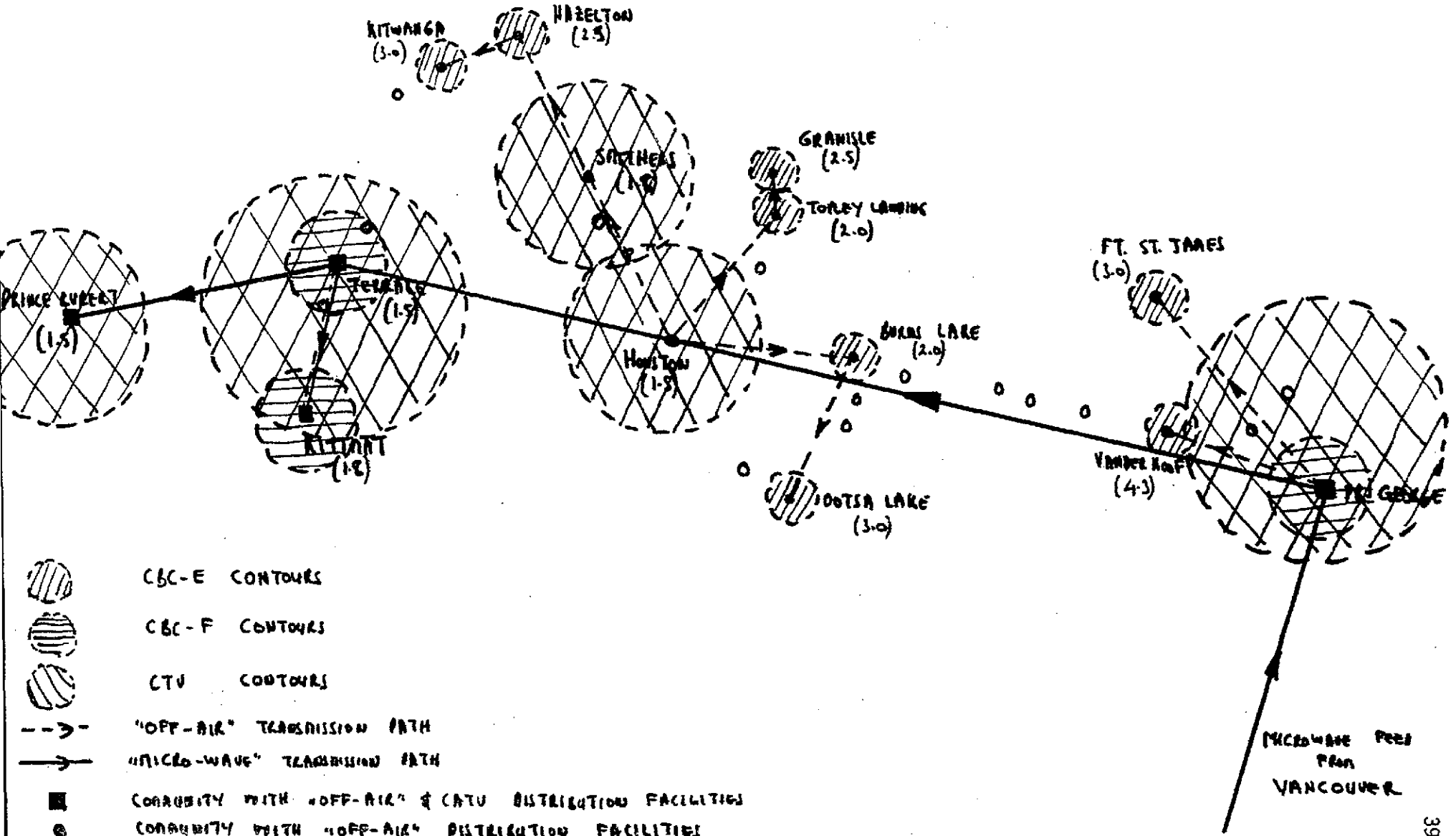
"BASIC PLAN" T.V. FACILITIES



CBC-E CONTOURS

CBC-F CONTOURS

CTV CONTOURS

"OFF-AIR" TRANSMISSION PATH

"MICRO-WAVE" TRANSMISSION PATH

■ COMMUNITY WITH "OFF-AIR" & CATV DISTRIBUTION FACILITIES

● COMMUNITY WITH "OFF-AIR" DISTRIBUTION FACILITIES

( ) ESTIMATED RECEPTION QUALITY:

1 EXCELLENT 2 FINE 3 PASSABLE

4 MARGINAL 5 INFERIOR 6 UNUSABLE

FIGURE 6

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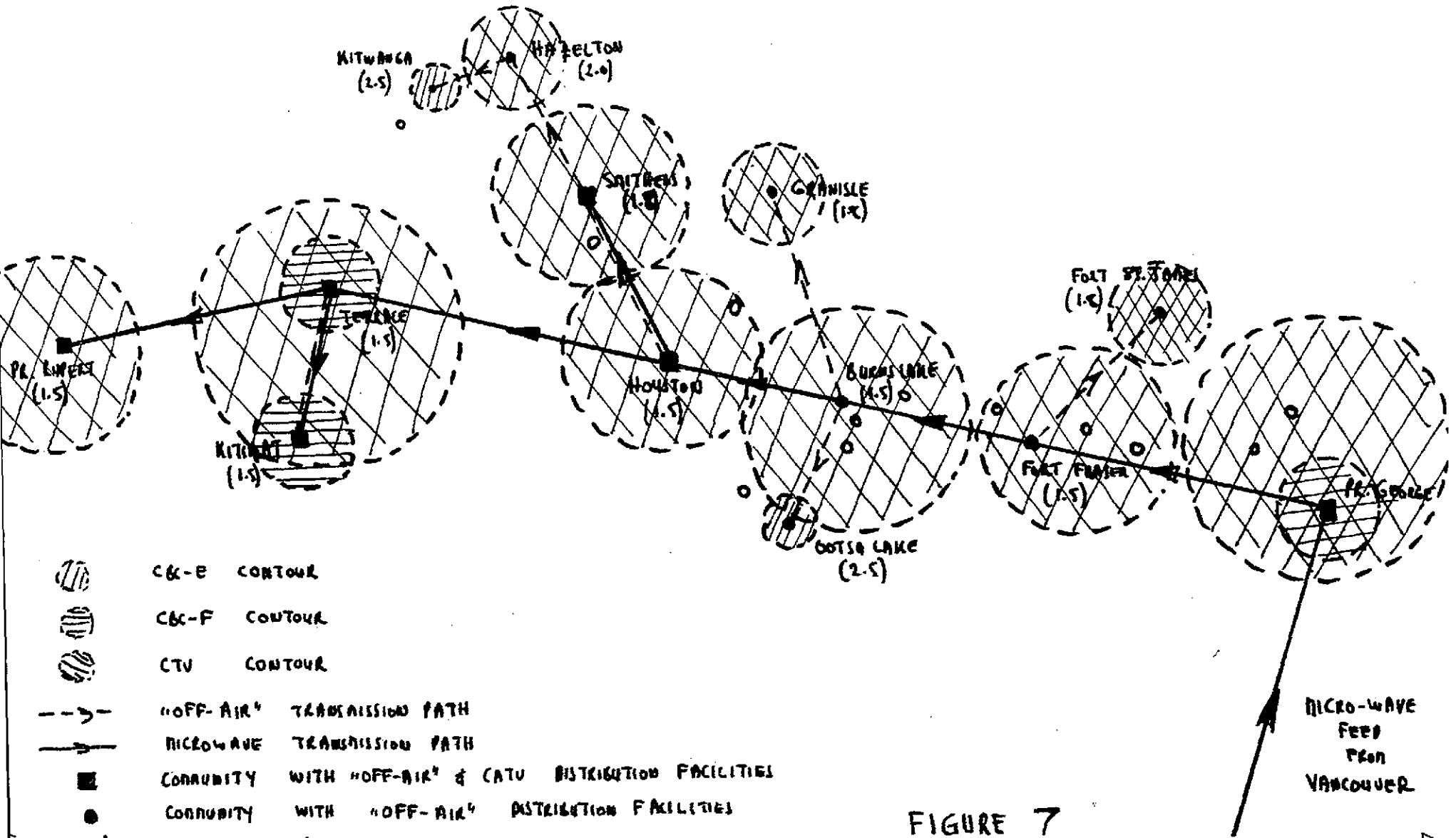
"STANDARD PLAN" T.V. FACILITIES



