The Development and Structure of the Settlement System in The Yukon

by

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PREFACE

The central theme of this work is the structure of human settlements in the Yukon and the relationships between them. The paper moves from a systematic analysis of various aspects of settlement, examining sources, history, inter-community migration patterns and economic base, through to analysis of individual settlements. The concluding chapter outlines possible future settlement policies in the light of the preceding discussion and analysis.

In many respects problems evident in the Yukon are representative of contemporary problems throughout the Canadian Northland. They include land-use conflict, alienation of Indian populations, social health of single-enterprise communities, the true economic value of resource development to the region, and intra-regional economic disparity. In the Yukon, as elsewhere, these problems are inter-related and are manifest in the various dimensions of life in the Territory's communities. Thus an overview of the structure of the Territory's settlement system provides a synthesis with some relevance to the understanding of a host of development-related issues in north-west Canada.

Despite the Lysyk Inquiry and the evident investment of time and money by various agencies examining the many dimensions of life in Yukon communities very little primary data have been generated, and much published data are inaccurate. Consequently much of the data used in this study were generated through field work conducted through the summer of 1978 when information on population size, inter-community migration patterns, economic activity, and land-use was gathered. The data included in the study are part of a larger data-set which hopefully will make a positive contribution

towards community and land-use planning in the Yukon.

Because of the scope of the study there are two obvious omissions. First, Whitehorse is not discussed in anything like the detail that its size or complexity warrants; this would be a study in itself, and discussion is thus limited to that necessary to explain its role in the Territory's settlement system. Secondly, the pipeline issue is not a focal point of the work. Although it is hoped that this study and related data will contribute towards the understanding of development impacts in the Yukon the pipeline debate has not influenced the contemporary settlement pattern and is largely irrelevant to the explanation of settlement development.

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1. INTRODUCTION - APPROACHES TO THE STUDY OF YUKON SETTLEMENT

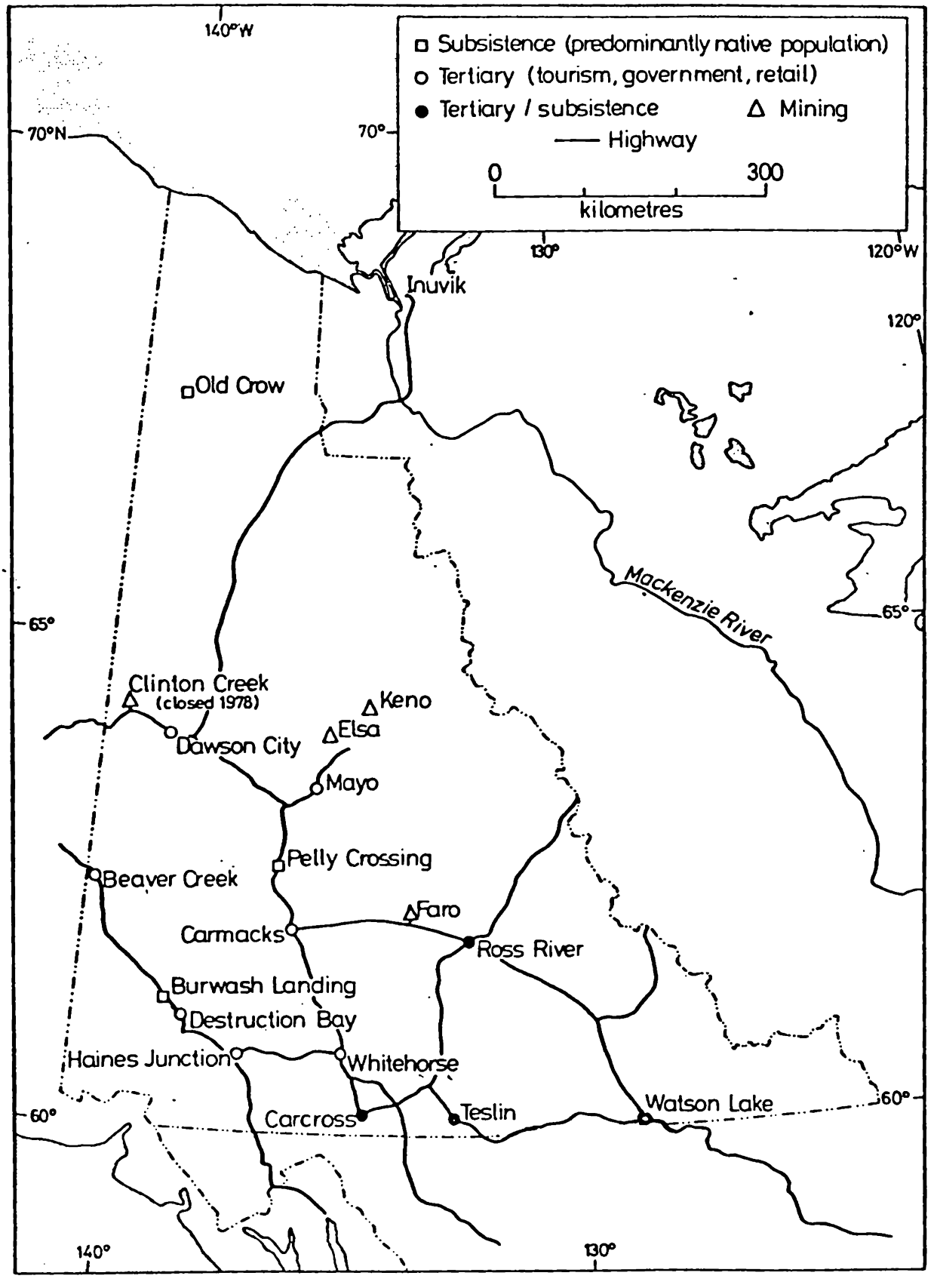
The publication that forms the basis of the present work (Duerden 1971), examined the process of settlement development in the Yukon Territory up to 1968, describing the development, function, and form of some eighteen communities. A major concern was with settlement patterns, both the internal configuration of settlements and their spatial distribution. Although a schema of settlement evolution in the territory was presented the work was largely descriptive, and the methodology employed was, in the absence of hard data, largely intuitive.

The present work similarly takes both a macro-view and a micro-view of settlement patterns. At the macro scale it examines the development of the overall settlement pattern since 1968 with reference to such factors as inter-community migration and economic linkages. At the micro scale land-use patterns in individual communities are described and changes in function, population, and land-use discussed.

In any settled area there clearly are strong relationships between events at the macro level and events at the micro level. Investment decisions are manifest in functional and land-use changes in communities (for example investment in a mine or tourist facilities), while an induced resultant in-migration is manifest in the supply of housing stock. Investment flows and migration are inter-community events (either within the Yukon or from the outside into the Yukon) and therefore macro; land-use changes or provision of an expanded housing stock are at the community level and are therefore micro-events.

It is thus within settlements that the effects of various policies and decisions influencing the course of northern development are manifest, and thus the analysis of the structure of the Yukon's settlement system leads

Fig. 1 Location and Function of Yukon Settlements, 1978.



to an identification of contemporary settlement related problems and a critical evaluation of factors influencing the pattern of settlement in the Yukon over the past ten years.

Approach

In many respects the perspective taken in this work represents a departure from the traditional approach to the study of northern settlements. Previous studies have tended to describe various characteristics, such as history, plan, and economy of individual communities (Lotz 1963, Denis 1955, Ridge 1952) and then draw conclusions concerning the well-being or future of such communities. Settlements have been discussed in isolation from their broader regional context, and the few works which have taken an overview of a group of settlements have been concerned with describing processes of development and have devoted little space to inter-community transactions (Laatsch 1974, Green 1976). The traditional approach is in keeping with the long-established conventional wisdom that settlements in northern Canada are essentially isolated appendages of the major industrial-urban system of the south, and any interaction is with this system rather than with each other; a perspective largely based on a prior assumption as opposed to substantive supporting evidence.

There are a number of largely unanswered questions concerning the well-being of northern settlements, most of which relate to economy, which in itself relates to quality of life and long-term stability of places. Such questions are,

i. Do major developments (such as mining) create income flows and employment in the north?

ii. Are the beneficial effects of development (job creation, increased purchasing power) spread around a prescribed region in a spatially

equitable manner, so that communities other than the mining community benefit substantially?

iii. Are employment opportunities in settlements created for indigents, or for outsiders?

iv. Is there inter-settlement mobility, or do northern settlements, although perhaps displaying longevity, contain ephemeral, short-staying populations with no long term commitment to the area in which they live?

v. Does inter-settlement mobility take place within the prescribed region, or are the main links of the individual components of the population largely to locations outside the region?

Apart from providing important insights into the spatial-economic structure of the Yukon the answering of the above questions can provide important inputs into pre-pipeline planning. It has been proposed (Lysyk 1977) that a residency requirement be placed on potential pipeline construction employees in the Yukon; analysis of residential mobility patterns can form a basis for establishing what that requirement should be.

It is obvious that the traditional, largely descriptive approach to northern settlement cannot provide an adequate framework for analysis of the described process of settlement development or for approaching the questions raised. Examination of described processes and problems can only be accomplished through a dynamic methodology that examines inter-place relationship

The approach thus taken is the settlement system approach, which regards the settlements of the Yukon territory as components of an inter-related system of settlements. The communities are linked to a greater or lesser extent by various transactions, thus changes in one settlement would conceivably be transmitted to others. For example the expansion of mining in a community may attract in-migration from other communities. This may result in depopulation in such communities, resulting in closure of retail facilities as the critical threshold population supporting these facilities falls

In the described schema the settlement system is linked to the larger urban industrial system of North America. This relationship is manifest in the case of the Yukon by investment flows, flows of tourists and migration. Consequently the northern system is influenced by changes in the southern system. Thus the fortunes of the Yukon settlement system is susceptible to changes in the outside world. Such changes would be an energy crisis (decrease in long-distance tourists, increased interest in the north as an energy source), international monetary fluctuations (demand for gold leading to re-opening of previously uneconomic mining areas), variation in world mineral prices (closure of mining towns). One aspect of the relationship between the urban-industrial system of the south and northern communities discussed by Robinson (1962 p 514) is that as the former regions go into economic depression so the flow of migrants to the north increases.

The type of approach described is one which has had currency as a mode of analysis of settlement in more densely populated areas of the world for the past twenty years, but it is an approach which has not been used on any scale in northern Canada. Simmons (1978), in building a model of the Canadian urban system linked the Yukon to the Canadian system through Whitehorse, indicating that Whitehorse was the recipient and transmitter of flows of goods, services, people, and information from and to Vancouver. However the extension of such a model to the small scattered settlements of the Yukon has not taken place.

Critical Evaluation of Approach

It could be argued that the application of the described approach is inappropriate in isolated frontier regions; they are a special case and do not have the same characteristics as more settled areas. A brief examination of some of the features of Yukon settlement indicates that the view of the Yukon communities as an interactive settlement system is perhaps an appropriate starting place.

Of the sixteen settlements outside Whitehorse three are planned single enterprise communities, three relict mining service centers and the balance are highway oriented communities which have (with one exception) gained prominence since 1950. A major portion of the settlement system evolved as a communication support system for the territory's mining industry and the fortunes of these settlements (in the Yukon Valley, Klondike and Mayo areas) have been related to the varying viability of the mining industry and changes in transport technology. It has been demonstrated (Duerden 1976) that the fortunes of major service centers were tied to those of the mining towns, while those of transport oriented settlements were related to changes in media and the economic condition of the mining industry. Thus, historically, there has been a measure of community interdependence in the Yukon. Currently all communities are linked by all weather highways, which although simple in lay-out has (for a northern location) a high degree of connectivity and has succeeded in dramatically transforming time-distance relationships between communities.

Apart from a functional view of settlement interdependence there is also a perceptual view. In many respects the Yukon Territory approximates the isolated state of classical geographical literature. It is divided from the ecumen of North America by both distance and marked physical barriers; there is only one major inter-urban airport in the territory and this serves as the high-speed link with the North American urban system. The Yukon territory is perhaps one of the few areas in North America where the population's perception of space coincides with the described geographic reality. The theme of isolation from the outside world has been recurrent in Yukon literature; indeed the term 'outside' is part of the Yukoner's vocabulary and refers to locations outside the territorial boundaries and the homogeneity of both isolation and climate gives the Yukoner a regional sense of place.

Measures of Interaction Utilised

Three measures of interaction and interdependence between settlements and between the Yukon settlements and the 'outside' have been identified - migration, journey to shop, and economic linkages. These cover almost all forms of interaction between communities except that involving the various electronic media.

The migration data, depicting household migrations through the study period is initially a 15 x 15 matrix representing intra-system and inter-system migration through the study period. Such data can indicate i) The extent to which communities are both linked to each other and to the outside world, ii) The input of major investment decisions (in the case of the Yukon the construction of Faro new town) on migration patterns, iii) The role of migration as a component of growth in individual communities.

Journey to shop data essentially examines the flow of personal expenditures within the system. It indicates the extent to which service relationships exist between communities, the extent to which growth or income is transmitted between settlements due to functional differentiation, and the extent to which income flows from the various communities to Whitehorse.

The study of economic linkages serves to illustrate the extent to which major activities in the territory have a spin-off through either backward or forward linkages that transmit growth to other locations. One question addressed is whether such conventional statements that mining in the north has a multiplier effect of two represent a valid way of measuring the positive impact of mining. Assuming that the stated size of the multiplier is correct says nothing about the spatial impact of mining, growth may be transmitted to only one other location in the system.

Critical Review of Existing Data

The data used in the study are drawn from a number of sources, government

documents, consultants reports, theses, academic studies, interviews, and field work. As can be seen from a review of existing literature, because the approach taken to the study of Yukon settlement is a departure from the conventional one there was a paucity of useful data, while some potentially useful data were unreliable.

From a historical standpoint there is a vast amount of material concerned with various aspects of Yukon settlement. Many of the works published in the first half of the century were related to the gold rush and, with a few exceptions tended to be colourful, narrow in theme, and inaccurate (Duerden 1971 p 233). They succeeded in fixing in people's minds a direct mental association between 'Yukon' and 'Klondike', and by omiting to mention native occupance or present a balanced view of physical environment succeeded in creating an image of the territory as a remote, physically hostile, industrially linked frontier region.

It is only since 1950, with increased Government, business and academic interest in the north that publications have become more dispassionate and apparently more scientific in their treatment of the Yukon.

Between 1963 and 1977 some 157 works with some relevance to Yukon settlement were produced - 51% coming from various government sources, the balance being shared by business, interest groups and academics (Yukon Bibliography 1970, 1975, 1977, 1978). The works display a strong spatial bias in perspective - Dawson City with less than 4% of the territory's population is the focus of 33% of all references, while Whitehorse, with 64% of the population, is the concern of only 25% of all works. Only ten works take an overview of settlement, while the balance examine either small groups of settlements or individual settlements, thus reinforcing the view that communities are spatially and functionally isolated from each other as opposed to constituting components a regional settlement system.

Works relevant to settlement can be divided into two groups - those

which contain primary data (Census data, maps, community data), and those which, via synthesis, attempt to draw conclusions or make recommendations regarding settlement. It is obvious that the accuracy of the latter is predicted on the integrity of the former, and the accuracy of both becomes the basis for meaningful statements about the future.

Population data for the Yukon are available from a number of sources - Statistics Canada, the Economic Research and Planning Unit of the Yukon (ERPU), DIAND, the Lysyk Inquiry, and the Council for Yukon Indians (CYI). Although there may be a degree of cross-reference between these sources there are significant differences in their population figures for similar time periods. Overall the Statistics Canada data for the period 1966-76 is probably accurate, but field work conducted by the author indicates that when it is disaggregated for major communities it may have up to 100% error. This is probably a reflection of both data collection technique and the attitude of the population towards data collection.

ERPU (1977A) data is based on medical records, using 1971 Census data as a base. The problem here is that population location is based on mailing address, and ERPU itself states that in some instances figures were generated by guess-work (ERPU 1977A p 2). The Lysyk Report (1977) contains community surveys, but the population figures provided are un-referenced, and although field work indicates that they may be fairly accurate this may be due as much to intuition as to scientific data gathering.

The population data problem is further compounded when ethnic breakdown is considered. ERPU (1977b) claims that in 1976 there were some 3,100 Indians in the territory, the CYI states that there are 6,000 (Lysyk 1977 p 84), while the Socio-Economic Baseline Data Inventory (DIAND 1978) only contains a 1971 population figure. The discrepancies may be attributable to confusion over classification of 'status' and 'non-status' Indians combined with data collection problems, but politicisation of figures in the light of impending

TABLE 1

Official Settlement Populations 1966-1976

	1966	1971	1976
Whitehorse	4771	11,217	13,311
Faro	-	850	1,544
Dawson	742	762	838
Watson Lake	553	553	808
Elsa	529	298	456
Mayo	479	462	448
Ross River	173	317	371
Carmacks	311	348	346
Haines Junction	195	179	268
Teslin	324	340	241
Old Crow		175	221
Carcross	199	188	275
Pelly Crossing	137	141	135
Beaver Creek	114	120	123
Upper Liard	148	219	106
Destruction Bay	64	82	72
Burwash Landing	69	67	71
Keno	144	79	70
Stewart Crossing		43	39
Swift River		33	33

Source - Statistic Canada

TABLE 2

Author's Estimate of 1978 Permanent Population of Selected Settlements based on Number of Occupied Dwellings

	Total		Estimated Indian Population
Whitehorse	13,000		500
Faro	1,600		
Dawson	907		190
Watson Lake	770	(Excludes surrounding area)	
Elsa	470		
Mayo	473		200
Ross River	370		180
Carmacks	350		207
Haines Junction	434		140
Teslin	362		185
Carcross	285		135
Pelly Crossing			
Beaver Creek	104		
Destruction Bay	63		
Burwash Landing	110		100
Keno	106		
Stewart Crossing	15		
Swift River	30		

land-claims may also be responsible for the differences.

The Socio Economic Baseline Data Inventory (DIAND 1978) is the major statistical compilation directly related to pipeline impact studies. Much of the data in the work is dated - 1971 being taken as a baseline - thus ignoring major changes in the territory over the following six years, and the publication contains many serious inaccuracies. Many tables do not balance - a problem perhaps attributable to 'rounding' of figures, which is misleading in an area of small rural communities. The major omission of the work is that it neglects to give any weight to the native economy. Ample field evidence is available as to the presence (if not viability) of the native land-based economy yet according to the Inventory no person is involved in such activity in the two settlements when it is most dominant (Old Crow and Pelly Crossing). Only 1.89% of the Yukon's Indian labour force is listed as being employed in hunting based activities. Ironically the preface to the study states,

> 'it is hoped that this inventory will not only provide data useful for impact studies..... but will be of valuable assistance to researchers of other Yukon studies.'(DIAND 1978 p. 3)

Obviously any person using the source would be compounding existing errors.

If base population data is suspect then manipulation of such data becomes even more speculative. Chang-Me Lu (1975) utilises a sophisticated model to predict population levels in the Yukon in 1981; the base native population used is that provided by Statistics Canada, and the paper contains the Statistics Canada assumption that households move only once every five years. Such an assumption is hardly valid in a region reknown for its high population turn-over rates (Laatsch 1972, Duerden 1979).

Cartographic data supplements census data as a primary source of information. Although the Department of Local Government (1978) has produced community maps, field work conducted by the author in the summer of 1978 indicated that most of

the maps contain gross errors relating to plan, building location, and general orientation.

The secondary sources on Yukon settlement have been produced by academics, interest groups, consultants, and government departments. They range in scope from discussion of individual settlements (Lotz 1963, Koroskil 1970) and groups of settlement (Ridge 1953, Laatsch 1972) to overviews of settlement structure (Bore 1963, Duerden 1971, Green 1976). Both Lotz (1963) and Koroskil (1970) were concerned with the development of the respective communities of Dawson City and Whitehorse in the regional context of the Yukon, and within their works is an implied recognition that these communities do not exist in isolation but that their well-being is a function of their relationship with other communities in the territory.

A recurring theme of those works that take an overview of settlement development is one of settlement persistence. Essentially, concern is with identification of those factors responsible for longevity and stability of settlements in the north; even here the preoccupation has been with mining settlements as opposed to the numerically larger set of tertiary and subsistence based communities. This is probably a reflection of the fact that data are more readily available on the former than on the latter. The persistence theme was first developed by Ridge (1953) and then re-echoed by Duerden (1971) and Green (1976). These works contain relatively little reference to native population or settlement - despite the fact that it has been the most persistent human feature of the territory's landscape. It was Cruikshank (1974) who first synthesised material on native settlement and drew attention to this largely ignored dimension of Yukon spatial structure.

Green's work is indicative of the way errors may be compounded when data from government sources is used uncritically and existing material on the territory is synthesised without verification through field work. In examining settlement persistence Green (1976) used historical population and

employment data. Although his base maps post-date similar maps and related critique by five years (Duerden 1971) they contain some major inaccuracies, while failure to recognise the presence of either native population, communities, or spatial economic structure, is an error made less understandable by the fact that his work post-dates Cruikshank's by two years.

Government reports on Yukon settlement range from housing surveys (Government of Yukon 1977) to the Lysyk Enquiry and the Yukon Land Use Study (Redpath 1979). There are two major housing surveys; that produced by the territorial Government in 1977 contains major inaccuracies in measuring housing stock in the various Yukon communities,[2] while a consultants report examining housing needs in the Yukon (BCRH 1975) fails to even mention the housing stock in any one of the eight communities studied.

The Lysyk Report (1977) contains data and descriptions based largely on the described data sources and synthetic works. It is rather disturbing that despite the financial outlay for inquiry preparation no new data were generated. The Lysyk Inquiry recognised the problem and expressed its frustration,

> 'the effect of information deficiencies are cumulative..... the failure to accumulate and use base data has long-range implications. Without an accurate indication of past trends analyzing current trends becomes difficult if not impossible.' (Lysyk 1977 p 89).

Data Generation

Data were generated in the course of the project in response to two needs - the already described failings of existing data, and the specialised needs of the project. In the former case data existed, but because of inaccuracies (for example land-use maps) they could not be used. In the latter case the specialised needs of the project related to the fact that the approach taken - attempting to measure interaction between communities, was unique. Because of the described deficiencies extensive field work was required.

In the course of field work data were generated on migration, employment, shopping behaviour, land-use, building conditions, and changes in community land-use in the period 1968-78. Field work also provided data that could not be quantified - a qualitative feel for the various dimensions of life in Yukon communities; a feel for the extent to which published works concerning the Yukon matched the reality of life there.

Land use mapping was simply accomplished by walking round communities and placing information - building function, condition, construction material - on a base map. In many instances the base maps (compiled by Stanely and Associates for the Government of the Yukon) were wrong and had to be corrected.

Migration data, employment data, and journey to shop data were obtained from questionnaires. A major problem confronting questionnaire oriented research in the north is the apparent sensitivity of the population to questionnaires. Such sensitivity tends to manifest itself in small sample sizes.

Two steps were taken to ensure adequate sample sizes. First questionnaires were very simply structured - sacrificing a plethera of possibly relevant but also possibly infuriating detail and concentrating on the main questions.

A main concern of the work is with patterns of movement rather than with motivation for movement. Previous works (E G Jackson and Poushinsky, 1971) have attempted to establish motives for migration, with relatively little concern for spatial patterns. Such endeavours have the use of lengthy and complex questionnaires, and it is the opinion of the author that there is perhaps an inverse relationship between questionnaire complexity and sample size. Thus questionnaires were structured in such a manner as to elicit only the essential locational information (fig 2). The second step taken to guarantee large sample sizes was to have questionnaires orally administered, in the vast majority of cases by a member of the community being surveyed. Respondents were more receptive to a person from their own background (who,

FIGURE 2

RESIDENTIAL MOBILITY QUESTIONNAIRE

COMMUNITY

RESPONDENT NO:

OCCUPATION:

LENGTH OF RESIDENCE IN YUKON TERRITORY _____

LENGTH OF RESIDENCE IN COMMUNITY:

PREVIOUS RESIDENCE (1)

FOR HOW LONG? _____

OCCUPATION

PREVIOUS RESIDENCE (2)

FOR HOW LONG? _____

OCCUPATION:

PREVIOUS RESIDENCE (3)

FOR HOW LONG? _____

OCCUPATION:

OTHER COMMENTS (eg Reasons for Moves)

in many instances they knew), than to what they perhaps perceived to be ivory-towered academics from the south.

Questionnaires were distributed on a household basis - one per each head of non-Indian household. Where possible random sampling was employed, with stratified random sampling used in those communities displaying marked social differentiation - Elsa, Faro, and Whitehorse.

Resultant sample sizes were large (table 3), and lower sizes resulted not from refusals (less than 10 out of a total of 962 questionnaires), but because potential respondents were not at home.

The data have been used on a household basis. For example the sample for a given community has been weighted to represent the community as a whole. Thus in discussing residential mobility or journey to shop behaviour we are discussing household moves, or household shopping habits as opposed to actions of individual members of the population.

Questionnaires were not distributed to the Indian population. This was done out of deference to the CYI who, although cooperative in all other aspects of this project, were concerned about the sensitivity of data in the light of ongoing land settlement negotiations and also felt that the surveys would further burden the Indian populace who were cooperating in CYI operated research projects. Although it must be conceded that failure to obtain this data detracts greatly from this type of study, - comparison of Indian and non-Indian migration patterns would be of inestimable value in evaluating the impact of various developments in the Yukon - it does not damage the validity of the current work. The establishment and growth of most settlements has been attributable to the non-native population; non-Indian decision making (investment and government) have been responsible for changes in population distribution; migration of population into the territory is overwhelmingly non-Indian; the wage labour force in the Yukon is non-Indian. Thus it is argued that a reasonable picture of changes in the territory's settlement pattern can be obtained without direct inputs from the Indian population; at

TABLE 3

Community Populations and Sample Sizes

	Estimated number of permanent Non-Indian households	Number sampled	%
Whitehorse	4235	427	10
Faro	580[1]	106	18
Dawson	200	100	50
Watson Lake	219	73	33
Elsa	224[1]	45	20
Mayo	78	39	50
Haines Junction	84	50	60
Carmacks	42	28	66
Ross River	59	14	24
Carcross	42	14	33
Beaver Creek	24	12	50
Destruction Bay	17	6	35

[1] Contains numerous single person households.

the same time the view would be more balanced and the whole study enhanced by the inclusion of such data.

The central question in the residential mobility questionnaire (fig 2) asked respondents to trace back their last four residential moves and state what their occupation was in each location, including the present one. Aggregation of responses to the questionnaire permits the construction of an origin/destination matrix for the Yukon over the past ten years, and also provides data on current employment in the various communities. Shopping behaviour questionnaires asked respondents where they shopped for a comprehensive variety of goods and services. Analysis of the questionnaires allows us to trace inter-settlement and extra-territorical expenditure patterns, and establish the extent to which money earned in communities stays in either those communities or the territory, and the extent to which retailing contributes towards inter-community transmission of economic activity.

Employment data used in this study are synthesised from a number of sources - residential mobility questionnaires, published reports, interviews with government officials, interviews with business operators, and interviews with town managers. Thus they only conform to figures published elsewhere in very few cases, but the author feels that they are representative of economic activity in individual communities in the summer of 1978. This data allows one to identify the functional structure of individual communities and establish the extent to which different communities are functionally linked.

2. SETTLEMENT IN THE YUKON 1850-1971

Essentially the Yukon Basin consists of a series of steep-sided plateaus with an average elevation in excess of 3,000 feet, bounded on three sides by mountain ranges and drained solely by the Yukon River and its tributaries (Fig3). To the north, the basin is bounded by the Ogilvie Mountains, to the east it is bounded by the Mackenzie Mountains, in the south and sout-west the interior plateaus terminate against the St Elias Mountains. These three ranges present formidable barriers to the penetration of the region.

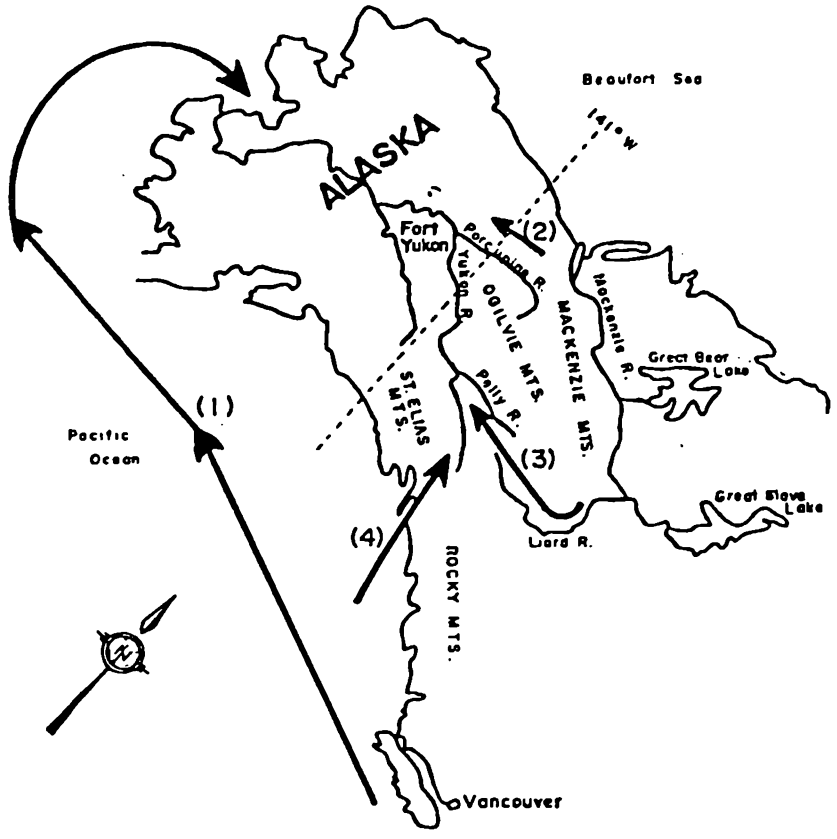
In human terms the climate of the Yukon Basin is adverse. January mean minimum temperature in valley locations vary from -10^{o} at Carcross in the south to -28^{o} at Dawson City in the northern part of the presently inhabited area.

Apart from topographic barriers and climatic vissicitude, penetration of the Yukon Basin in the past was discouraged by its very distance from more densely populated areas of North America. Whitehorse, in the southern part of the study area, is 920 air miles from Vancouver and 1,000 air miles from Edmonton. Further, the low-level route into the Territory is from the west, from the Bering Sea via the Yukon River, the mouth of which is frozen over some five months of the year (Fig 3).

The relief of the Yukon Basin, however, is such that once man has overcome distance and penetrated the surrounding barriers, he has a relatively high degree of freedom of movement. Numerous large inter-connected valleys contain navigable rivers and provide access to almost every part of the basin, while river confluences and forested valleys provided numerous potential sites for settlement and resource for construction and fuel.

Prior to non-Indigenous settlement the territory's population essentially consisted of two broad linguistic groups - the Tlingit in the Coastal Range area of the south and the Athapaskans throughout the Yukon Basin. All groups

Figure 3
The Situation of the Yukon Basin and Major Pre-Gold Rush Approaches



KEY

(1) Pacific Coast – Bering Sea Route
(2) Bell's Route 1842-1847
(3) Campbell's Route 1842-1847
(4) Pacific Coast – Chilcoot Pass Route C. 1878

had a land-based economy which involved them in extensive and largely nomadic use of the land. There is evidence (McClellan 1964 p 7) that even prior to white occupancy the Indians of the territory were involved in trade, inter-Athapaskans into indirect contact with the Russians on the coast of Alaska, with the Tlingit trading with both the Athapaskans and the Russians. Trade probably transformed Indian attitudes towards land, even before the establishment of Trading Posts by the early explorers. Land became the basis for acquisition of goods produced elsewhere, and this had a value over and above susbsistence. By the time trading posts were established land was regarded both as a basis for subsistence and a means of importing commodities.

Initially motive for movement into the Yukon Basin by the non-Indigenous population was the search for fur-bearing animals - and penetration was from the east, a logical extension of Hudson's Bay interests from the Mackenzie Basin. In 1842 Robert Campbell entered the Yukon Basin, crossing the Mackenzie Mountains from the headwaters of the Pelly, and descending the latter river to its confluence with the Lewes (Yukon), where he established Fort Selkirk in 1847 (Campbell1885). Further north John Bell had entered the Yukon system in 1842 from the Mackenzie by traversing the Peel watershed to the headwaters of the Porcupine and thence down this river to its junction with the Yukon, where in 1847 A H Murray founded Fort Yukon.

It was not until 1850 when Campbell sailed from Fort Selkirk to Fort Yukon that it was realized that both forts lay on the same river. This discovery resulted in the abandonment of the Pelly-Liard route in favour of the less arduous Peel-Porcupine route to the Mackenzie basin; the section of the Yukon River between Fort Selkirk and Fort Yukon was used to transport the products of trade to the start of the new route (Innis 1956 p 291).

Fur trading did not prove to be lucrative enough to further full exploration of the Territory, and there were many set-backs to the development

of the trade. In 1852 Indians sacked Fort Selkirk; Hudson's Bay posts consistently ran at a loss (Innis 1956 p 234), whilst in 1869 Fort Yukon was found to be in American territory and its operations were transferred to Rampart House on the Porcupine (Ogilvie 1913 p 65). The acquisition of Alaska by the USA appeared to be further detrimental to the interests of the Hudson's Bay Company insomuch as it now faced competition on the Yukon from the Alaska Commercial Company. In the face of the competition the Hudson's Bay Company started to consolidate its commercial interests on the Mackenzie at the expense of interests in the Yukon Basin (Wolforth 1971).

A further motive for the penetration of the Yukon Basin prior to 1896 was the search for gold. The sporadic infiltration of the Central Yukon by prospectors from about 1865 onwards must be seen as a continuation of the northern movement of prospectors through the Cordillera which had started with the California gold rush of 1849. Prospectors came from the Pacific Coast, and in their northerly movement entered the Yukon Basin from the south, developing a new line of communication. In 1878 George Holt entered the Yukon Valley system by traversing the Coast Mountains via the Chilcoot Pass from the Pacific Ocean to the headwaters of the Yukon (Berton 1958 p 6). Holt's route had two major advantages. Firstly the approach to the Canadian Yukon from the Pacific Coast was shortened by well over 2,000 miles. Secondly the Chilcoot Route could be utilised earlier in the year than the route from the mouth of the Yukon - the upper river being free of ice and consequently navigable before the lower river.

A north-south line of communication was thus established through the territory. The route essentially ran transverse to those traditionally used by the Indian population who tended to utilise the tributaries of the Yukon River. The two route systems reflected the spatial impress of two different economic systems, one concerned with the exploitation and removal of industrially oriented resource, the other land oriented. Cruikshank argues that the paucity of reports of sitings of Indians by early prospectors and

traders resulted not from the fact that Indian population was sparse but from the fact that the inhabitants of the territory pursued two different economic activities with different patterns of movement (Cruikshank 1974 p 37).

Until 1896 small groups of prospectors entered the Territory, establishing settlements that were abandoned as their inhabitants drifted from reported gold strike to reported gold strike. Prior to the Klondike Rush only four settlements with any semblance of permanence emerged. These were Stewart, Ogilvie, and Fortymile, which acted primarily as mining service centers and trading posts, and Fort Selkirk which was re-opened in response to increased traffic on the Yukon River.

The settlements acting as mining service centers displayed similar locational features. All were located at the junction of the Yukon and a tributary river on which prospecting was taking place. Fortymile was the most important of the communities. It had evolved in 1887 at the junction of the Fortymile and Yukon rivers, close to the Alaskan boundary in response to the discovery of gold in the valleys of the Fortymile river and its tributary streams. With a population in excess of 500, an NWMP detachment, mission, and two trading companies it was, by 1892, the largest settlement in the Yukon Basin (Berton 1958_B).

The Yukon Basin appears on the eve of the Klondike Rush as a sparsely populated and largely unexplored area with non-native occupance confined to the Yukon River Valley. As late as 1892 Charles Hayes of the United States Geological Survey reported that,

> "Between the Yukon River and the St Elias Mountains lies a large area... which has been geographically a blank. So far as can be learned it has never been penetrated by a white man, and the lakes, rivers and mountains which appear on many maps are a product of the geographer's imagination."[13] (Hayes 1892 p 120).

Within the area of occupance there was further imbalance of population distribution. The vast majority of the Territory's immigrant population,

estimated to be about 1,000 in 1893 (Berton 1958_B), was located in the vicinity of the Fortymile gold strike, with the remainder living in scattered camps through the Yukon Valley.

The discovery of gold on Rabbit Creek, a tributary of the Klondike River, on August 16, 1896, provided the trigger action for migration into the Territory on an unprecedented scale, effectively driving a population salient into the virtually uninhabited Canadian Northland. The migration to the Klondike area was in two stages. Firstly there was internal migration as prospectors moved from camps within the Territory to the new strike. In 1897 Ogilvie was able to record that,

> "The reports from the Thron-Diuck are very encouraging, so much so that all other creeks are now practically abandoned, especially those on the Fortymile," (A letter from Cuhady, Y.T. 11/1/97).

Secondly there was influx of population from outside the Yukon Basin. This movement cannot be explained by just one positive factor, namely gold discovery; there were other factors influencing the individual's appraisal of the region that made it seem both attractive and accessible. Mass circulation newspapers exaggerated the size of the gold discoveries and neglected to mention the physical adversity of the Yukon Basin. The news of the gold discovery hit an economically depressed industrial-urban world where, if anything, there was an abnormal demand for individual wealth, where supplies for an expedition were cheap, and where the possibility of finding gold was a viable alternative to unemployment. Finally mechanised transport in the form of the railroad and the steamship could convey a person to the periphery of the Yukon Basin from any of the populated areas of North America in a matter of days.