C&C-E CONTOUR

C&C-F CONTOUR

CTV CONTOUR

"OFF-AIR" TRANSMISSION PATH

MICROWAVE TRANSMISSION PATH

COMMUNITY WITH "OFF-AIR" & CATV DISTRIBUTION FACILITIES

COMMUNITY WITH "OFF-AIR" DISTRIBUTION FACILITIES

( ) ESTIMATED RECEPTION QUALITY:

1 EXCELLENT 2 FINE 3 PASSABLE

4 MARGINAL 5 INFERIOR 6 UNUSABLE

FIGURE 7

21/3/75

"FULL COVERAGE PLAN" T.V. FACILITIES

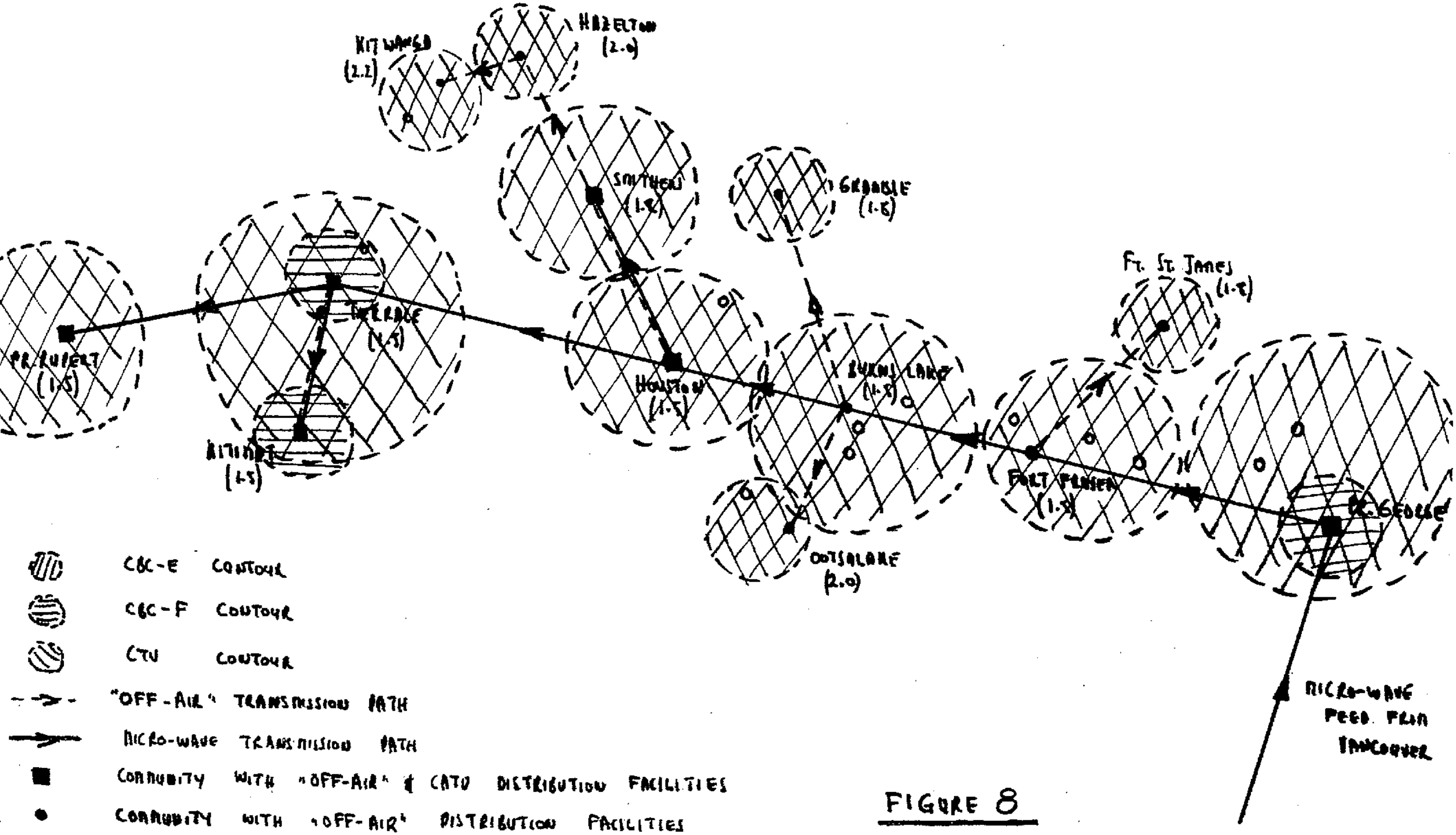


FIGURE 8

( ) ESTIMATED RECEPTION QUALITY:

1 EXCELLENT 2 FINE 3 PASSABLE

4 MARGINAL 5 INFERIOR 6 UNUSABLE

21/3/75

C. Costs of Each of the Three T.V. Augmentation/Improvement Plans

The cost of improving and augmenting T.V. reception can be broken down in the following cost groups: (i) cost of acquiring T.V. signals; (ii) cost of carrying the signals from the source to the distribution point; and (iii) cost of distributing the signals either "over-the-air" or via CATV plants. It should further be noted that some of the cost items are for capital expenditures, whereas other cost items are for recurring charges such as maintenance and administration.

Basic Plan

(i) Cost of acquiring the T.V. signals.

This cost is nil for the CBC and CTV signals; however, to acquire the CBS and PBS signals at Prince George, a "signal acquisition" charge payable to the Prince George CATV operator is required. CATV spokesman has indicated that this fee will probably be ≃ 15% of carrying CBS and PBS from Vancouver to Prince George. The latter cost is in the order of $200,000 per year. The signal acquisition fee is, therefore, .15 * 200k or 30k/year.*

(ii) Cost of carrying the signals via microwave facilities.

The existing B.C. Telephone microwave system can be expanded to accommodate the carriage of all additional T.V. signals. Schematically, this network in the corridor is indicated in sketch on the following page.

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* Throughout the symbol "k" will be used to indicate thousand of dollars.

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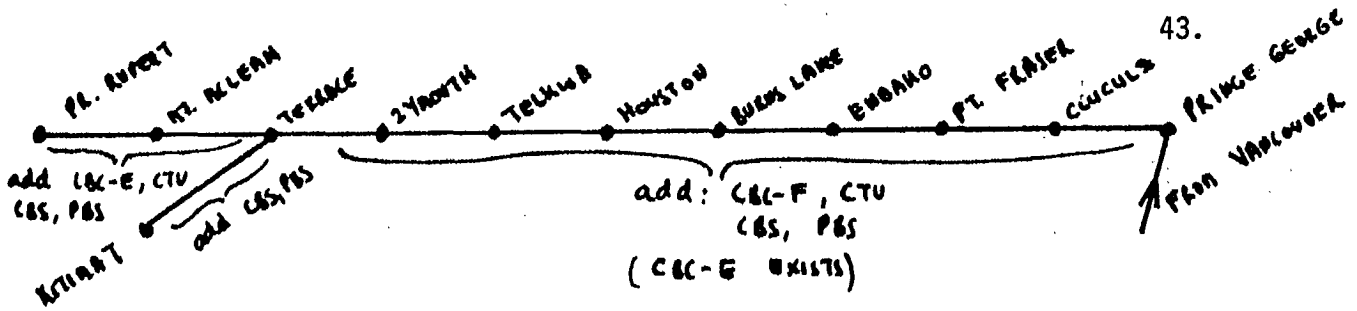

B.C. TELEPHONE MICRO-WAVE SYSTEM
PR. GEORGE - PR. RUPERT

If we assume that B.C. Tel will charge $900 per month per T.V. channel per micro-wave hop,* the annual additional rental rates are, therefore, as follows:

CBC-E			
	Prince Rupert	2 hops @ $900/month	21.6k/year
CBC-F			
	Terrace	8 hops @ $900/month	86.4k/year
CTV**			
	Terrace	8 hops @ $900/month	86.4k/year
	Prince Rupert	2 hops @ $900/month	21.6k/year
CBS/PBS**			
	Terrace	8 hops @ $1,800/month ($900 per channel)	172.8k/year
	Kitimat	1 hop @ $1,800/month	21.6k/year
	Prince Rupert	2 hops @ $1,800/month	43.2k/year

(iii) Cost of distributing the signals.

The costs of "off-air" distribution facilities is as follows:

	Capital	Maintenance, Admin/year***
CBC-E		
Houston-100 w XMTR	55k	8.3k
Smithers-100 w XMTR	31k	4.7k
CBC-F		
Terrace-30 w XMTR	41k	6.2k
Kitimat-30 w XMTR	41k	6.2k
CTV		
Houston-100 w XMTR	55k	8.3k
Smithers-30 w XMTR	31k	4.7k
Terrace-2kw XMTR	180k	27.0k
Prince Rupert-500 w XMTR	140k	21.0k

* Charges for carrying T.V. signals vary from $500-$1,000 per T.V. channel per micro-wave hop. An estimate of $900 for the Northern part of B.C. appears appropriate.

** It should be noted that the cost of carriage charged against any community is the cost of extending the signal from the last distribution point to that community. Thus, for extending CTV services to Terrace & Prince Rupert, the cost shown against Terrace is the full cost of extending CTV from Prince George to Terrace, & the cost charged against Prince Rupert is the full cost of extending the signal from Terrace to Pr.Rupert.

*** This is estimated to be 15% per year of the capital expenditure.

The costs of CATV distribution facilities is as follows:*-1

	Capital	Maintenance, Admin/year
Terrace*-2	224k	33.6k
Kitimat*-3	132k	19.8k
Prince Rupert*-4	189k	28.4k

The summarized costs of the Basic Plan are shown in Table F. It should be noted that, wherever money values are indicated, the reception quality for that service in the particular community will improve to an "excellent-fine" (1.5) value. When no outlays are made for a given community, significant improvements (noted as "marginal improvements" in the table) might still be realized because of the substitution of some microwave facilities for "off-air" facilities in the "carriage" of the signal to that community.

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*-1 Skeena Broadcasters provided DOC with the following information on March 19, 1975:

Terrace: 5100 H.H. in franchise area; all H.H. in front of CATV plant; 2250 H.H. subscribe to CATV.

Prince Rupert: 5390 H.H. in franchise area; all H.H. in front of CATV plant; 2450 H.H. subscribe to CATV.

Kitimat: 3875 H.H. in franchise area; 3406 H.H. in front of CATV plant; 2054 H.H. subscribe to CATV.

In the discussions below, it is assumed that a penetration rate of 80% is attainable in all three communities after CBS and PBS are offered on the distribution plant.

*-2 This consists of trunk cable 70k, housedrops 54k, processors and antenna 20k, modulator 10k, microwave break-outs 50k, contingency 20k.

*-3 This consists of plant enlargement 30k, housedrops 27k, processors and antenna 20k, modulator 10k, microwave break-outs 25k, contingency 20k.

*-4 This consists of trunk cable 70k, housedrops 54k, processors 10k, modulator 10k, microwave break-outs 25k, contingency 20k.

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BASIC PLAN (Table F)

	CBC-E			CBC-F			CTV			CBS/PBS (CATV)			TOTAL		
	Capital	Annual Charges		Capital	Annual Charges		Capital	Annual Charges		Capital	Annual Charges		Capital	Annual Charges	
		Carr.	Dist.		Carr.	Dist.		Carr.	Dist.		Carr.	Dist.		Carr.	Dist.
1. Burns Lake	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
2. Cedarvale	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
3. Decker Lake	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
4. Endako	N.I.	N.I.	N.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
5. Fort Fraser	N.I.	N.I.	N.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
6. Fort St. James	N.I.	N.I.	N.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
7. Francois Lake	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
8. Fraser Lake	N.I.	N.I.	N.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
9. Granisle	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
10. Hazelton	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
11. Houston	55k		8.3	n/a	n/a	n/a	55k	54.0	8.3	n/a	n/a	n/a	110k	54.0	16.6
12. Kitimat	*-1	*-1	*-1	41k		6.2	*-1	*-1	*-1	132k	21.6	19.8	173k	21.6	26.0
13. Kitwanga	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
14. Lakelse	*-1	*-1	*-1	*-1	*-1	*-1	*-1	*-1	*-1	n/a	n/a	n/a			
15. Nukka Lake	*-2	*-2	*-2	n/a	n/a	n/a	*-2	*-2	*-2	n/a	n/a	n/a			
16. Ootsa Lake	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
17. Pr. Rupert/Pt. Edward		21.6		n/a	n/a	n/a	140k	21.6	21.0	189k	43.2	28.4	329k	86.4	49.4
18. Reid Lake	*-2	*-2	*-2	n/a	n/a	n/a	*-2	*-2	*-2	n/a	n/a	n/a			
19. Smithers	31k		4.7	n/a	n/a	n/a	31k		4.7	n/a	n/a	n/a	62k		9.4
20. Telkwa	*-3	*-3	*-3	n/a	n/a	n/a	*-3	*-3	*-3	n/a	n/a	n/a			
21. Terrace/Thornhill	exists	exists	exists	41k	86.4	6.2	180k	32.4	27.0	224k	172.8	33.6	445k	291.6	66.8
22. Tintagel	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
23. Topley	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
24. Tsechinkut Lake	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
25. Usk	*-1	*-1	*-1	*-1	*-1	*-1	*-1	*-1	*-1	n/a	n/a	n/a			
26. Vanderhoof	N.I.	N.I.	N.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
27. Wistaria	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Acquisition											30			30	
Total	86k	21.6	13.0	82k	86.4	12.4	406k	108.0	61.0	545k	267.6	81.8	1,119k	483.6	168.2

*-1 receives Terrace signal *-2 receives Prince George signal *-3 receives Smithers signal

M.I. = Marginal Improvement N.I. = No Improvement n/a = not applicable

Standard Plan

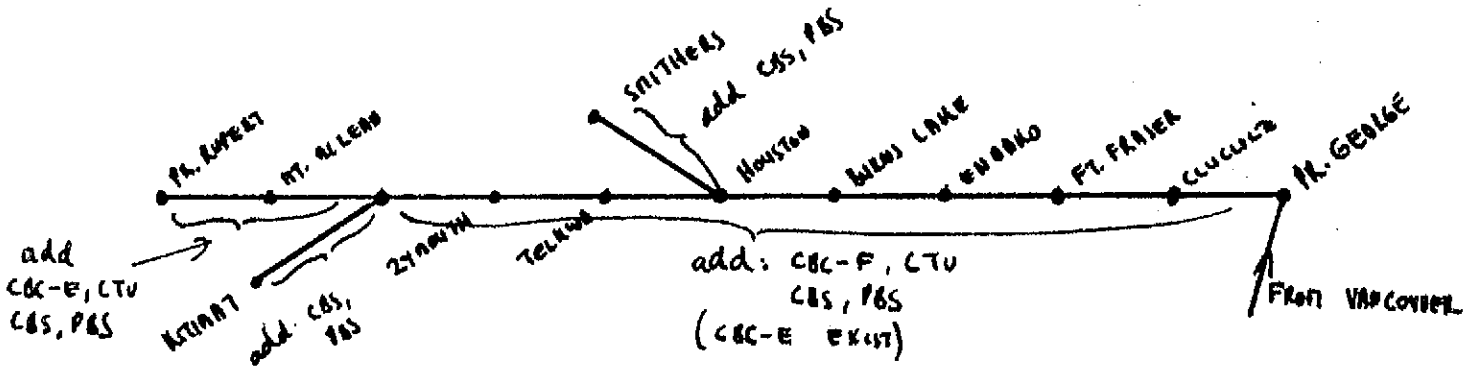
(i) Cost of acquiring the signals.

This cost is the same as for the Basic Plan and applies only to the acquisition of the two foreign signals (CBS, PBS) at Prince George.

Total Cost: 30k/year

(ii) Cost of carrying the signals via microwave facilities.

To implement the Standard Plan, two T.V. channels (for CBS and PBS) are required between Houston and Smithers. This is in addition to the microwave facilities needed for the Basic Plan.



B.C. TELEPHONE MICRO-WAVE SYSTEM
PR. RUPERT - PR. GEORGE

Additional Carriage Cost:

CBS/PBS

Smithers	1 hop @ $1,800/month	21.6k/year

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(iii) Cost of distributing the signals.