As can be seen from comparison of figures 4 and 5 the Klondike rush did not greatly widen the existing zones of non-Indian occupance in the study area. The Yukon Valley functioned as a major route to the gold-bearing areas as it had for the previous twenty years, and numerous small settlements appeared on the banks of the Yukon throughout its length from its source to its junction

with the Klondike. The main area of concentration of population and settlement was the gold-field area, comprising the valley of the Klondike and its tributaries where the vast majority of the 30,000 persons arriving in the Yukon Basin in the period 1896-99 were located. The only significant immediate change in population distribution brought about by the Klondike Rush was the attraction of migrants to the Klondike as opposed to the Fortymile.

Four types of settlement can be identified in the period 1896-1900.

i) Service and Distribution Centres. Service and distribution centres had existed prior to the Klondike Rush in the form of Stewart, Ogilvie, and Fortymile. Dawson City, which became the centre for the Klondike mining area displayed similar locational features to its predecessors. It was located at the junction of the major navigable river (the Yukon) and a non-navigable tributary (the Klondike), the valley of the latter giving easy access to the mining area.

All the non-extractive settlements stood either at low-level nodal locations in the territory's river valley network or at physical obstacles to navigation. They were usually in flood plain locations, where a trade-off was accepted between flood hazard, amelioration of adverse climate related to altitude, inversions, easy access to the surrounding area and ample room for growth.

ii) Mining Settlements. These housed the labour force involved in mining and prospecting operations. Their location was dictated by proximity to gold-bearing gravels, and they lay in valleys of creeks tributary to the Klondike and Indian Rivers.

iii) Settlements Serving Lines of Communication. Settlements emerged on the routeways through the teritory, essentially to serve transients on these routes and maintain the lines of communication. The distribution of these settlements was partly dictated by the nature of the transport route itself. On the Yukon River route, Bennett emerged at the point where travellers and

lake coincided and boats could be built for the journey northwards; Canyon City and Whitehorse came into existence where navigation difficulties dictated a portage; the settlement of Laberge acted as a resting place after the hazardous crossing of Lake Laberge. Initially examination of a map of the Yukon Valley for the period 1900-1910 showing regular distribution of settlement suggests that such settlement emerged due to the service needs of transients and the fueling necessities of steamboats. However, whilst the servicing of transients was undoubtedly a major motive for the emergence of many Yukon Valley settlements, it is to be borne in mind that hunting and trapping made a substantial contribution to the livelihood of these communities. Consequently it is to be surmised that the spacing of settlements in the Yukon Valley may have been partly a function of the area required to maintain a viable hunting and trapping economy.

iv) Indian Settlement. It would appear that, apart from the Klondike area where the pressure of population was so great that an Indian Village was established at Moosehide, and Selkirk where land was set aside for a reserve, the Indian population was largely unaffected by the Klondike Rush. In some instances newly established river settlements coincided with the location of Indian summer camps. This increased Indian dependence on the non-native population and provided new employment opportunities for Indians in seasonally operated wood camps.

The "Klondike Rush" was short-lived. It reached its peak in the summer of 1898; by 1900 its force was spent. With improved economic conditions in industrial-urban North America, exhaustion of the more accessible gold, the advent of large-scale capital-intensive extractive methods, and realization of the hardships involved in living in the Territory, population declined rapidly. The Territory's population, estimated to be 30,000 in 1899, had fallen to 8,512 by 1911. In terms of human numbers, the Klondike Rush had

been over-subscribed, the miners who were in the Territory prior to the discovery of the Klondike deposits staked the best ground before migrants from outside arrived. There were no alternative occupations for the surplus population.

> "The Klondike Rush could not reveal, as others could, the capacity of a region for carrying a large population at a higher level of civilization." (Morrell 1939 p 400).

The Klondike Rush left a marked impression on the Yukon. Numerous settlements had been established in areas where none had existed before. A regular north-south line of communication had been forged with the introduction of a regular steamboat service on the Yukon River, the opening of the White Pass railway from Skagway to Whitehorse (1900), and the construction of the Whitehorse-Dawson winter road (1902) (Fig 4). Finally the magnitude of the Klondike Rush had been such that exploration of the Territory had been furthered, whilest the residue population after the rush had terminated was large enough to act as a reservoir for future exploration and development.

Paradoxically the decrease in population was accompanied by proliferation of settlement outside the Klondike area. The reason for this proliferation lay in the search for economically viable minerals beyond the confines of the Yukon Valley and the Klondike gold-fields. As production in the Klondike levelled out and became increasingly monopolized by large-scale organizations, so prospectors encouraged by the magnitude of the Klondike discovery directed their attention to other parts of the Yukon Basin.

Whether a mineral claim was staked or worked depended upon human assessment of the economic viability of the ore involved. This assessment involved the consideration of numerous variables - the most important of which were transportation costs, the actual cost of working the ore, and world mineral prices. The most important single factor contributing to the development of mining in the period 1900-12 was reduction in transportation costs. The construction of the White Pass railway had reduced the cost of transport from Whitehorse to Skagway from $1.00 per lb. in 1898 to 4½ cents per lb. in 1901 (Sessional Papers 1901) and although brought into existence by

the Klondike development, it aided the whole region, substantially reducing the cost of transporting any mineral found within the Yukon Basin.

As the search for minerals widened through the Central Yukon, so numerous temporary prospectors' camps emerged, eventually being replaced by more permanent settlement following the discovery of apparently economically viable minerals. Despite the spate of exploration in the period 1900-1910, when most of the major valleys of the study area were surveyed, mining only developed in four areas - the Mayo area (silver, lead), the Kluane area (gold) in the immediate vicinity of Whitehorse (copper) and on Windy Arm of Tagish Lake (Fig 6).

The location of apparently economically viable mineral deposits dictated the direction of growth of lines of communication within the Yukon Basin. Transport routes were forged to connect the new mineral deposits to the main north-south line of communication. The Stewart River became the line of communication between the Mayo mining area and the Yukon Valley; the valleys of the Takhini and Dezadeash joined the Kluane area to the Yukon Valley, whilst the Whitehorse and Conrad areas lay within the Yukon Valley itself. The extension of communications was accompanied by the growth of attendant transient serving settlements, and in the mining areas themselves service and distribution and extractive settlements emerged. Kluane acted as distribution centre for the Kluane mining area, Mayo Landing and Gordon Landing served the same function for the Mayo area (Keele 1904 p 127), and Carcross, at the point where the White Pass railway crossed Tagish Lake, acted as the distribution centre for the Conrad Mines (Cairns 1906 p 210).

Proliferation of mining activity was accompanied by proliferation of trading posts beyond the immediate confines of the Yukon Valley - Champagne in 1902, Ross River 1903, Burwash 1904, and Old Crow in 1912 (Cruikshank 1974). As a result the more distant Indian populations were brought more directly into contact with the non-native economic system.

Throughout this period much of the Indian population remained nomadic. Although land was surveyed and allocated for native occupany at Mayo (date unknown), Whitehorse (1916) and Little Salmon (1916), the population pursued traditional nomadic hunting and trapping activities, returning periodically to live and trade in the vicinity of established posts at such places as Ross River, Burwash Landing, Selkirk, Champagne, Watson Lake, and Old Crow.

The forces of dispersion were spent in a very few years. By 1910 proliferation of communications and settlements had virtually ceased, and over the next two decades the mining developments which had followed the termination of Klondike Rush proved to be economically precarious. The Conrad mine closed, transportation proving to be a costly factor in development despite proximity to rail-head (Cairns 1916, p 452). In the Whitehorse area geological problems rendered copper mining expensive, extraction eventually ceasing with the collapse of copper prices at the end of the First World War (Ridge 1953 p 289). By 1930 the Mayo area, the site of the most important post-Klondike minerals discoveries, was experiencing difficulties as world silver prices declined,

> "...an ore that was profitable a year ago can no longer be considered an ore, the minimum content of silver necessary for economic operation has nearly doubled." (Cockfield 1930 p 611)

It was increasingly evident that mining activity within the Yukon territory, characterized by high costs due to such factors as distance from markets, labour shortage, and high capital expense involved in working in areas of permafrost, could only survive under boom conditions where exceptional world prices off-set high cost of production.

Despite the low level of population in the period 1920-40 there was no appreciable shrinkage in the number of settlements or abandonment of any major inhabited areas. As mining activity faltered settlements moved towards a subsistence existence, trapping making a greater contribution to the economy of individual settlements. As long as the mines in the northern part of the

study area remained open the unwieldy communications network which served them had to be maintained with its attendant road houses, steamer fueling stations, and dependent hunting and trapping-based river settlements.

The stagnation of the period 1920-40 seems almost paradoxical when conditions in this period are contrasted with those contemporarious to the Klondike Rush. The territory was now mapped and explored; there was a transportation infra-structure, the cost of movement within the territory was relatively low. Settlements existed providing accomodation and services; there was even a major world depression greater than that which had preceded the Klondike Rush, conceivable providing external conditions favourable to migration into the Territory (Robinson 1962).

The causes of stagnation were economic and human. The economic causes - distance from world markets and fluctuating world mineral prices - have already been outlined. In human terms man was now fully acquainted with difficulties of life in the Territory; the penetration of the Yukon Basin was no longer the pioneering trip of thirty years previously with aspirations and hopes built upon lack of knowledge, false report, and rumour. The printed media which was once exaggerated the accessibility and wealth of the Yukon Territory now told of the hardships faced by the vast majority of the gold-seekers on the Trail of '98 - people who had entered the Yukon in the winter of 1897 prior to the advent of the railroad, steamboat, or sizeable permanent settlement.

The second growth period in the Yukon dates from the end of the Second World War, and three factors can be seen as instrumental in the revival of the territory's economy: highway construction, renewed government interest in the Canadian North, and increased world demand for a variety of minerals.

Construction of the Alaska Highway system for Alaskan air-bases heralded an era of road development. Within the study area the highway runs from the British Columbia border to Whitehorse and then along the line of the former Kluane wagon road and Shakwak Valley to the Alaska border. In the post-war

period a Government (Federal) financed road construction programme was introduced; by 1955 highways paralleled and replaced the Yukon River and the Stewart River as routes to the mineral bearing areas of the north. More recently the highway system has been modified with the construction of a highway from Watson Lake on the Alaska Highway to Carmacks on the Whitehorse-Dawson road in order to serve the Anvil-Dynasty development and the associated new town of Faro. This link may well have future regional significance insomuch as it represents the first true, albeit primitive, network development in an area with a transport system which up to the present time has been of the type traditionally associated with the early stages of economic development (Taaffe 1963, p 504).

Both highway development and Government activity have been instrumental in influencing the final factor contributing to economic growth in the post-war period - namely increased mineral exploration. High world mineral prices, reflecting increased demand for a wide range of technologically applicable minerals - such as copper, zinc and asbestos - led to renewed prospecting and mining activity. The new highway system reduced transport costs and provided all-season single-media transport to the mining areas, whilst Government financial assistance created a climate favourable to the expansion of the mining industry.

In the period 1945-1971 the settlement pattern in the study area changed radically. The initial observation to be made is that population increased from 4,914 in 1951 to 18,385 in 1971, but the number of settlements fell from 26 to 19 in the same period. (Figs 8 and 10). At the same time there was no non-native proliferation of settlement outside that part of the valley framework of the Yukon Basin peopled prior to 1910 - namely the valleys or immediate tributaries of the Yukon, Stewart, Dezedeash, Takhini, and Shakwak - and one major area, the Klondike, was virtually abandoned (Fig 10)

The decline in the number of settlements can be accounted for by two major factors - the abandonment of mining camps in the Klondike as operating costs rose in the face of a fixed world gold price, and the ceasing of river traffic on the Yukon following the construction of the Whitehorse-Dawson Highway. Although river settlements had a dual economy, namely trapping and the servicing of river traffic, the closure of regular river transport led to their demise. Lotz commented on the social ramifications of highway development,

> "Before 1953 the river was alive with boats... a living thread down which travelled people, news, goods and gossip. The highway that can be traversed so quickly does not serve the same function." (Lotz 1962 p 23).

With the advent of the highway the cumbersome transport routes which had required numerous service settlements were displaced. Those river settlements which the Whitehorse-Dawson-Mayo road by-passed failed, and it is interesting to note that with their demise came a decline in the value of furs trapped in the Yukon, (Carr 1968 p 187) possibly reflecting the contribution that these river settlements had made to the economy of the territory.

Native settlement patterns have gone through several transformations since 1850 and changes related to highway construction were the latest in the process of debasement of Indian life-style. Prior to contact temporary camps served nomadic subsistence and trade related activities. Following contact a certain amount of Indian dependence on the white population for various commodities developed, and non-native settlements became incorporated into nomadic patterns. As this dependence grew with the ascendancy of the non-native economy and government so permanent villages were established and the Indian population became increasingly sedentary. Changes in lines of communication - displacement of river traffic from the Yukon, the construction of the Alaska Highway, resulted in abandonment of traditional villages and the establishment of new ones - mainly in dominantly non-native settlements.

The decrease in the number of settlements accompanied a shift in the balance of population distribution from the Dawson-Mayo axes in the north to the Alaska Highway in the south. Once more the failure of mining in the Klondike was a contributing factor, but further factors were the rapid growth of Whitehorse as the Territorial Capital after 1953, and the growth of settlements such as Watson Lake, Haines Junction and Beaver Creek on the Alaska Highway as tourist services developed and native settlements by-passed the new highway were depopulated.

The advent of the all-weather highway has influenced the location of extractive settlements. Prior to 1955 three types of settlement - communications serving, distribution centre and mining community - may have been required to serve a mining area, reflecting the cumbersome and seasonal transport links within the territory. After 1955, with single media transport only one functional type, or indeed one settlement was required. Settlements involved in extraction could act as both service center and mining community; reliable single media transport allows a community to be located away from the point of extraction, possibly allowing compromise between relatively hospitable settlement site and access to the mining area.

This new locational trend was seen in the development of the new towns of Clinton Creek and Faro. Both towns were created in the late 1960's, Clinton Creek serving an asbestos mine on a tributary of the Fortymile River, and Faro housing the labour force of the Anvil lead-zinc mine near the Ross River. Although it would have been cheaper to combine townsite and mine at one location in the case of Clinton Creek, (Christian 1966 p 151) aesthetic considerations over-rode short-term financial considerations and the town was located on the Fortymile River some five miles from the mine-site, whilst Faro is located about fifteen miles from the Anvil mine. One may surmise that the sociological and psychological benefits of this location for the settlement's population may, in the long run, outweigh any short-term financial saving that would have been made by location at the point of extraction.

The Territory's service centres act as the nodes of the highway system, and as such their fortunes over recent years have been closely tied to the new lines of communication. Although the highway displaced the original "raison d'etre" (break of media) of the communities, the high speed transport it provided strengthened their hold over their umlands. Displaced persons from the river settlements which had collapsed with the closure of river traffic now moved into these large centres. The result of these changes was that the decline of Dawson and Mayo was halted (at least temporarily) and Whitehorse, at the hub of the transportation system, strengthened its position as the Territory's primary service centre.

From the foregoing examination three virtually inseparable factors influencing the development and distribution of Yukon settlement can be recognized.

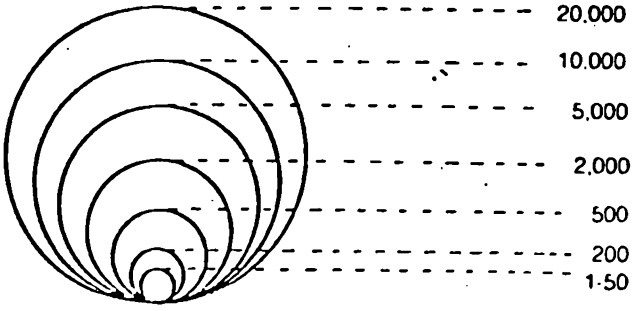
The first is the physical factor. Interconnected valleys with relatively low elevation provide the most hospitable settlement sites and easiest routeways in a remote, rugged, and climatically adverse area. With the passage of time accumulated geographical knowledge and technological advance have given man the capacity to settle in what he previously perceived to be marginally habitable areas, thus apparently diminishing the importance of physical controls. At the same time, however, improved transportation has enabled man to locate on fewer, more hospitable settlement sites without any corresponding reduction in the aerial extent of primary economic activity. Within the valley framework man had a high degree of freedom of movement, and direction of settlement development within the framework was dictated by the second factor, namely that of economic incentive.

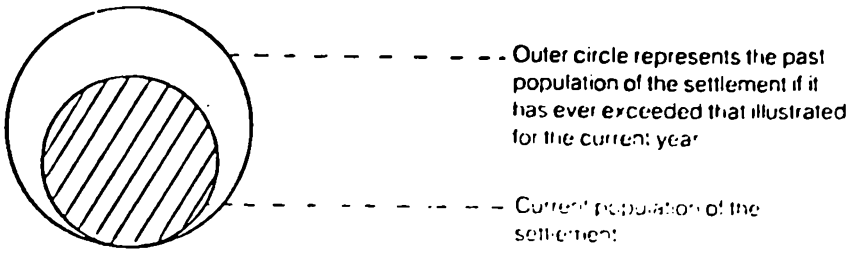
The role of the economic factor can be seen on two levels. On the national scale it was the economic attractiveness of the region relative to other regions as perceived by potential migrants which was responsible for migration into the territory. On a regional scale, the proliferation of

settlement accompanied the discovery and attempted exploitation of seemingly economically viable minerals, the location of the mineral deposit dictating the direction of settlement proliferation. Much short-lived settlement resulted from failure to adequately consider such factors as transport costs, or relate costs incurred in extraction and transportation to world mineral prices. It is significant to note that the greatest proliferation of settlement took place in the decade following the discovery of gold on the Klondike, when man's assessment of the possible mineral potential was coloured by objective optimism resulting from the discoveries in the period 1896-98, and when much of the territory was unknown and the marginality of mining operations not fully appreciated.

The final factor influencing location of settlement is technology. Technological improvements have rendered mining operations less marginal and physical adversity more tolerable over time, changes in mining techniques and transportation influencing the actual site and distribution of settlement. Changes in transport technology have resulted in the most visible modifications in settlement pattern. As old lines of communication were displaced by new ones, the Chilcoot Trail by the railroad, the Yukon River by the highway, so the spatial distribution of settlements changed in response to the changing requirements and capabilities of different types of Media Transport improvement has given man as increasing degree of freedom in respect to settlement location and has allowed him to concentrate his activities in fewer settlements without any corresponding decrease in the area of the ecumene.

KEY TO POPULATION CHANGE MAPS





Major Function

Communication Servicing
Mineral Extraction
Trading Post
Local Service Centre
Territorial Service Centre

Routes

River
Trail
Wagon Road/Winter Road
Railway
Highway

Absence of a population size circle indicates a settlement with unknown population, in most cases probably much less than fifty.

Figure 4
1893

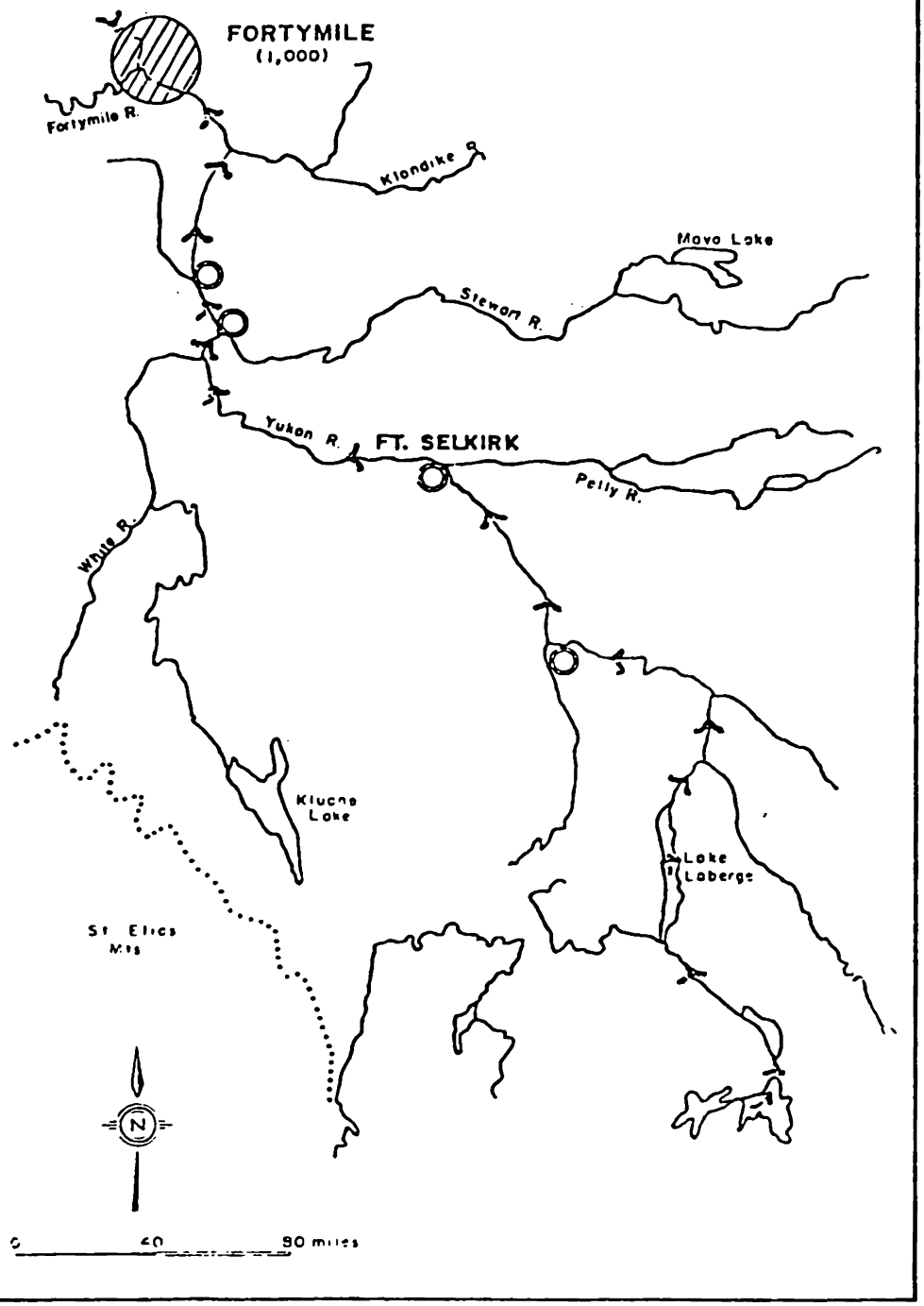


Figure 2.5
1899

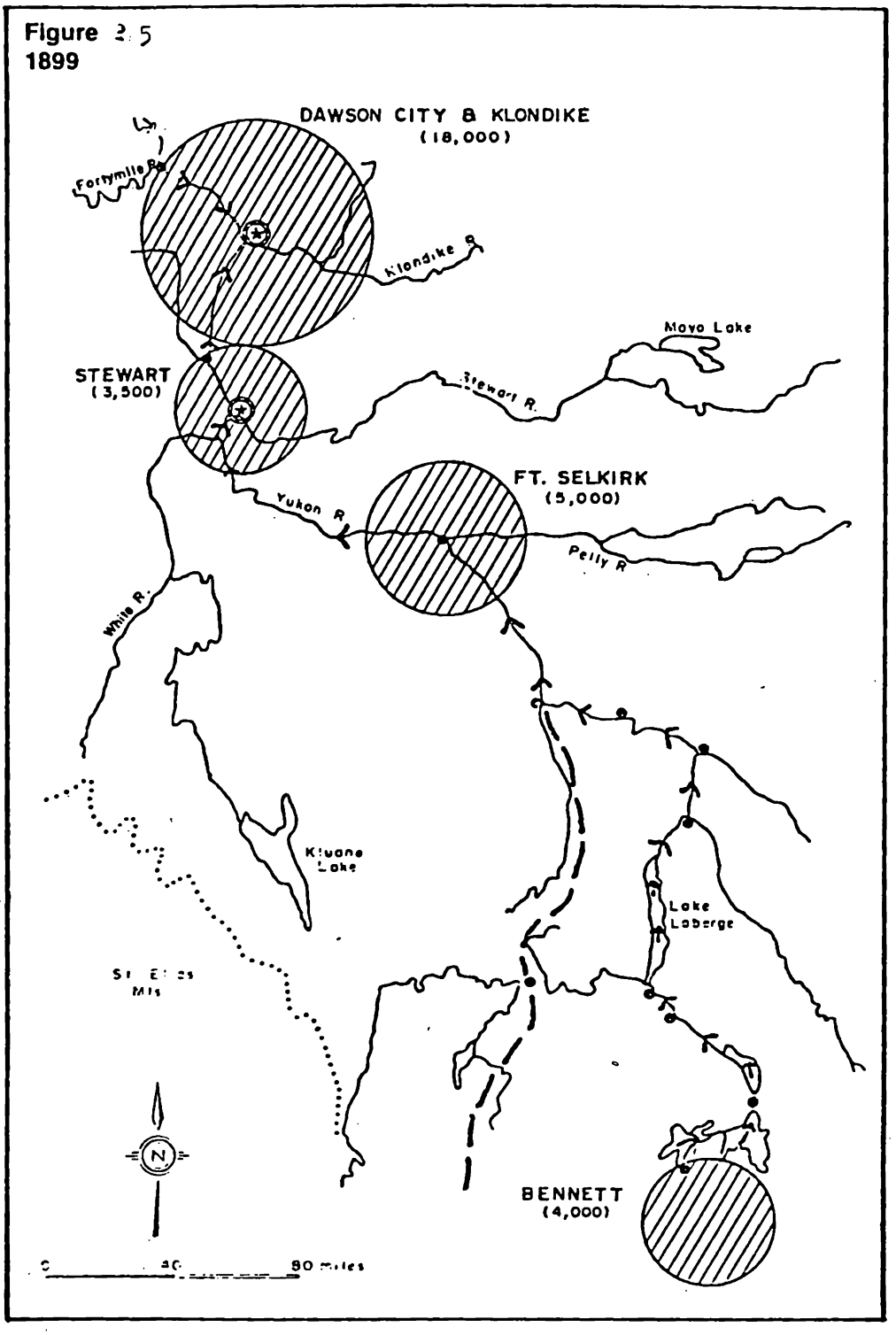


Figure 6
1911

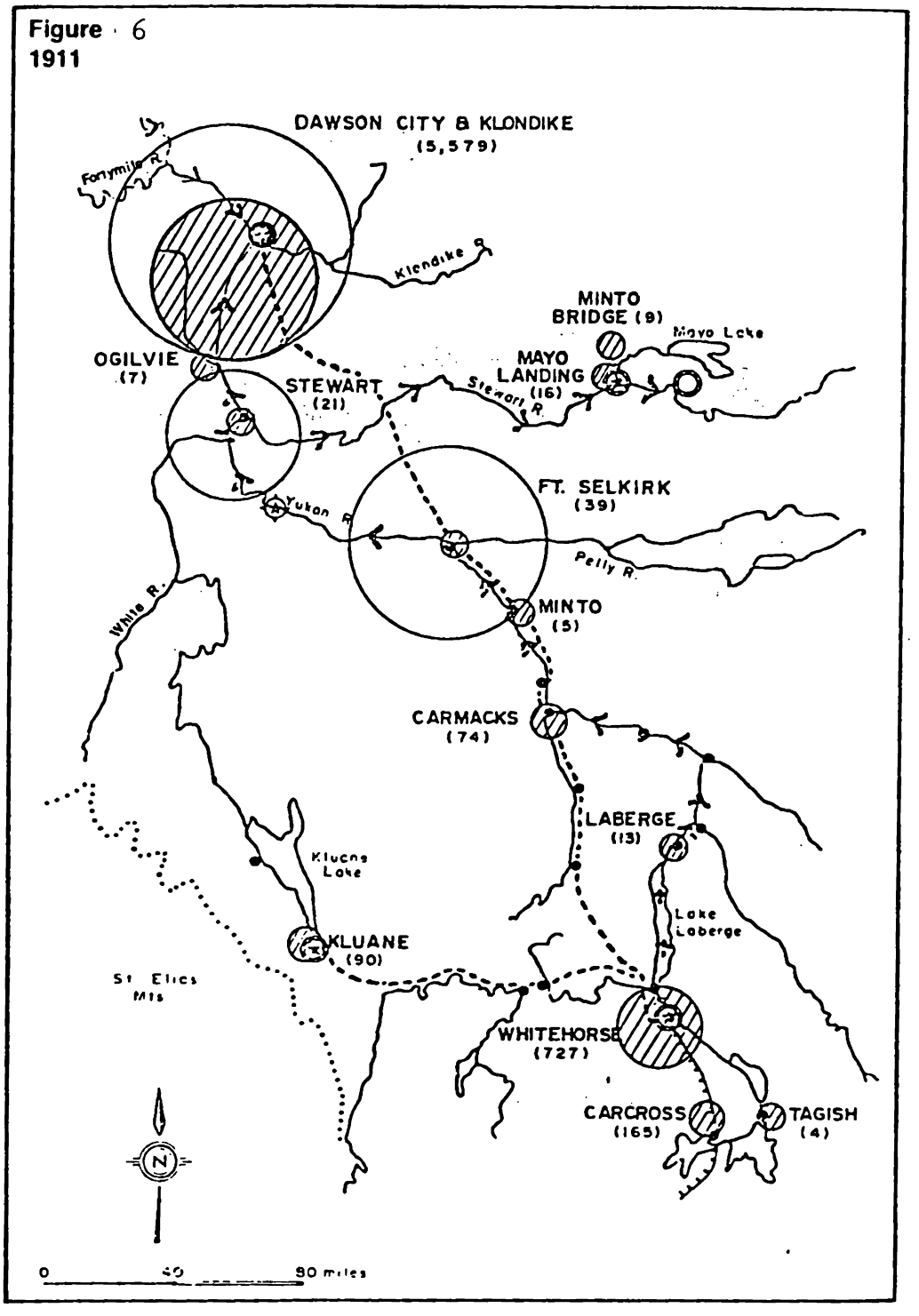


Figure 7
1921

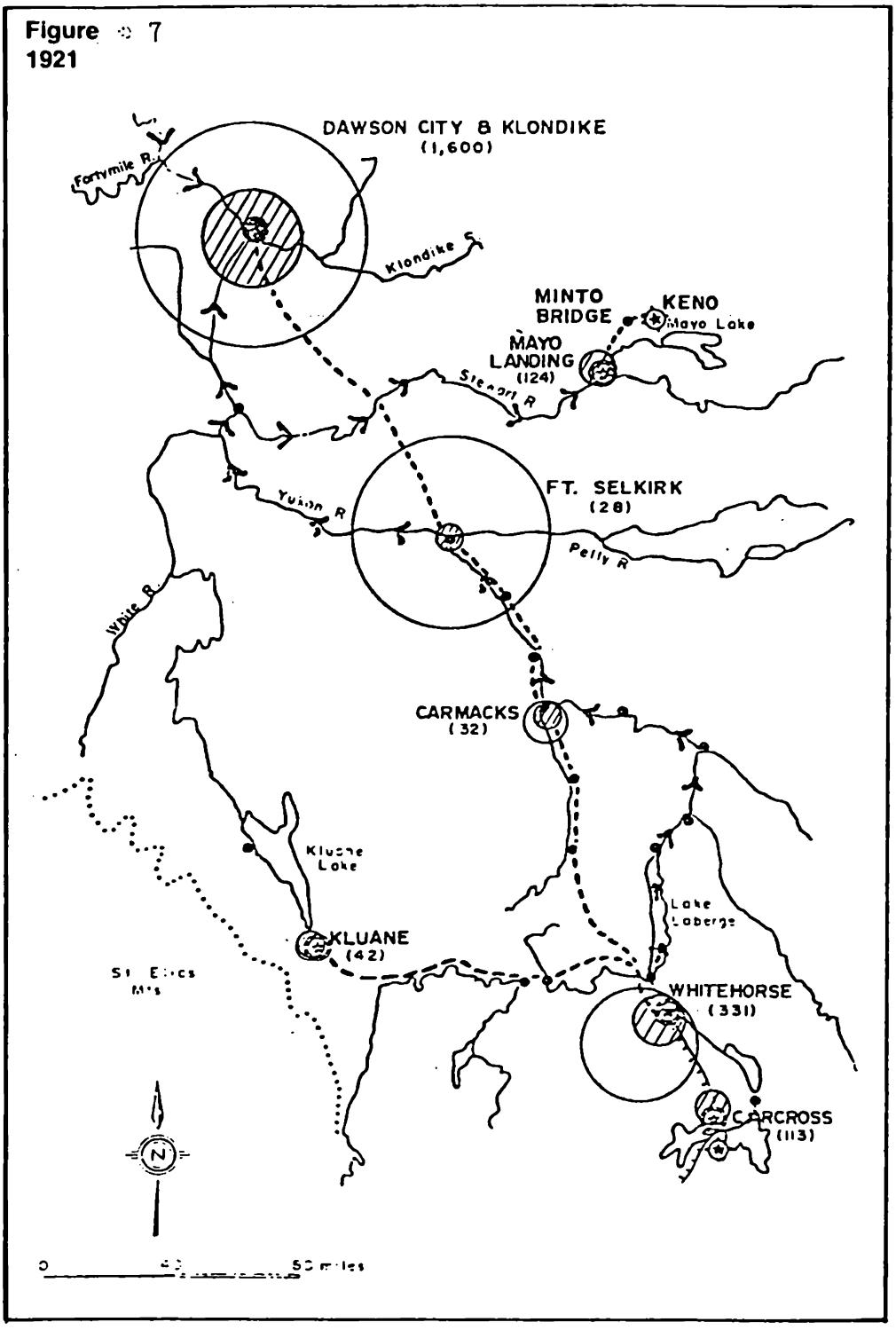


Figure 8
1951

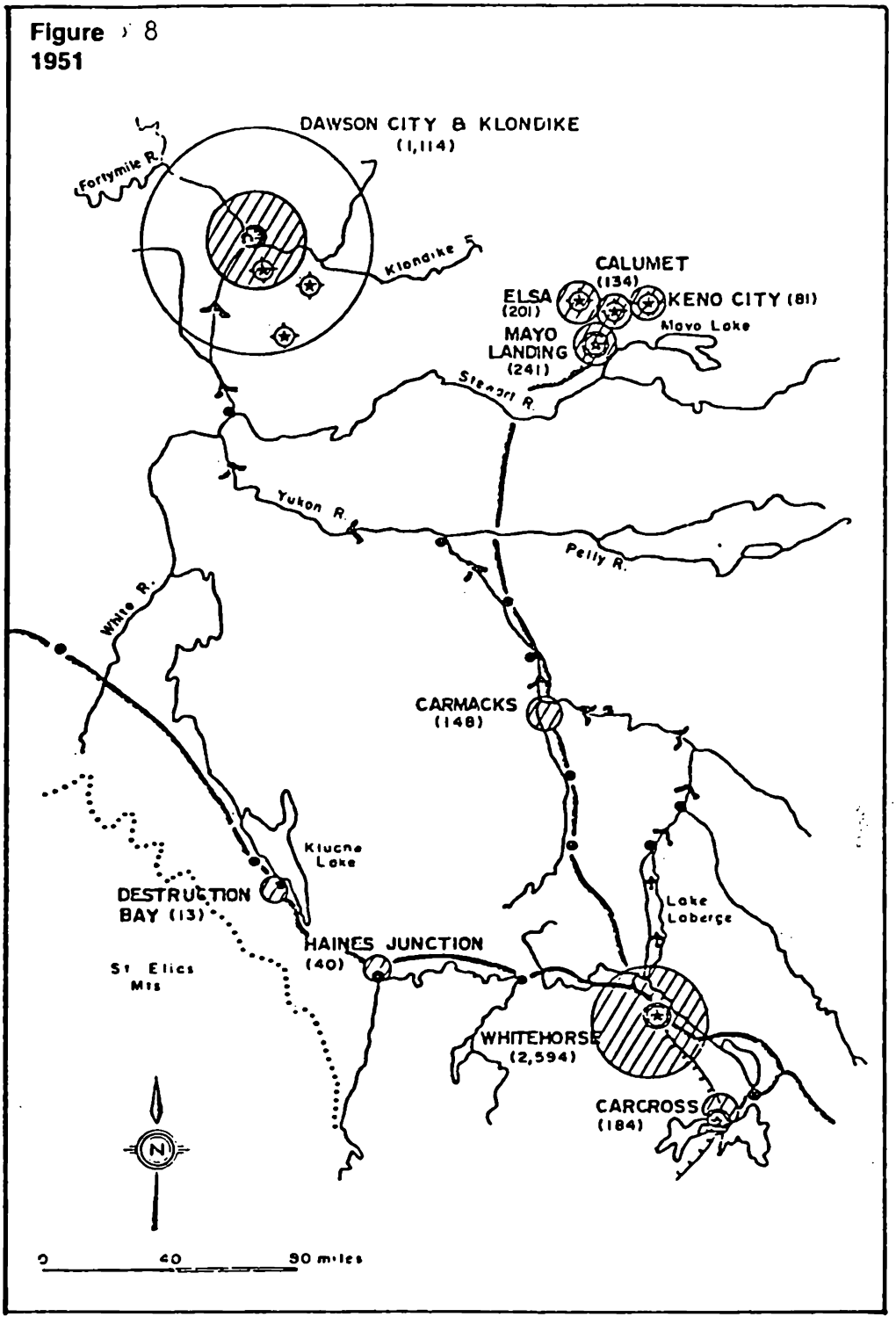


Figure 9
1961

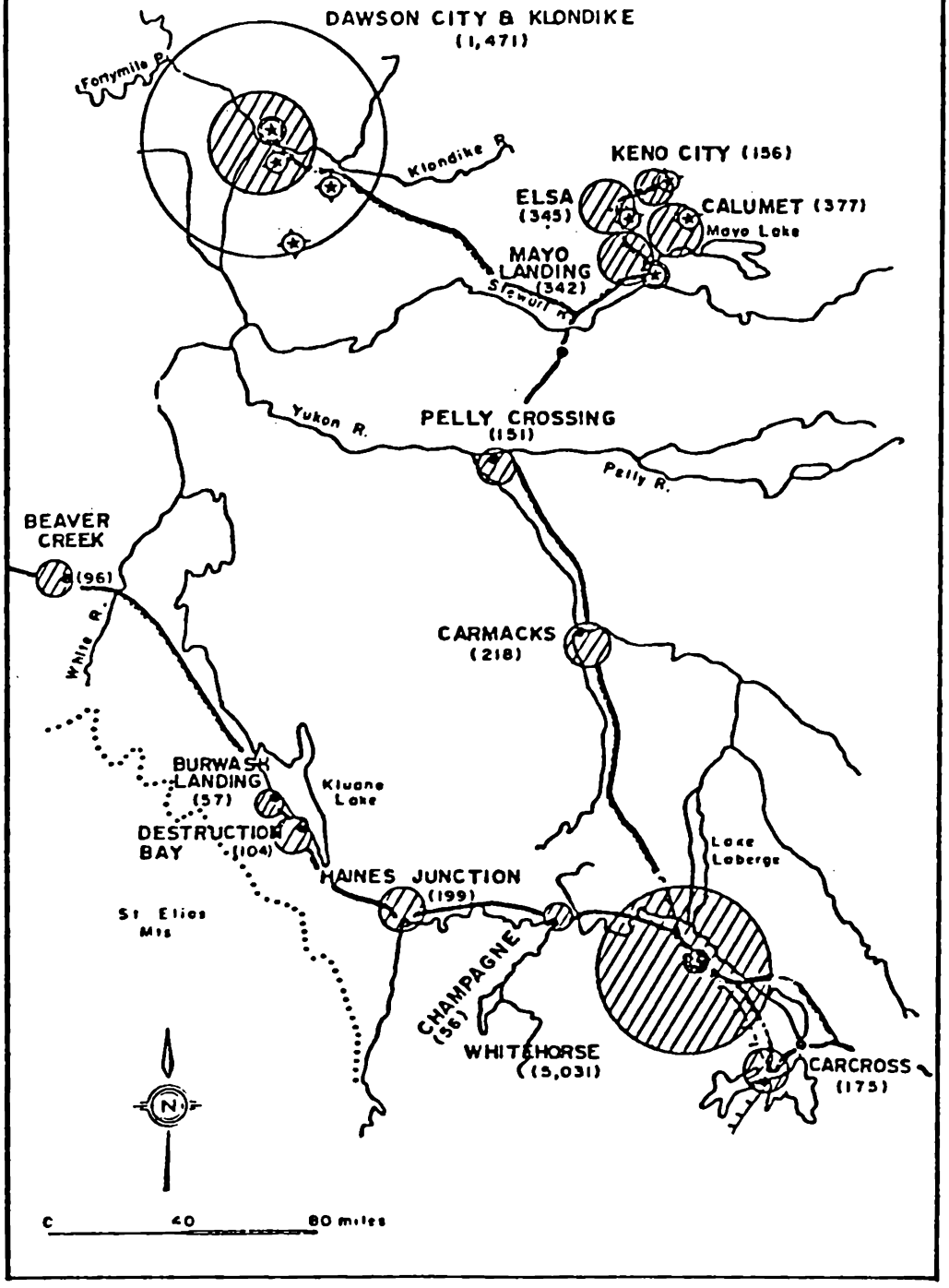
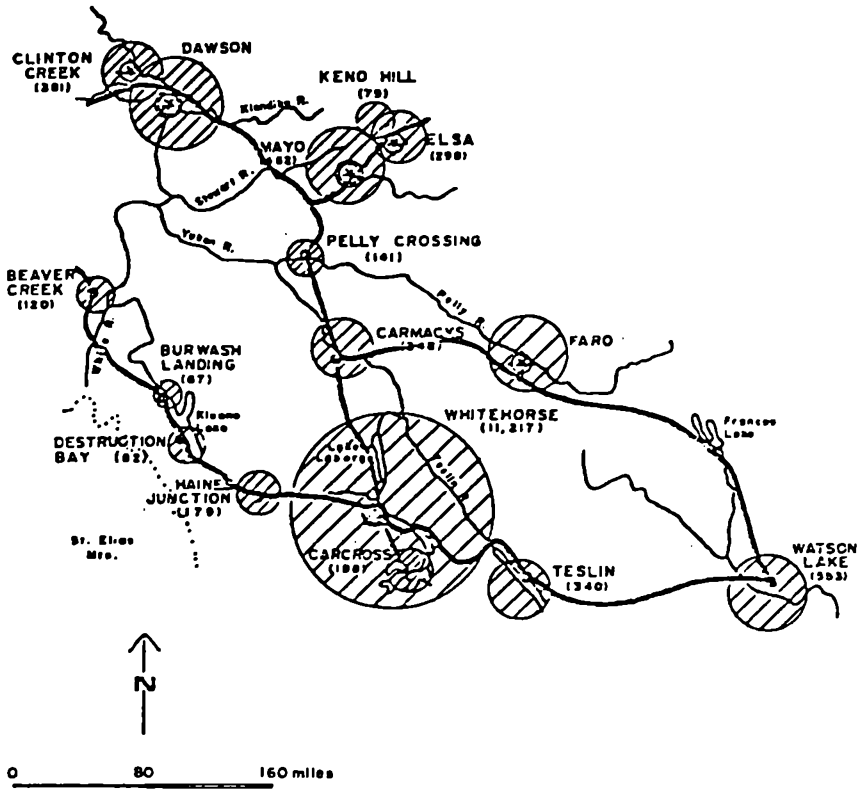