The cost of "off-air" distribution facilities, in addition to the costs shown under the Basic Plan, is as follows:

	Capital	Maintenance,*** Admin/year
CBC-E		
Burns Lake-1 kw XMTR	165k	24.8k
Fort Fraser-30 w XMTR	55k	8.3k
Fort St. James-5 w XMTR	31k	4.7k
Granisle-5 w XMTR	31k	4.7k
Hazelton-5 w XMTR	31k	4.7k
CBC-F		
nil		
CTV		
Burns Lake-1 kw XMTR	165k	24.8k
Ft. Fraser-30 w XMTR	55k	8.3k
Fort St. James-5 w XMTR	31k	4.7k
Granisle-5 w XMTR	31k	4.7k
Hazelton-5 w XMTR	31k	4.7k

The cost of CATV distributing facilities, in addition to those of the Basic Plan, are as follows:

	Capital	Maintenance,*** Admin/year
Houston*	209k	31.4k
Smithers**	205k	30.8k

The summarized costs of the Standard Plan are shown in Table G.

---

* This consists of trunk cable 50k, plant construction (10 miles) 50k, housedrops (500) 15k, processors and antennas 20k, modulators 10k, microwave break-outs 50k, contingency 14k.

** This consists of plant construction (20 miles) 100k, housedrops (800) 24k, processors and antennas 20k, modulators 10k, microwave break-outs 25k, contingency 26k.

*** Calculated at 15% of the capital cost per year.

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STANDARD PLAN (Table G)

	CBC-E			CBC-F			CTV			CBS/PBS (CATV)			TOTAL		
	Capital	Annual Charges		Capital	Annual Charges		Capital	Annual Charges		Capital	Annual Charges		Capital	Annual Charges	
		Carr.	Dist.		Carr.	Dist.		Carr.	Dist.		Carr.	Dist.		Carr.	Dist.
1. Burns Lake	165k	21.6	24.8	n/a	n/a	n/a	165k	21.6	24.8	n/a	n/a	n/a	330k	43.2	49.6
2. Cedarvale	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
3. Decker Lake	*-4	*-4	*-4	n/a	n/a	n/a	*-4	*-4	*-4	n/a	n/a	n/a			
4. Endako	*-4	*-4	*-4	n/a	n/a	n/a	*-4	*-4	*-4	n/a	n/a	n/a			
5. Fort Fraser	55k	21.6	8.3	n/a	n/a	n/a	55k	21.6	8.3	n/a	n/a	n/a	110k	43.2	16.6
6. Fort St. James	31k		4.7	n/a	n/a	n/a	31k		4.7	n/a	n/a	n/a	62k		9.4
7. Francois Lake	*-4	*-4	*-4	n/a	n/a	n/a	*-4	*-4	*-4	n/a	n/a	n/a			
8. Fraser Lake	*-5	*-5	*-5	n/a	n/a	n/a	*-5	*-5	*-5	n/a	n/a	n/a			
9. Granisle	31k		4.7	n/a	n/a	n/a	31k		4.7	n/a	n/a	n/a	62k		9.4
10. Hazelton	31k		4.7	n/a	n/a	n/a	31k		4.7	n/a	n/a	n/a	62k		9.4
11. Houston	55k	10.8	8.3	n/a	n/a	n/a	55k	10.8	8.3	209k	108.0	31.4	319k	129.6	48.0
12. Kitimat	*-1	*-1	*-1	41k		6.2	*-1	*-1	*-1	132k	21.6	19.8	173k	21.6	26.0
13. Kitwanga	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
14. Lakelse	*-1	*-1	*-1	*-1	*-1	*-1	*-1	*-1	*-1	n/a	n/a	n/a			
15. Nukka Lake	*-2	*-2	*-2	n/a	n/a	n/a	*-2	*-2	*-2	n/a	n/a	n/a			
16. Ootsa Lake	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
17. Pr. Rupert/Pt. Edward		21.6		n/a	n/a	n/a	140k	21.6	21.0	189k	43.2	28.4	329k	86.4	49.4
18. Reid Lake	*-2	*-2	*-2	n/a	n/a	n/a	*-2	*-2	*-2	n/a	n/a	n/a			
19. Smithers	31k		4.7	n/a	n/a	n/a	31k		4.7	205k	21.6	30.8	267k	21.6	40.2
20. Telkwa	*-3	*-3	*-3	n/a	n/a	n/a	*-3	*-3	*-3	n/a	n/a	n/a			
21. Terrace/Thornhill	exists	exists	exists	41k	86.4	6.2	180k	32.4	27.0	224k	64.8	33.6	445k	183.6	66.8
22. Tintagel	*-4	*-4	*-4	n/a	n/a	n/a	*-4	*-4	*-4	n/a	n/a	n/a			
23. Topley	*-4	*-4	*-4	n/a	n/a	n/a	*-4	*-4	*-4	n/a	n/a	n/a			
24. Tsechinkut Lake	*-4	*-4	*-4	n/a	n/a	n/a	*-4	*-4	*-4	n/a	n/a	n/a			
25. Usk	*-1	*-1	*-1	*-1	*-1	*-1	*-1	*-1	*-1	n/a	n/a	n/a			
26. Vanderhoof	*-5	*-5	*-5	n/a	n/a	n/a	*-5	*-5	*-5	n/a	n/a	n/a			
27. Wistaria	M.I.	M.I.	M.I.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Acquisition											30			30	
Total	399k	75.6	60.2	82k	86.4	12.4	719k	108.0	108.2	959k	289.2	144.0	2,159k	559.2	324.8

*-1 receives Terrace signal *-2 receives Prince George signal *-3 receives Smithers signal *-4 receives Burns Lake *-5 receives Ft. Fraser signal

M.I. = Marginal Improvement n/a = not applicable

Full Coverage Plan

The costs of implementing this plan are, in addition to those listed for the Standard Plan, as follows:

(i) Cost of acquiring T.V. signals.

No new costs are incurred.

(ii) Costs of carrying the signals over microwave facilities.

No new costs are incurred.

(iii) Cost of distributing the signals.

The cost of additional "off-air" facilities is as follows:

	Capital	Annual Charge
CBC-E		
Kitwanga-5 w XMTR	31k	9.3k
Ootsa Lake-5 w XMTR	31k	9.3k
CTV		
Kitwanga-5 w XMTR	31k	9.3k
Ootsa Lake-5 w XMTR	31k	9.3k

There are no new costs for CATV distribution facilities.

Table H, page 50, shows a summary of all costs involved for implementing the Full Coverage Plan; further, Table I, page 51, compares the total costs of all three plans.

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FULL COVERAGE PLAN (Table H)

	CBC-E			CBC-F			CTV			CBS/PBS (CATV)			TOTAL		
	Capital	Annual Charges		Capital	Annual Charges		Capital	Annual Charges		Capital	Annual Charges		Capital	Annual Charges	
		Carr.	Dist.		Carr.	Dist.		Carr.	Dist.		Carr.	Dist.		Carr.	Dist.
1. Burns Lake	165k	21.6	24.8	n/a	n/a	n/a	165k	21.6	24.8	n/a	n/a	n/a	330k	43.2	49.6
2. Cedarvale	*-6	*-6	*-6	n/a	n/a	n/a	*-6	*-6	*-6	n/a	n/a	n/a			
3. Decker Lake	*-4	*-4	*-4	n/a	n/a	n/a	*-4	*-4	*-4	n/a	n/a	n/a			
4. Endako	*-4	*-4	*-4	n/a	n/a	n/a	*-4	*-4	*-4	n/a	n/a	n/a			
5. Fort Fraser	55k	21.6	8.3	n/a	n/a	n/a	55k	21.6	8.3	n/a	n/a	n/a	110k	43.2	16.6
6. Fort St. James	31k		4.7	n/a	n/a	n/a	31k		4.7	n/a	n/a	n/a	62k		9.4
7. Francois Lake	*-4	*-4	*-4	n/a	n/a	n/a	*-4	*-4	*-4	n/a	n/a	n/a			
8. Fraser Lake	*-5	*-5	*-5	n/a	n/a	n/a	*-5	*-5	*-5	n/a	n/a	n/a			
9. Granisle	31k		4.7	n/a	n/a	n/a	31k		4.7	n/a	n/a	n/a	62k		9.4
10. Hazelton	31k		4.7	n/a	n/a	n/a	31k		4.7	n/a	n/a	n/a	62k		9.4
11. Houston	55k	10.8	8.3	n/a	n/a	n/a	55k	10.8	8.3	209k	108.0	31.4	319k	129.6	48.0
12. Kitimat	*-1	*-1	*-1	41k		6.2	*-1	*-1	*-1	132k	21.6	19.8	173k	21.6	26.0
13. Kitwanga	31k		9.3	n/a	n/a	n/a	31k		9.3	n/a	n/a	n/a	62k		18.6
14. Lakelse	*-1	*-1	*-1	*-1	*-1	*-1	*-1	*-1	*-1	n/a	n/a	n/a			
15. Nukka Lake	*-2	*-2	*-2	n/a	n/a	n/a	*-2	*-2	*-2	n/a	n/a	n/a			
16. Ootsa Lake	31k		9.3	n/a	n/a	n/a	31k		9.3	n/a	n/a	n/a	62k		18.6
17. Pr. Rupert/Pt. Edward		21.6		n/a	n/a	n/a	140k	21.6	21.0	189k	43.2	28.4	329k	86.4	49.4
18. Reid Lake	*-2	*-2	*-2	n/a	n/a	n/a	*-2	*-2	*-2	n/a	n/a	n/a			
19. Smithers	31k		4.7	n/a	n/a	n/a	31k		4.7	205k	21.6	30.8	267k	21.6	40.2
20. Telkwa	*-3	*-3	*-3	n/a	n/a	n/a	*-3	*-3	*-3	n/a	n/a	n/a			
21. Terrace/Thornhill	exists	exists	exists	41k	86.4	6.2	180k	32.4	27.0	224k	64.8	33.6	445k	183.6	66.8
22. Tintagel	*-4	*-4	*-4	n/a	n/a	n/a	*-4	*-4	*-4	n/a	n/a	n/a			
23. Topley	*-4	*-4	*-4	n/a	n/a	n/a	*-4	*-4	*-4	n/a	n/a	n/a			
24. Tsechinkut Lake	*-4	*-4	*-4	n/a	n/a	n/a	*-4	*-4	*-4	n/a	n/a	n/a			
25. Usk	*-1	*-1	*-1	*-1	*-1	*-1	*-1	*-1	*-1	n/a	n/a	n/a			
26. Vanderhoof	*-5	*-5	*-5	n/a	n/a	n/a	*-5	*-5	*-5	n/a	n/a	n/a			
27. Wistaria	*-7	*-7	*-7	n/a	n/a	n/a	*-7	*-7	*-7	n/a	n/a	n/a			
Acquisition											30			30	
Total	461k	75.6	78.8	82k	86.4	12.4	781k	108.0	126.8	959k	289.2	144.0	2,283k	559.2	362.0

*-1 receives Terrace signal *-2 receives Prince George signal *-3 receives Smithers signal *-4 receives Burns Lake signal *-5 receives Ft. Fraser signal

*-6 receives Kitwanga signal *-7 receives Ootsa Lake signal

n/a - not applicable

Table I - Costs

	BASIC		STANDARD		FULL	
	Capital	Annual Charge	Capital	Annual Charge	Capital	Annual Charge
CATV	545	349.4	959	433.2	959	433.2
CBC - F	82	98.8	82	98.8	82	98.8
- E	86	34.6	399	135.8	461	154.4
Total	168	133.4	481	234.6	543	253.2
CTV	406	169.0	719	216.2	781	234.8
TOTAL	1,119	651.8	2,159	884.0	2,283	921.2

D. Benefits Accrueing from Each of the Three Plans

General

The improvement in terms of quality and quantity of the television signals delivered to the corridor will generate benefits which accrue to the CATV operator(s), the broadcasters, the industry of the region, and the public of the region in general.

The CATV operator's gain consist of the revenues generated by a higher penetration rate (or larger number of subscribers). At the present, the penetration rate in the three centres with CATV facilities (Terrace, Kitimat, Prince Rupert) is in the order of 50%. It would appear reasonable to assume that an 80% penetration rate would be attained after the CBS and PBS networks are offered on the CATV plant (CBS and PBS are not available "off-air").*

The commercial broadcasters gain because of a greater audience size and, therefore, a higher per minute advertising rate. In the past, however, the Canadian Radio Television Commission (CRTC) has ruled that any broadcaster moving into a new area, such as BCTV in this instance, must compensate the broadcaster already established in the area (CBC's affiliates CKPG, CFTK) for loss of revenue caused by audience fragmentation. Thus in the first instance, total advertising revenue does not increase for broadcasting as a whole. Only in the second instance is there a gain in revenue caused by the increased total T.V. viewing time attributable to the availability of additional T.V. signals. It would appear that this increase of additional advertising revenue obtained from a given market through the introduction of a second T.V. outlet is in the 10-20% range.

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* It should be noted that the penetration rate of CATV in the Vancouver area is 80-90%, while in the Victoria area it is in excess of 90%.

Industry gains because of lower labor turn-over cost brought about by making the employee's environment more attractive through the availability of an additional 1-4 T.V. signals. At the present, the labor turn-over rate in large centres like Kitimat is 40-50% per year.* In the smaller centres it is likely to be higher. Further, it would appear that the cost of "turning-over" one employee is probably between $1,000 and $2,000.** From the labor force size, the turn-over rate, and the cost per "turn-over", we can estimate the total cost to industry caused by labor force turn-over. If we further assume that improved T.V. availability will reduce the labor turn-over rate by 3%, we can estimate the total benefit to industry generated by better T.V. availability

The public at large gains because of the additional educational/entertainment value obtained from their investment in T.V. sets. These households subscribing to CATV services are willing to pay $8.50 per month*** for this additional service. If we, therefore, assume that the value of the additional T.V. signals is worth $5.00 per month per household for these households that do not subscribe to CATV (although it is available in their area of residence) and for those households that are not in CATV-franchised areas, an estimate of the total value to the public of the additional T.V. signals can be obtained.

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* See Financial Post, September 29, 1973.

** See Financial Post, September 29, 1973. Alcan's turn-over of some 2,000 employees is estimated @ $2,000,000 or $1,000 per employee.

*** This is the current CRTC-approved rate charged in Kitimat/Terrace/Prince Rupert.

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Benefits-Basic Plan

(i) CATV benefits*-1

Initial additional "connection" revenues*-2	112k
Annual "service rental" revenue - main outlet*-3	459k
Annual "service rental" revenue - second outlet*-4	8k
Annual "re-connect" revenue*-5	16k

(ii) Commercial broadcaster's revenue

The second T.V. outlet (CTV) in the corridor will compensate the first outlet (CBC) for any loss in revenue. However, CTV will gain about 10% of the total revenue obtained from the corridor.

CBC	nil
CTV*-6	55k

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*-1 Additional households wanting to subscribe to CATV services is estimated at Terrace - 1800; Prince Rupert - 1800; Kitimat - 900; Total: 4500.

*-2 Connection revenue is thus 4500 H.H. @ $25.

*-3 This consists of 4500 additional subscribers paying $8.50 per month rental.

*-4 It is estimated that 15% of all subscribers purchase a second outlet facility. Fee for this service is $1 per month. See Manitoba Perspective, op cit.

*-5 It is estmated that 15% of the households connect and disconnect each year. See Manitoba Perspective, op cit.

*-6 Only the national advertising time is BCTV's gain; local advertising revenue accrues to CKPG & CFTK. Of the 10-15 minutes of advertising in each hour, 50-80% is national in scope. BCTV operates ≃ 20 hours per day. Total national advertising time per day is thus 10 *.5 * 20 = 100 minutes. It is estimated that the 50,000 additional households reached in the Basic Plan are worth $15 per minute to the advertiser. Of the total $1500 spent per day on the corridor, CTV will gain 10% or $150.00 per day or $55,000 per year.

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(iii) Industry benefits

Of the 18,000 people who are in the labor force,* a conservative estimate of 6,000 (33%) will resign their jobs each year. At an estimated cost of $1,000 per employee turn-over, total cost to industry is in the order of $6 million. Better T.V. reception is estimated to reduce the labor turn-over rate by 3%.

Benefit to industry: 3% of $6 million or 180k/year

(iv) Public benefits

Of the 50,000 people covered by the Basic Plan, 42,469 have access to CATV; 20% of these do not subscribe to CATV service. The total population that benefits from the additional T.V. quality and quantity provided is thus (· 2 * 42,469) + (50,000-42,469) or 16,024. This is equivalent to approximately 4,000 households.** Total value to the public is, therefore:***

4,000 * 12 months * $5 = 240k/year

Table J summarizes the benefits of the Basic Plan.

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* The Basic Plan covers approximately 50,000 residents, of which ≃ 35% is in the labor force.

** Number of people per household varies from 3.5 (Prince Rupert) to 4.0 (Terrace), Statistics Canada 1971 Census Survey.