Figure 10
1971



3. CHANGES IN THE SETTLEMENT SYSTEM 1968-1978

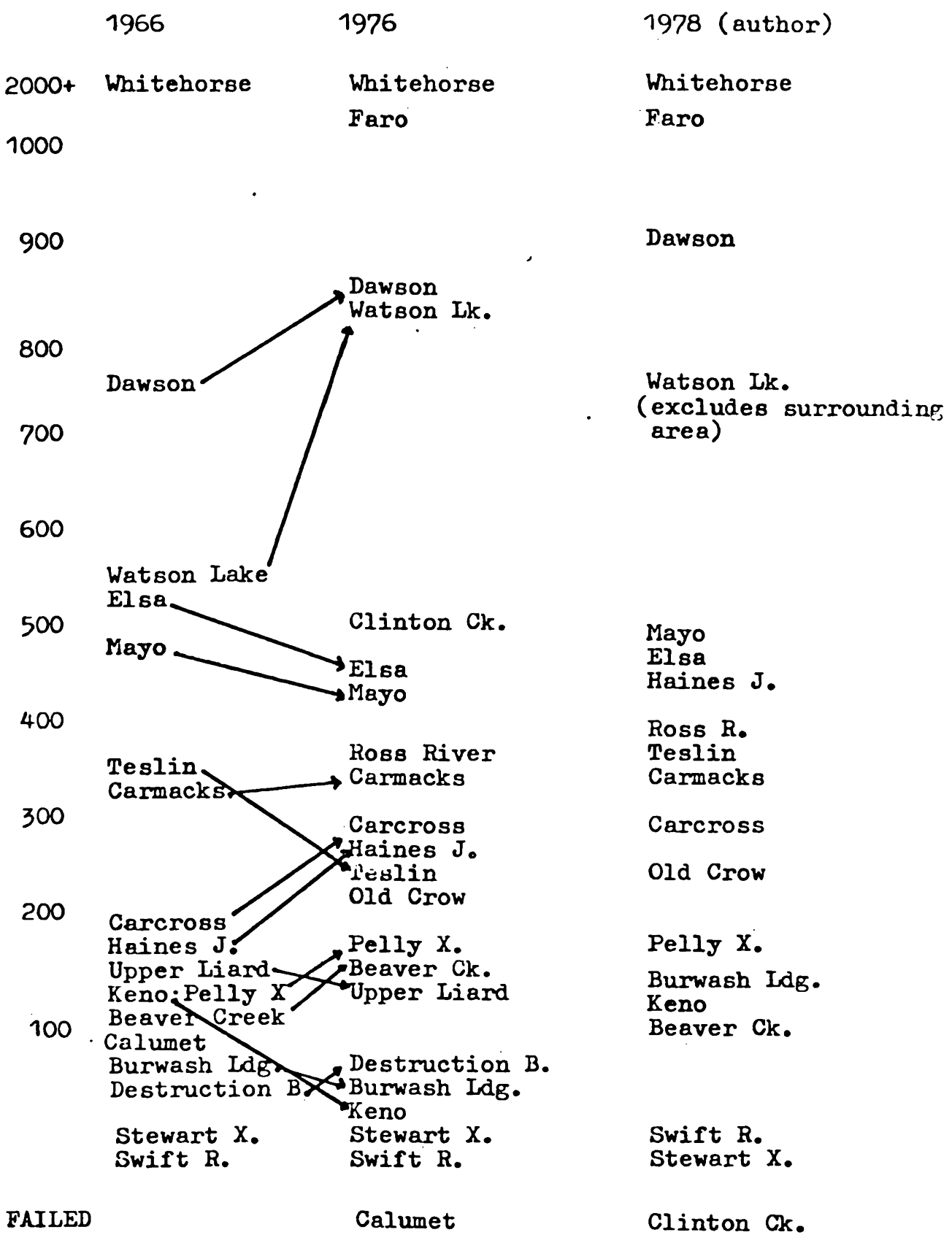
In the period 1968-78 two major settlements emerged and three effectively disappeared (table 4). Most communities experienced some growth, but in many instances it was below what could be attributed to natural increase - a reflection of out-migration and high turn-over rates. The most dramatic growth was recorded by tourist oriented settlements in nodal locations, notably Watson Lake and Haines Junction, and by single enterprise towns, Faro and Clinton Creek.

The construction of the new towns of Clinton Creek and Faro to serve the Cassiar asbestos operation and the Anvil Dynasty mine respectively, represented the most visible change in settlement pattern in the Yukon since the construction of the Alaska Highway. In earlier times the developments would have induced growth in a number of settlements serving lines of communication; the highway orientation of the new towns have rendered such settlements obsolete.

Faro, the second largest settlement in the Yukon, attained a population of 1600 in the early 1970's and has stayed at this level until the present. In many respects, it is a temporary community when considered from the standpoint of population permanence, with population levels sustained by high turn-over rates and rapid flow-through of population. Despite an estimated investment of at least $200 m (DIAND 1970) accompanying the Anvil project the direct impact on settlement has not been great, the major contribution to overall settlement infrastructure being construction of the Watson Lake - Carmacks highway (Robert Campbell Highway) which greatly modified accessibility and transport connectivity in the Yukon.

Clinton Creek emerged, grew, functioned and disappeared in the ten year period. Despite the prediction that it would be a 25 year mine in the summer of 1978 the project was closed and Clinton Creek reverted to the Yukon equivalent of a green-field site. As with Faro direct impact on settlement pattern was

Table 4. Changes in Settlement Size and Rank 1966-78.



The 1966 and 1976 population figures are from Census data. It is felt that the 1978 field data depicts relative settlement sizes more accurately than the 1976 Census.

minimal, and expected benefits of the project to Dawson City never materialised (Lerehs 1977).

Sustained growth took place in Whitehorse, its share of the territory's population increasing from 33% in 1966 to 61% in 1976. Although growth was partly due to boundary change the current population figure (c. 14,000) may under-state the actual functional extent of the city. Whitehorse has the advantage of nodality, large service base, urban-type atmosphere, direct contact with urban Canada, and one of the more moderate climates in the territory, all of which interact together to promote growth. Much of the population increase in Whitehorse over the study period was due to increase in both Territorial and Federal Government employment, from 2441 in 1971 to 3362 in 1976, with almost all this increase concentrated in Whitehorse.

Communities serving highway traffic had mixed fortunes. Those in nodal locations grew, although such growth was aided by other factors. In the case of Haines Junction fortuitous location near Kluane Park was important; Carmacks is located adjacent to coal deposits used in the Anvil project and growth has also been due to in-migration of Indians. Watson Lake flourished as a local service center as well as a highway oriented community. Because of improved travel conditions and 'self-containment' of tourists there has been a decline in non-nodal lodges and tourist facilities that may have become the nucleus of new settlements, and stagnation in non-nodal highway communities - Swift River, Destruction Bay and Beaver Creek.

Relict mining service centers continued to stagnate. Dawson City was a potential service town for the Clinton Creek development, but its failure really benefit from the project and the collapse of the Cassiar asbestos operation in 1978 means that its economic base is increasingly dependent on tourism and Government support. Mayo Landing suffered due to consolidation of mining activity in its hinterland and associated decrease in its service population. Unlike Dawson Mayo does not have a major tourist component in

its economy, and population levels have been sustained through in-migration of Indians and maintenance of various forms of Government employment in the community.

The general pattern that emerges is one where growth has mainly taken place in more accessible locations in the southern part of the Yukon, and while a number of communities did experience rapid growth in the study period an increasing portion of the territory's population came to live in Whitehorse. Whether it is true to say that an increasing portion of the territory's more permanent population become urbanised, or whether the urbanised component of the population has been drawn from outside the territory is discussed in Chapter 4 , where various aspects of inter-community mobility in the period 1968-1978 are examined.

4. MIGRATION PATTERNS AND YUKON SETTLEMENTS 1968-1978

Internal Migration Patterns

It is a long established conventional wisdom that settlements in northern Canada are linked directly and individually with the continental urban system of North America and that interaction between settlements in the northland is negligible. This view is reinforced by physical inter-community isolation, the raison d'être (resource extraction) of many northern communities (which invariably implies strong links to urban/industrial centers elsewhere), and lack of data on the topic. Of the various types of interaction, migration is the most important, because accompanying migration are flows of commodities, information, and capital, all of which are important components of regional development. Examination of non-Indian migration patterns into and within the Yukon provides insights into the movement of population in response to real or perceived variations in quality of life, and the role of such movement in settlement growth dynamics. Analysis of such patterns also allows us to gauge the extent to which major investment decisions, such as the Faro development, influence inter-settlement movement.

Non-Indian migration patterns over the study period were reconstructed from the data provided by the residential mobility questionnaires. A certain amount of data manipulation was required because the questionnaires obviously could not provide two key pieces of information essential to the construction of a comprehensive origin-destination matrix for the Yukon. Such information was a) the number of persons leaving the Territory over the study period, and b) the number of persons both entering and leaving. These data are required in order to examine the strength of migration links between Yukon communities and gauge the strength of internal migration links relative to external links.

Three approaches to the problem were considered. One approach was to assume that the number of migrants leaving a community for the 'outside' was

directly proportional to the number leaving for other settlements in the Territory. The number of migrants from the territory (Census Canada data 1966-76) would then be allocated to each community proportional to the number of out-migrants to the rest of the Yukon system. Field work and extensive literature on the topic indicated that a key assumption was not valid, characteristically the single enterprise communities have high turn-over rates and far stronger migratory linkswith centers outside than with other centers in the system. Thus movement to other centers in the system is not representative of total movement out of all centers.

A second strategy was to calculate total in-migration for individual communities for the period 1968-78, by taking the peak year for arrivals in this period as being representative of annual in-migration. Any in-migration not accomodated by the increase in number of dwellings over the ten year period was accomodated by out-migration. The proportion of out-migration to the rest of the system from individual settlements is already known from field data, thus the balance is accomodated by movement out of the system.

The technique selected was essentially based on the annual rate of out-migration from individual communities. From analysis of the questionnaires it is possible to establish the length of time persons who had left communities for other locations in the territory had stayed in their origin community before leaving. Thus if 20% of the population leaving a specific community spent only one year there, and 30% spent two years, 10% three years, etc. one can calculate the probable dates of arrival of persons leaving a specific community in a given year. If, for a given year, one has almost perfect knowledge of the number of arrivals it is possible (given the expansion in housing stock in that year and the amount of housing stock required to satisfy domestic household formation) to calculate what portion of in-migration are contributing to growth and what proportion are replacing population which moved out. Almost perfect knowledge is available for the period July 1977 to

July 1978 from the questionnaires, they provide an almost complete record of persons moving into settlements over that year. Over the year there will be relatively little attrition of that population moving in, and what attrition rate of this population is likely to occur can be calculated by examining the length of time persons who left a specific community stayed. Thus the number of out-migrants in the period 1977-8 can be established from comparing the number of in-migrants with expansion in non-domestic housing stock; the surplus of in-migrants above housing stock is replacing population moving out.

Given the data for 1977-78 it is possible to calculate the number of persons moving into a specific community in the period 1976-77. This will consist of persons arriving in this period and who were still there in 1978, plus those who arrived and moved out in the period 1977-8. The latter figure is calculated from establishing what portion of the population arriving in the period 1977-8 probably replaced persons arriving in the period 1976-77, persons who had lived in the community less than two years but more than one year. By successive iterations it is thus possible to calculate total arrivals and departures at annual intervals all the way back to the base-date of 1968.

Data on expansion of housing stock in each year, and the extent to which such expansion accomodated domestic household formation as opposed to growth due to migration were generated from interviews, census data, community data and field-work. Field work conducted in 1968 provided the base for calculating annual increase in dwelling stock, while the annual demand for new housing generated by domestic household formation was gauged by weighing the probable rate of household formation against death rate. From questionnaire data and age tables (Statistics Canada 1971) the number of persons residing in specific communities in 1968 who still lived there in 1978 and who entered the age of probable household formation (18-25) over the ten year period was calculated. It was assumed that for every two persons entering this age

group in the study period one residence would be required. The probable number of deaths in the non-native population was calculated from death-rate figures for the Yukon; it was assumed that every two deaths would result in a household vacancy.

In every community except Whitehorse the stable base non-Indian population was so small and attrition due to migration so great that natural increase in this sector of the population did not result in additional housing; housing vacated by deaths balanced that demanded for domestic household formation. Thus housing constructed in almost every community was to either replace existing housing, house expanded Indian population, or accomodate demand due to in-migration.

The completed matrix(table 5)depicts migration between Yukon Settlements and migration between such settlements and the outside world. Initial observations (table 5) are that there were high population turnover rates in all the settlements studied, that Whitehose is the major receiver and generator of migration within the Territory, and that only two communities, Mayo Landing and Carcross, had greater interactive contact within the territory than outside it, while the single enterprise communities had far greater direct external contact than any other settlement. Growth in non-Indian population in all settlements except Whitehorse is attributable to in-migration as opposed to natural population increase, and this is sustained largely from outside the territory. Only Faro and Whitehorse had a positive migration balance with the rest of the system. Although no data were collected on Indian migration patterns it is apparent that such migration is largely within the territory, thus a hypothetical zone of Indian migration is depicted, with migrants either interacting with Whitehorse or other settlements in the system.

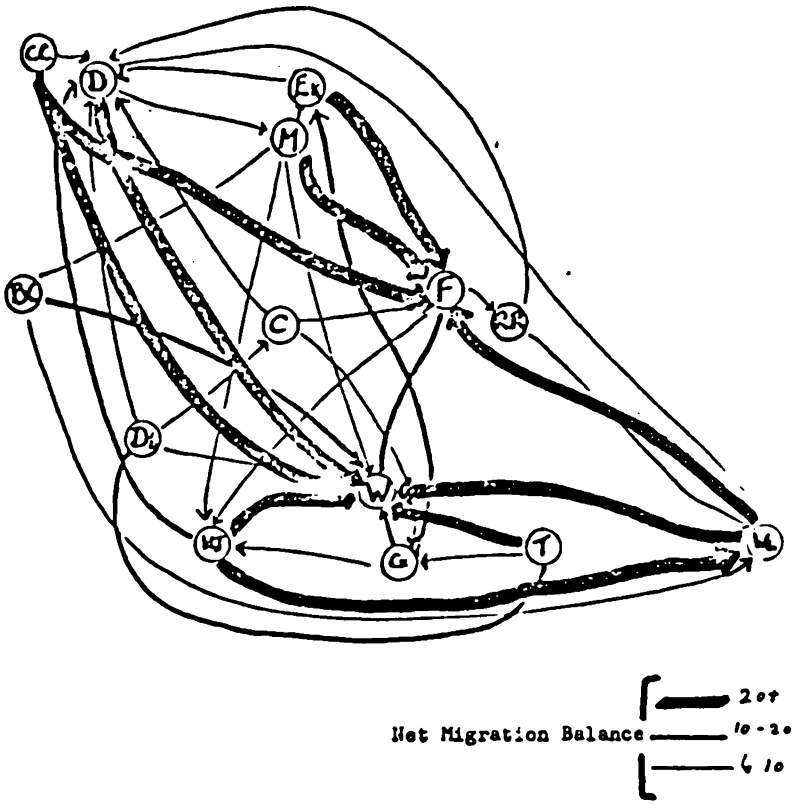
In most settlement systems migration takes place along well defined paths, influenced by a variety of historic, cultural, functional and

Table 5 Origin/destination Matrix for Migrants 1968-78.

ORIGIN \ DESTINATION	Outside	Whitehorse	Faro	Dawson	Watson Lake	Haines Junction	Elsa	Mayo	Ross River	Carcross	Carmacks	Beaver Creek	Teslin*	Destruction B.	Clinton Creek	Other	TOTAL
Outside		2576	1537	141	168	105	841	49	40	38	49	59	19	33	?		5655
Whitehorse	1123		75	38	32	18	20	16	4	10	14	3	1	5	5	9	1373
Faro	857	68		4		2			4		4						939
Dawson	95	54			11	10		16			1						187
Watson L.	51	56	16	6		2		2	2								135
Haines J.	27	50			13												90
Elsa	805	61	19	4				2			1				5		897
Mayo	30	20	11	13		3	5				1	3					86
Ross R.	35			2	3												40
Carcross	15	20		9		1	9				1						55
Carmacks	41	10	5	4		2	5			6							73
Beaver C.	42	9			3					3			3			2	62
Teslin*	?	40						1		3				6			50*
Destruction	29	9		2							4						44
C. Creek	800?	30	16	4													850?
Other		68	5			1		4	4	2	2					8	
	3950	3071	1684	227	230	144	880	90	54	60	77	67	23	44	810	11	

(household moves)

Fig.11 Net Migration Balance Between Yukon Settlements 1968-78

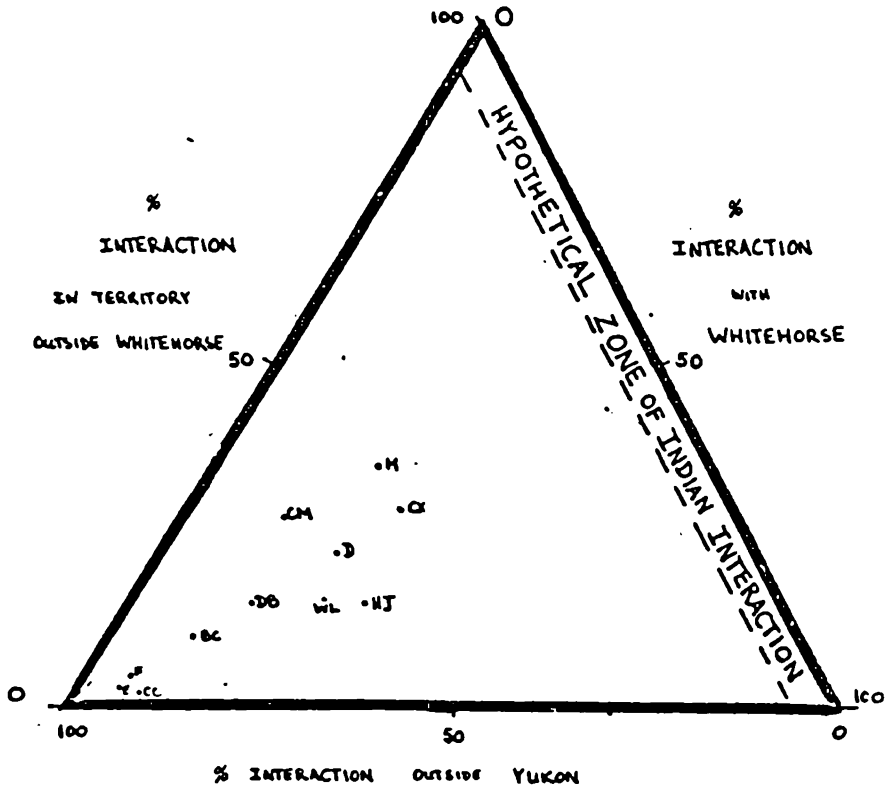


locational factors. A number of strong interactive links between specific settlements are to be noted. The most obvious of these are the links between the mining communities, reflecting changing relative fortunes, and interchangability of labour. As some centers have stagnated or declined (Clinton Creek, Elsa) so migration has taken place to growing centers (Faro). Another obvious migratory channel is between Dawson and Mayo, two settelements with a well documented similarity of history, function and location which have high mutual interaction. Apart from the strong individual links that most settlements have with Whitehorse it is difficult to discern further obvious migration paths.

In many studies sophisticated models are constructed in order to assess the relative influence of history, function, population size and location on migration patterns. However, the sample of communities in the study area is so small, and their characteristics so variable that a descriptive typology is most meaningful. The typology is based on the extent to which settlements interact with locations outside the territory, interact with Whitehorse, and interact with the rest of the Yukon system. This distinction between three possible migratory relationships is useful because it allows us to a) examine the strength of contacts with the outside world, b) identify which communities have the strongest relationships within the territory, c) isolate the role of Whitehorse as a generator or recipient of migrants. The three components can be represented on a three dimensional graph (fig 12), and settlements placed on the graph according to relative volume of migratory transactions with the three locations regardless of whether the migration is in-migration or out-migration.

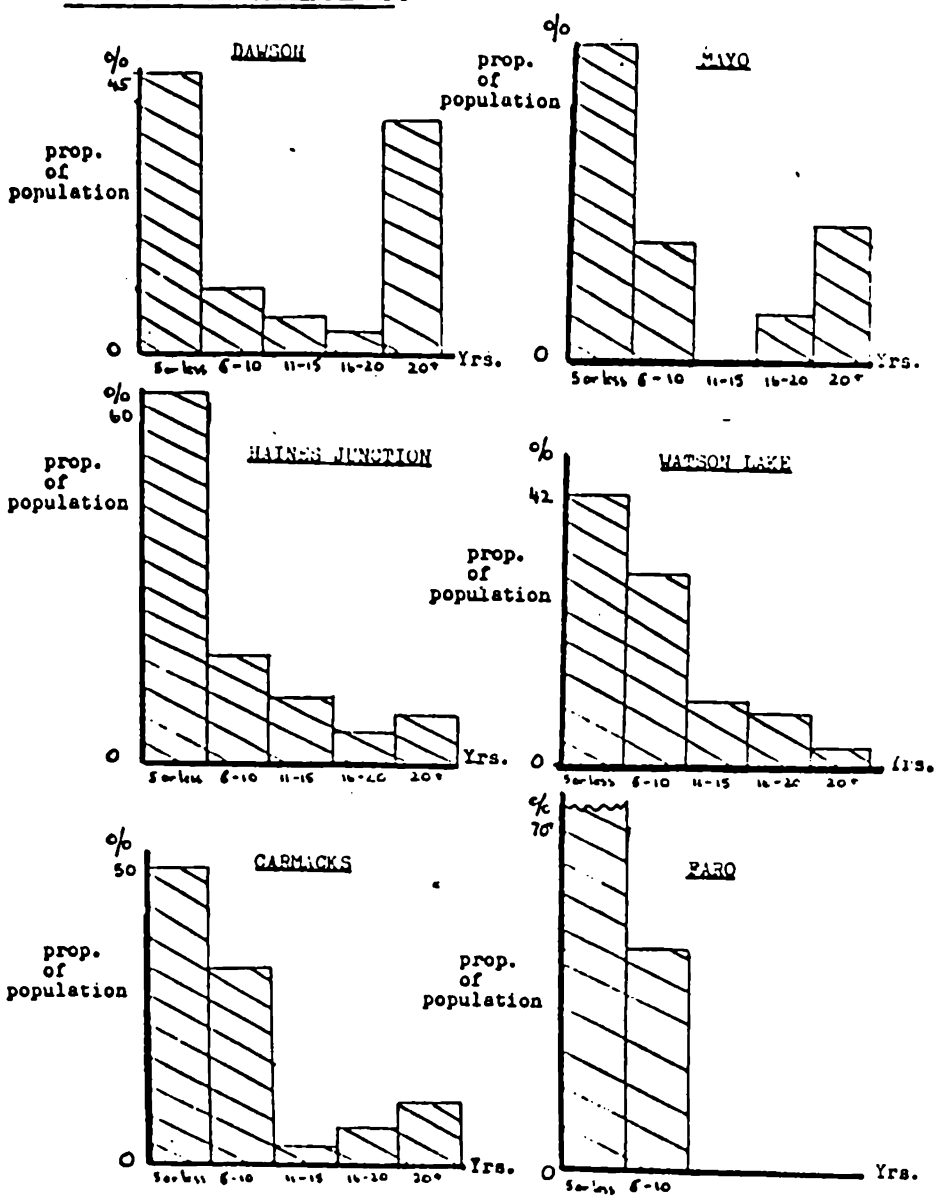
The graph indicates a tendency for settlements with functionally and historically similar profiles to display similar traits in terms of migratory transactions. The Single Enterprise communities cluster in the bottom left hand corner of the graph, with more than 90% of their interaction with the

Fig. 12 Relative Importance of Migratory Links Within the Yukon, With Whitehorse, and With Locations Outside the Yukon.



The graph depicts migratory links regardless of direction of movement.

Fig. 13 Length of Time Population has Lived in Yukon Communities.



outside. In contrast the older communities - Dawson, Carmacks, Carcross and Mayo, display higher degrees of interaction within the system, - both with Whitehorse and with the rest of the system. Between the two groups lie the highway oriented communities which have grown since 1945.

There are a number of possible explanations for the depicted grouping. The single enterprise communities attract a highly paid transient labour force which, given the Territory's small population, must be drawn from outside. Older communities have a rather dilute economic vitality, and are the home of the long-term or even second or third generation Yukoner. Finally the highway oriented settlements are in the more accessible areas of the southern Yukon and have experienced rapid transient related growth since 1960 which has attracted enterprise and labour from outside the territory.

The foregoing classification of settlements - Whitehorse as the major generator and receiver of migration in the system, the settlements brought into existence by the Klondike Rush and its immediate aftermath, the Single enterprise mining communities, and the post-war highway oriented settlements - is used as the basis for the discussion of the migration relationships of individual communities.

1. Whitehorse

As the dominant center in the system Whitehorse has migratory links to every settlement. Through the study period Whitehorse has had a positive migration balance with the rest of the territory, and a positive relationship with every settlement except Faro and Carmacks. Analysis of questionnaires indicated that the city serves as the interception point for persons moving into the territory, they stay for a short while and then move to other locations in the territory. It also acts as a destination for persons who have spent a considerable length of time in the territory - possibly as a place to which they retire. Although it is believed that many non-native

Yukoners retire to locations outside the territory the availability of medical facilities and a comprehensive range of services attract a considerable number of Whitehorse.

2. Communities brought into existence by the Klondike Rush and its immediate aftermath

a. Dawson City

Dawson has a negative migration balance with every community except Carmacks. Its growth was thus maintained by migration from outside the territory. The settlement's strongest links were with the functionally similar service settelements of Watson Lake and Haines Junction, and with the historically similar center of Mayo Landing.

b. Mayo Landing

As with Dawson there was a negative migration balance with the rest of the system and the settlement, population level was maintained by migration from outside the territory. The strongest migration links were with Dawson, and with the closest (and historically and functionally closest linked) settlement of Elsa and with Faro, where miners formerly working in the Keno hill area and living in Mayo had moved.

c. Carmacks

Has a negative balance with the rest of the territory. The settlement's links are with a number of functionally diverse settlements, a reflection perhaps of Carmacks central location and diverse functional base - with mining and service activities explaining links with Elsa, Faro and Dawson.

d. Carcross

There is net out-migration to every community with which Carcross has links. The communities relationship with Whitehorse is dominant - essentially a reflection of proximity, while high out-migration to Elsa may well be attributable to the closure of mines in the vicinity of Carcross in the early years of the study period. There is a strong link to Dawson,

a settlement of the same vintage and group.

3. Single Enterprise Mining Communities

a. Elsa

The oldest single enterprise community still functioning. Its links within the territory are weak, and the strongest interaction outside Whitehorse is with functionally similar settlements, Faro, Clinton Creek, Carmacks, and Carcross. Interaction with the territory is minimal when compared with interaction outside the system. Of 1775 transactions 93% were with locations outside the Yukon.

b. Faro

Faro has strong positive links with the rest of the Yukon system, and has induced more migration in the system than any other community except Whitehorse. Although this is to be expected, Faro being the second largest settlement, the degree of internal migration is minimal when weighed against the settlement's population turn-over in the study period; 91% of all transactions were with locations outside the Yukon.

4. Highway Oriented Settlements

a. Watson Lake

Watson Lake has a strong migratory balance with the rest of the Yukon system, but growth has been maintained by in-migration from outside the Territory. Net in-migration has taken place from the functionally (service) similar settlements of Haines Junction and Dawson, while out-migration has been to Faro. This out-migration is a reflection of Faro's size and relative proximity along the Campbell Highway from Watson Lake.

b. Haines Junction

As one of the more rapidly growing settlements in the territory, Haines Junction has a strong migratory balance with the territory's settlement system outside Whitehorse, but much of the growth over the past ten years has been attributed to movement from outside the Yukon. The community's

strongest migratory links are with similarly service-based or tourist oriented locations - Dawson City, and Watson Lake.

c. Destruction Bay

Apart from a relatively strong link with the functionally similar (communications servicing) settlement of Teslin, Destruction Bay has few links in the territory, and has been dependent on migration from Whitehorse and the outside to maintain its population. This is a reflection of the specialised and highly mobile labour force that constitutes the majority of Destruction Bay's population.

d. Beaver Creek

As table 5 illustrates Beaver Creek relies heavily on migration from outside the system to maintain its population. Although out-migration takes place to a number of locations in the territory Mayo Landing is the only community outside Whitehorse generating in-migrants. The settlement's relative isolation may contribute to this lack of interaction as may dependence on a large seasonal labour force, largely made up of students and drawn from outside the territory.

Not only do the four groups display differences in terms of orientation of migration, their populations display different degrees of long-term stability. Histograms (fig 13) depicting the length of stay of the contemporary population of communities indicate that the older communities have disproportionally large populations staying in excess of twenty years. The highway oriented settlements have no outstanding 'tail' on their graphs, while no respondent in the single enterprise communities had lived there for more than ten years.

The pronounced tail in the older settlements is generally indicative of a marked split between 'leavers' and 'stayers'. People either stay for a very short time or a very long time, there rarely is an intermediate step.

Essentially the 'short-stayers' are the population at risk - subject to change - 45% of Dawson City's population arrived in the period 1973-78 and the total turnover in Dawson was 90% of Dawson's current population. In Mayo Landing 50% of the population arrived in the last five years of the study period and the turnover was 120% of the town's population. Much of that portion of population which did not move in the study period had not moved in the previous five years neither. It is clear that high population turnover rates are not uniform within settlements. Through-put of population is high if considered in terms of a proportion of the total population, but it is evident that in the older settlements only one, albeit large, section of the population moves.

This break between the highly mobile component of population and permanent population is of importance from the standpoint of both settlement resilience and growth dynamics. Although settlement resilience has been the theme of at least one major work on Yukon settlement (Duerden 1971, Green 1976) the role of the permanent population in ensuring survival at a time of decline has not been examined. It is postulated that when decline takes place the potential 'short-stayers' leave and are not replaced, while the 'long-stayers' move towards a land-related economy. It could well be that the non-native long-stayers, located in the older mining and mining/service related communities are the legitimate non-native Yukoners, with a commitment to the territory. The permanent element in settlement populations may have a role as a social 'establishment' and this in itself could possibly aggravate the non-permanence of new in-migrants who would feel like outsiders.

As already outlined the domestic rate of non-native household formation in most settlements is not large enough to create additional demands for housing or, concomittently, give rise to self-perpetuating growth. In the older settlements this is due to the relatively low numbers of 'stayers' and the fact that this group is getting older (and consequently un-reproductive),

while movement into the 'stayers' group is slow. In Dawson potential 'stayers' are those persons who have been there between five and ten years (only 20 households); in Mayo 11 households.

Because of their relative youthfulness it is difficult to ascertain whether the highway oriented communities will attain self-perpetuating growth. Although the prospects for the smaller more remote communities - Beaver Creek and Destruction Bay seem dim in terms of self perpetuating growth the situation in Haines Junction and Watson Lake is more enigmatic. Rapid growth only occurred in Haines Junction in the latter half of the study period, and its pleasant accessible location along with a potentially stable economic base tied to Kluane Park may induce a sizeable portion of the population to stay to the point of subsequent household formation.

As a basis for examining migration into the system from 'outside', Canada was divided into a number of regions and migrants arriving in the territory over the past ten years classified according to their point of origin. The regions were identified on the basis of proximal location to the Yukon, and residential character (Rural, Urban, Northern).

External Migratory Links

Over the study period some households entered the territory and left. As can be seen from reference to fig 14 urban British Columbia and Urban Southern Ontario generated the greatest proportion of migrants. At the simplest level two basic factors can be said to be responsible for the volume of out-migrants generated by a place - its size, and its distance from the final destination. There are obviously also a host of other closely related factors - cultural similarity, functional similarity, political similarity, and general perceptions concerning the potential destination. By utilising a simple gravity model, which allows us to postulate what type of migration patterns would occur if population size and distance from the potential destination were the only factors influencing migration we can get some idea

of the influence of other factors.