*** Value per household per month of the improved T.V. services offered has been assumed to be $5.00

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Table J

(Basic Plan)

	Recurring Benefits/year	One-time Benefits
CATV	483k	112k
CBC	nil	nil
CTV	55k	nil
Industry	180k	nil
Public	240k	nil
Total	958k	112k

Benefits-Standard Plan

(i) CATV benefits

Initial additional "connection" revenues*-1	32k
Annual "service rental" revenue - main outlet*-2	132k
Annual "service rental" revenue - second outlet*-3	2.3k
Annual "reconnect" revenue*-4	4.8k

*-1 Generated by 800 subscribers in Smithers and 500 subscribers in Houston; charge: $25 per subscriber.

*-2 1,300 subscribers @ $8.50 per month.

*-3 15% of H.H. purchase second outlet services @ $1.00 per month.

*-4 15% of all household connect/re-connect their service each year @ $25.00 per re-connection.

. . . / 57

(ii) Commercial broadcaster's revenue

As discussed earlier, the revenue for the CBC will be nil, whereas for the CTV it will be 10-20% of the revenue generated by advertising in the market (the corridor).

CBC	nil
CTV*-1	73k/year

(iii) Industry benefits

Of the 75,000 people reached by implementing the Standard Plan, approximately 26,000 are in the labor force. Of these, some 8,000 will resign their job each year. The savings generated by better T.V. reception is therefore:*-2 240k/year

(iv) Public benefits

Of the 75,000 people covered by the Standard Plan, 48,565 have access to CATV; 20% of these do not subscribe to CATV services. The total population that benefits is thus · 2(48,565) + (75,000 - 48,565) or 36,148. This is equivalent to some 9,000 households. The total annual value to the public is thus estimated to be:

9,000 * 12 months * $5.00 = 540k/year

Table K summarizes the Standard Plan benefits.

---

*-1 CTV will reach some 25,000 additional H.H. in the Standard Plan (over the Basic Plan). The total increased viewing population for the Standard Plan is therefore 50,000 + 25,000 or 75,000. The audience is estimated to be worth $20 per minute to the advertiser. Total advertising revenue is therefore 100 minutes * $20 or $2,000 per day. The Standard Plan is thus worth about $200 per day (10% increase in revenue) to the broadcaster.

*-2 8,000 employees @ $1,000 per resignation equals $8 million total cost. It is assumed that improved T.V. reception will reduce this cost by 3% or 240k.

. . . / 58

Table K

(Standard Plan)

	Recurring Benefits/year	One-time Benefits
CATV	622	144
CBC	nil	nil
CTV	73	nil
Industry	240	nil
Public	540	nil
	1,475	144

Benefits-Full Plan

(i) CATV benefits

These are the same as for the Standard Plan since no additional CATV facilities are constructed in the Full Plan.

(ii) Broadcaster's benefits

For CBC, these benefits remain nil; for the BCTV, the benefits remain $200 per day since the additional viewers generated in the Full Plan over the Standard Plan is only a marginal audience size increment (from 75,000-77,000).*

CBC	nil
CTV	73k

(iii) Industry benefits

Of the 77,000 people covered by the Full Coverage Plan, some 27,000 are in the labor force. Of these, some 8,500 will resign their jobs each year. The cost of this turn-over to industry is ≃ $8.5 million. Better T.V. reception will reduce this cost by 3% or 255k/year.

* It should be noted that some 3,000 people of the corridor remain without T.V. after implementation of the Full Plan.

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(iv) Public Benefits

Of the 77,000 people covered by the Full Plan, 48,565 have access to CATV services; 20% of these do not subscribe to CATV services. The total population that benefits by "off-air" signal quality and quantity improvement is thus · 2(48,565) + (80,000 - 48,565) or 38,148. This is equivalent to some 9,500 households. The total value to the public is therefore:

9,500 * 12 months * $5 or 570k/year

Table L summarizes the Full Coverage Plan benefits, while Table M summarizes the benefits of each of the three plans.

Table L

(Full Coverage Plan)

	Recurring Benefits/year	One-time Benefits
CATV	622k	144k
CBC	nil	nil
CTV	73k	nil
Industry	255k	nil
Public	570k	nil
Total	1,520k	144k

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Table M - Benefits

	BASIC		STANDARD		FULL	
	Recurring	Non-Recurring	Recurring	Non-Recurring	Recurring	Non-Recurring
CATV	483	112	622	144	622	144
CBC	-	-	-	-	-	-
CTV	55	-	73	-	73	-
Industry	180	-	240	-	255	-
Public	240	-	540	-	570	-
TOTAL	958	112	1,475	144	1,520	144

E. Cost/Benefit Comparison

(i) Costs & Benefits - Total

Table I, page 51, has shown the total costs incurred in order to implement any of the three plans, while Table M, page 60, has shown the benefits that each of the three plans generates. The costs and benefits of the three plans are consolidated in Table N.

Table N

Total Cost-Benefit Comparison

	Basic		Standard		Full Coverage	
	Capital	Recurring	Capital	Recurring	Capital	Recurring
Total Costs	1,119	651.8	2,159	884	2,283	921.2
Total Benefits	112	958.0	144	1,475	144	1,520.0
Benefit-Cost	1,007	306.2	2,015	591	2,139	598.8

If the recurring costs/benefits are converted to present values, a direct comparison of the three plans can be made. This has been done in Table P. Since the Present Value of the recurring benefits/costs clearly depends on the prevailing interest rate, the table shows the Net Present Value for a number of interest rates.

Table P

Total Net Present Value of the Three Plans*

Interest Rate	Basic	Standard	Full
5%	2,171	4,120	4,076
10%	409	1,263	1,122
20%	424	748	660
25%	175	267	170
26%	134	188	92
27%	95	113	17*
28%	59	42	-13*
29%	25	-23	-121
30%	0*	-83	-182

*Calculated at annual compounded rates over a 15-year period.

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Inspection of Table P shows that the internal rate of return for the three plans is approximately as follows: Basic - 30%, Standard - 29%, Full - 28%. Although all three plans thus have a large, positive yield, none of the plans has been implemented to date because no mechanism exists through which all benefits can be internalized. It is, therefore, instructive to examine the Net Present Value of each plan to each of the entities who distributes signals to corridor households.

(ii) Costs & Benefits - CTV

Table Q has been constructed from Tables I and M and shows the CTV costs and benefits of each of the three plans.

Table Q

CTV Cost/Benefit Comparison

	Basic		Standard		Full Coverage	
	Capital	Recurring	Capital	Recurring	Capital	Recurring
CTV Costs	406	169	719	216.2	781	234.8
CTV Benefits	-	55	-	73.0	-	73.0
Benefits-Costs	-406	-114	-719	-143.0	-781	-162.0

If the recurring costs are converted to present values, a direct comparison of the costs to CTV for the three plans can be made. This is done in Table R.

Table R

CTV Net Present Value of the Three Plans

Interest Rate	Basic	Standard	Full
5%	-1,589	-2,203	-2,463
10%	-1,273	-1,806	-2,013
15%	-1,073	-1,555	-1,728
25%	-846	-1,271	-1,407
30%	-779	-1,186	-1,310

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At the prevailing market rate (10-15%), the cost to CTV of providing service to Highway 16 corridor is thus in the $1-$2 million range.

(iii) Costs & Benefits - CBC

Table S has been constructed from Tables I and M and shows the CBC's costs and benefits of each of the three plans.

Table S

CBC's Costs/Benefits Comparison

	Basic		Standard		Full Coverage	
	Capital	Recurring	Capital	Recurring	Capital	Recurring
CBC Costs	168	133.4	481	234.6	543	253.2
CBC Benefits	-	-	-	-	-	-
Benefits-Costs	-168	-133.4	-481	-234.6	-543	-253.2

If the recurring costs are converted to present values, a direct comparison of the costs to CBC for the three plans can be made. This is done in Table T.

Table T

CBC's Net Present Value of the Three Plans

Interest Rate	Basic	Standard	Full
5%	-1,553	-2,916	-3,171
10%	-1,183	-2,265	-2,469
15%	-948	-1,853	-2,023
25%	-683	-1,387	-1,521
30%	-604	-1,248	-1,360

At the prevailing market rate, the cost to the CBC of providing service to Highway 16 corridor is thus in the $1-$2.5 million range.

It should be noted that the CBC has received Treasury Board approval for its Accelerated Coverage Plan (ACP). This plan will upgrade CBC services in a number of areas. The CBC's ACP has the following allowances for T.V. improve-

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ments in the corridor:

	Capital Expenditures	Recurring Annual Expenditures
English T.V.	188k	22k
French T.V.	82k	90k
Total	270k	112k

From this information and the information contained in Table S, we can calculate the additional cost to the CBC for implementing any of the three plans. Table U shows this information in terms of capital and recurring charges, while Table V shows the present value of these capital and recurring charges at various interest rates.