The model utilised in this work takes population density as a surrogate for size of a place and distances are air-line distances. Verbally the model states that the expected degree of interaction between two places (in this case the Yukon and other individual destinations), is directly proportional to the size of the places, and inversely proportional to their distance apart, or

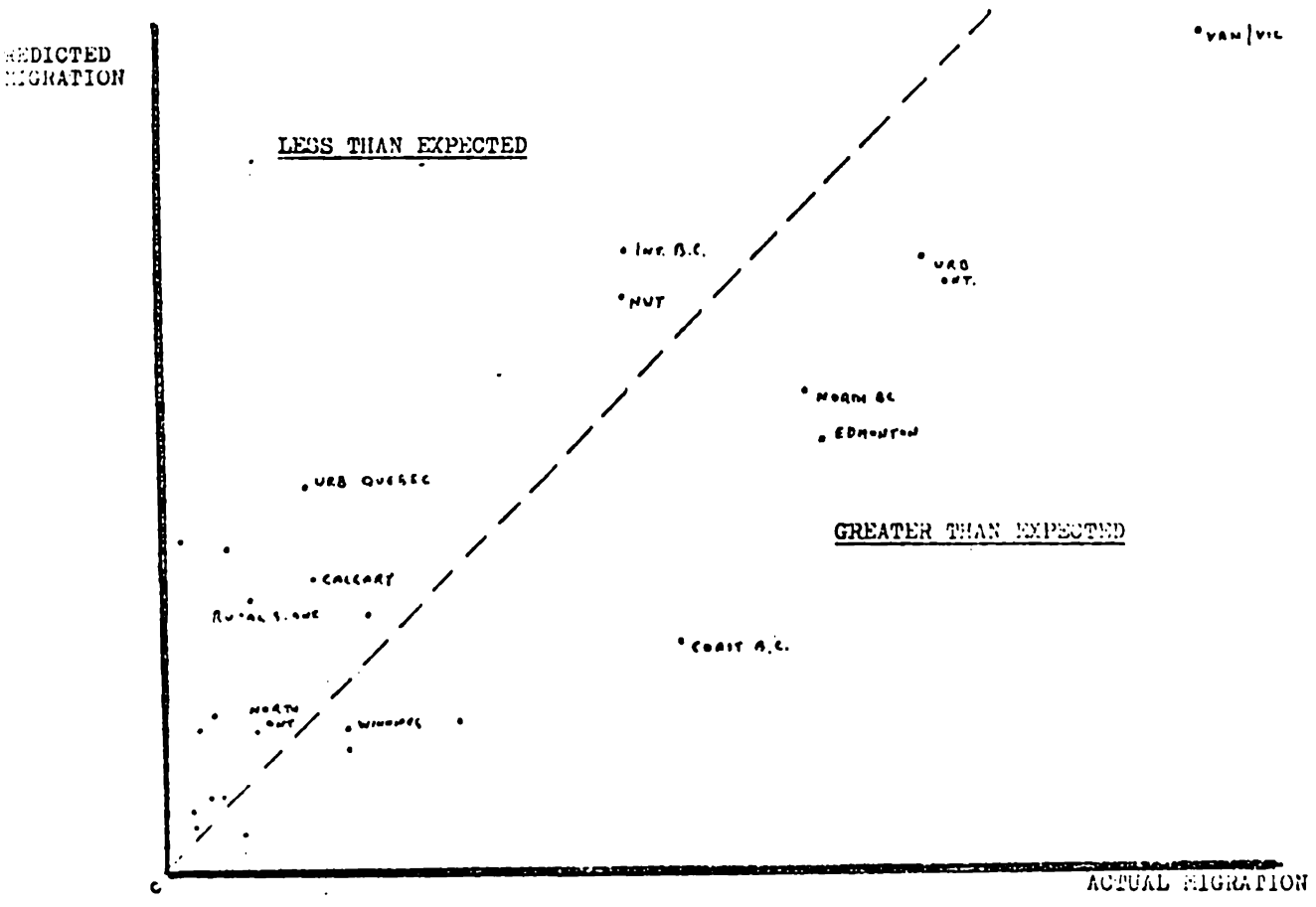
$$K = \frac{p_1 p_2}{d^2}$$

The logic behind this argument is discussed in numerous geographic works. Stated simply, the argument is that, all other things being equal, as population size of places increases then, as a function of sheer mass, multiplicity of different employment types, and diversity of culture and aspirations the probability of interaction between the places increases. However as distance between places increases then the friction of distance in the form of increased transport cost, and weak images and poor information deter interaction.

When interaction with the Yukon is graphed against distance from the Yukon the influence of distance can be seen; the further a place is from the territory the less likely it is to generate migrants. There are, however, a number of anomalies, and when actual interaction is graphed against predicted interaction (as derived from the model) these anomalies become more apparent.

As can be seen from fig 14 the regions closest to the study area tend to generate a disproportionate number of migrants. This is attributable to bias in lines of communication and a degree of cultural and occupational similarity within the Yukon. This is especially true of Northern British Columbia, and Coastal British Columbia, which has a topography and remoteness akin to the Yukon and is traversed by the Cassier Highway and the Alaska

Fig.14 **Expected and Actual Volume of Migrants From Selected Locations in Canada.**



ORIGIN OF RESIDENTS OF YUKON ENTERING TERRITORY IN THE PERIOD 1968-78 - BY LOCATION OF PREVIOUS RESIDENCE

Urban Coastal B.C.	15%
Southern Ontario (Urban)	13%
Edmonton	11%
Northern B.C.	10%
NWT	7.5%
Coastal B.C.	7.5%
Interior B.C.	5%
Northern Alberta	4%
Urban Maritimes	3.5%
Winnipeg	2.5%
Central Saskatchewan	
S. Alberta	2%
Urban Quebec	2%
Rural S. Ontario	1.5%
Northern Ontario	1.5%
S. Saskatchewan	1.5%

Highway. Edmonton and Urban British Columbia both have higher than predicted interaction; both have direct air links with Whitehorse, while Edmonton is easily accessible to the Alaska Highway and is a major communications centre serving the north. Urban Ontario sends a disproportionately high number of migrants to the Yukon, possibly a reflection of the availability of a variety of marketable skills, reaction against urban life and economic uncertainty. A further marked anomaly is migration from the Maritimes - probably attributable to economic problems.

One would expect the North West territories to generate a disproportionately high number of migrants insomuch as the area has physical and functional similarities with the Yukon and living conditions in NWT communities are similar to those in Yukon communities. The fact that the NWT generates less migrants than expected may well reflect lack of horizontal geographic mobility in Federal Government postings (from northern location to northern location), and that the activities inducing migration into the territory over the past ten years (other than Government) have largely been related to mining, which involves specific skills not widely available in the NWT.

The position of urban and Rural Quebec on the graph can be explained in terms of cultural factors. As first described by Mackay (1955) linguistic and cultural differences greatly reduce Quebec's interaction with English Canada, and in the case of the Yukon territory such factors - relate to images of a place, communication, and marketability of skills - aggravate the role of physical distance as a deterrent for migration.

5. THE ECONOMY OF THE YUKON - A SPATIAL PERSPECTIVE

Within the scope of this work the examination of the economy of the Yukon Territory has three purposes, the analysis of the functional structure of individual communities, discussion of the extent to which settlement pattern and economic structure of the territory are related, and the identification of various linkages - both between settlements in the territory and between individual settlements and the outside world. The analysis commences with a brief discussion of data problems, followed by an examination of the spatial-economic impact of each of the territory's economic sectors, concluding with an overview of the economic basis of Yukon communities.

There are numerous problems confronting any attempt to measure the true dimensions of the five sectors - mining, tourism, tertiary activity, government, and subsistence land based activity - which constitute the Territory's economy. Statistical data vary in quality - they are virtually non-existent for subsistence activity, while differentiation between true tertiary activity (commercial and retail activity serving the Territory's population) and Tourism is problematic. The level of economic activity varies greatly from season to season and there are marked fluctuations in employment in tourism, teritorial government, and subsistence type activities between summer and winter. A problem in attempting to obtain comparable data for the various sectors for a given year is that the mining industry has been prone to strikes, with attendant variations in revenue and employment. Most of the data used in this chapter for comparable purposes, consequently are for 1975.

In examining the relationship between economy and settlement two broad areas are considered. First the nature of the individual sectors and their relationship with other sectors of the region's economy and with locations outside Yukon, secondly the economic base of individual communities and the extent to which they are linked in the Yukon economic system.

The conventional view of the economy of the Yukon territory is that the single most important economic activity is mining, followed by tourism and government. In 1975 the relative dollar value of each of the major sectors was,

Mining[1]	Tourism[2]	All Government[3] (Payroll)	Retail[4]	Subsistence[5]
$228.8M	$27.3M	$39.19M	$37.5M	$0.4M

In many respects the figures are misleading and one should be aware of this before any analysis of the territory's economy is considered; the values expressed do not reflect the amount of money going into circulation in the territory. For example, in 1975 the Director of ERPU claimed that mining in the territory was worth $10,370 per capita (ERPU 1975). In reality, when the actual amount of money actually going into circulation in the territory is generously considered, the figure is $1,800 per capita[6]. Indeed, if economic value in terms of payroll is considered Government (all forms) makes the greatest contribution to the territory's economy. At the same time the value of hunting and trapping may be under estimated insomuch as only tagged animals are considered in accounting, while replacement value of food consumed is ignored.

Use of gross figures for the Yukon tends to distort the value of some sectors to the territory's welfare insomuch as they present an aggregate picture and fail to present a spatial view of variations in the contribution of different activities to the economic base of individual settlements. There are nineteen settlements distributed through the Yukon; by virtue of variation in location, size, and employment characteristics there are differences between them in terms of potential for growth. The extent to which growth is transmitted between settlements in the form of inter-community demand for goods and services is a measure of the degree to which any of the developments in the territory can be said to be regionally beneficial. As will be seen from the following analysis there is great variation in the distribution of

economic activities between settlements, and the 'spin-offs' of growth transmitted from settlements where viable activities are located to other settlements in the territory are very limited and tend to be very narrowly channelled.

Mining

Through the study period mining has been concentrated in four major locations, Clinton Creek (Asbestos, 300 employed), Faro (Lead, Zinc 600 employed), the Dawson area (gold, 50+ employed), Elsa (silver, lead, 300 employed), Whitehorse (Copper, 200 employed). The entire production from these mines is shipped out of the territory.

Because the economic base of the territory is narrow, with little secondary industry, a vast portion of the miningsector's industrially oriented expenditure goes to locations outside the territory. Of the total expenditure of the mining industry in 1975 of $116,499,000 some $57,653,000 was potentially expenditure within the Territory. However this figure is modified when disaggregated. In its gross form it includes Federal Income tax paid by employees and also includes the total of outward transport costs, only a fraction of which are incurred in the territory. It is estimated, from analysis of payroll figures that the amount of money potentially put directly into into circulation at each location was, Faro, $10,458,000, Elsa $5,100,000, Clinton Creek $5,100,000, Whitehorse $3,400,000.[7]

Through direct purchases of goods or services by the company, purchases of commodities or services by employees, or provision of infrastructure that can be utilised by other sectors of the territory's economy, mining has a number of linkages both with other sectors of the territory's economy and with other locations in the Yukon.

Direct linkages include the purchase of transport from the White Pass Co based in Whitehorse, the purchase of coal from the mine at Carmacks for use in the Faro operation, and the obtaining of timber for the Elsa operation from

the valley of the Stewart River in the vicinity of Mayo. The largest direct linkage is to the transport sector with $21,991,000 being spent on transport in 1975 (Price Waterhouse 1975). Of this figure it is liberally estimated that $6 m was spent on wages.[8] The regional multiplier effect of this however is minimal insomuch as of the 389 persons employed in transport 380 are based in Whitehorse[9] and consequently will spend much of their income there.

There are some 12 persons employed in the Carmacks operation, and using the Territorial average income per miner as a base[10] it is calculated that the operation to produce coal for the smelter at Faro possible contributes $204,000 pa to the economic base of Carmacks.

The link between the mining industry and the tertiary sector comes in the form of income spent by miners and their families on goods and services. Analysis of retail questionnaires provided a measure of the extent to which growth in the tertiary sector was related to the mining sector. In Faro, the community with the most sophisticated retail base, only 59% of all transactions were conducted in the community; 25% were conducted in Whitehorse, and the balance conducted outside the territory. The volume of transactions in Elsa is much larger, possibly reflecting demographic make-up and high labour turn-over rates[11].

Outside the mining settlements themselves Whitehorse is by far the greatest beneficiary of money spent on consumer goods by employees of the mining industry. Mayo, which traditionally served as the service centre for the Elsa-Keno mining area, receives only 10% of the retail transactions generated by the population of Elsa. Dawson City is the recipient of expenditures by placer miners working in the Klondike over the summer months, although it appears that the settlement never benefitted to any great extent from the development of the nearby Clinton Creek mine.

The relationship between Dawson and Clinton Creek was examined by Lerchs (1977). He discovered that the vast majority of tertiary expenditure

by the employees of Cassiar Asbestos and their families took place in Clinton Creek and the effect of the closure of the town on the service base of Dawson would be minimal. It was indicated by Lerchs that Clinton Creek may have had a detrimental effect on Dawson's retail base - with people from Dawson shopping in Clinton. Only in one instance, however, did the retail base of the mining community clearly serve other than the mining community. This was in the case of Ross River, with 10% of its retail transactions conducted in Faro, with a corresponding reduction in transactions in Whitehorse.[12]

It has been postulated that the development of the mining industry promotes tourism because the provision of roads to the mining areas also opens up new areas of the territory to tourists. Selection of the Faro townsite was partly predicted on the possible generation of tourist traffic, while at the Mayo junction on the Whitehorse-Dawson road tourists are exhorted to visit the Mayo area. The volume of traffic on the Campbell highway in the summer of 1976 was 165 vehicles per day (a liberal estimate)[13]. In 1974 a detailed survey had shown that of the 195 vehicles per day travelling this section of the highway only 12% had other than Yukon licence plates and would possibly have been tourists. In 1977 115 vehicles per day travelled the Stewart-Mayo road; in 1974 of the 100 vehicles per day travelling this section of the highway only 12% had other than Yukon plates. The paucity of tourism in these areas compared with other parts of the territory is underlined by the fact that at mile 946 on the Alaska Highway, in the summer of 1974, 494 vehicles per day were enumerated; 57% of these had non-Yukon licence plates and could be inferred to be tourists[14].

From the foregoing discussion it is apparent that the spatial-economic impact of Yukon's mining industry is not as great as one would expect given the value of mineral production. The direct benefits of the mining industry have been felt in the towns constructed to house the industry's labour force - Faro, Clinton Creek, and Elsa, and in Whitehorse where many company

and employee transactions take place. Dawson's failure to derive any substantial economic spin-off from the nearby Clinton Creek development and the gradual decline of Mayo as a service centre for the Keno-Elsa mining area are illustrative of the fact that the mining industry is largely independent of much of the established economic and settlement infrastructure in the territory. In many respects outside Whitehorse the mining industry appears as a very thick veneer on the Territory's basic socio-economic structure. Mining related populations fluctuate largely independent of other developments in the Yukon; as mining booms labour is imported as it declines labour is exported, it does not serve as a major employer of the long-term Yukoners - an observation supported by the data provided in the section on migration.

It could be argued that this separation between mining and the existing settlement structure of the territory is desirable; it shields existing communities from the impact of boom/bust cycles historically associated with mining in the north.

Tourism

All communities except Elsa and Clinton Creek have, to a greater or lesser extent, some tourist activity. The volume of tourism and related expenditures in various communities tends to be a function of location; the most lucrative tourist zone is the Alaska Highway Corridor, while the major single tourist centre outside Whitehorse is Dawson City. Only 22% of visitors in 1977 were from Canada, with 72% from the USA. Most of the tourists were passing through the Yukon en route to Alaska as opposed to making the territory their final destination.

The Yukon Government provides gross regional figures for tourism expenditure in the Yukon (Dept. of Tourism 1977 p 27). Using these as a base and interpolating from lodge, motel, and campsite capacities in each

TABLE 6

Estimated Value of non-resident expenditures in Yukon Communities, 1976[1]

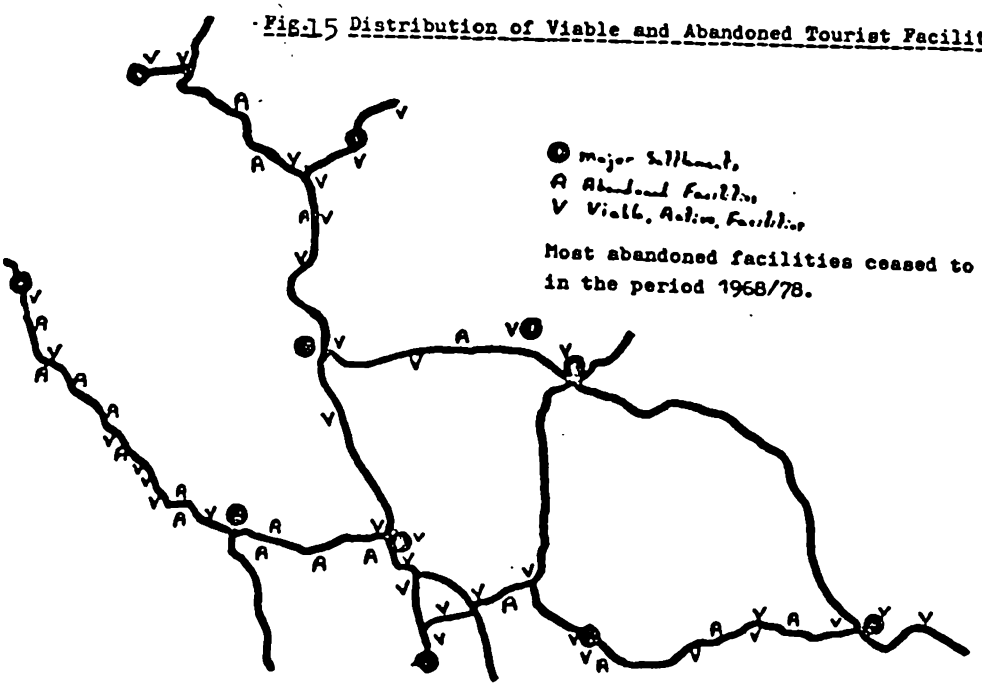
	$
Whitehorse	11,697,409
Dawson	2,094,827
Watson Lake	1,496,673
Beaver Creek	1,140,669
Haines Junction	570,241
Teslin	463,245
Carmacks	245,178
Faro	223,444
Carcross	212,962
Mayo	176,098
Ross River	154,225
Swift River	152,997
Destruction Bay	140,293
Stewart	68,024
Total	$ 18,836,285[2]

Although the figures are for 1976 and are thus rather dated they are indicative of the relative importance of non-resident expenditures in Yukon communities.

1 The term 'non-resident' is used as opposed to 'tourist' because it is evident that in some centers (notably Faro, Ross River and Mayo) the majority of persons using accomodation services were not tourists.

2 Yukon Tourism Expenditure Model gives a figure of $20,878,628. The difference can be explained by the fact that the figures used here omit a number of non-community locations. This also may result in an over estimation of the value of expenditures in such settlements as Faro and Carcross.

Fig.15 Distribution of Viable and Abandoned Tourist Facilities, 1978.



location, availability of services, and expenditure patterns, the contribution of tourism to the economic base of individual communities was calculated (table ( ). Working from first principles the calculated figure came to 90% of the estimated total expenditure in the tourism sector in 1976. As can be seen from the spatial breakdown of expenditure (table 4), nodality and location on the major through-route to Alaska were major factors governing the viability of tourism.

A further factor is distance that can be driven without replenishment of either passengers or vehicle. As highway conditions have improved along with increased MPG so intervening tourist facilities between major nodal points have declined. Comparison of the distribution of facilities in 1968 and 1978 (fig 15) illustrates this point. Over the ten year period the total number of tourist facilities increased from 156 to 266 (70% increase) while expenditures increased by 250% (Dept of Tourism 1977). As the number of establishments increased so their spatial concentration changed; in 1968 the four largest centers contained 53% of all activities, by 1978 they contained 60%[15]. Although the number of highway activities (outside nodal centers) increased from 35 to 50 in this time period the 50 were contained in only 17 locations. Many centers (Mayo, Destruction Bay, Stewart, Pelly) saw no increase in tourist facilities since 1968, while in 1978 abandoned facilities were mapped in 18 locations; most of these facilities had provided a multiplicity of services.

Tourism is only actively an important sector of the territory's economy during the summer months, and it is evident that the population of many communities (other than that constituted by the tourists themselves) fluctuates greatly over the period of a year. In Dawson City, in the summer of 1978, 454 persons were employed [16], interviews with local businessmen yielded the information that the winter employment level would be 116. Of this loss of 338 jobs 251 were in the non-mining and non-government sectors. Two things

accounted for the loss - the seasonal collapse of tourism and a slight decline in the domestically oriented retail sector in Dawson due to the reverse multiplier effect as summer employees in the tourist industry left. In Haines Junction the seasonal impact is far less marked, with perhaps only 15-20 jobs lost[17]. The difference between the two settlements can probably be attributed to the fact that Haines Junction is strategically placed at a nodal point on the major through highway and handles transient traffic all year round, whereas Dawson is at the dead end apex of the triangle formed by the Whitehorse-Dawson road and the Sixtymile road.

Government

In 1976 all Government (Territorial and Federal) payrolls totalled in excess of $41 m[17], - a figure substantially higher than mining payroll, and if non-payroll government expenditure (Unemployment pay, social insurance, construction) is considered Government emerges as the major component of the Yukon's economy. Government employees are found in every community with the exception of Keno and Elsa, with notable concentrations outside Whitehorse (which has 70% of all Government employees) associated with Federal Government activity in Haines Junction and Dawson City.

The role of Government employment as a growth stimulus can be seen from reference to employment increases in the period 1971-76. In this period the total number of Government employees increased by 38%, from 2450 to 3362 (DIAND 1978 p.80), while population increased by only 16%, with much of this increase concentrated in Whitehorse. If the absolute increase of 912 in Government employment is weighted by an average family size factor then population increase in this period can be almost wholly attributed to increase in Government employment.

Apart from actively promoting various aspects of the territorial economy (such as tourism), and providing unemployment and welfare income, the Government sector interacts most closely with the tertiary sector insomuch as

this is the recipient of employee's personal expenditures. As the largest payroll sector in the Yukon economy the Government sector thus has the greatest influence on the non-tourist tertiary sector. In Haines Junction, Carmacks, Mayo Landing, Ross River, Carcross, Destruction Bay, Swift River, and Whitehorse the government sector is the largest wage employer.

The level of employment in the Government sector varies seasonally, - some types of activities can only be pursued in summer, (highway maintenance, some construction activities), while other activities are tourism related and are not pursued in winter. It is difficult to gauge the impact of seasonal government employment on communities insomuch as many summer jobs are taken on a part-time basis by students from outside the territory, while others may provide part-time employment for other than the major bread-winner in a family.

Retailing

The spatial distribution of retail activity in the Yukon is related to population distribution, income levels, isolation of settlements and tourism. Generally as population size of settlements increases so threshold levels are passed with a concomittant increase in number and sophistication of retail types (Fig 17). The distribution of activities is influenced by tourism insomuch as the volume of tourists in Watson Lake, Haines Junction, and notably Dawson generates a seasonal demand for retail services. Fig 17 illustrates the variation in number of activities between summer and winter, and although most of this variation is attributable to tourism directly, a portion of the fluctuation in Dawson is probably attributable to demand created by the settlement's large summer labour force.

The number of activities in each settlement at various population levels is somewhat higher than one may expect to find in settlements of corresponding population levels in more densely populated regions of North America. Even

Fig. 16 Relationship Between Volume of Retail and Service Interaction With Whitehorse and Distance From Whitehorse.

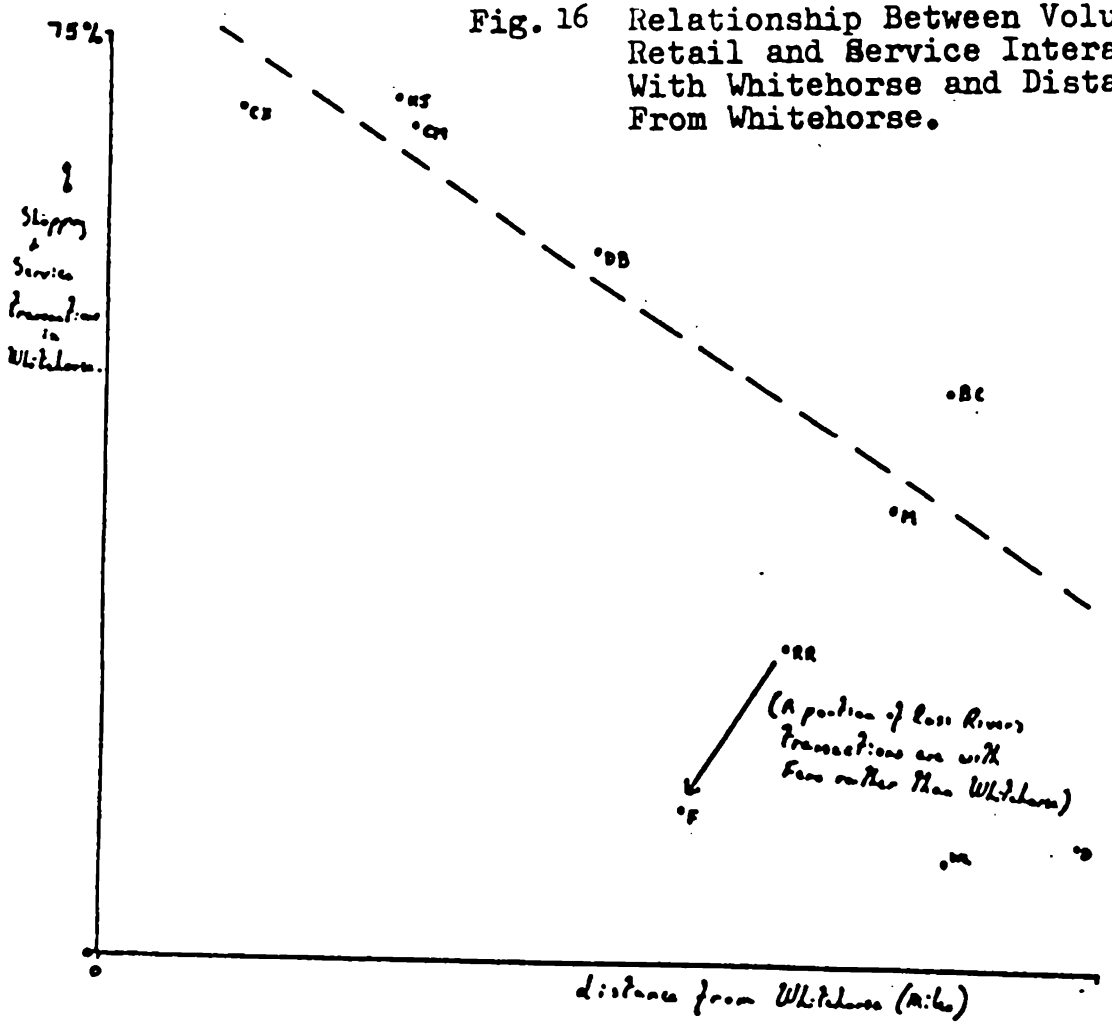
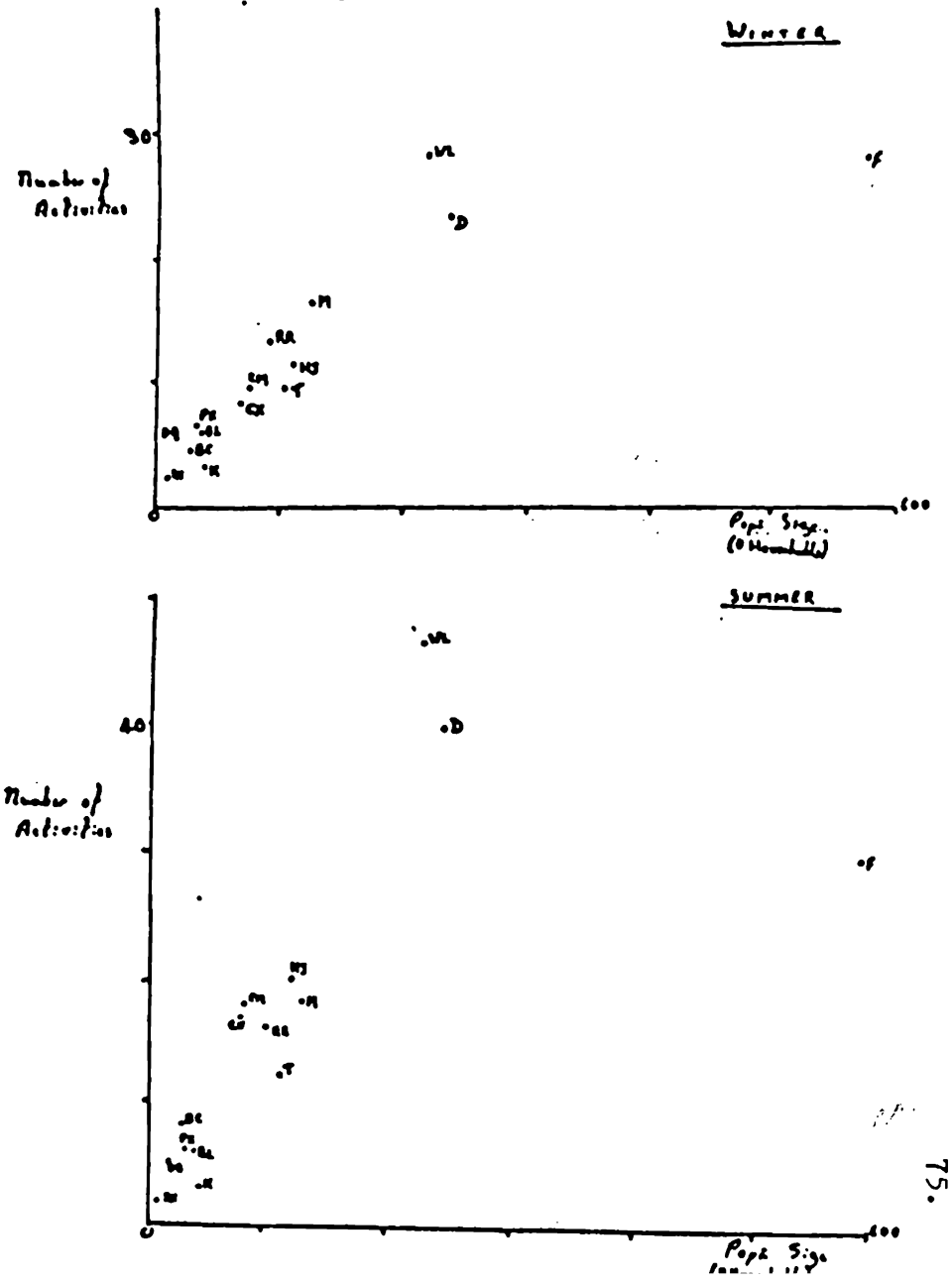


Fig.17 Relationship Between Population Size and Number of Service and Retail Activities.



the smallest settlements have three activities, - gas station, restaurant and some general groceries, while most communities market a large range of merchandise. The range of retail activities is not matched by the number of business establishments. Each business carries more lines of merchandise than one would expect, or operates a number of different activities; thus increased number of activities is not necessarily matched by increased employment in the retail sector.

Isolation and the resultant high cost of travel between settlements influences the provision of retail activities insomuch as distance is a deterrent to inter-community travel while retailers can raise prices to just that level where it is marginally more expensive to travel to Whitehorse to purchase goods or services. Thus a commodity may be marketed at a lower threshold level than in more populous areas where large centers are easily accessible. Lerchs (1977) briefly discusses the relative economies of shopping in Whitehorse vis a vis shopping in Dawson City and states that only by purchasing in bulk does a person purchasing general groceries in Whitehorse obtain savings that overcome the cost of the round trip from Dawson to Whitehorse.

Data from retail questionnaires revealed that no centre in the territory except Whitehorse could be said to have Central Place type characteristics - drawing population from a surrounding region to purchase a variety of goods and services not available in settlements in the hinterland. Outside Whitehorse interaction was limited; Watson Lake provided services for surrounding native populations; there was some interaction between Elsa and Mayo, while the populace of Ross River utilised the retail base of nearby Faro.

Retail interaction patterns were mapped from analysis of questionnaires, listing some activities. Essentially three major types of retail interaction can be identified, interaction within settlements themselves, journeys to Whitehorse and interaction with retail centers outside the system. Graphically

TABLE 7

RETAIL INTERACTION[1]

	Shopping Destination				
	% in Yukon	% in settlement	% in Whitehorse	% Other locations in Yukon	% Outside Yukon[2]
Faro	85	59	25		14
Dawson	89	66	23		11
Watson Lake	95	72	22		5
Elsa	79	44	35	9 (Mayo)	10
Mayo	91	46	45		9
Haines Junction	96	24	72		4
Carmacks	92	22	70		8
Ross River	82	36	36	10 (Faro)	17
Carcross	92	20	71		7
Beaver Creek	90	31	58		9
Destruction Bay	80	16	62		20

[1] Based on location where each product purchased or service obtained as opposed to frequency of trips.

[2] Includes catalogue shopping.

the three types of interaction can be depicted as related to distance from Whitehorse, and to the size of the community in which respondents lived. As fig 16 illustrates there is an obvious distance decay pattern, with interaction with Whitehorse falling as distance from Whitehorse increases. Noted anomalies are the larger settlements with less interaction with Whitehorse than one would initially expect, and Elsa. In the former case the communities duplicate a number of the services available in Whitehorse, consequently contacts are outside the territory for more 'exotic' services; in the latter case Elsa, demographic make-up (single male labour force) probably mitigates against sophisticated shopping trips, while the provision of a subsidised supermarket is a further inducement to shop in the community. Ross River's lack of expected interaction with Whitehorse can be explained by the fact that it lies in close proximity to Faro and 10% of its retail transactions take place here, with a resultant drop in interaction with Whitehorse.

From the foregoing discusion it is evident that the volume of retail activity conducted in a community by its inhabitants is related to isolation and settlement size. Distance from other centers mitigates against external shopping trips, while the provision of goods and services increases with population size. This is illustrated by regressing volume of internal shopping for each settlement against settlement size and distance from Whitehorse - an r^2 value of .97 is obtained.

Interaction with locations outside the territory varies from community to community, with as already explained, higher volumes coming from larger settlements. Catalogue sales account for the greatest portion of extra-territorial interaction (54%), while personal shopping trips were to two major destinations, - Edmonton (30% of all external interactions) and Vancouver (15% of all interactions). The volume of interaction is not really representative of the volume of purchasing power leaving the territory - shopping outside the territory tends to be for higher order goods and services which involve a high per unit expenditure.

Land-Based Activity

The traditional economy of the Yukon's Indian population has been land-based, but a chain of events starting with establishment of trading posts in the latter half of the nineteenth century steadily eroded traditional native-land relationships (Cruikshank 1974). Disruption of traditional land-use patterns as non-native economic activity and associated population increased, the enticement of life in newly established settlements, the example effect of white consumption patterns, the displacement of land-based activities by more lucrative white dominated activities, all served to drastically weaken the native economy (Cruikshank 1976 p.19) For the past twenty five years the native economy has been regarded as having little importance, and when official statistical data have been available it has generally supported this view.

Establishing the current importance of the land-based economy in the Yukon is somewhat enigmatic. The enigma exists because data on most land-based activity does not exist in any formal sense. Data relating to hunting, fishing, or trapping compiled by the Federal Government only appertains to formally declared spoils - such as furs sold commercially. Because produce consumed for subsistence purposes is not recorded the value of the land-based economy is consistently under-stated, and the true extent of the subsistence component is a subject of extensive controversy. Part of the problem is that the land based economy is a volatile political issue, with the pro-development/pipeline lobby dimissing its importance, and Indian groups involved in Land Claims litigation striving to prove that the land makes a significant contribution to their habitat and economy. The data available has tended to favour the former group - not because it conclusively proves their case but because it has been collected in such a manner that it supports preconceived notions of the importance of the native way of life and fits into an essentially industrially oriented accounting system which measures value of production in terms of cash value.

The importance of land-based economy cannot be measured just in terms of economic worth - it has to be seen in terms of life-style and culture. Through seasonal time budgets, division of labour and the types of skills employed, it has a central role in influencing Indian culture. It generates land-use patterns in terms of the spatial dimensions of hunting and trapping activities which are mainly alien to whites from the industrial south who perceive (and cartographically depict) economically related land-use patterns in terms of industrial complexes and neat fields of tilled land.

A number of studies in the 1970's have attempted to establish the worth of subsistence production in different locations (Rushforth 1976). They utilised land-use maps depicting the spatial dimensions of native land economy and measure the value of produce consumed in terms of replacement value of food at current market prices. Unfortunately data of this nature for the Yukon are not readily available - the only detailed study being conducted in Old Crow (Stager 1974). This study is really not representative of land-based economy in other locations in the Yukon because Old Crow is a special case as the most isolated community in the territory, and the community least disturbed by the disruptive influence of past events.

Stager's study indicated that the people of Old Crow obtained well over 50% of their meat and fish requirements from the land each year. If the volume of fish (8,135 lbs) and meat obtained in 1973 (93,670 lbs) are measured in terms of replacement value at 1972 market prices in Whitehorse[18] then the produce was worth $2,675 per resident family. If added to per capita total income in the community (Stager 1974) the average per capita figure for 1973 was $2,130 per capita, compared with a Canadian average of $3,000, and a per capita figure for Old Crow provided by the 1971 Yukon Manpower Survey (Bissett and Meldrum 1973) of $800 per capita.

Data for communities other than Old Crow, if they exist, are unavailable. The statement in the Lysyk Report that 75% of the estimated 500-600 individuals involved in trapping are of Indian ancestry and that between them they produced

28,897 pelts in 1975-76, is (as Lysyk acknowledges), virtually meaningless (Lysyk 1977 p 91). It says nothing about the distribution of the trappers or spatial variations in trapping activity.

Eby (1977) produced data showing the number of Indian involved in subsistence fishing in 1972. Although the trends (fig 17a) are what one may expect, with subsistence activity of greatest importance in the larger more isolated communities with marked segregation and a long history of occupance, (Carmacks, Ross River, Old Crow and Teslin), the author feels that the figures are not entirely reliable, especially in the light of the statement in the work containing the table that,

> 'No data are available on non-licensed traditional hunting, fishing and trapping activities for inclusion in this statement.' (Foothills 1978 2-16)

Given the dearth of data the conclusions must be drawn, qualitatively and intuitively from field work. It is evident that native land related economy exists in other settlements than Old Crow; it is also evident that official published sources understate the magnitude of native economy - especially if official government figures for Old Crow are compared to those generated by examination of replacement value of country produce, and such analysis is extended to other Yukon communities.

Notwithstanding the observations of the Socio-Economic Baseline Data Inventory (DIAND 1978 p49), which lists only 25 Indians as being employed in traditional activities, it was evident from field observations that wherever an Indian population exists there is land-based activity. However the extent of such activity varies greatly from location to location. The culturally and economically most viable native populations appeared to be either the most isolated ones located in traditional areas of occupancy, or those most clearly segregated from the non-native community. Such settlements - Old Crow, Teslin, Burwash Landing, Pelly Crossing, and Carmacks display a high degree of community cohesion and morale compared to those in more urban-type

Fig.17a Estimate of Indian Subsistence Fishing Activity.

BAND	PRINCIPAL SETTLEMENT	TOTAL POPULATION	TOTAL NUMBER OF FAMILIES	NUMBER OF FAMILIES ENGAGED IN FISHING	TOTAL NO. OF INDIVIDUALS IN FISHING FAMILIES	%OF POPULATION INVOLVED IN FISHING
Aishihik	Haines Junction	71	30	1	6	8 4
Carcross	Carcross	83	32	3	6	7.2
Carmacks	Carmacks	238	74	11	59	24.8
Champagne	Haines Junction	106	63	1	1	0.9
Dawson	Dawson	177	69	4	14	7.9
Mayo	Mayo	182	65	6	?	?
Old Crow	Old Crow	191	74	13	67	35.1
Ross River	Ross River	137	56	17	73	53.3
Selkirk	Pelly Cross	300	111	9	23	7.7
Teslin Lake	Teslin	246	104	15	45	18.3
Whitehorse	Whitehorse	571	66	19	90	15 8
Atlin-Tesl.r.		167	70	1	1	0 6
Liard River	Upper Liard	576	187	?	?	?
Kluane	Burwash	94	49	4	14	14 9
	TOTAL	3,139	1,050	104	399	16 8

This table was produced in 1977 by Eby and Associates and included in Foothills Environmental Impact Statement. For comments see text.

locations where segregation is not as marked - notably Dawson City and Mayo Landing.

The only community in which it can be said with any certainty that land-based activity makes a substantial contribution towards economic base is Old Crow. In other communities the contribution of present land-based activities towards a viable economy may be negligible. However, in the absence of other sources of employment in native communities land based activity is the only productive economic pursuit of most of the Indian population.

The Economy of Yukon Settlements - An Overview

Essentially there are two approaches that can be taken in analyzing the economic structure of settlements or groups of settlements, economic base analysis and input-output analysis. The economic base approach divides a settlement's economy into two sectors, basic, containing all economic activity which, via production and trade brings money into a community from other locations, and non-basic, containing that activity which exists due to demands placed on it by the settlement's population. Thus in a simple economic structure a mine would be basic, bringing money into the community; a general store non-basic, being the recipient of money spent in the community by miners. By utilising either revenue or labour data, (in most circumstances the latter) it is possible to calculate the relationship between these two broad sectors of a settlement's economy and express them as a ratio. For example 200 persons employed in mining call into existence 25 persons employed in services, giving a basic/non-basic ratio of 8:1.

The alternative approach is the input-output model, which divides the economy of a settlement or a region into sectors and then maps out the inter-relationship between the sectors in terms of inter-sector purchases. For example, the mining industry purchases from both the transport sector and the Tertiary sector, and given the volume of expenditure in each sector it is

then possible to predict how increased demand for mine output would call forth output in the transport and tertiary sectors.

There are problems inherent in the application of either of these models to the Yukon. Ideally the input-output model is best suited for analysis of economic structure - it side steps some structural objections to the economic base model, while it provides a precise measure of the relationship between different sectors. However, the data required are difficult to obtain - being a full inventory of inter-sector purchases over a time period that is long enough to give a reliable measure of the flows between each sector. The author feels that where such data exist for the Yukon they are unreliable.

If economic base analysis is used measurement of the non-basic sector is problematic because of the presence of subsistence activity which, apart from being poorly documented, does not fit easily into a basic/non-basic schema. It is also problematic because in some settlements high levels of unemployment creates an economic group which is difficult to accomodate in terms of the model.

A further problem which has to be addressed if the economic base approach is to be taken relates to the logic behind the model. The model is based on the idea that non-basic activity is a function of basic activity, and that the volume of non-basic activity will vary with the volume of basic activity. As more persons are employed in export activity then the level of demand for goods and services within the community will increase. Although this relationship may well be valid for single enterprise mining communities with near full employment and high stable salary levels, its application to non-mining settlements in the Yukon is doubtful. It would appear from field work and perusal of available data that the existence of non-basic activity is more a function of the fact that a place exists rather than the presence of expert type activity. Thus welfare cheques and unemployment pay

give rise to retailing, while Government activities - schooling, police, medical, - exist as a matter of social obligation not because of direct or indirect demand generated from viable economic activity, or growth in population resulting from expansion of basic activity.

Because of these problems the basic/non-basic view has been modified. Initially the basic sector of a settlement's labour force is identified and the relationship established between the basic sector and the balance of the settlement's employable population. This serves to illustrate links within the spatial economic system - the extent to which individual settlements have a viable economic base either bringing income in from other locations in the territory or outside the territory. The non-basic sector is identified in order to obtain some impression of the multiplier effect and explore the extent to which basic activities generate growth in the non-basic sector in a community. For the purpose of this work non-basic activities are identified as subsistence activity, non-tourist tertiary activity, and Federal and Territorial government activity which would occur just as a function of the existence of a settlement. Basic activities include mining, all tourism and transient based tertiary activities, and all Federal and Territorial Government employees over and above those required to maintain essential services. This latter group brings money into settlements from outside in the form of salaries paid to officials.

Table 8 depicts the relationship between overall population size and employment. The ratio between the two varies greatly - both spatially and seasonally. Inter-community variations are attributable to differences in ethnic composition, demographic factors and location. Those communities with the lowest ratios throughout the year are the mining communities with consistently high employment levels, while the tourist/transient based settlements (notably Dawson City and Haines Junction) have relatively low ratios in the summer. Settlements with the highest ratios are those with

TABLE 8

Employment/Permanent Population Ratios

	Summer	Winter
Faro	.37	.37
Dawson	.54	.14
Watson Lake	.30	.25
Mayo	.15	.12
Elsa	.80	.80
Haines Junction	.28	.19
Ross River	.17	.13
Teslin	.16	.12
Carmacks	.17	.13
Carcross	.12	.10
Beaver Creek	.79	.21
Destruction Bay	.47	.30

(Ranked according to author's population figures)

TABLE 9

Wage Employment Breakdown by Community - Summer

	Government	Retail & Service	Industrial (Mining/lumber)	Transport & Other
Whitehorse	2735	2000(?)	200	750
Faro	31	60	500	
Dawson	98	296	50	10
Watson Lake	92	150	50	15
Elsa	6	13	340	
Mayo	44	19	11	3
Haines Junction	63	60		
Carmacks	31	12	15	
Ross River	34	16	16	
Carcross	21	11		3
Beaver Creek	22	62		
Destruction Bay	15	5		5
Burwash Landing				
Swift River	15	6		
Pelly Crossing	6	6		
Stewart Crossing	7	4		

large native populations and with neither mining nor tourism as a large employer. The difficulty of measuring native employment has already been discussed; economic base analysis does not accomodate subsistence or land related activity. Consequently a low ratio does not necessarily imply the existence of a weak community economy; in terms of land-based activity a community's economy may be very viable. This is definitely the case in Old Crow and possibly the case in Pelly Crossing and Burwash Landing.

Seasonal variations in the employment/population ratio are great - but are most marked in Haines Junction and Dawson City, where decline in tourism results in marked decline in employment (Table 8). The summer ratio for Dawson reflects the fact that the city has to import labour to operate tourist facilities. Watson Lake, which is stratigically placed as a local service centre and as major transient service centre serving year round traffic on the Alaska Highway, does not display the same marked seasonal variations as other transient/tourist oriented communities.

It is difficult to assess the impact of seasonal fluctuations in economic activity on individual communities. In those centres with normally low ratios (Mayo, Carmacks, Ross River) the impact will be minimal. In Dawson City and Haines Junction the impact of seasonal decline may not be great. An assumption that in summer 20% of Dawson's permanent population is employed probably overstates the level of indigenous employment[19], in winter the employment/population ratio falls to 13%, - substantially reducing the level of employment, but not reducing it by three quarters as the summer ratio of 54% would lead one to believe. Assuming the same activity rate for Haines Junction as for Dawson the effect of seasonal economic decline on the local populace is minimal, with most of the high summer employment level being accounted for by temporary employees from outside the territory.

The basic/non-basic ratios for individual communities are indicative of the extent to which they generate income from external sources - either through

TABLE 10

Basic/Non-Basic Ratios[1]

	Summer	Winter
Faro	500:91	500:91
Dawson	415:76	47:76
Watson Lake	193:76	119:76
Mayo	54:23	43:23
Elsa	339:20	339:20
Haines Junction	100:23	61:23
Ross River	45:23	22:23
Teslin	47:23	21:23
Carmacks	35:23	20:23
Carcross	12:23	8:23
Beaver Creek	76:8	76:8
Destruction Bay	19:8	11:8

(ranked according to authors population figures)

[1] Minimum requirements

Population Size

	700+	250-450	Less than 150
Federal Government	5	3	0
Territorial Government	26	10	4
Service and Retail	45	10	4
Mining/lumber/specialised	0	0	0

linkages with other communities or through contact with locations outside the territory. A minimum requirements technique was utilised to calculate the non-basic portion of a settlement's labour force employed in the Government and service sectors. Settlements were divided into similar size groups, and the community in each group with the smallest proportion of its labour force in a given activity was taken as being representative of the labour force just required to provide the activity adequately for the community. Any labour force above this figure was assumed to be generating income from outside the settlement or providing goods and services for internal consumption as a reflection of high and stable income levels.

Table 10 illustrates the fact that high and stable income levels do not generate a large tertiary sector. Elsa and Faro are the two communities with the most viable export related bases, yet Elsa has the lowest level of service and government employment of any community in the 300-600 population range. All Faro's non-mining labour force can be assumed to be non-basic in virtue of its lack of any tourist activity, yet this sector of the labour force constitutes only 5% of the total population - a figure that compares with 8% in Dawson City.

Faro's Basic/Non-Basic ratio compares with Dawson's summer ratio (.18 v. .19)[19], and the strength of the non-basic sector in Dawson is probably under-stated in this work, the temporary summer labour force placing demands on retail and government services over and above the demands of the settlement's permanent population.

The general trend depicted by table 10 is for the non-basic sector of community economy to increase as population decreases; this supports the previously stated contention that non-basic activity exists merely by virtue of existence of a place as opposed to the presence of a basic sector. As employment levels fall so the non-basic sector as a portion of employment increases. In summer all communities have a higher proportion of their

labour force in the basic than in the non-basic sector; in winter Dawson City, Carmacks, Ross River and Carcross have high employment levels in the non-basic sector than the basic sector. It is evident from the foregoing analysis that only four settlements outside Whitehorse - Dawson City, Elsa, Faro, and Watson Lake have significant 'self-propelled' economies insomuch as they generate a substantiveportion of economic activity from outside the community, while only three of these have such stability on a year round basis.

The basic components of community economics are generated either by linkages within the Yukon or by linkages outside the territory. Faro, Elsa, Dawson City, Haines Junction and Watson Lake have economic bases closely tied to demands from outside the territory. In the first four of these centers the basic sector of the settlements economy exists entirely because of demand from outside the Yukon. In Watson Lake a portion of the basic sector in retailing serves demand generated by neighbouring settlements. Inter-community transactions are limited, and as depicted on fig four types can be identified -

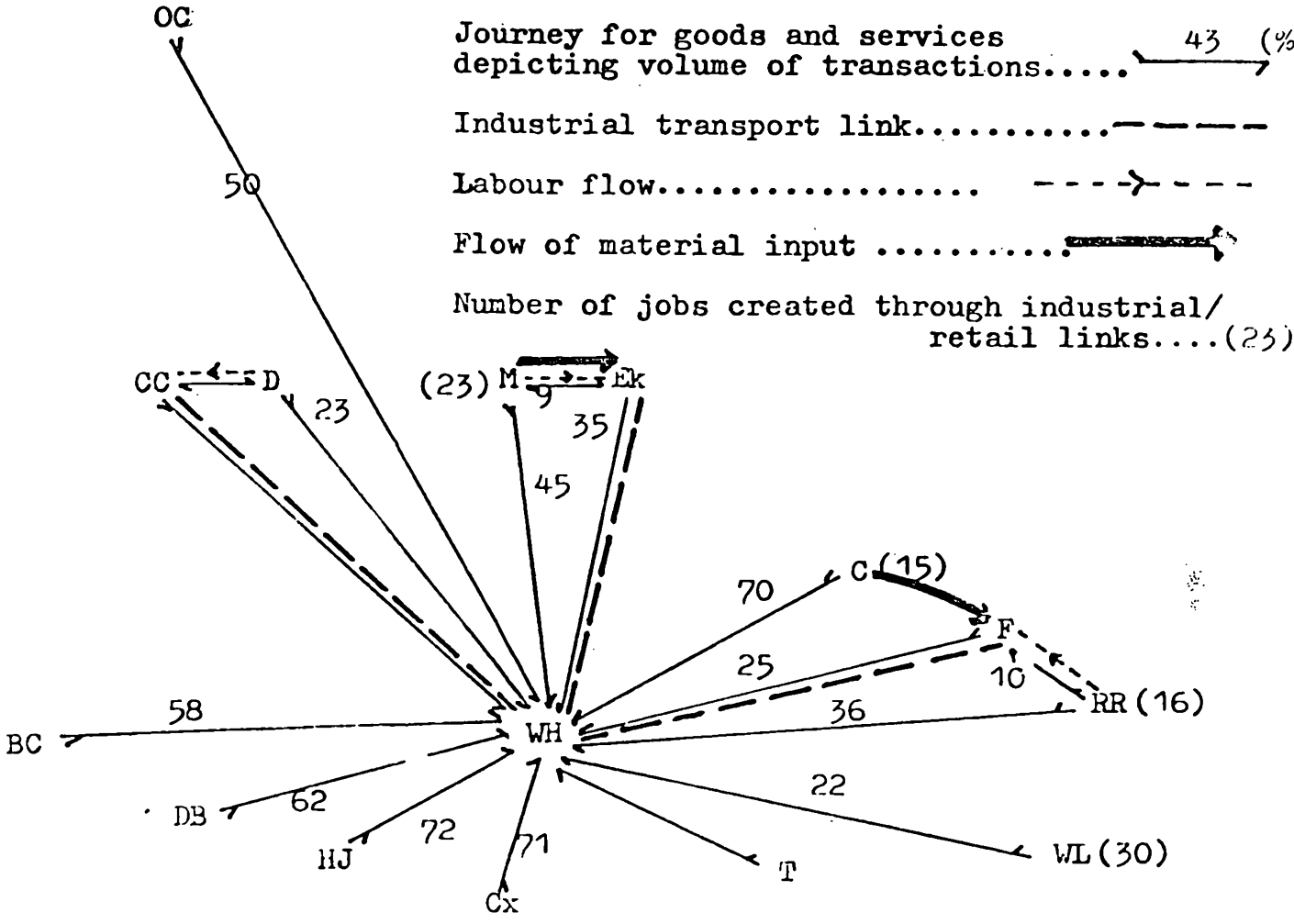
i. Material Flows. Mining in Carmacks provides Faro with coal, while Mayo serves as the base for a small timber industry serving the Elsa mining area.

ii. Retail Flows. A portion of the labour force of Faro, Mayo, and Watson Lake exists to serve demands generated by neighbouring settlements. In Whitehorse a considerable portion of the labour force is basic - providing relatively sophisticated goods and services for all other settlements in the territory.

iii. Labour Flows. A considerable portion of Ross River's basic activity is in mining, with the labour force commuting to Faro. Similarly a few miners commute from Mayo to Elsa.

iv. Service Linkages. Transport facilities used by themining companies are based in Whitehorse, and consequently income flows into Whitehorse from both Anvil Dynasty and United Keno Hill mines in return for the use of

Fig. 18 Economic Linkages, Labour Flows, and Expenditure Flows Within the Yukon



A maximum of 84 jobs are created outside Whitehorse due to demand for labour, industrial inputs or goods or services from other Yukon communities. If inter-community Government services (e.g. hospital services, schooling) are liberally considered the number of jobs created rises to 167, less than eight percent of the 2223 wage-earning jobs outside Whitehorse.

such facilities.

Fig 8 illustrates the distribution of employment generated by the linkage system in the Yukon. Of the 2223 wage-earning jobs in communities outside Whitehorse only 167 could be said to be attributable to inter-community demands. Gauging the linkage effect on Whitehorse's retail sector is somewhat problematic because of tourism and demands created as a function of the settlement's size.

Notes

1. Price Waterhouse. 'The Yukon Mining Industry 1975'.
2. Yukon Tourism 1977. p 10.
3. Socio Economic Baseline Data for the Yukon p 80.
4. Calculated by subtracting tourist retail component from total retail sales.
5. Socio Economic Baseline Data for the Yukon p 198.
6. Based on all direct and indirect mining expenditures within the Yukon, including payroll expenditures, capital expenditures, and expenditure on roads and transport. It overstates the amount of money going into circulation insomuch as only a small fraction of capital expenditures actually take place in the Territory, while a portion of payroll income will be spent outside the Territory.
7. Based on payroll figures, it overstates the amount of money going into circulation.
8. It is assumed that White Pass workers handling out-bound ore are based in Whitehorse as opposed to Skagway or other locations.
9. Correspondence - Yukon and White Pass Co.
10. $17,000 in 1975 after tax.
11. It is postulated that because Elsa has a large single-male component in its labour force consumer demands will not be very sophisticated, and because of high labour turn-over rates a considerable amount of money will be spent outside the Territory.

12. See Table.

13. Unpublished traffic flow figures obtained from Highways Dept., Whitehorse. The figure here is taken at the highest flow point, and assumes that the traffic was involved in other than local trips.

14. A liberal estimate. Not all vehicles with non-Yukon licence plates will be driven by tourists.

15. In the context of this work the term 'activity' refers to each major component of a business endeavour. Thus in one establishment there may be a motel, bar, and gas station - three activities.

16. Interviews with every business in Dawson.

17. Socio Economic Baseline Data for the Yukon, p 80.

18. $1.14c per lb for meat; 71 c per lb for fish. This understates replacement value insomuch as it ignores transport costs from Whitehorse to Old Crow.

19. In wage employment.

20. .18 means 18% of the labour force is non-basic.

6. IDENTIFICATION OF SETTLEMENT GROUPS

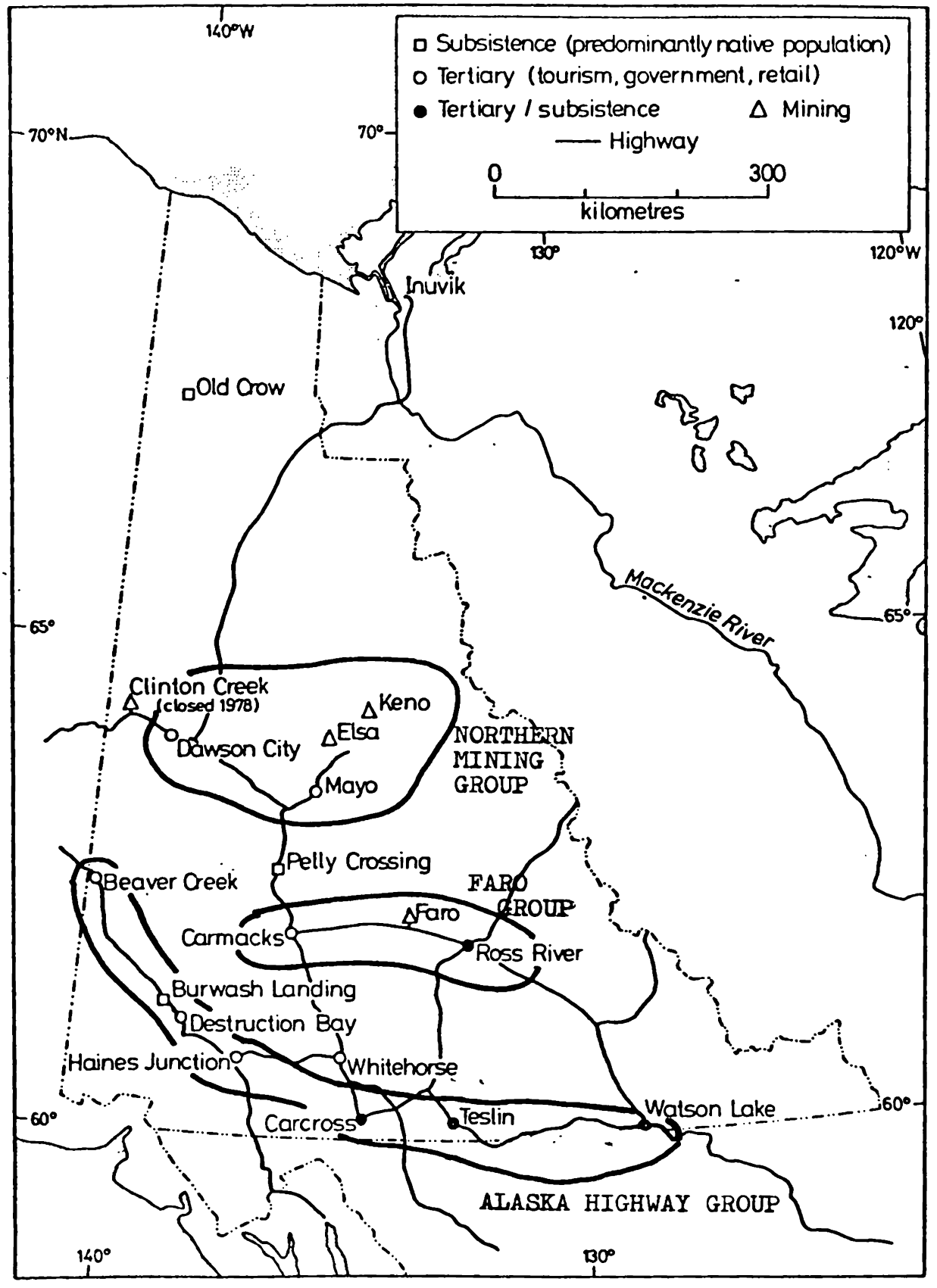
In order to facilitate discussion of the characteristics of individual settlements the communities have been divided into three groups. A number of possible approaches to grouping were considered. One was to group settlements in the same way they were grouped in the 1971 work - but the grouping here was largely intuitive and was also more directly concerned with settlement evolution and therefore mainly historical factors were of importance in identifying groups. Another approach was to group settlements according to their functional/migration characteristics outlined in Chapter 3. The problem with this is that such a grouping ignores the local regional context in which each settlement lies. It is impossible, for example, to discuss Mayo Landing without reference to Elsa, or Faro without reference to Watson Lake. If this schema were used Elsa would be discussed with Faro, and its historic link with Mayo would be virtually ignored.

The grouping selected is based on three major criteria. One is the various described linkages which exist between communities, another is similarity of raison d'être and a third is a similarity of historical experience. Four groups are identified, the northern mining group, the Faro group, the Alaska Highway group; Whitehorse is treated as a special case.

i. The Northern Mining Group This consists of settlements with a traditional base either in mining or providing services for the mining industry - Dawson, Mayo, Elsa and Keno. Dawson and Mayo have similar histories in terms of function and locational rationale (Duerden 1971), while, as already discussed, there are strong migration links between the two. Elsa and Keno are dominated by the same company, and both traditionally have had strong ties with Mayo Landing, their original service centre.

ii. The Faro Group Consists of Faro, Carmacks and Ross River. Faro's development had an impact on the other two settlements, and the three are linked through industrial linkages, (Carmacks/Faro), and service and employment linkages (Faro/Ross River).

Fig. 19 Settlement Groups Discussed in Text.



iii. The Alaska Highway Group Consists of those settlements lying on, or close to, the Alaska Highway; Watson Lake, Teslin, Carcross, Haines Junction, Destruction Bay, Burwash Landing and Beaver Creek. Almost all of these have an economic base tied to providing services for transients, and the communities in this group have similar migratory characteristics (Chapter 4). Carcross is included in the group because the Alaska Highway was originally routed through the community, and with the completion of the Whitehorse-Skagway road its future is closely related to automobile traffic.

The Indian communities of Old Crow, Pelly Crossing and Upper Liard do not fit conveniently into any of the described groups, and because of restrictions in data collection the amount of detailed information available is not as great as for other communities. Consequently only one of these settlements, Old Crow, is discussed in depth, and the analysis serves to critically evaluate the social and economic quality of life in a relatively isolated Indian community.

7. THE NORTHERN MINING GROUP

The northern mining group consists of Dawson City, Mayo Landing, Elsa and Keno, the four surviving settlements in an area with a long history of mineral extraction. Dawson lies some 184 km west of the other three settlements, in a physiographically different region, but in all other aspects, history, function and climate there are strong similarities between the Dawson region and the Mayo Region.

Mayo, Elsa, and Keno lie on the southern edge of the Stewart Plateau, a formerly glaciated upland area composed of metamorphised sediments of Pre Cambrian age overlain by Paleozoic sediments (Bostock, 1948). The area is characterized by broad steep-sided valleys, and contained within the underlying pre Cambrian rocks is the mineral, Galena, the extraction of which formed the economic base of the area.

Dawson lies at the junction of the Klondike and Yukon valleys, at the point where the Yukon River enters the Tintina Trench. The area never underwent Pleistocene glaciation (Ridge 1953, 68), and thus gold deposits resulting from volcanicity and late Mesozoic and early Cenozoic intrusions were thus never eroded from the area. The dominance of water erosion led to the deposition of gold in gravels on the beds of rivers and creeks.

Climatically there are close similarities between the Dawson and Mayo areas, with a January mean of -25°C at Mayo and -25.5°C at Dawson, although winters in Dawson are generally harsher (January mean minimum of -30°C in Mayo and -31.5°C in Dawson). July mean temperatures are 15°c at Dawson and 14.4°c at Mayo. Permafrost is a problem in all the settlements in the group, lying at depths of between six and ten feet at Mayo.

Both Dawson and Mayo served as transport, distribution, and service centres for mining activities in their hinterlands, lying on major rivers in close proximity to areas where mining was taking place. Prior to highway construction steamboats broughtsupplies into these centres for distribution

to the surrounding area and took out minerals. Because of seasonal navigation food and provisions were stockpiled for winter use in these centers, and in the Mayo area silver lead extracted in winter was stockpiled for removal in Spring.

After 1900 Dawson had a gradually diminishing service role as the Klondike District became depopulated and small communities in its hinterland died. The decay continued with periodic interruptions until the 1960's. Today there are no settlements in the former service area of Dawson bar a few scattered mining camps in the Klondike resulting from increased world gold prices. The landscape around Dawson, however, bears mute testimony to past occupance and activity. River especially in the major mining area east and south east of Dawson City.

Throughout the Klondike gold fields creeks and river channels have been greatly modified by dredging; miles of tailings line the floors of the creeks, whilst on the valley sides secondary vegetation (willow and poplar replacing the native spruce) is indicative of the destruction of forest cover for the provision of fuel and building materials. In many places the derelict infrastructure of the gold industry of the past persists. Abandoned settlements abound. Towns such as Granville, Bear Creek, and Dominion lie desolate. Abandoned drainage channels contour the steep slopes of the area's flat-topped hills; disused pipe-lines are to be seen and derelict telegraph and power cables parallel the rapidly decaying waggon roads.

The settlements in the Mayo Region evolved following gold discoveries in the early 1900's. In the period 1914-1920 the extraction of silver-lead ore assumed importance, with Mayo Landing emerging as the service centre for the region. Keno was the major extracting centre for the silver-lead through the 1920's, with Elsa emerging in 1934 following the transfer of the Treadwell Company's mill from Wernecke on Keno hill to the present site of Elsa.

Over the years other camps have emerged and disappeared, but Elsa and Mayo have survived. Throughout the surrounding area abandoned mines, abandoned camps and blighted landscape bear testimony to past mining activity, perhaps the most disturbing example of blight being the gutted remains of Calumet, for a while the largest of the mining settlements, lying on a bleak hillside 300m above Elsa. Mayo, as Dawson, is a service centre of diminished importance. The advent of all weather highway displaced its port function; falling population in its hinterland reduced its service population, while relative ease of access to Whitehorse means that Keno and Elsa interact far more with Whitehorse than they did in the past.

DAWSON CITY

Dawson City lies on a flood plain at the confluence of the Yukon and Klondike Rivers. The settlement is bounded to the south and west by these rivers, and to the north and east by a steep scarp, the summit of which lies some 125m above the townsite. The site was selected at the inception of the gold rush because the confluence of the Yukon and Klondike was a break of media points, with the valley of the un-navigable Klondike giving access to the mining area (Duerden 1971, p 82). It was purely fortuitous that the flood-plain provided flat land for the town-site, and (being in a low-level location) a degree of climatic moderation.

There are a number of problems related to the town's site. Permafrost is found throughout the area, presenting construction problems, while spring-time flooding is a perpetual hazard. A major flood following the formation of an ice-dam on the Klondike River in the spring of 1979 resulted in severe damage to several buildings in Dawson. Other site problems are inversions which prevent solar radiation reaching the town in the short winter days,

and the light restricting tendencies of surrounding hills which reinforce the role of altitude in restricting winter sunlight. Lotz (1963 p 5) speaks of the resultant adverse psychological impact of the combination of location and climate in Dawson.

Land Use Changes

The original town-plan of Dawson was a grid pattern, occupying the flood plain and the scarp. In its hey-day the settlement occupied the flood plain, the South bank of the Klondike (formerly known as Lousetown) and the west bank of the Yukon (West Dawson). With economic decline physical constraints dictated the extent of the town. The outlying areas, Lousetown, West Dawson and the bench above the town were abandoned as population declined, and vast areas of the main townsite itself were deserted.

By 1949 the current town-form of Dawson was clearly established. The town was confined to the flood plain, with commercial activity, oriented towards the still-active port area largely concentrated on Front, Second and Third Streets. Obvious decline in population and business premises had taken place by 1953, with abandonment of commercial premises and shrinkage of water-front activity.

The ceasure of river traffic was reflected in Dawson's 1963 land-use pattern (fig 22). Commercial activity had further decreased, while transfer of Federal Government activities to the new capital, Whitehorse, resulted in a shrinkage of Government Land-Use.

Dawson's decline exacerbated by the demise of Y.C.G.C. activity in the Klondike region, continued into 1968, although by this year reorientation of the city's commercial base was apparent. Tourism was assuming importance in Dawson, and this was reflected in the revival of commercial activity on Front Street, although commercial premises on adjacent streets were abandoned.

There was evident expansion of both population and commercial activity in Dawson in the period 1968-78 (compare figs 23 and 24) and this can be