Table U

CBC's Cost/Benefits After ACP Allowances

	Basic		Standard		Full Coverage	
	Capital	Recurring	Capital	Recurring	Capital	Recurring
CBC Costs	168	133.4	481	234.6	543	253.2
CBC Benefits	-	-	-	-	-	-
Benefits-Cost	-168	-133.4	-481	-234.6	-543	-253.2
ACP Allowance	270	112.0	270	112.0	270	112.0
Further Requirements	-102	21.4	211	122.6	273	141.2

Table V

CBC's Net Present Value After ACP Allowance

Interest Rate	Basic	Standard	Full
5%	120	1,483	1,738
10%	61	1,143	1,347
15%	23	928	1,099
25%	-19	684	818
30%	-32	612	734

. . . /65

(iv) Costs & Benefits

Table W has been constructed from Tables I and M and shows the CATV operator(s) costs and benefits for each of the three plans.

Table W

CATV Operator(s) Costs/Benefits Comparison

	Capital	Recurring	Capital	Recurring	Capital	Recurring
CATV Costs	545	349.4	965	434.1	965	434.1
CATV Benefits	112	483.0	144	622.0	144	622.0
Benefits-Costs	-433	133.6	-821	187.9	-821	187.9

If the recurring costs/benefits are converted to present values, a direct comparison of the costs/benefits to the CATV operators for the three plans can be made. This is done in Table X.

Table X

CATV Net Present Value for the Three Plans

Interest Rate	Basic	Standard	Full
5%	954	1,129	1,129
15%	348	278	278
25%	83	-95	-95
30%	4	-207	-207

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Conclusions & Recommendations

In this paper we have shown that television reception for some 80,000 residents in the Prince George-Prince Rupert corridor is poor in quality and quantity. We have further shown that T.V. is an important amenity in today's society and without that amenity, the social development of the corridor is likely to remain impaired.

To alleviate this problem, three plans have been presented which will augment and improve television coverage in the corridor. Each of these plans has a large internal rate of return (> 25%) if conservative estimates of the most important benefits are used.† The project, or the implementation of any of the three plans, appears therefore to be well worthwhile. Yet, implementation has, to date, not occurred. Why?

The reason clearly is that the costs and benefits accrue to different groups and that, to date, no mechanism has been found or established through which the groups that benefit re-imburse the groups for whom the project is a non-paying proposition.

The public and the primary and secondary industries of the corridor are by far the largest "gainers", while the broadcasters are the largest "losers". The CATV industry will earn a substantial return on its investment, but can only earn this return if the broadcasters extend their services.

It is clear that the interrelatedness of the above costs/benefits, and group interests, make it desirable that some formal mechanism be established which could further deal with ways and means through which T.V. services in the

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† Benefits to the community and regional district, for example, have not been included in the above cost/benefit analysis.

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Corridor 16 Region might be improved. Appendix B contains a list of organizations to whom the Corridor 16 T.V. project is of interest. An early meeting of spokesmen for these groups might enable the implementation of plans for better and more television in the North-West area of British Columbia.

APPENDIX "A"

George Wall
C/O Box 70,
Smithers B.C.

Nov. 25, 1973

The Editor:
The Interior News,
Smithers B.C.

An open letter to the people of the communities of:
Kitwanga, The Hazeltons, Moricetown, Smithers, Telkwa, Houston, Granisle, Topley and Burns Lake, concerning the atrocious quality of the CFTK-TV signal.

If my memory serves me correctly, I believe the signal quality has steadily deteriorated over the past few years.

I have talked with the CFTK-TV technicians and management from Terrace and have been unable to get a satisfactory explination as to why the consistently poor signal.

I believe the people of these communities have suffered in silence long enough. Now is the time for action !!

Suggestion #1:

Write to the following and explain about the present unsatisfactory service:

Your Member of Parliament
Your Member of the Legislative Assembly
The Canadian RadioTelevision Commission, 100 Metcalfe St, Ottawa, Ont.
The Canadian Broadcasting Corporation, 1500 Bronson Ave, Ottawa, Ont
The Honorable Gerard Pelletier, Minister of Communications, Ottawa, Ontario.
The Department of Communications, Ottawa Ontario.

Don't depend on your neighbour to write, do it Yourself !

Nov. 25, 1973

Letter to: The Editor
The Interior News

Suggestions #2

These communities join together in bringing C.T.V. to our areas.

Judging from communications I have had with C.T.V. and a Telecommunication consulting Engineering firm and individuals in some of these communities we believe this is feasible. Rember that the C.T.V. signal already reaches as far as Fraser Lake.

We have been advised that community groups can incorporate themselves under the Societies Act in order to have a legally constituted body to make an application.

I would welcome your thoughts, comments, and support on this proposal. Over 20,000 people should be able to get something done.

Yours truly,

George W. A. Wall

South Hazelton WOMEN'S INSTITUTE

10002

December 11, 1973

Dear Sir;

We are very dissatisfied with the quality of Television Reception in our area (Hazelton, B.C.). We have contacted C.F.T.K. (Terrace,B.C.) many times, and receive no co-operation whatsoever, so therefore the community is forced to endure very poor Television reception, both with picture and sound.

We would appreciate anything you could do to improve this situation.

Yours truly,

Mrs. T. Widmark (Sec.)
South Hazelton Women's Inst.

cc: Mr. Frank Howard M P
Mr. Hartley Dent M L A
The Canadian Radio Television Commission
The Canadian Broadcasting Corporation
The Honorable Gerard Pelletier
The Department of Communications

A-4

30933

DISTRICT of Bulkley Nechako

INCORPORATED 1966
BOX 820
BURNS LAKE, BRITISH COLUMBIA

ADMINISTRATOR _____ PHONE 692 - 3195

6001-8-38
RDP

December 19th 1973

DISTRICT
HOUSTON

TOWN
SMITHERS

VILLAGES
BURNS LAKE
FORT ST. JAMES
FRASER LAKE
GRANISLE
TELKWA
VANDERHOOF

ELECTORAL AREAS
"A"
"B"
"C"
"D"
"E"
"F"
"G"

Mr. W. H. Halladay,
Regional Director,
Communications Canada,
320 - 325 Granville Street,
VANCOUVER 2, B. C.

Dear Sir:

Over the past while numerous complaints have been made because of the very marginally poor television reception in this part of the country, as well as any lack of variety - only one channel is available, and that for only questionable periods of time - if at all.

"Project B. C. Vision" - of which you are reported to have received a copy shows the reception in some parts of our Regional District of a higher standard than it actually is on an average, and during the past two months or longer it has actually been deplorable a good percentage of the time.

We feel it is time that sufficient re-broadcasting stations, repeaters, or whatever system is necessary to provide more than one channel and an acceptable level of sound and picture viewing be installed.

Television is one of the few amenities very urgently required in this country to help satisfy people for a more pleasant home life and would greatly assist in the large turn-over in the work force so hard to keep in this part of the country.

Your early attention to give this problem a high priority is urged and would be greatly appreciated, as I have been asked by the Board of Directors of the Regional District of Bulkley-Nechako to express the above sentiments to you.

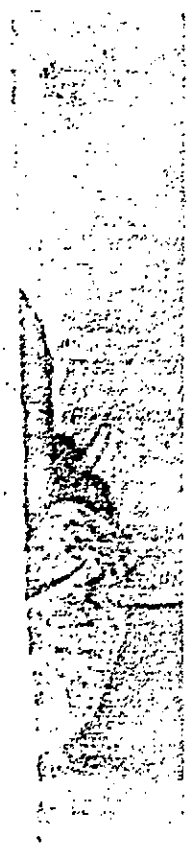
Yours truly,

R. J. Peace,
Regional Administrator.

RJP/gt

cc Hon. R. M. Strachan,
Minister of Transport and Communications

rst Regional Board scans T.V. scene



In a letter to the Regional District of Bulkley-Nechako the B.C. Land Commission acknowledged receipt of the Proposed Agricultural Land Reserve Plan submitted by this Regional District.

Chairman of the Commission, Mr. Bill Lane, said that he hoped the proposal could be reviewed by the end of January. The Land Commission will then forward their recommendations to Cabinet.