Figure 20

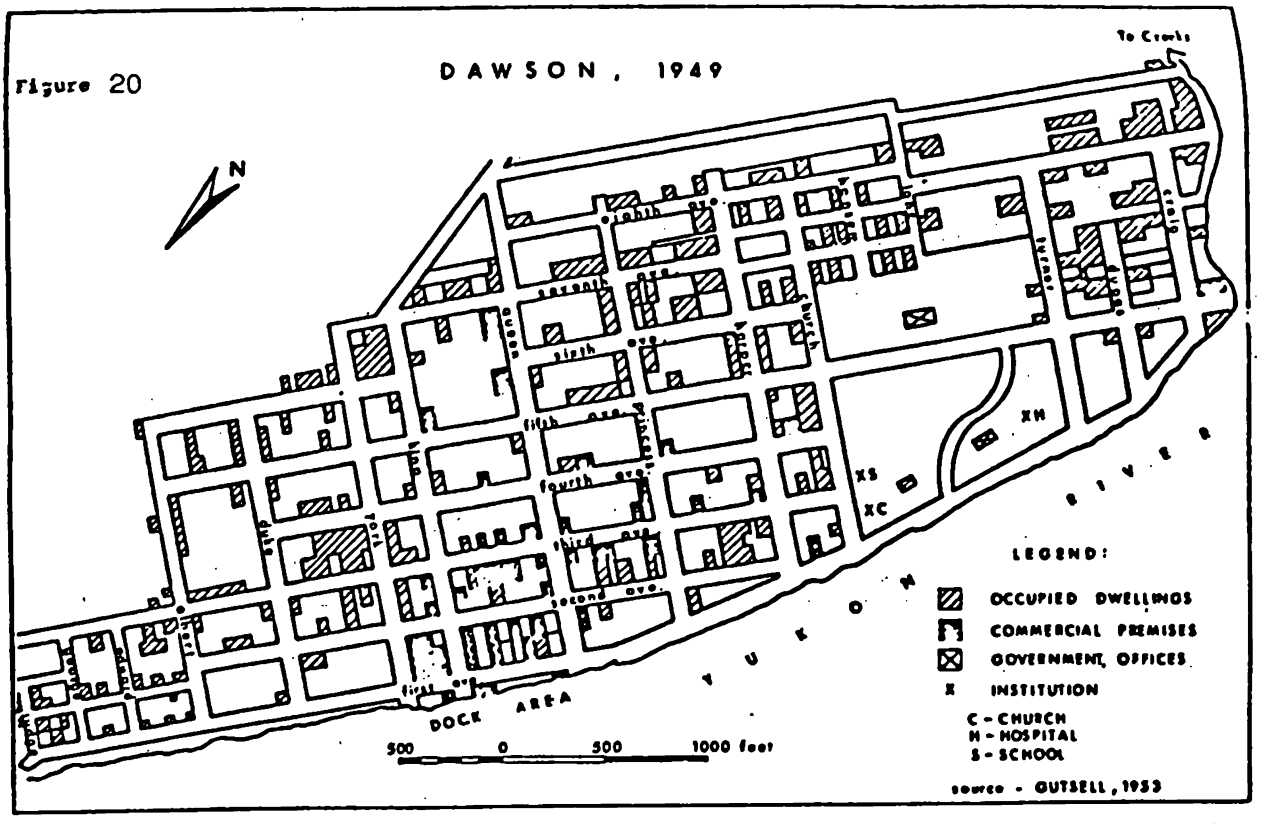


Figure 21

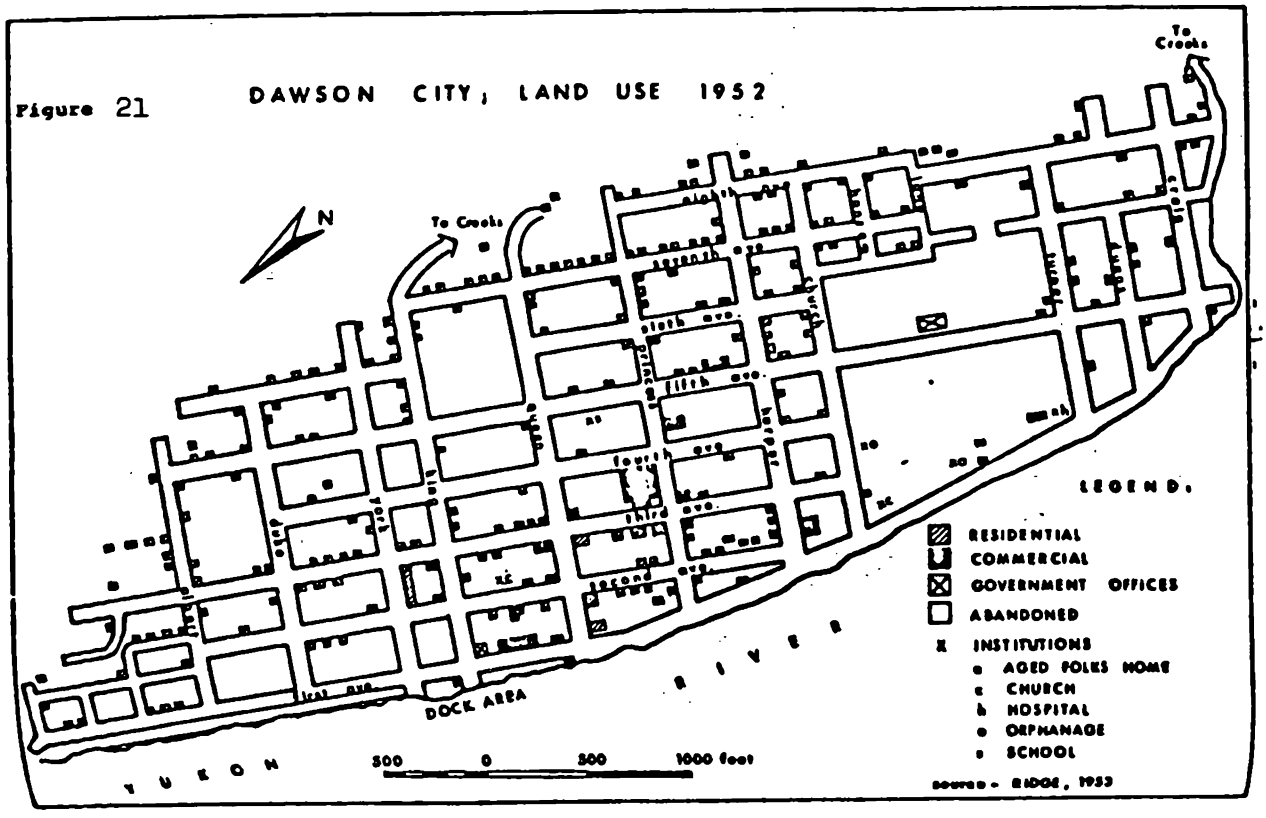


Figure 22. DAWSON CITY, LAND USE 1963

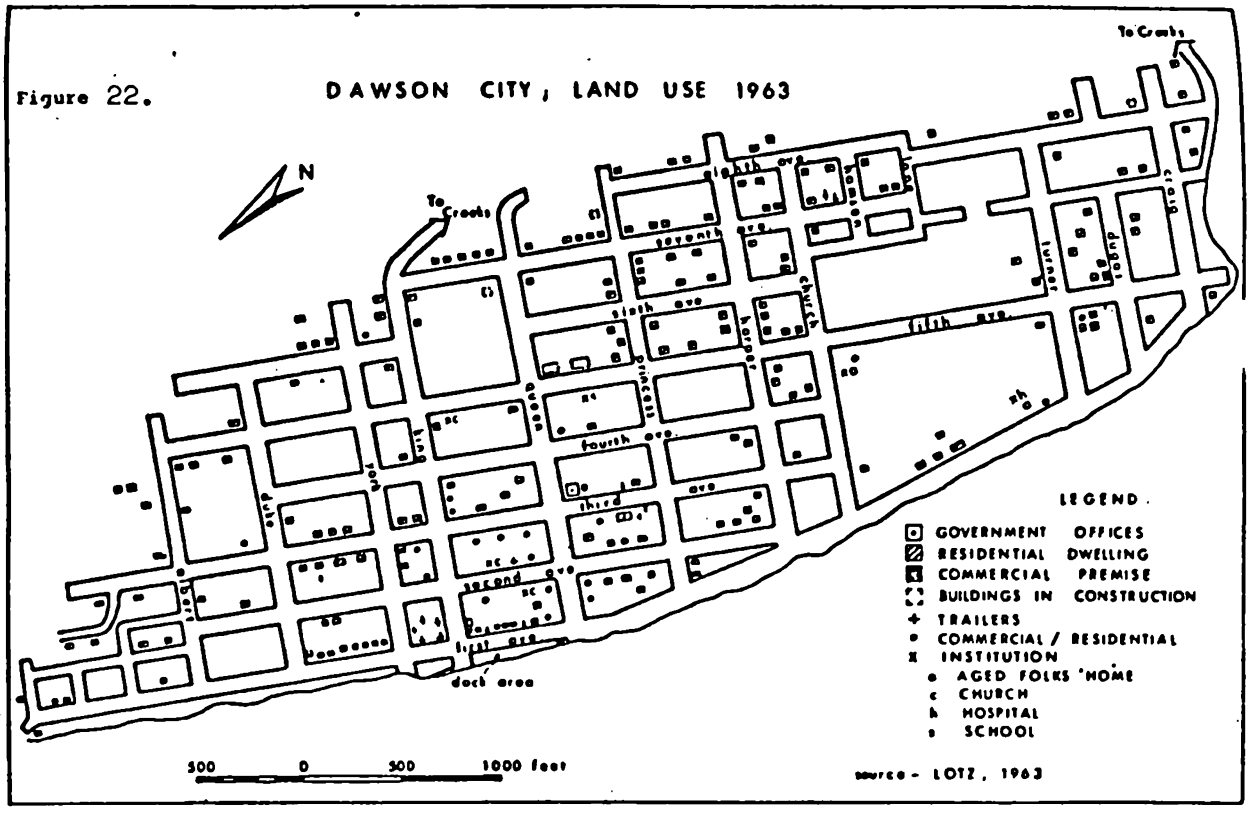
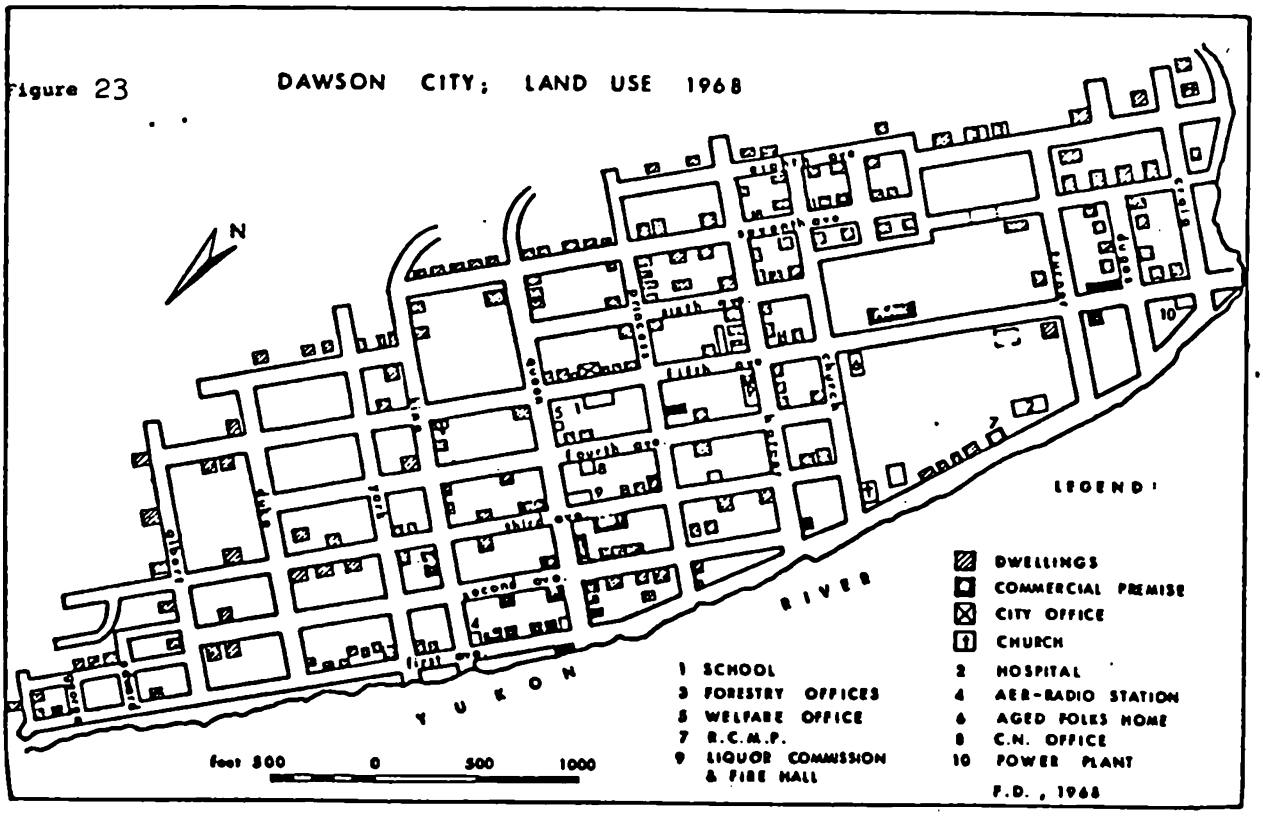
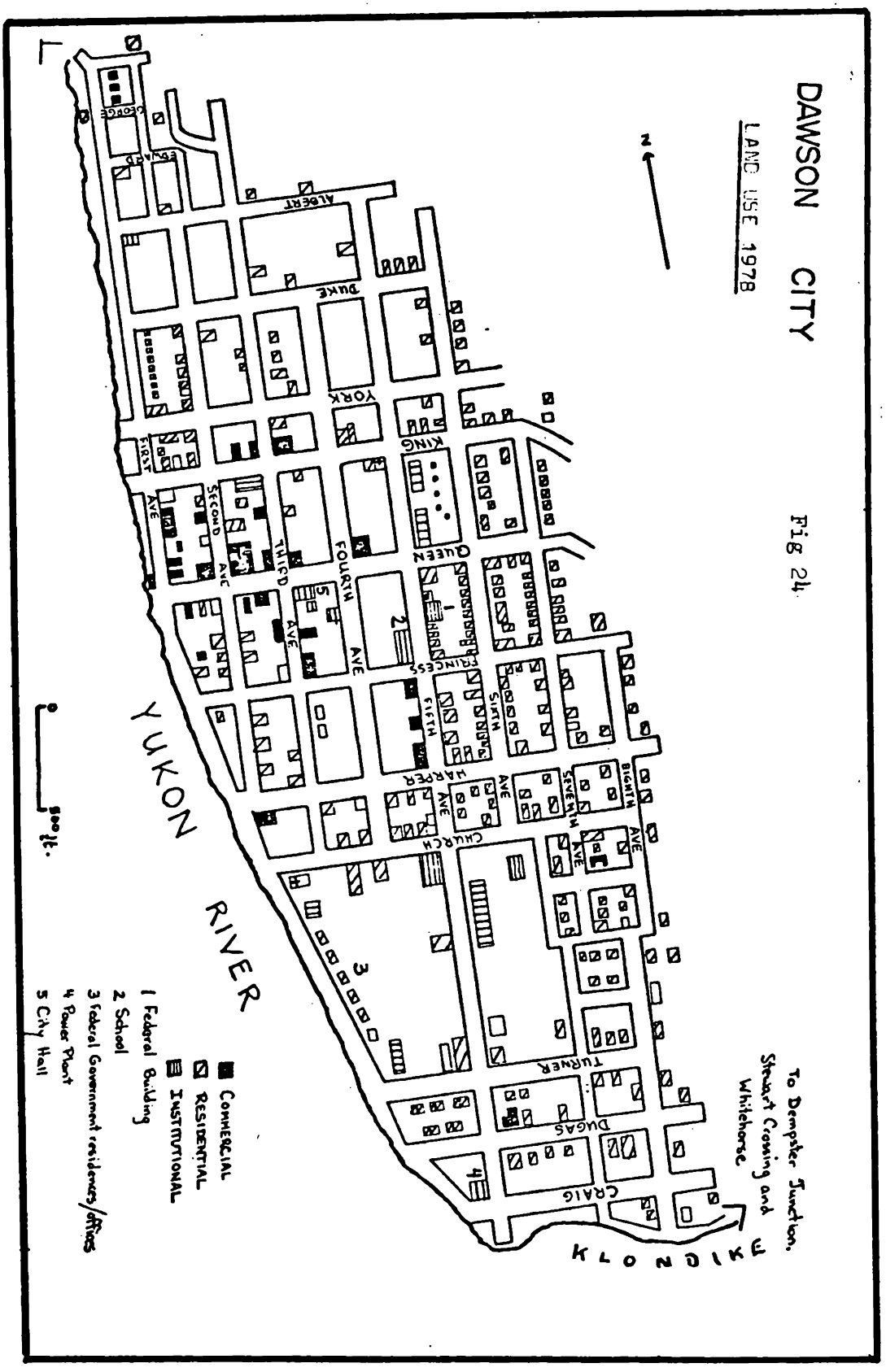


Figure 23 DAWSON CITY; LAND USE 1968




DAWSON CITY
LAND USE 1978
Fig 24
N
To Dempster Junction, Stewart Crossing and Whitehorse
KLONDIKE
CRAIG
DUGAS
TURNER
CHURCH
HARPER
QUEEN
KING
YORK
DUKE
ALBERT
FIRST AVE
SECOND AVE
THIRD AVE
FOURTH AVE
FIFTH AVE
SIXTH AVE
SEVENTH AVE
EIGHTH AVE
YUKON RIVER
500 ft.
Commercial
Residential
Institutional
1 Federal Building
2 School
3 Federal Government residences/offices
4 Power Plant
5 City Hall

related to natural increase in the Indian population, expanded tourist facilities, and increased Government activity. Between 1968 and 1978 a major component of population increase was a net gain of 48 households through in-migration; the major source of migrants within the territory were Watson Lake, Mayo and Carcross. Out-migration was to Watson Lake, Mayo and Haines Junction.

Comparison of figs 23 and 24shows that land-use in Dawson in 1978 was, as in 1968 clearly segregated. The majority of the Indian population live in dilapidated stereotyped houses crowded together on one barren lot on the western end of the Yukon waterfront; the Federal Government occupy a large reserve at the eastern end of the waterfront. Commercial premises are still largely confined to First and Second Avenue, but as fig. 24 indicates there has been a diffusion of tourist oriented activities throughout the townsite since 1968. Construction of new housing has resulted in the in-filling of a number of vacant lots - especially towards the periphery of the main townsite over the past ten years.

Housing

The decline of Dawson from mid 1940 until the 1960's was manifest in the decrease in number of occupied dwellings. In 1947 there were 215 functional dwellings in Dawson, by 1968 this figure had fallen to 172. As can be seen from comparison of land-use maps (Figs 23and 24)there was a marked increase in the number of dwellings between 1968 and 1978, when 245 functional dwellings were counted. 85 of these dwellings did not exist in 1968, 12 consequently had been built to replace dwellings abandoned or demolished over the past ten years. The construction of new dwellings has resulted in the 'in-filling' of abandoned lots in Dawson.

Both the Federal and Territorial governments have been active in housing construction, and some 25% (81 units) of Dawson's housing stock is administered by Government agencies. Approximately half the Government administered housing is for Government employees, with balance involved in rental/purchase schemes.

In 1968 it was noted that building types in Dawson reflected two periods of growth, the era when Dawson was a major mining centre, and the Post War period. The more recent housing was prefabricated, and mobile, reflecting the temporary nature of many of the operations in Dawson and uncertainty in the future. This trend continued through to 1978, with the vast majority of new houses being of prefabricated or 'panabode' design, while the number of trailers in the settlement increased from 10 in 1968 to 28 in 1978. The role of trailers as a major portion of housing stock in almost all Yukon communities is related to their portability, weatherproof characteristics, and lack of need for extensive foundations.

Despite an increase in new, or replacement dwellings, it is obvious that adverse site conditions, (notably permafrost), create structural problems. 24% of the occupied dwellings had externally obvious structural problems, such as leaning walls, sagging foundations or sagging roofs. This was a far higher proportion than in any other settlement and is even more serious insomuch as the total housing stock includes trailers.

Economic Base

Traditionally Dawson's major role has been as a service centre for mining operations. Its initial decline came with the marked decrease in population in the Klondike region in the early 1900's. The settlement's role was now reduced to serving such communities as Bear Creek, Granville, and Dominion, and for numerous small prospecting camps scattered through the Klondike. In 1963 the YCGC closed its operations in the Klondike, and it was feared that the effect on Dawson, which relied on the company for both utilities and retail business would be devastating,

> 'Although Dawson is not a company town it has many of the attributes of one, lying as it does under the shadow of YCGC..... Some Dawson residents will not believe that the company is closing..... Dawson also depends upon the company not only for services, but for employment and for money spent locally both by the company and its

employees.' (Lotz, 1963 100).

There was a marked shrinkage in the number of commercial establishments from 46 in 1963 to 34 in 1968. At the same time, however, new opportunities arose for the re-orientation of Dawson's service base notably the development of the Clinton Creek asbestos deposits, and the promotion of tourism. By 1968 about 50% of the commercial activity in Dawson was tourist oriented, while the balance of the service base was directed towards providing services for the settlement's permanent population, construction workers at Clinton Creek and some 35 prospectors in the Klondike.

In 1978 the service base was evidently larger. The number of tourists had increased substantially since 1968, and of the 40 commercial establishments in Dawson 27 could be said to be tourist oriented. The promotion of tourism in Dawson is pursued by a number of agencies, notably the Klondike Visitors association who operate the gambling hall, and the Federal Government, investing $10 million over a twenty five year period to restore many of Dawson's historic buildings. This restoration activity has both a short-term and long term impact on Dawson's economy. In the short term the labour force employed in restoration adds to Dawson's summer population, in the long term restoration of Dawson may attract more tourists. It could be argued, however, that the restoration of Dawson is rather too meticulous and that too much time has to be spent restoring individual buildings and that investing the money more widely in generally improving Dawson's appearance would be more beneficial to the tourist industry in the immediate future. After the cosmetic changes had been made then work could proceed on detailed internal restoration of individual buildings.

Dawson still acts as a service centre for an out-lying population, and it would appear that the out-lying population is larger than it was in 1968. It was estimated that in the summer of 1978 there were 27 persons located on the Yukon River between Dawson and Fortymile, 60 persons on the Dempster Highway and in excess of 200 persons in the Klondike.

TABLE 11

Commercial Operations in Dawson City, 1953-1978

	Ridge 1953	Lotz 1963	Author 1968	1978
Blacksmith's Shop	2			
Garage	2	2	2	2
Commercial Gardener	1	1		
Barber	2	1	1	
Beauty Palor	1	1	1	1
Theatre	1	1	2	2
Hardware Store	1			
Bicycle Shop	1			
Souvenir Ship	2	3	3	3
Restaurant	2	4	3	5
Hotels (with bars)	5	5	2	3
Rooming Houses, Cabins		3	2	1
Motels		5	4	7
Banks	2	2	2	1
Transportation Companies	6	10	3	5
General Stores	2	3	3	3
Bakery	1	1		
Newspaper Office	1			
Clothing Store	1	1	1	3
Company Offices	4	2	2	
Taxi Companies		1	2	1
Laundromat			1	1

The development of the Clinton Creek mine and associated community in 1968 was, at the time, seen to be the key to Dawson's re-invigoration, with Dawson providing many of the goods and services demanded by the mine labour force[2]. In 1978 the mine (heralded in 1966 as a 25-year mine) closed, and the town of Clinton Creek was, literally, destroyed.

It would appear, however, that the Clinton Creek development came and went without leaving any lasting impact on Dawson. Lerchs, in a study of the potential effects of the Clinton Creek mine closure concluded,

> 'very few of the potential revenues available from wages and salaries paid at Clinton Creek ever reach Dawson.' (Lerchs 1977 p 16).

He found that commodities were cheaper at Clinton than at Dawson, and that consequently a number of persons from Dawson did their shopping in Clinton. The greatest impact of the mine was in winter when traffic between Whitehorse and Clinton Creek generated custom that compensated, to a small extent, for loss of tourist revenue in Dawson. It would appear, (and is a conclusion elsewhere in this work) that high speed highway transport and the associated self-contained mining towns have sounded the death-knell of service oriented communities such as Dawson.

Employment

As can be seen from reference to table 9 the service sector employed some 296 persons in Dawson in the summer of 1978, compared with approximately 140 employed in various government departments. The high level of government employment can be accounted for by various tourism related agencies (Parks Canada notably), and the settlement's location at the northern edge of the Yukon ecumen, Dawson serving as a local administration point for a wide area.

Employment levels in all sectors fall in winter (table 8), but the most notable collapse is in the service sector. In winter the service labour force shrinks to 45, the number of establishments falling from 40 to 13. The permanent inhabitants of Dawson lose service advantages brought about by

artificially inflated summer retail thresholds, while further reduction in retail viability results from the winter out-migration of much of the tourist-oriented labour force. However, as discussed in Chapter 4 the impact of the collapse of tourism in winter may not have as an adverse effect on employment levels as the volume of summer employment would suggest, much of the summer labour force being temporary employees drawn from outside the territory.

MAYO LANDING

Mayo Landing lies on the north bank of the Stewart River, at its junction with the Mayo, about 50 km above the confluence of the Stewart and the Yukon. It developed in the early 1900's first as a trading post and then as a port to serve mining developments in the Duncan Creek and Keno areas, the settlement's location being at the closest point on the Stewart to these areas (Duerden 1971 p 109). As a service centre its fortunes were directly tied to the prosperity of the area's mining industry, and periodic recessions in the 1920's and 1930's adversely affected the settlement's growth. The settlement's raison d'être was displaced in 1950 with construction of the all weather highway from Whitehorse to the Mayo mining area which brought about the ceasure of Mayo's port function. It was noted in 1968 that the settlements in Mayo's hinterland were becoming increasingly self-sufficient, and in 1978, with the total demise of Calumet, the continued stagnation of Keno, and the presence of a subsidised retail base in Elsa, Mayo's role as a service base is greatly diminished.

Lack of economic growth since the mid 1960's has been accompanied by lack of substantial growth in population. The Indian sector of the population made the largest contribution to growth, increasing from an estimated 142 in 1968 to 200 in 1978, and this is attributable to in-migration from camps in the valley of the Stewart as well as natural increase. The non-Indian sector increased by four households in this period, due exclusively to in-migration.

Fig. 25 MAYO LANDING ; LAND USE 1952

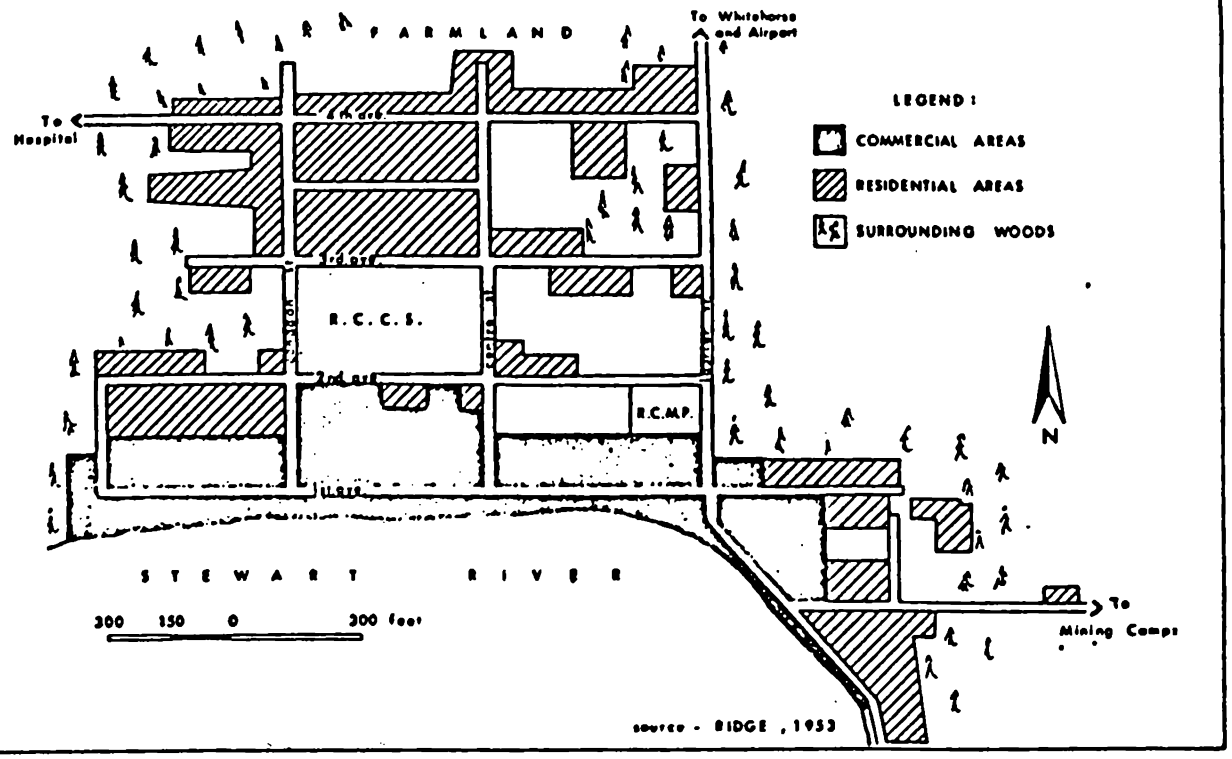


Fig. 26 MAYO LANDING; LAND USE 1968

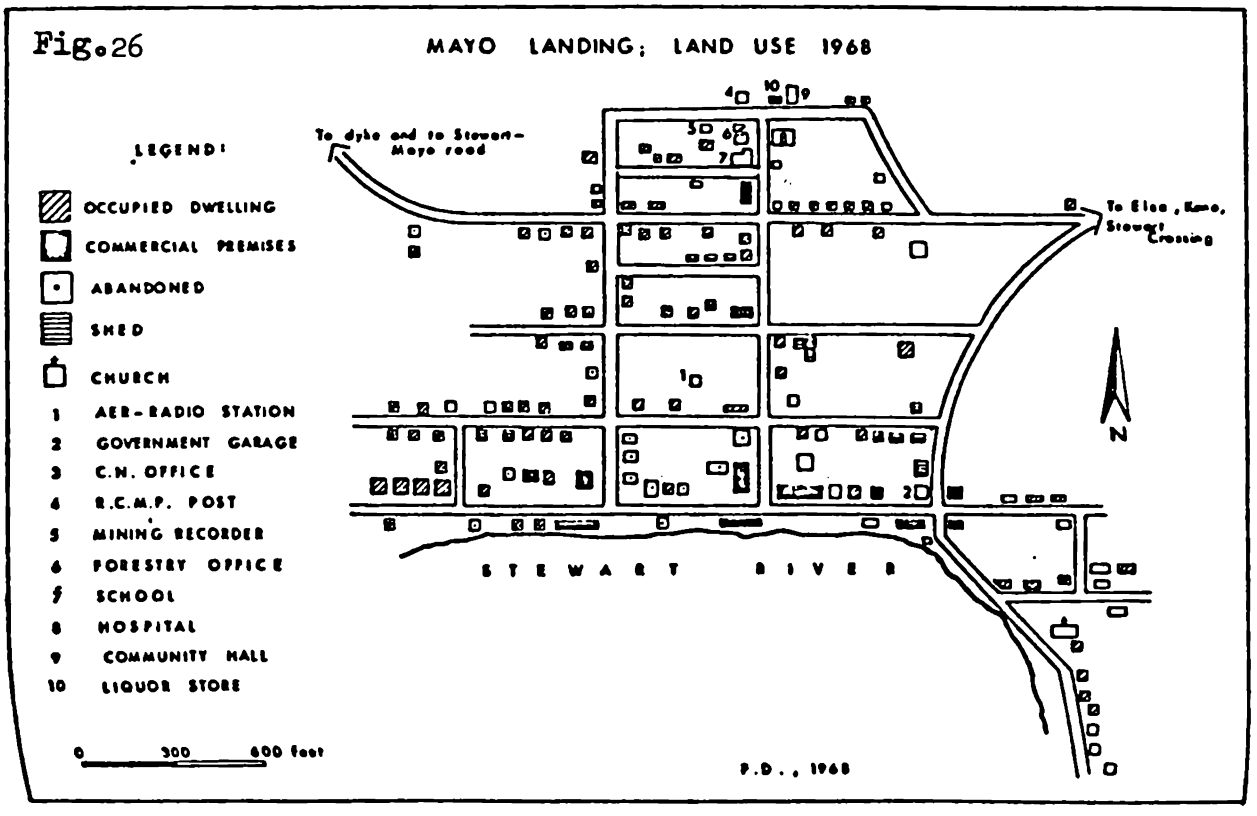
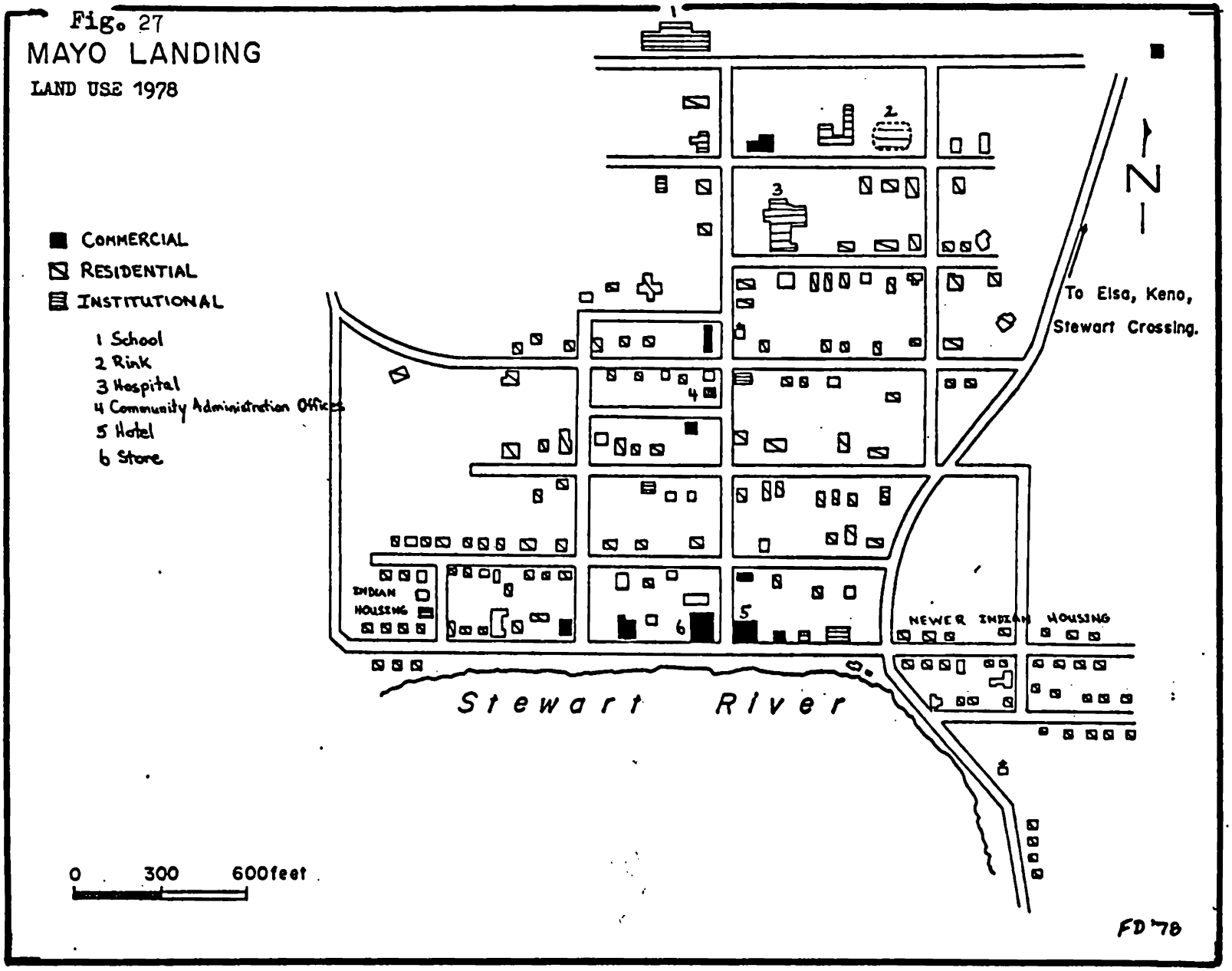


Fig. 27

MAYO LANDING

LAND USE 1978



In-migrants were drawn from Dawson and Whitehorse, while out-migration was to Dawson, Elsa and Faro. A portion of the town's population is employed in the mining industry, with Mayo serving as a 'dormitory' for Elsa.

Land Use

The land-use plan of Mayo remains much as it did in 1968, although there has been a considerable amount of new housing constructed in the community and the eastern end of the town is far more developed than it was in 1968. Land-use segregation is still marked, with government activity located in the northern part of the settlement, and commercial activity still confined to the generally decayed Front Street, retaining a waterfront orientation that was rendered redundant in the 1950's. Much of the Indian population still lives in the south west part of the settlement, but there has been considerable movement to the new housing in the south eastern part of Mayo.

Housing

As population increased in the period 1968-78 so did housing stock, from 89 occupied dwellings in 1968 to 124 in 1978. The incidence of abandoned buildings is low, with only six buildings abandoned, compared with 15 in 1968. Of the 124 residences 64 existed in 1968, and the expanded housing stock has accomodated the expanded Indian population and also served to replace sub-standard dwellings. Much of the housing expansion has taken place at the eastern end of the settlement, and Indians moved to here from housing in the traditional Indian occupied area at the western end of the town. This transfer was necessitated by the accumulation of sewage in the lowlying area of the settlement adjacent to the mouth of the Mayo River. It would appear that the transfer is only partly successful insomuch as abandoned dwellings are occupied by other Indians soon after the inhabitants move out (BCRHPCI)[2].

Although permafrost is present on the Mayo Landing site only 6% of the residences had obvious structural problems - although some of these were in houses constructed over the past ten years.

Table 12.

Retail and Service Operations in Mayo Landing.

	1953(Ridge)	1968(author)	1978(author)
Airline Office	1		
Bank	1		1(part-time)
Bar	2	2	1
Barber	1		
Book Store	1		
Cafe	2	1	1
Clothing Store	1	1	1(in general store)
Garage	2	2	2
General Store	2	2	1
Hotel	2	2	1
Laundramat			1
Liquor Store			1
Motel		1	1
Saw Mill	2	2	2
Trucking Co.	4	1	3
Variety Store		1	1

Economic Base

Mining, the territorial and Federal governments, and retailing are the major sources of cash income in Mayo Landing. A considerable portion of the Indian population is probably employed in land related activities, but there are no data available to substantiate this assertion. The various government agencies in Mayo are the largest employer, employing 44 out of a total labour force of about 80. In some respects Mayo serves as a dormitory for Elsa, with miners commuting to work in the Keno Hill area; while a number of former Mayo residents now reside in Elsa.

In terms of numbers of establishments Mayo's service base has shrunk since 1968 (table 12.), with the closure of a large general store and a beer hall. However a wide range of retail activities have been consolidated in the community's supermarket. Although there are a hotel and motel in Mayo the volume of tourist traffic is negligible, and the accomodation provided is mainly used by other itinerants - government officials, miners. Because tourism is of little importance in Mayo retail thresholds are not artificially inflated as in Dawson, and consequently the range of goods and services provided is somewhat restricted. The demise of the regional service function in Mayo, with the town serving the Keno Hill mining area, is to be noted from the observation that only 10% of the retail transactions conducted by Elsa's population were conducted in Mayo. Journey to shop patterns of Mayo's populace also reflect an inadequate base when compared to Dawson - 46% of retail transactions take place internally, as compared to 60% internal transactions in Dawson.

KENO

Keno, 67 km north east of Mayo Landing lies at an altitude of 935 m aligned north-south along a shallow ridge; to the south it is bounded by

Lightning Creek while to the west the level falls away towards the Mayo River. The settlement's location is typical of a pre-automobile or pre-single media transport mining town, with the townsite lying adjacent to the mining area with proximity to ore taking precedence over hospitability of townsite as a factor in settlement location.

With its origins as a base for silver ore extraction in the vicinity of Keno Hill following a stampede to the area in 1919 Keno's fortunes have fluctuated with the prosperity of the local mining industry. In 1921 Keno's population was recorded as 101; by the 1930's depopulation was taking place as a result of collapse of silver prices (Cockfield 1930). Although the 1951 population was only 81 the community boomed in the early 1950's. Ridge (1953) described the settlement as containing a mill, bunkhouses, private dwellings and beer halls, and stated that it was a 'wide open mining town' (Ridge p 310). By 1956 the census population of Keno numbered 190. The boom period was short lived, the closure of mines around Keno combined with a rationalisation policy conducted by United Keno Hill mines who started to consolidate activity at Elsa, some 11 km. to the south west, was reflected in a decrease in census population to 144 in 1966 (although by 1968 it was considerably less than this), and 70 in 1976.

Land Use

In appearance the settlement is chaotic. Northwards old mine workings abut into the town, whilst to the west mining activity has defaced the landscape. Numerous buildings are abandoned and there is a profusion of derelict and overgrown lots. As can be seen from figs 28 and 29 there has been little change in Keno over the past 10 years, although a number of buildings have disappeared. In 1968 out of sixty dwellings twenty nine were abandoned; by 1978 the number of occupied dwellings had increased from 30 to 33, but field observation indicated that 12 of these dwellings had serious structural problems.

Fig. 28

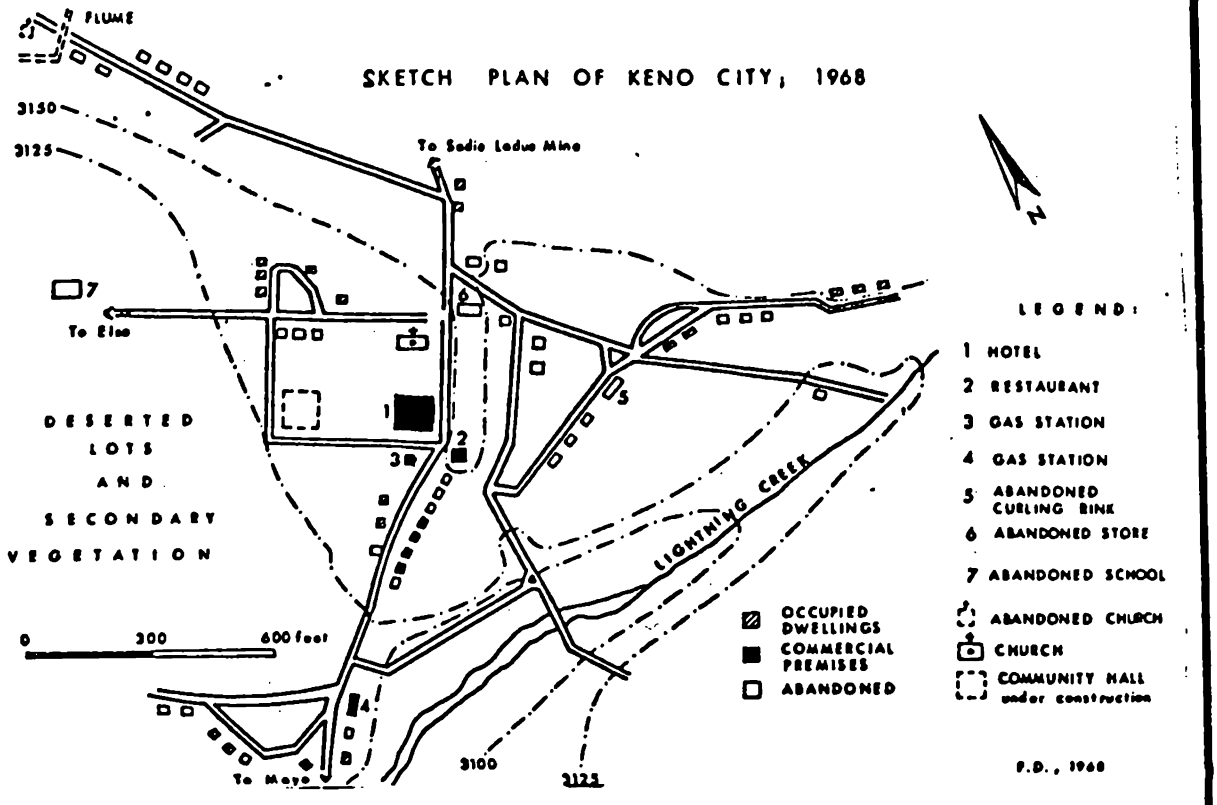
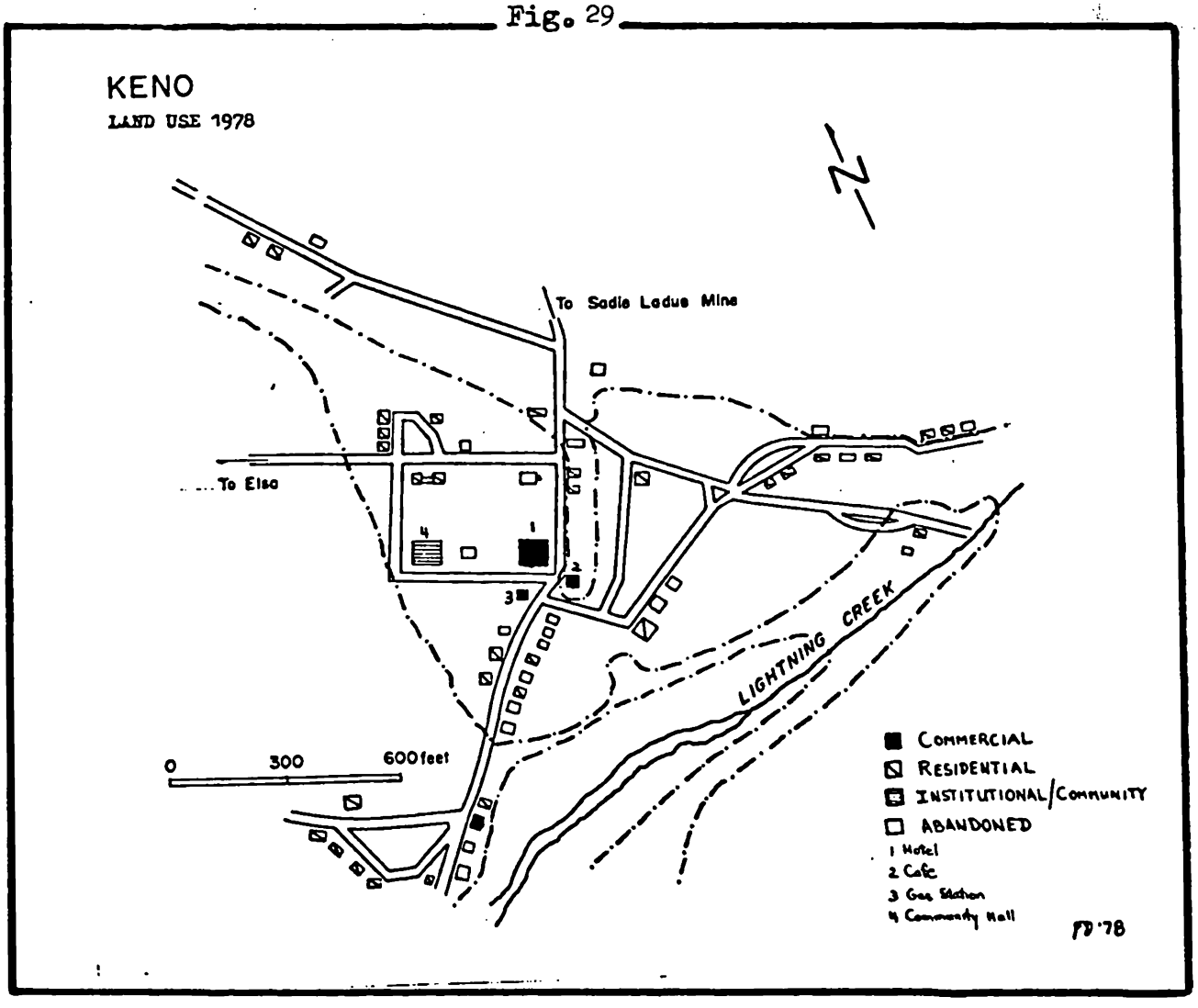

SKETCH PLAN OF KENO CITY, 1968
FLUME
3150
3125
To Sadie Ladue Mine
To Elsa
DESERTED LOTS AND SECONDARY VEGETATION
LIGHTNING CREEK
0 300 600 feet
To Mayo
3100
3125
OCCUPIED DWELLINGS
COMMERCIAL PREMISES
ABANDONED
LEGEND:
1 HOTEL
2 RESTAURANT
3 GAS STATION
4 GAS STATION
5 ABANDONED CURLING RINK
6 ABANDONED STORE
7 ABANDONED SCHOOL
ABANDONED CHURCH
CHURCH
COMMUNITY HALL under construction
P.D., 1968

Fig. 29


KENO
LAND USE 1978
To Sadie Ladue Mine
To Elsa
LIGHTNING CREEK
0 300 600 feet
COMMERCIAL
RESIDENTIAL
INSTITUTIONAL/COMMUNITY
ABANDONED
1 Hotel
2 Cafe
3 Gas Station
4 Community Hall
PD '78

Economy

The community's economic base is tied almost exclusively to mining, while the few services that exist (gas bar, hotel, restaurant) are operated on a part-time basis. Although the Sadie Ladue mine at Keno was reopened in 1973 and currently employs 40 men, this has had no impact on the settlement, Elsa being the base from which the mine is managed.

The present survival of Keno can perhaps be explained by reference to the type of life-style it provides. First it is conveniently located to serve as a community for those members of the United Keno Hills mine labour force who do not want to live in the company town (Elsa). Secondly it provides habitation for a small 'back to the land' element. This group takes advantage of the town's isolated location and available abandoned dwellings to practice their 'alternate life-style'.

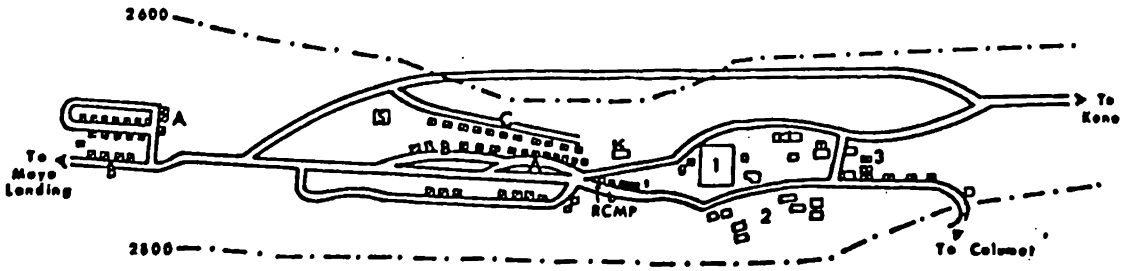
ELSA

There has been mining activity in the vicinity of Elsa ever since the Galena Hill silver ore was first worked in 1914. Located on an exposed hillside some 56 km north east of Mayo Landing, the community has been of major importance since 1934 when the Treadwell Yukon Gold Company removed its mill at Wernecke and located it at Elsa in response to the discovery of the Calumet mineral deposits (Ridge 1953, 316). The settlement grew rapidly, and by 1938 boasted such social capital as a school, hockey rink and community hall (Bostock 1938, 12).

Rapid growth in the community's census population took place after 1950 from 151 in 1951 to 529 in 1966. Falling ore prices in the late 1960's combined with rising costs curtailed development and the labour force fell from 405 in 1966 to 284 in 1971. In 1978 the mine had some 300 employees, and

Fig. 30

SKETCH PLAN OF ELSA, 1968



LEGEND:

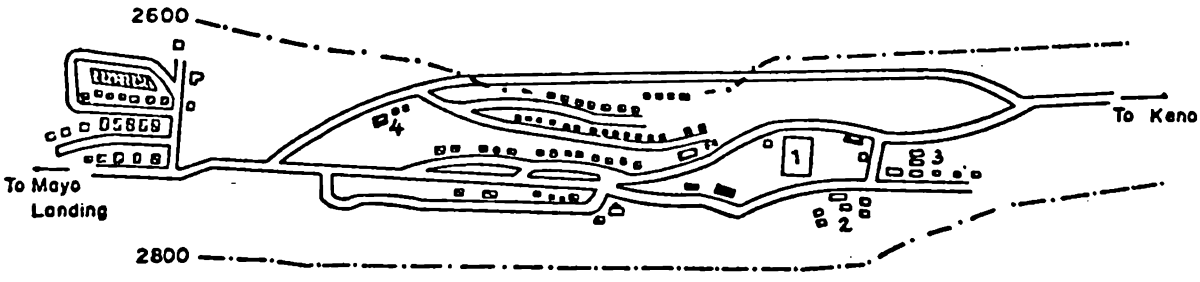
- RESIDENTIAL BUILDINGS
- A DWELLINGS ESTABLISHED WITH CAMP
- B DWELLINGS CONSTRUCTED 1951 - 1955
- C DWELLINGS TRANSFERRED RECENTLY FROM CALUMET
- COMMERCIAL BUILDINGS
  - b BANK
  - s STORE
  - g GASOLINE STATION
- 1 MILL & ASSOCIATED BUILDINGS
- 2 ADMINISTRATIVE AREA
- 3 BUNK HOUSE AREA
- SCHOOL
- sc SOCIAL CLUB
- cl CURLING CLUB
- m MESS HALL
- BUNK HOUSE

0 600 1200 feet

F.D., 1968

Fig. 31

ELSA
LAND USE 1978



- COMMERCIAL
- RESIDENTIAL
- INSTITUTIONAL and COMMUNITY

1 Mill and Associated Complex
2 Office Area
3 Bunkhouse Area
4 School

0 600 1200 feet

FD'78

the population of the settlement was estimated to be 500.

The contemporary community has been influenced by a policy of rationalisation that commenced in 1966 with the closure of the Keno Hill mine and the consolidation of activities from the nearby mining community of Calumet (which had a population of 198 in 1966) at Elsa.

Site

The site of Elsa is a case of optimum location in terms of access to ores taking precedence over optimum location in terms of townsite. The settlement lies on the side of Galena Hill, well above the valley floor, at an altitude of 523 m at the site of the mine. The disadvantages of such a site are obvious. Firstly, water has to be pumped some 3900 m, with a vertical rise of 300 m to the site of the town where it is fed into a public piped water system. Secondly, there is little room for growth, except either laterally along the hillside, or vertically by terracing the hillside. Vertical development means increased construction costs.

Hillside location and altitude give rise to other disadvantages. Climatically the settlement does not have a sheltered location, it faces the junction of two valleys down which winds are funnelled. Because of climate vissicitude the buildings in the community are linked by a utilidor system.

Land Use

In form the settlement has changed little from 1968 (fig 30). There is marked internal segregation of land-use, with four land-use types identifiable as one moves from north to south. At the north end of the town lie the bunk houses of miners and labourers, along with an associated social infra-structure, cafe and beer hall. South of this lies the main mine complex, the mill and associated buildings lying west of the road (down-slope) and the administrative buildings lying east of the road (up-slope). Behind the administrative buildings lie the bunk houses of members of the managerial hierarchy. Immediately south of the main mine complex is the service center

of the settlement.

On both sides of the road south of the service area are the dwellings of miners' families. These lie on streets terraced into the hillside, most of which lie west (i.e. down-slope) of the main street. As can be seen from fig 31 three eras of housing development are to be identified. These are firstly the older ashphalt dwellings, some of which lie on the first street north of the main street. The dwellings located here were amongst the first on the settlement site. Another group of dwellings of similar age and type are those in the most westerly part of the town. This group of dwellings was constructed in the early days of settlement by mine workers themselves, whilst the managers of the mine lived some distance away at the site of extraction.

The second era of dwelling construction was in the period 1950-56 when timber dwellings were constructed. As can be seen from the map (fig 31) these houses are located alongside the most westerly group of ashphalt-fronted buildings.

The most recent era of construction has included the removal of dwellings from Calumet and their placing in Elsa. These houses run parallel to the general trend of the community, west of the main street (fig 31).

Economy

Elsa's operation is characteristic of any single enterprise community. The townsite and mill intermittently serve six mines, five in the immediate vicinity and one above Keno. The Keno mine was reopened in 1973, and employs 40 men. After concentration the silver-lead is trucked to Whitehorse and shipped out of the territory to the American Smelting and Refinery Company's smelter in East Helena, Montana.

Totally 300 persons are employed in mining, and 19 employed in services. Although the service base appears to be limited, consisting of supermarket, post-office part-time bank, and bar 44% of all shopping trips are internal -

a higher portion than one may perhaps expect. This is largely due to the presence of a predominantly male labour force who do not stay very long and generally lack sophisticated retail demands, and to price subsidies in Elsa's supermarket, where prices were (on average) 5% below those for comparable goods in Whitehorse.

Of the estimated 500 persons currently living in Elsa, 150 are single males living in bunk houses, and the balance consist of members of relatively large families living in single family dwellings. As can be seen from the origin destination matrix in Chapter turn-over rates are high (a fact commented on by Laatsch (Laaatsch p64)), with population levels maintained by migration from outside the Yukon.

It could be argued that the existence of the town of Elsa is anachronistic. The settlement developed in the days prior to all-weather highway, when, of necessity, townsite had to be located close to the mine. At one time it was suggested that the town be moved to a more attractive site, namely Hanson Lake in the McQueston Valley (Laatsch 1972 p 46). Uncertainty about the longevity of mining activity clearly mitigates against any new townsite development (the mine manager stated that the management perpetually views the Elsa mine as a twelve month mine; such limited time horizons don't make for long term planning). Relocation in Mayo Landing has been suggested, with the labour force commuting to the mining area every day. This alternative has a number of attractions. It would realise economies through the operation of one townsite; the resultant expanded population of Mayo Landing may give rise to the provision of more sophisticated goods and services, and it would re-vitalise the stagnant economy of Mayo. Development of the Mayo townsite as a hospitable place to live may also realise further economies for United Keno Hill Mines by cutting down on labour force turn-over rates.

Notes

1. BCRH suggested the destruction of the housing stock left behind by occupants moving to new housing. Such a measure seems rather extreme, reoccupation of abandoned housing suggesting that there is a housing shortage.

8. THE FARO SETTLEMENT GROUP

Faro, Ross River, and Carmacks have widely differing histories, but are related through their links with the Anvil Dynasty lead-zinc mine located north of the Pelly River about half-way down the Tintina Trench. Construction of the mine, associated town of Faro, and supporting infrastructure brought an investment variously estimated to be $100 million (DIAND 1970) to $200 million (Whyard 1968). Although Whyard (1968) stated

'There isn't a business or a resident in the Territory who hasn't felt the benefit (of the development) in some way' (Whyard 1968 p 21).

it would appear that the case is rather strongly over-stated, and (as argued in Chapter 3) excepting the construction phase the only communities outside Whitehorse and Faro influenced by the development are Carmacks and Ross River.

Faro itself had no history prior to the establishment of the Anvil mine. Located on the north bank of the Pelly west of Ross River it was created as a town to house and act as a service base for employees of the Cyprus Anvil mining Company.

Carmacks, with its origin as a trading post situated at the junction of the Yukon and Norderskold rivers, has had a long history of occupance and historically has played an important role in the north-south line of communication along the Yukon valley. The construction of the Campbell Highway from Watson Lake to Carmacks to serve the Anvil development gave the community a nodality it never had previously. Carmacks provides a direct industrial input for the Anvil mine, the coal mine at Tantalus Butte producing coal which is consumed in the Anvil smelters. Thus, with its non-Indian economic base firmly entrenched in coal mining and provision of services for transients the prosperity of Carmacks is closely tied to the Anvil operation.

The community of Ross River lies in the central part of the Tintina Trench, at the junction of the Ross River and the Pelly. People have lived in the vicinity of Ross River since the turn of the century, but a coherent community did not emerge until the 1950's. Construction of the Canol pipeline

and road through Ross River to the Alaska Highway in the early 1940's gave the community direct high speed contact with the north-west highway system and gave the community some importance as a base for prospecting operations in the Central eastern Yukon. The inception of the Anvil project, some 64 km to the north west of Ross River in the late 1960's led to drastic transformation in the community. Initially Ross River served as a base for mine and townsite construction,[1] leading to an expansion in both housing stock and service base. Construction of the Robert Campbell highway provided the community with direct links to Watson Lake and Carmacks and from a communications standpoint led to closer integration with the rest of the territory's settlement system.

Because of its relative proximity to Faro a number of miners live in Ross River and work in Faro, and constitute an important component of Ross River's basic economic sector. A further link between the Faro development and Ross River is in the field of retailing. Partly as a result of its size and employment characteristics Faro provides a number of relatively sophisticated goods and services, previously only available to residents of Ross River in Whitehorse.

FARO

Faro was established in 1968 as a town to serve the Anvil Dynasty lead-zinc mine, some 64 km north west of Ross River. The settlement lies at an altitude of 393 m on the north bank of the Pelly River, some 76 m above the valley floor and 24 km from the mine-site. Five potential sites were selected for the town (Laatsch 1972 p 135), and the present site chosen because of its relatively low elevation, pleasant aspect, and distance from the mine. Other factors were ease of access to the Robert Campbell highway and the possibility of attracting tourists into the town from the highway.

The basic philosophy behind the planning of Faro was that by creating a community which would have a family orientation, broad service base, and marked division between work and residence, employee morale would be maintained and labour turnover rates reduced from those normally associated with most northern single enterprise communities. It was hoped that after initial development the average length of stay of employees would be five years (Laatsch 1972 p 148).

However, the broader locational considerations apparently overcame more local considerations of site quality, and a number of site related problems have occurred. On the eve of construction a forest fire destroyed all vegetation within a two mile radius of the site, but the settlement's location was not changed. Permafrost affected some of the buildings in the community, notably the hotel which lies at the focal point of the town (fig 32), while a process of electrolysis resulted in the perforation of much of the settlement's water supply system.

Land Use

The townsite occupies two benches, the northerly one, on which the main body of the town lies, being some meter above the southerly one. As can be seen from reference to fig 32 the northern portion of the settlement site is occupied by extensive and potentially temporary users of land - light industry and trailer units. The commercial and administrative core of the community is south east of here, with the school, supermarket, stores and hotel in close proximity to each other. Residential units lie east of the commercial/administrative core and on the lower bench, where most of the detached single family dwellings are located.

The presence of trailers (105) is indicative of both rapid growth and possibly the temporary nature of occupancy in Faro, while the more substantial dwellings are akin to south Canadian suburbia and it is doubtful whether they are well suited to northern climate. In a survey of attitude towards housing in Faro Laatsch found that whilemost respondents expressed general satisfaction

Fig. 32 Generalised Land Use Plan of Faro, 1978.

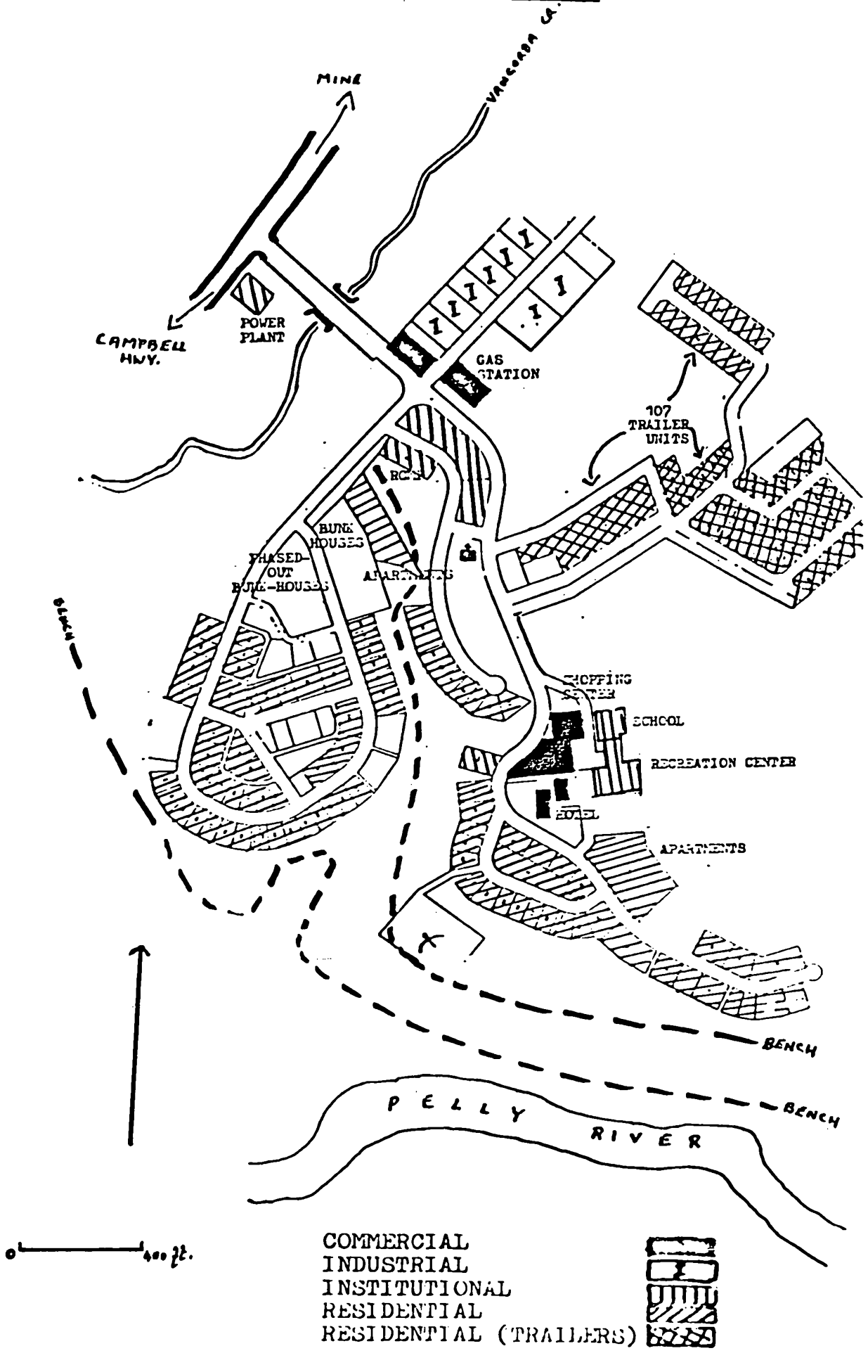


Table 13. Retail and Service Operations in Faro, 1978

	number of activities.
Appliance Sales	1
Auto Sales	1
Auto Rental	1
Bank	1
Barber	1
Cinema	1
Cleaner	1
Clothing	3 (types)
Furniture	1
Groceries	1
Hardware	1
Hotel	1
Insurance	1
Laundramat	1 (for mine employees)
Liquor	1
Pharmacy	1
Plumbing	1
Post Office	1
Radio/T.V.	1
Restaurant	1
Service Station	2
Specialised (Jewelry, souvenirs)	2
Tavern	1
Taxi	1
Travel Agent	1
Variety Store	1

Several activities may be located in one establishment.

with their residences 86% had complaints concerning building quality and climate related problems.

In keeping with the policy of developing a community with family orientation the type of housing stock in Faro has been changed as the community has evolved. Thus there has been a gradual abandoment of bunkhouse living and a movement towards single family dwellings and maisonettes.

Population

As was discussed in Chapter 3 the growth of Faro has largely been due to migration from outside the territory. Only 11% of the current population of approximately 1600 lived in the Yukon prior to the Faro development while 9% of the population entering the community in the past ten years came from other Yukon communities . In-migrants were drawn from settlements of similar functional structure, - Carmacks, Elsa, and Mayo. Despite attempts to establish a viable, stable, town as opposed to a mining camp population turn-over rates ramain high.

Economy

The lead-zinc deposits in the vicinity of Faro have an economic life expectancy of eleven years, while further extensive deposits (the Grum deposits) which as yet have not been worked may give the town a 25 year life expectancy . Any attempt to produce a solid prediction of life expectancy for single enterprise mining communities is difficult because life expectancy is not based on volume of ore available but current world prices for such ore, and variation in market price may either drastically curtail or prolong an operation. This is especially true in frontier locations where operating costs are adversely affected by distance from markets, physical problems (permafrost, cold) and high labour costs. 84% of Faro's labour force is employed in the service mining, with the balance employed in the service sector. As can be seen from table 13 the service sector is relatively

sophisticated, with 28 activities. The size of the service base reflects relative isolation, and the presence of high stable income levels that generate a persistent demand for a wider range of goods and services. Prices are higher than in most other Yukon communities, possibly as a result of the demand-pull of high income levels, yet 59% of retail transactions are conducted in the community - second only to Dawson City in terms of internal interaction. This high internal interaction is at the expense of potential interaction with Whitehorse (table 7).

ROSS RIVER

The community of Ross River is located at the junction of the Ross and Pelly rivers, 185 miles above the latter's confluence with the Yukon. It lies at the site of one of several trading posts established in the area in the years following the Klondike Rush. The post, Nakanie House, was founded in 1900 at what proved to be the highest point on the Pelly accessible to steamboats. Nahanie House was centrally located relative to the area's Indian population, but through the 1920's and 30's thepost declined in importance as a result of competition from new posts established in its hinterland. Decline of fur prices in the 1940's led to the demise of a number of trading posts, and Ross River was the only one to survive on the Pelly, its survivial probably being attributable to its historical role and central location.

A sizeable Indian population was associated with Ross River, but into the 1940's there was no sedentary indian settlement. Cabins were established in the vicinity of the post, but lack of wood and shortage of accessible game served to reinforce nomadic pattern (Sharp 1977 p 40).

Construction of the Canol pipeline in the early 1940's drastically changed Ross River's transport orientation. The pipeline crossed the Pelly

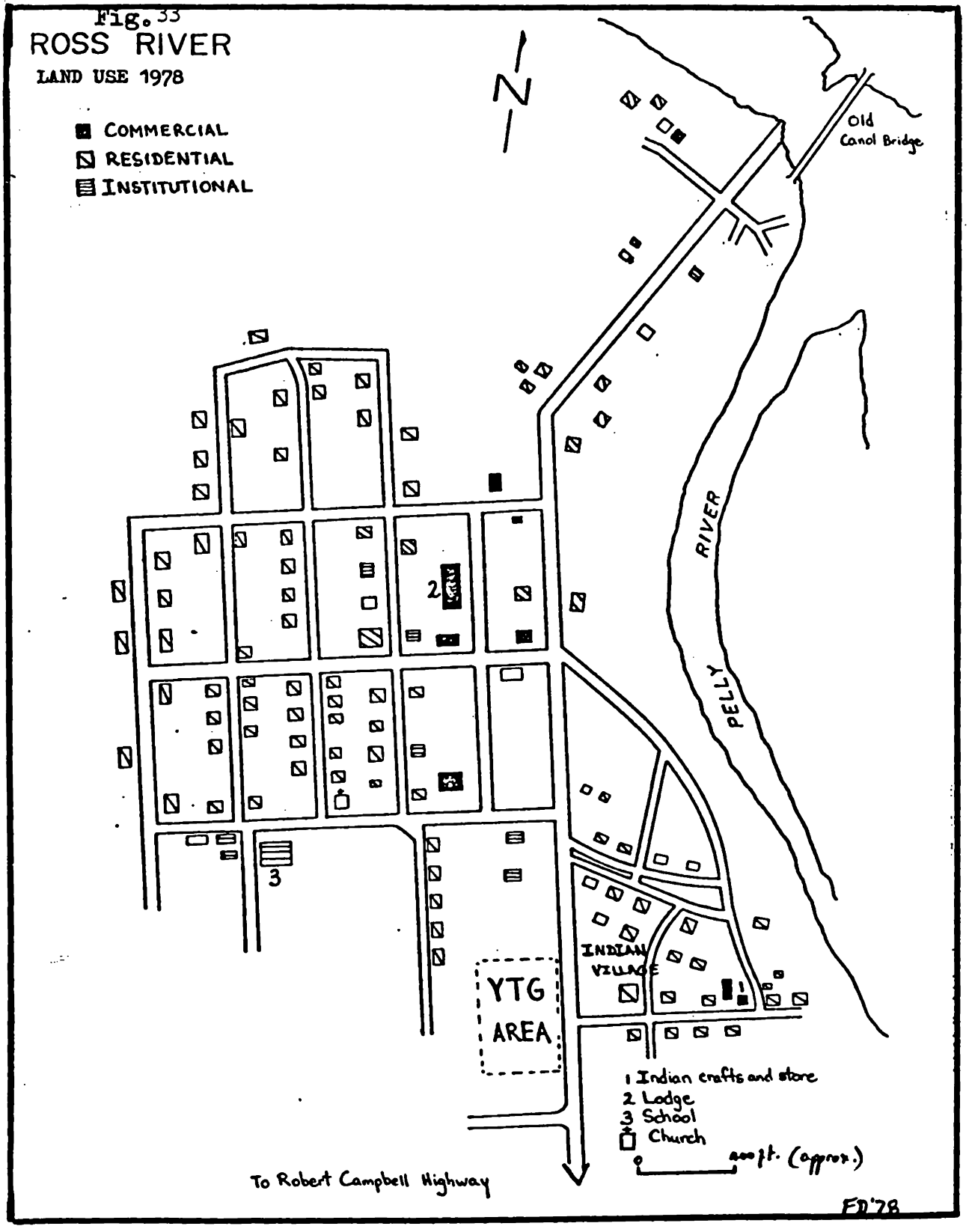
at Ross River, and the settlement served as the ferry station on the associated Canol highway. Ross River now had a direct, relatively high speed, link with the Alaska Highway; this assured future importance insomuch as Ross River now became an easily accessible base for prospecting in the eastern central Yukon. However highway construction led to no immediate change in the community and it wasn't until the 1950's and 60's that more permanent settlement developed. The nomadic pattern of indian habitation continued with Ross River as the focal point, and as dependence on the settlement's store and various government activities increased so this pattern broke down and sedentary Indian settlement grew. In the period 1955-64 five Indian families and two white families lived in Ross River, although it would appear that the periodic bush-Ross River-bush migration of the balance of the area's Indian population became more frequent (Sharp 1977 p 50).

Exploration activity and increased government interest in the 1960's resulted in a marked growth of the white population, and it was in this period that the contemporary form of the settlement had its origins. The use of Ross River as a base for the construction of Faro and the associated mine complex resulted in a rapid expansion of facilities. A department store, garage, motel, cafe, police station, health clinic, and a school were all constructed in the 1960's. Although Ross River was briefly considered as a possible alternative townsite to Faro as a base for the Anvil development the idea was rejected, partly because of the narrowness of the existing service base in Ross River, partly because of concern about the growth of the Indian population (Laatsch p 132), and partly because of its distance from the Anvil site.

Land Use

The settlement lies on a river cliff about 5 meters above the south bank of the Pelly River, at the point where the Canol pipeline crossed the Pelly. A street running almost due south from the river forms the core of the settlement

Fig. 33


ROSS RIVER
LAND USE 1978
COMMERCIAL
RESIDENTIAL
INSTITUTIONAL
N
Old Canol Bridge
PELLY RIVER
2
3
INDIAN VILLAGE
YTG AREA
1 Indian crafts and store
2 Lodge
3 School
Church
To Robert Campbell Highway
FD'78

and it is along this street that the various commercial enterprises lie (fig 33). As can be seen from reference to Fig 33 the street serves to divide the community, to the west is the modern (almost suburban style) predominantly white community, while to the east lies the Indian community. Visually there is a sharp contrast in the quality of dwellings between the two communities.

Population and Economy

The population of Ross River, estimated to be about 370 in 1978, is fairly evenly composed of Indians and non-Indians. Growth in population over the past 30 years can be related to various economic changes which have taken place in the settlement. At the outset (the period up to 1950), fur trading and land-based subsistence activity were dominant; in the 1950's and early 60's prospecting attained some importance, while the Faro project of the late 1960's provided employment in construction. At the present time Government agencies, mining, and service activities are the major employers.

As the economic base has changed so has the nature of the labour force. The transformation from being a small community servicing an essentially land-based economy was complete by the mid 1960's. The Anvil project brought construction workers into Ross River from the outside - none of the existing white population were employed in the project. Some 15 Indians were employed, thus weakening their links with the land. The construction project introduced a substantial service sector to Ross River, and with it grew Indian dependence on the various facilities the town had to offer. Inevitably the example effect of the non-Indian consumption patterns, government policy of concentration of facilities (eg schooling) led to a movement away from the land. In 1960 five Indian families lived in Ross River, in 1967 18 of the 29 Indian families associated with the community lived in permanent residences there. By 1974 there were 32 houses occupied by Indians (Sharp 1977 p 81), in 1978, 34. The increasing sedentary nature of the Indian population of Ross River has not been matched by an increase in Indian wage economy. In a

period of less than thirty years the community changed from primarily serving a land-based economy to being dominated by an essentially non-Indian wage economy.

The origin-destination matrix (Chapter 4) indicates that Ross River does not have very strong migratory links within the Yukon - that the non-Indian population is largely drawn from outside the territory. Such migratory links are what one may expect, the settlement having grown very rapidly, and having single enterprise orientation through its employment links with Faro. Interviews conducted in the summer of 1978 indicated that the community has a relatively large temporary summer population, which live there in summer and live either in Whitehorse or outside the territory in winter.

CARMACKS

Carmacks is one of the most resilient settlements in the Yukon; as a result of fortuitous location and periodic changes in function it is the only surviving community on the Yukon River between Whitehorse and Dawson. Lying on the western bank of the Yukon, close to the mouth of the Nordenskold River Carmacks may have served as a temporary Indian Camp over a considerable period of time. Non-Indian habitation was established with construction of a trading post by George Carmacks in the years preceding the Gold Rush, and following the Rush the community had a multiplicity of functions. It provided road house facilities for both the Dalton trail (which followed the valley of the Nordenskold to the Yukon) and the Whitehorse - Dawson winter road as well as acting as a fueling point of steamers on the Yukon. Coal from Tantalus Butte, on the eastern bank of the Yukon just below Carmacks was mined both for steam boat fuel and for general use in Dawson City from about 1900. Production fluctuated greatly, a major problem being the seasonal nature of river transport between Carmacks and Dawson.

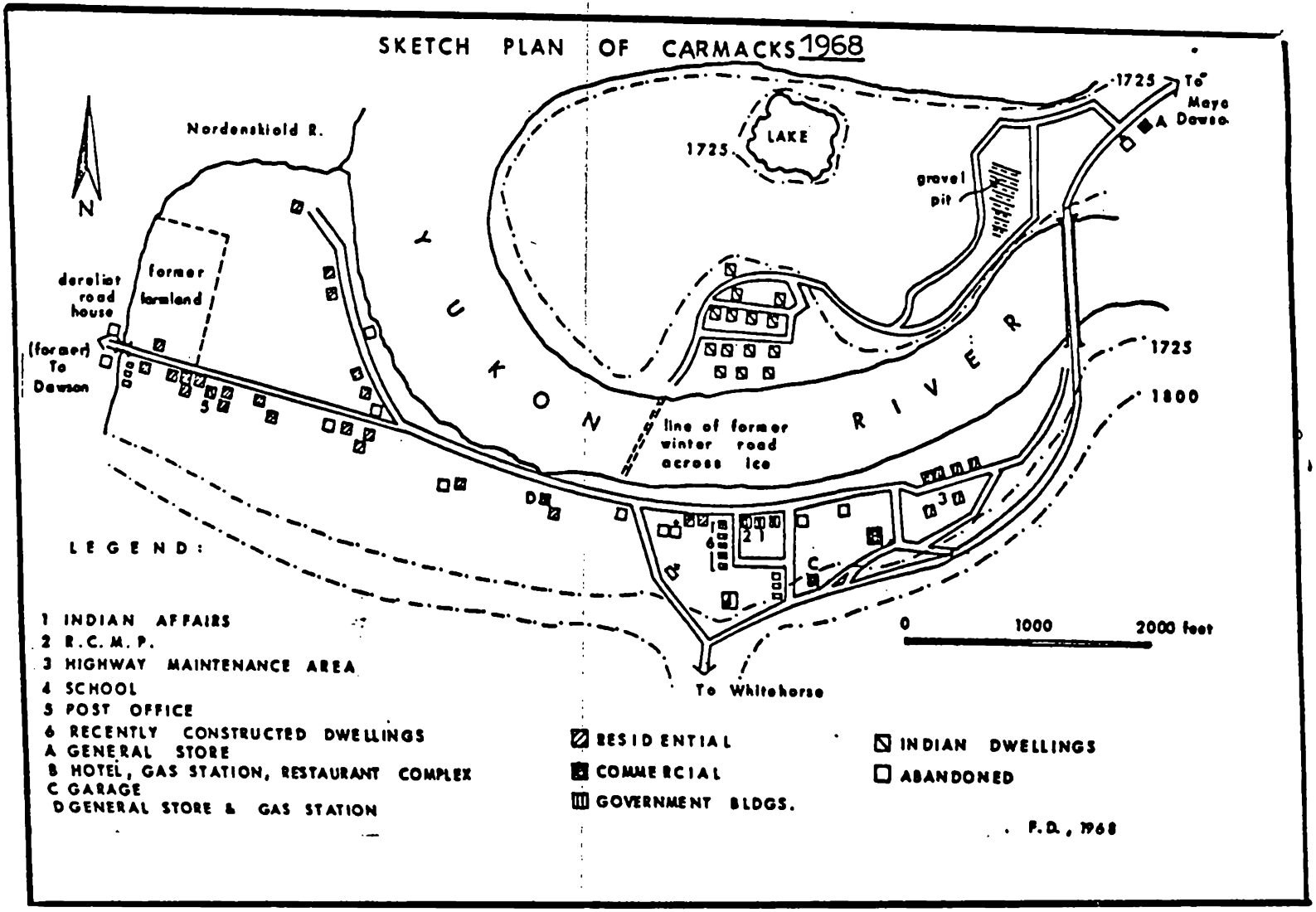
The community's river orientated functions continued until the 1950's, when the construction of the all-weather Whitehorse-Dawson highway resulted in the removal of steamships from the Yukon. Carmacks became the lowest bridging point on the Yukon River, and a number of automobile oriented services developed. Development of the Faro complex aided the economy of Carmacks, with the coal from Tantalus Butte being transported to the Anvil mine-site by empty ore trucks returning from Whitehorse; the coal is used in the smelter operation at Faro, and there are suggestions that it be used to power a thermal generating plant. The Faro development also brought the Robert Campbell highway into existence, Carmacks lying at its western terminus. The community's new nodality created a wider market for its transient oriented activities.