The Regional District passed a motion "... that we put pressure on to the C.R.T.C. and send of copy to the Provincial Ministry of Communications, to provide better T.V. reception in this area, in relation to audiable clear sound, a better picture and more than one channel, and enclose a copy of the survey made by University students this past summer."

A second motion on T.V. reception made by the Board was "that letters be sent to Municipalities and Chambers of Commerce in our region advising them the funds required will have to be provided by them, and it could be done on a Specified Area basis by direct property taxation."

The Board also moved to get in touch with T.V. Consultants about T.V. in the region.

The Regional Board will contact Hoyles Niblock Associates Limited, as well as Saperstien Consultants for a detailed outline of what a T.V. extension study would provide, and if it would include specified places for transmitters or repeaters or whatever will guarantee good reception.

The Yellowhead 16 (B.C.) Travel Association in the letter to the Regional District informed of grants given to Visitor Information Centres for 1973 operations in this District.

Houston received $375; burns Lake $375; Telkwa $300; Vanderhoof and Smithers $500.00 each. Total grants for this region were $2,050.00.

In new business the Regional Board passed a motion to write the Department of Highways requesting them to maintain the road east of the Morice River Road to Francois Lake and keep it in a satisfactory travelling condition in winter as well as in summer so that people living along that road are able to get out whenever necessary, and that a copy of the letter be sent to the Minister of Highways.

Years baby. 22 a.m. on couple. The ne first born

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students'

Minister Gets

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A-6

REGIONAL DISTRICT of Bulkley Nechako

INCORPORATED 1965
BOX 820
BURNS LAKE, BRITISH COLUMBIA

REPLIES TO THE ADMINISTRATOR — PHONE 692 - 3195

April 2nd, 1974

DISTRICT
HOUSTON

TOWN
SMITHERS

VILLAGES
BURNS LAKE
FORT ST. JAMES
FRASER LAKE
GRANISLE
TELKWA
VANDERHOOF

ELECTORAL AREAS
"A"
"B"
"C"
"D"
"E"
"F"
"G"

The Chairman,
C. R. T. C.,
OTTAWA. ONTARIO

Dear Sir:

Re: T. V. Reception, North West B. C.

For some time now we have had correspondence in relation to trying for better television reception in our area, Vanderhoof West to the Hazeltons, and the availability of a second channel.

We have employed the firm of Hoyles, Miblock Associates, Vancouver, to do a feasibility study which is to provide answers as to what kind of installations will be necessary to give a good signal to our area.

Some of our correspondence has been with Mr. Ron East of C.J.C.I. radio network, and he advises that he is one of the principals in the extension to supply the communities of 100 Mile House, Williams Lake, Quesnel and Prince George, and he would then intend to extend westward to Hazelton and in conjunction with C.F.T.K. in Terrace on to include west to Prince Rupert.

Relative to the above our Board of Directors in regular meeting March 28th, 1974 passed a motion in support of the application of C.J.C.I. which was heard in Vancouver March 12th to 15th.

We further wish to re-iterate that lack of enjoyable television reception is one of the factors that deters an adequate work force in our northern communities, and consequently the proposed north west development scheme will suffer.

Yours truly,

R. J. Peace,
Regional Administrator.

RJP/gt

c.c. Mr. Ron East, C.J.C.I.
Mr. E. G. Rose, B.C.T.V.
Mr. W. H. Halladay, Communications Canada

KITWANGA ASSOCIATION

Box 98
KITWANGA, B.C.

V0J 2J0

December 3, 1974

The Honourable Max Beck
Secretary of State
Province of British Columbia
1525 West 8th Avenue
Vancouver, British Columbia

Dear Mr. Beck:

I was pleased to hear you this morning in an interview broadcast over CFPR Radio from Prince Rupert. Of particular interest to our community are the funds to which you referred which are available for community projects of various types.

Our area is in dire need of an improved television re-broadcasting system. Our present system is small and re-directs a signal from Hazelton which re-directs a signal from Telkwa (near Smithers) which re-directs a main transmitter signal from Terrace (CFTK)! You can well imagine that this is less than adequate. The problems of even locating problems are immense. Then we must depend on other communities to repair and maintain their systems.

We have wanted to improve our system by replacing it with a transmitter which will re-direct the main transmitter signal from Terrace. This can be done readily but at a cost of $8- to 15,000 depending on the power generation system that we choose. Today, we arranged with Crowder Communications, Ltd., in Terrace, to prepare a brief of specifications for equipment which they would recommend to meet the needs of the area.

The reason that we have not acted to change our system is, of course, funds. Our Association--and the surrounding communities as well--are currently constructing a much-needed community centre which requires the funding of approximately $280,000. We have financial assistance for this project from the B. C. Community Facilities Fund, Local Initiatives Programme, and our local School District. We needed a T.V. system at the outset

KITWANGA COMMUNITY ASSOCIATION
Box 98
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of this project and had to choose between the two.

Our current situation with television reception is that we have been virtually without audio for over a month due to icing on Hazelton's antennae....we think.

Our community is growing rapidly both in population and commercial services. This is bound to increase rather rapidly in the next five years because of a bridge being built across the Skeena at Kitwanga to link our town with Highway 16. When completed the bridge will make us the first community on the Stewart-Cassiar link to the Alaska Highway. We also have three Indian Reserves within close proximity....two of which have little or no television reception. We feel that a new system here can be designed to provide television to the Reserves, to the present community and to most of the areas which will be available for future development...both residential and commercial.

We feel that television is an important and essential service for a northern community such as ours. We are fairly well isolated from the cultural and intellectual stimulation of the larger urban centres and television... though not always good...does help to fill this need for learning. We feel it is particularly valuable here to improve the knowledge of language especially for the young. Our schools here cannot presently make use of the very excellent Canadian Schools Broadcasts because of the poor reception and this is regrettable.

It is our sincere hope that you will be able to assist our organization with funds to provide this system for our area.

Thank you in advance for your consideration of the matter.

Very sincerely yours,

KITWANGA COMMUNITY ASSOCIATION

(Mrs.) Pamela A. Biffle,
President

PAB:ak

APPENDIX "B"

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The following groups have a mandate or an interest in ensuring that better T.V. communications are implemented in the Highway 16 Corridor:

Broadcasters

(i) CBC - The national broadcasting service should be extended and improved in the corridor. Under the ACP, the CBC does plan to make substantial improvements in the corridor. However, additional improvements are needed. Further, there is a need to "phase" the ACP with other T.V. improvements (CTV, PBS, CBS) to avoid duplication of installation costs.

(ii) CTV - The CTV clearly needs to be consulted in regards to the extension of CTV to the communities of the corridor.

(iii) CATV Operator(s) - Skeena Broadcasters presently operates CATV plants in Kitimat, Terrace, and Prince Rupert. Discussions with Skeena Broadcasters on the carriage of CBS, PBS, and the construction of CATV plants at Houston and Smithers are necessary.

Common Carrier

B.C. Telephone is the only carrier in the corridor with facilities capable of transportation of T.V. signals. Discussions with B.C. Tel on charges for providing the required services is necessary.

Regulators

(i) CRTC - The Canadian Radio-Television Commission is responsible for the licensing of any broadcast undertaking (including CATV) in Canada. Discussions with the CRTC are necessary.

(ii) DOC - The Department of Communications (Government of Canada) is responsible for microwave network development and for the technical certification of microwave systems, off-air broadcasting, and CATV installations. Discussions with the DOC are necessary.

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Funding Groups

(i) DREE - The Department of Regional Economic Expansion is concerned with the balanced economic growth of Canada. The Department has funds available to stimulate investment in areas which are "under-developed". DREE, however, can only proceed with funding after consultation with the provincial counterpart.

(ii) Department of Economic Development (B.C.) - This department is concerned with the economic development of British Columbia. Like DREE, it has funds available for projects which would stimulate the economic growth of B.C. DED should be consulted by DREE on the feasibility of supplying funds for the social development of the corridor.

Other Groups

(i) Department of Transport & Communications (B.C.) - This department has an interest in the telecommunications infra-structure of British Columbia and should be invited to participate in any discussions.

(ii) Regional Districts - The regional districts of the corridor have been vitally interested in better T.V. reception in the past. Moreover, regional district funds might be made available for a coordinated T.V. improvement project.

(iii) Industry of the Corridor - Since industry stands to gain from better T.V. services through a lower labor cost, industry should be consulted and discussions with the large employers (Alcan, Eurocan, Cancel, Bulkey Valley Forest Products) should take place in order to ascertain industry's willingness to contribute to the above plan.

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