Land Use

The main body of the settlement extends for about a mile down the Yukon to just north of the mouth of the Nordenskold River. On the eastern bank of the Yukon, enclosed by a pronounced meander, lies an Indian village first surveyed in 1959. As the land use map (fig 35) shows there is marked segregation of use in Carmacks, with four distinct land use types; a retail service area, government reserve, predominantly non-Indian residential sector and the Indian village. The older buildings lie north of the main town-site along the line of the former winter road, while much of the main settlement development has taken place on streets joining the all-weather highway to the original water-edge community.

In the period 1968-78 the number of occupied dwellings in Carmacks increased from 52 to 78. Generally the condition of housing is good, the number of abandoned dwellings in 1978 was only 4, compared with 9 in 1968, while only 3 inhabited buildings displayed any obvious structural defects. Much of the increase in housing had taken place in the Indian Village, with 24 dwellings in 1978 compared with 15 in 1968; this expansion was attributable

Fig. 34


SKETCH PLAN OF CARMACKS 1968
N
Nordenskiold R.
LAKE
1725
1725
To Maye & Dawson
gravel pit
derelict road house
former farmland
(former) To Dawson
YUKON RIVER
line of former winter road across ice
1725
1800
LEGEND:
1 INDIAN AFFAIRS
2 R.C.M.P.
3 HIGHWAY MAINTENANCE AREA
4 SCHOOL
5 POST OFFICE
6 RECENTLY CONSTRUCTED DWELLINGS
A GENERAL STORE
B HOTEL, GAS STATION, RESTAURANT COMPLEX
C GARAGE
D GENERAL STORE & GAS STATION
RESIDENTIAL
COMMERCIAL
GOVERNMENT BLDGS.
INDIAN DWELLINGS
ABANDONED
0 1000 2000 feet
To Whitehorse
P.D., 1968

to demands of an increased Indian Population (207 in 1978 compared with 90 in 1968). Much of the construction was undertaken by the Indian band in 1972.

Population

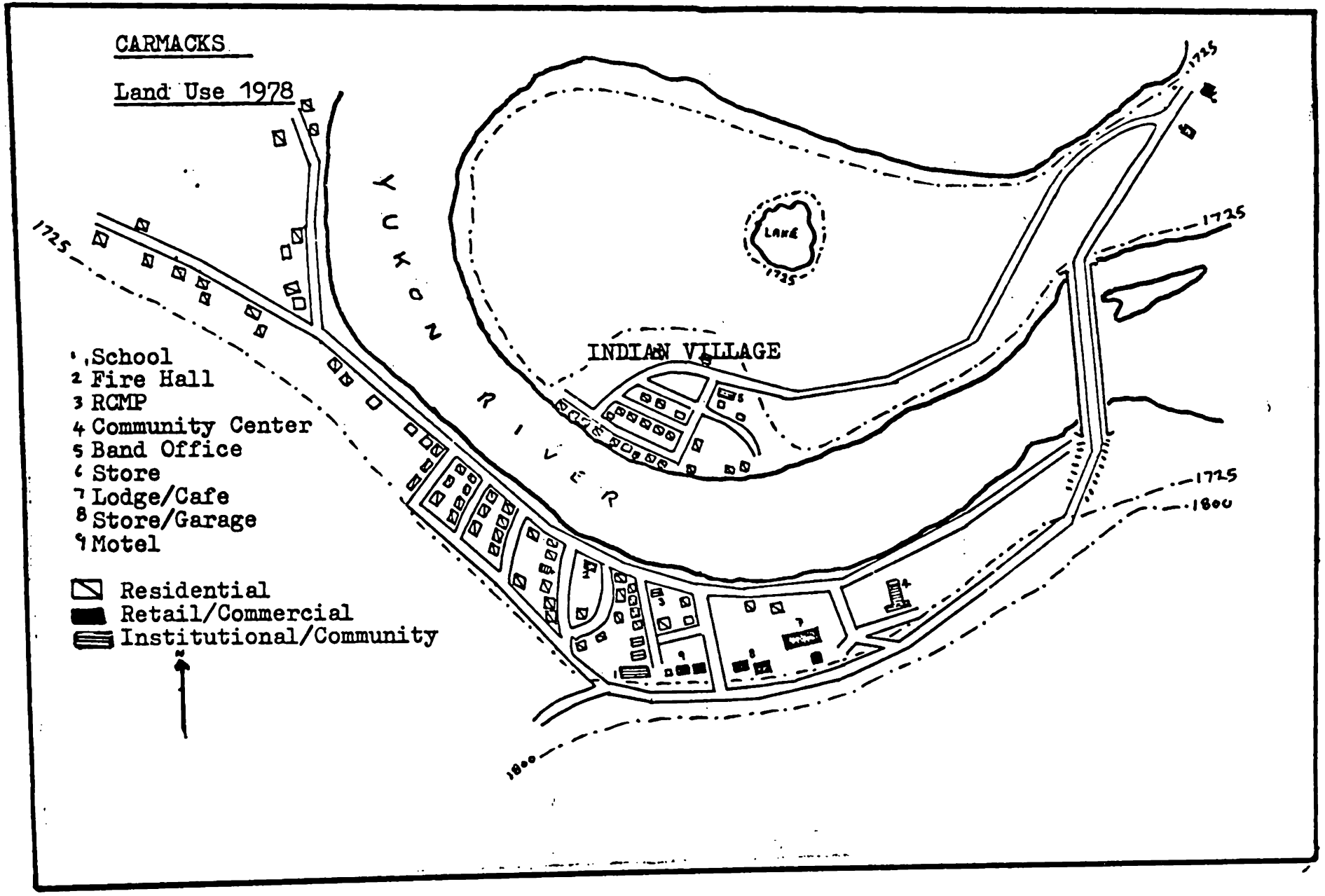
Carmacks population has fluctuated widely over the past eighty years. In 1911 it was officially 74, by 1921 32; by 1944 it was estimated to have fallen to 16 (Griffith Taylor 1944). Following the construction of the all-weather highway, establishment of the Indian village, and the development of the Anvil mine there was a marked and sustained increase in population. The 1961 Census population for Carmacks was 218, and by 1971 this had risen to 311. Although the official 1976 population was 420, it would appear from field work that it was substantially less than this, probably no more than 350.

Growth in the Indian population in Carmacks from a (probably low) estimate of 90 in 1968 (DIAND) to 207 in 1978 is attributable to both natural increase and continued in-migration. Since the displacement of river traffic from the Yukon the Indian population in the Yukon valley has migrated to three major centers - Whitehorse, Carmacks, and Pelly Crossing. The migration has been partly induced by the selective location of government services, such as nursing stations and schools in these centers. It would appear that the same type of processes are at work in Carmacks as in Ross River, dependence on various industrially based services resulting in concentration of population and increased sedentary settlement.

Economy

The three components of Carmacks economic base are mining, government agencies, and the provision of transient oriented services. Government agencies constitute the largest sector, employing 31 persons in summer (23 territorial employees, 8 Federal), while mining and the service sector each employ about 15 persons. It is estimated that employment falls from 64 in summer to about 43 in winter. The service sector is largely transient oriented, with the

Fig. 35


CARMACKS
Land Use 1978
YUKON RIVER
LAKE
INDIAN VILLAGE
1725
1800
1 School
2 Fire Hall
3 RCMP
4 Community Center
5 Band Office
6 Store
7 Lodge/Cafe
8 Store/Garage
9 Motel
Residential
Retail/Commercial
Institutional/Community

addition of one motel since 1968 (fig 35). Only 22% of the retail transactions of the non-Indian population are conducted in Carmacks, a reflection of the community's relative proximity to Whitehorse. The two general stores in the highway are both located in such a manner that they can take advantage of transient trade, but are oriented to two different community markets, the store west of the Yukon predominantly serving the non-Indian population, the one to the east of the river serving the Indian village.

The Alaska Highway settlement group consists of settlements lying on the Alaska Highway - Watson Lake, Teslin, Haines Junction, Destruction Bay, Burwash Landing and Beaver Creek. It also includes Carcross, which although lying south of the main highway has been greatly influenced by its construction and will probably develop a fuller range of transient oriented activities now the Whitehorse Skagway road, which crosses the Yukon river system at Carcross, is opened. All the settlements in the group have grown since the Second World War, a major component of their economies being the provision of services for transients on the Alaska Highway.

There were transport routes and trading posts through the southern Yukon prior to the construction of the Alaska Highway in the early 1940's and east of Whitehorse it was the catalyst that led to the growth of population at two long established posts, Watson Lake and Teslin. West of Whitehorse the highway followed an existing route, the Kluane waggon road (established in 1904), and then along the Shakwak valley, up the western shore of Kluane Lake towards Alaska.

The highway served as a focal point for Indians living in the southern Yukon. It brought temporary employment in highway construction, as well as government facilities located in selected settlement sites, imported retail goods, and the example effect of non-Indian consumption patterns. The sum effect of this was to attract Indians into highway communities with sedentary settlement replacing previously semi-nomadic land based activity. Following the initial attraction to highway locations it appears that a secondary migration took place, with Indians eventually migrating to larger highway communities, such as Teslin and Haines Junction.

The settlements in group have grown at varying rates, and it was evident from field work that in some cases there were notable discrepancies between actual population and census estimates.

The largest settlement is Watson Lake, with perhaps as many as 1200 persons

living in the community and its surrounding region; the rest of the settlements are small, with populations ranging from perhaps 400 in Haines Junction down to 80 at Destruction Bay.

Growth has been sustained in those settlements with a degree of nodality, notably Haines Junction, at the intersection of the Alaska Highway with the Haines Road, and Watson Lake, at the junction of the Alaska Highway and the Robert Campbell highway. Both these communities have activities over and above providing services for transients; Haines Junction serves as the headquarters for Kluane National Park while Watson Lake is a service centre for a surrounding population and also has a lumber industry. Non-nodal settlements, Beaver Creek, Destruction Bay and (notwithstanding recent increases in Indian population) Teslin, seem to have stagnated with no notable increase in service activity over the past ten years despite increased tourist traffic on the Alaska Highway. This stagnation is almost paradoxical, Teslin and Destruction Bay being located in two of the most scenically attractive areas along the highway.

It was evident from the number of abandoned commercial complexes on the highway that while the nodal locations are growing intervening locations are stagnating or dying. As highway conditions improve so tourists drive further in a day and rely less on highway services, thus viable transient oriented enterprises are located at focal points in the territorial road system which are approximately a comfortable days driving time apart - Watson Lake and Whitehorse, and (for tourists travelling to or from Fairbanks via Haines Alaska) Haines Junction. A further reason for the apparent under development of intervening facilities is the motive of many of the tourists travelling the highway, 74% of tourists are from the United States and their main motive is to get to Alaska.

WATSON LAKE

Although there has been sparse non-Indian occupance in the vicinity of Watson Lake since the late 1800's the present community only came into existence following the construction of the Alaska Highway. The original settlement was at an airstrip, 16 kms north of the contemporary community, and growth of the present settlement did not take place until the 1950's when a garage, hotel and trading post were established at the junction of the Alaska highway and the airport road. Subsequent growth has resulted from mineral exploration, tourism, and the construction of the Robert Campbell Highway. Until the highway was built connecting Watson Lake to Carmacks via Ross River and Faro, the settlement was isolated from the rest of the Yukon settlement system - 460 km from Whitehorse, and 991 km from Dawson City, it had only a one link connection with the system and had more in common with communities of northern British Columbia than with other communities in the Yukon.

Population

The 1971 Census population for Watson Lake was 553, and by 1976 this had risen to 801; in the summer of 1978 there were 223 occupied residences in the community. Growth in Watson Lake has been due exclusively to rapid in-migration, although much of this has been drawn from outside the territory (table5), there has been net in-migration from the similarly service oriented communities of Dawson City and Haines Junction. Net out-migration within the territory has been to Faro, which is easily accessible up the Campbell Highway and also has provided employment opportunities over the past ten years. Although a substantial Indian population lives in the vicinity of Watson Lake the population of the settlement is almost exclusively non-Indian.

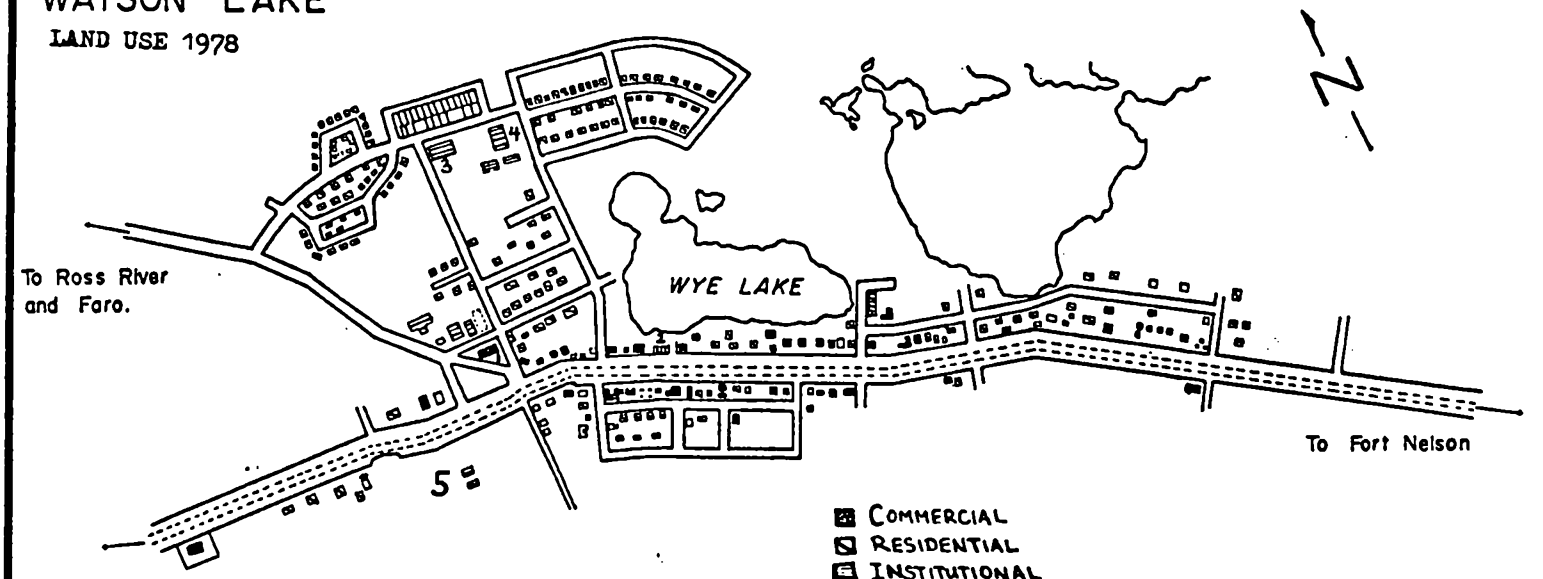
Land Use

The main body of the settlement is aligned along both sides of the Alaska Highway, running eastwards from the original nucleus around Watson Lake hotel and garage (fig 36). The commercial area lies directly adjacent to the highway,

Fig. 36

WATSON LAKE

LAND USE 1978



with residential areas north and south of this, in less accessible locations. Residential development is mainly concentrated north of the highway, and it is here that rapid growth has taken place over the past 10 years. Growth was in three stages; in the central and eastern part of the town ten years ago; in the western part of the settlement three years ago, and currently to the north. A measure of rapidity of growth is seen in the fact that 75 of the community's dwelling units (some 30% of current residential stock) are trailer units.

The lay-out of Watson Lake has been influenced by highway configuration and the presence of Wye Lake, restricting growth in the eastern part of the settlement. While the east-west alignment of service activities reflects the community's transient oriented service role northward expansion of the residential areas have been influenced by the alignment of the Robert Campbell Highway.

It would appear that in many respects Watson Lake is an 'underbound' community, not only has the main settlement been growing rapidly, but the immediate area surrounding the community contains a substantial (low density) population which depends on Watson Lake for various services.

Economy

Government employment, timber production, and the provision of services to both transients and indigents of the immediate region form the economic base of Watson Lake. The service sector is the largest employer, and the community has the most complex service base of any community except Whitehorse. There are 47 activities located in 30 establishments. 24 of these activities are tourist oriented, a reflection of the settlement's location as the first and last settlement on the Yukon section of the Alaska Highway. A considerable portion of the service sector, provides services for indigents and the population of the surrounding region, an extensive part of the Southern Yukon, and Northern British Columbia. This hinterland includes Lower Post and two villages located

some three kms from Watson Lake. 72% of all service transactions conducted by Watson Lake's population are conducted in the settlement, much higher than the figure for the similarly transient oriented community of Haines Junction (24%). Distance from the sophisticated service base of Whitehorse, the presence of a surrounding service population to increase threshold levels and the artificial thresholds created by transients are factors providing for the sophistication of the retail base and high internal interaction.

One measure of the proportion of the service activity serving the settlement population as opposed to transients may be gauged from comparison with Faro. In Faro there are 28 retail types for a population perhaps 500 persons in excess of that served by Watson Lake. Watson Lake has the same number of retail types but 47 activities ; one could then conclude that 19 activities in Watson Lake exist because of the transient population.

The major industrial activity is timber processing. With the finest timber stands in the Yukon, road access to markets in the Yukon, Alaska, and Northern British Columbia the settlement operates three saw mills, employing 50 persons. In 1977 timber production had a value of $2.4M . Government agencies employ some 72 persons in summer and 52 in winter (table 9).It is estimated that overall total wage employment in the community falls from 257 in summer to 194 in winter.

TESLIN

Permanent settlement at Teslin had its origin in 1903 when a trading post was founded. It was one of three posts on the northern shore of Lake Teslin which served the sizeable Indian population of the Teslin region. The post was strategically located at the point where the Nisutlin river enters the main lake and narrows served as a convenient crossing point on Nisutlin Bay (fig 37). Until the advent of the Alaska Highway the post served a largely nomadic Indian population, and no sedentary Indian settlement was established.

The Alaska Highway follows the eastern shore of Lake Teslin, crossing the mouth of Nisutlin Bay just south of the present settlement site. Construction of the highway led to an immediate and marked transformation in habitat. In the winter of 1942 Indians wintered at the Teslin Post for the first time, hoping to obtain employment in highway construction (Cruikshank 1974 p 13). One adverse effect of the initial contact with the vast labour force involved in the highway project was the increase in the incidence of disease, and it has been suggested that high mortality rates did enormous demographic damage to the Indians of the region (Cruikshank 1977 p 30). From the mid 1940's onwards Teslin's Indian population grew and the traditional nomadic patterns broke down - a result of the concentration of government services in Teslin, increased dependence on store based commodities, and possibly the example effect on non-Indian consumption patterns.

Current Population

It would appear from field work that the 1978 population of Teslin was probably about 400, considerably higher than the official 1976 Census figures of 241. According to the census the population fell by 100 in the period 1971-76, however within the community there was no evidence of decline, of 106 residences only 12 were abandoned or empty. Currently approximately half the population is of Indian ancestry.

Land Use

Most of the settlement lies south of the Alaska Highway, and in plan follows the contorted shoreline of the lake. Adjacent to the Teslin bridge are the transient oriented commercial activities, a lodge, motel, restaurants and two gas stations. The residential area lies on a peninsula (fig37) some distance from the highway, with the Indian community containing some 38 houses occupying the northern half of the peninsula and a predominantly non-Indian community occupying the south. North of the highway lies the community's air strip and government housing.

Economy

As with other Yukon communities Teslin's economic base is divided between government activity, provision of services for transients and subsistence. It is estimated that the summer wage labour complement is about 55 persons, the majority of which are government employees (table9). The level of Indian employment is difficult to gauge, and while there is wage employment in the Indian operated canoe factory and crafts store as well as in band administration, land based activities are still of considerable importance. This mix of activities suggests that employment for the average Indian family is divided between land-based activity and part-time wage employment.

CARCROSS

Carcross lies at the narrows which form the junction between Lake Bennett and Nares Lake. The main body of the community lies north of the narrows, on a flood plain that extends northwards to what appears to be the former shore of the lake. Part of the plain, which is about 1.5 km in width, is cove by sand-dunes but this does not create any serious problem for settlement. South of the narrows a steep scarp impedes settlement growth, and along the Lake shore lives the Indian component of Carcross's population.

There is some evidence that temporary Indian settlement existed in the vicinity of Carcross prior to the Klondike Rush, but it was the construction of the White Pass Railway, which crossed the headwaters of the Yukon at the narrows that brought about permanent settlement of Carcross. Initial growth was related to the fact that the site provided an early head of navigation and break of media point as the railway was pushed towards Whitehorse.

In the early 1900's the community was strategically placed to act as a distribution point serving the Conrad mining development on Windy Arm of Tagish Lake, and for a time acted as a port serving the mining town of Atlia in northern British Columbia.

In the early days of its existence Edwards described the community as, 'a collection of cabins and huts where they say some day there will be a city' (Edwards, 1904 p 75). He based his optimism on the Conrad mining development which showed spectacular growth but which was short-lived. Conrad City, lying on a bleak hillside above the tree line on the western shore of Windy Arm, was the settlement located at the point of extraction. In the first decade of the Twentieth Century Conrad City boomed. In 1906 Cairnes described it as boasting, 'several hotels, stores, restaurants, churches and so on.' (Cairnes, 1906, 211). Carcross acted as the distribution center for the mining area, merchandise being conveyed by railway over the White Pass, and then being placed on steamers at Carcross for transportation to Conrad City.

Whether Carcross would have attained importance as a distribution point if the Conrad operation had continued is doubtful. It seems probable that a branch line from the White Pass Railway would have been constructed to Conrad, this rendering Carcross's function as a distribtuion center defunct (Cairnes, 1906 p 211). Following the closure of the Conrad operation Carcross has had a seemingly stagnant existence, being dependent for growth upon periodic booms in the local mining industry. It is to be conjectured that function as a railway station, combined with the presence of a relatively large Indian population, has prevented catastrophic reduction in population at times of depression.

By 1968 the economy of the community was tied to two functions; its function as a distribution center and a labour reservoir serving mines in the area, its function as a small tourist center. Both the Arctic and Venus mines, (fifteen miles and three miles from Carcross respectively), were opened at the site of former mines in response to improved market conditions and more economic operation. Although a high proportion of the community's labour force are employed in mining (approximately 30%), it is to be seen that Carcross did not serve exclusively as a dormitory for the mines, most of the labour force employed at the mines living in bunk houses near the site of extraction.

Fig. 38

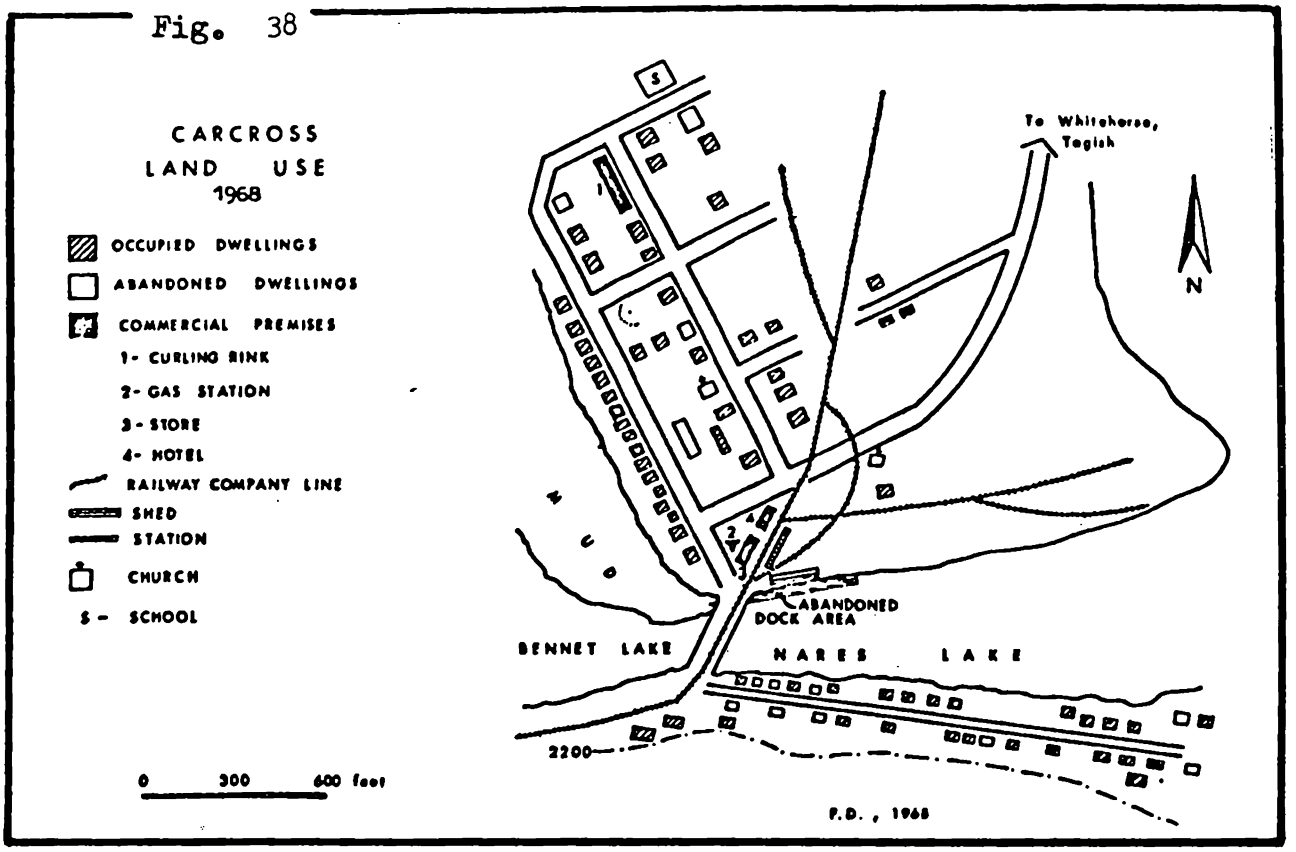
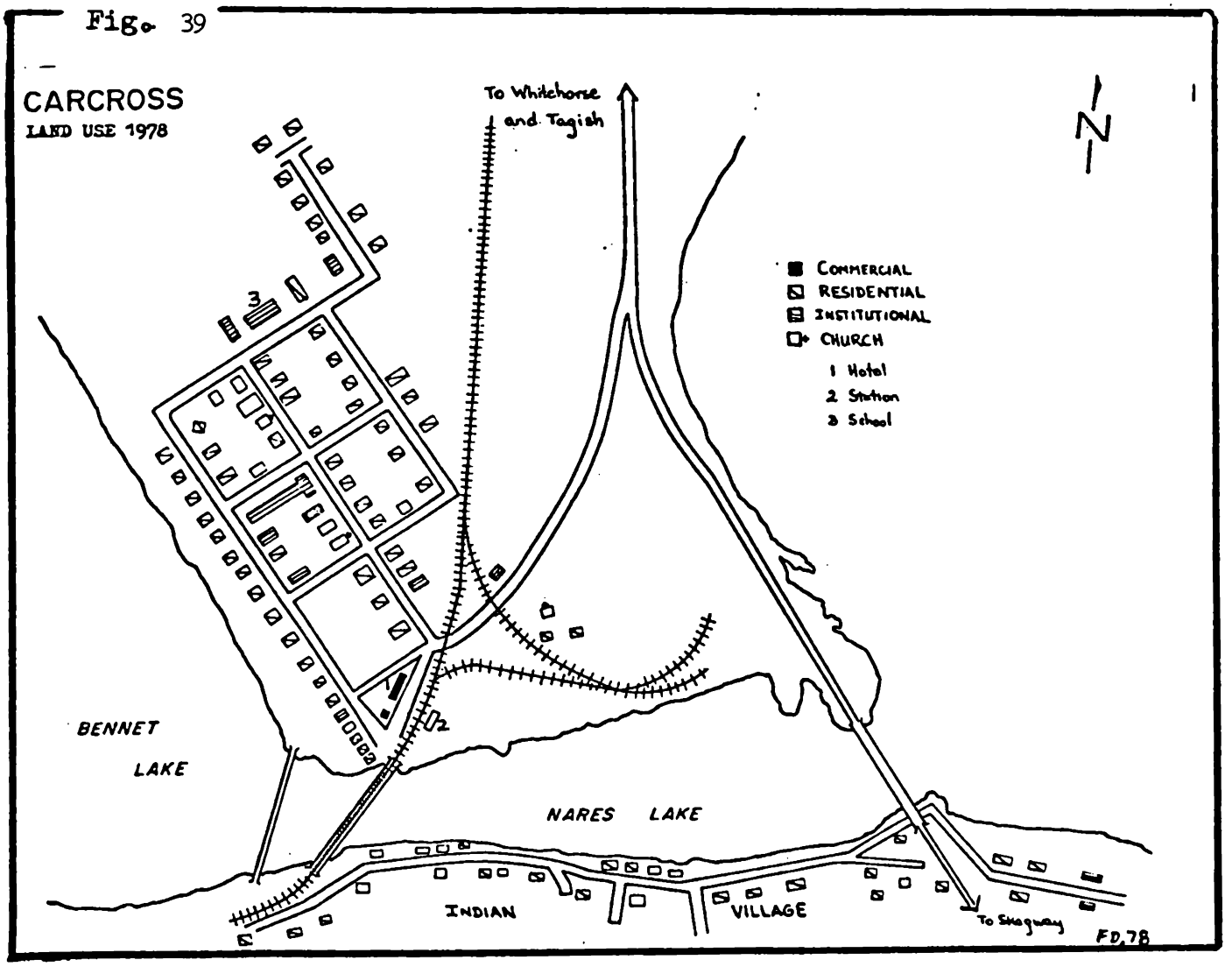

CARCROSS
LAND USE
1968
OCCUPIED DWELLINGS
ABANDONED DWELLINGS
COMMERCIAL PREMISES
1- CURLING RINK
2- GAS STATION
3- STORE
4- HOTEL
RAILWAY COMPANY LINE
SHED
STATION
CHURCH
S - SCHOOL
0 300 600 feet
To Whitehorse, Tagish
N
ABANDONED DOCK AREA
BENNET LAKE
NARES LAKE
2200
P.D., 1968

Fig. 39


CARCROSS
LAND USE 1978
To Whitehorse and Tagish
N
Commercial
Residential
Institutional
Church
1 Hotel
2 Station
3 School
BENNET LAKE
NARES LAKE
INDIAN VILLAGE
To Skagway
FD.78

Since 1968 major changes have taken place in the settlement's functional base. Both the Venus and Jupiter mines closed, while the closure of the Clinton Creek mine has apparently created economic problems for the White Pass Railway. The construction of the Carcross-Skagway road provides the settlement with a direct link to the Alaska coast, and increased volume of highway traffic passing close to the community may lead to the expansion of Carcross's service base.

Land Use

The lay-out of Carcross has changed little since 1968, with the retail area aligned along the railway (which it was built to serve), consisting of a general store and a hotel. East of the railway lie the remains of the former port area, west of it is the main residential sector of the settlement, consisting of a simple grid plan fronting onto Bennett Lake.

Population

The 1966 Census population of Carcross was 169 (probably an under-estimate), rising to 275 by 1976. This latter figure appears to be quite accurate, the 1978 population (based on house count) being about 285.

The dwelling stock in Carcross increased by 10 units in the period 1968-78, with expansion taking place both south of the narrows and in the western extremity of the townsite (figs. 38 and 39). Growth in the non-Indian population (four households) is probably related to increased government activity in the community and has resulted from net in-migration. Out-migration has been to two major destinations - Whitehorse and Elsa. In the former case migration was related to the city's size and its proximity to Carcross; in the latter to the out-migration of miners following the collapse of the Windy Arm operation.

Economy

An estimated 35 persons have wage employment in Carcross in summer, 21 of these are in government employment and the balance are employed in the service sector which consists of a general store, hotel, gas station and restaurant. These facilities are essentially tourist oriented, although the

commercial tourist facilities are surprisingly undeveloped considering the community's attractive location and ease of access from Whitehorse. Provision of services to the indigent population is limited, with the overwhelming majority of retail transactions being conducted in Whitehorse (70%), again a reflection of Whitehorse's size and proximity.

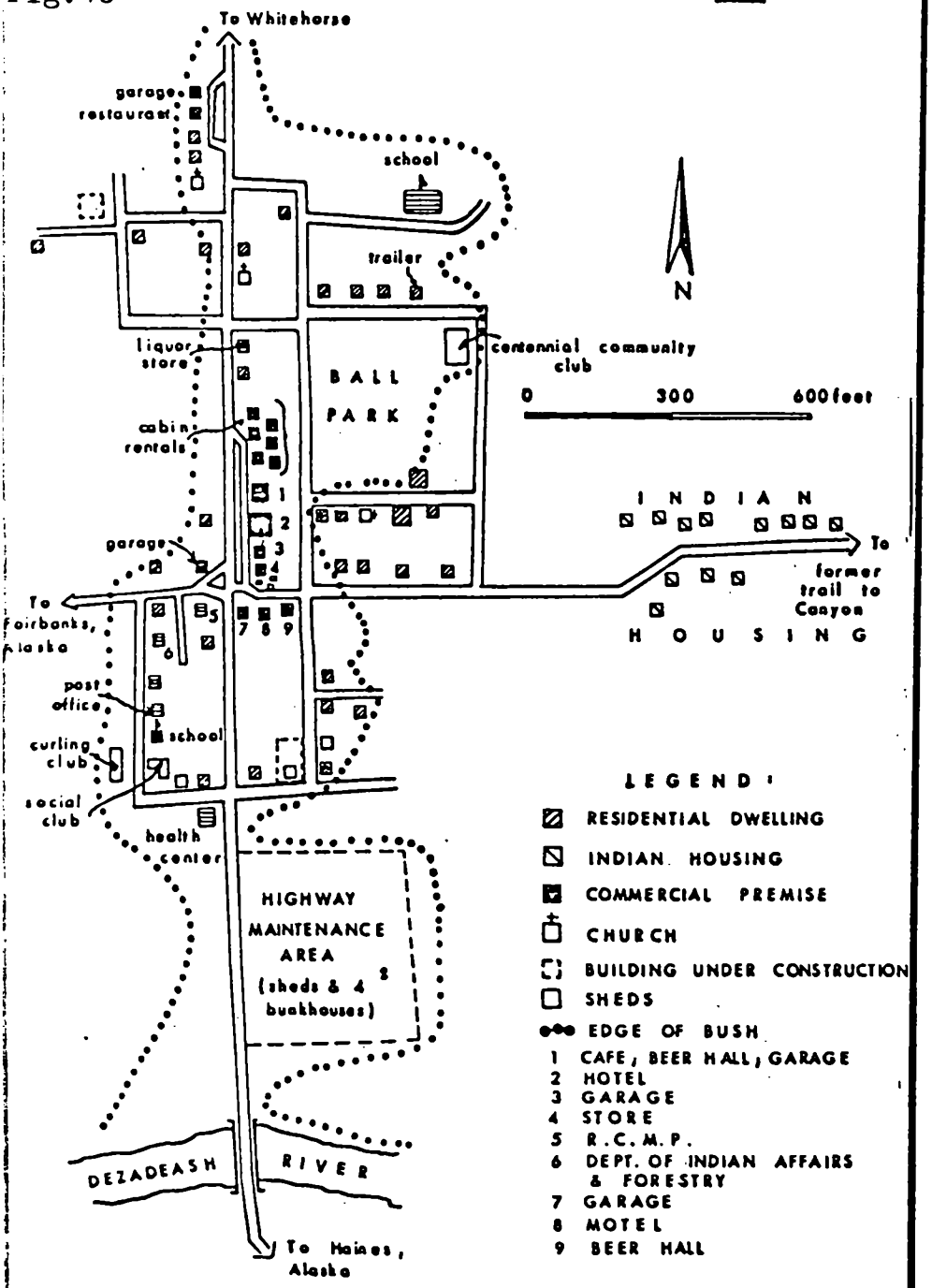
The new Whitehorse-Skagway highway crosses Nares Narrows at Carcross, and the community's new nodality (access to Whitehorse, the southern Alaska Highway, and Skagway) combined with an increased flow of tourist traffic may result in a broadening of Carcross's service base.

HAINES JUNCTION

Haines Junction, with a population of 195 in 1966, and an estimated population of 440 in 1978 is one of the fastest growing communities in the Yukon, and the largest Alaska Highway community west of Whitehorse. The community lies on the northern bank of the Dezadeash River, at the point where the Alaska Highway meets the road from Haines, Alaska; at this point traffic travelling from points south and south-west of Whitehorse to Alaska and traffic entering the Yukon via the port of Haines merge. Apart from its nodal location Haines Junction is favourably situated as the closest community to Kluane National Park, and the establishment of the park headquarters in the community along with increased park access over the past ten years have been instrumental in growth.

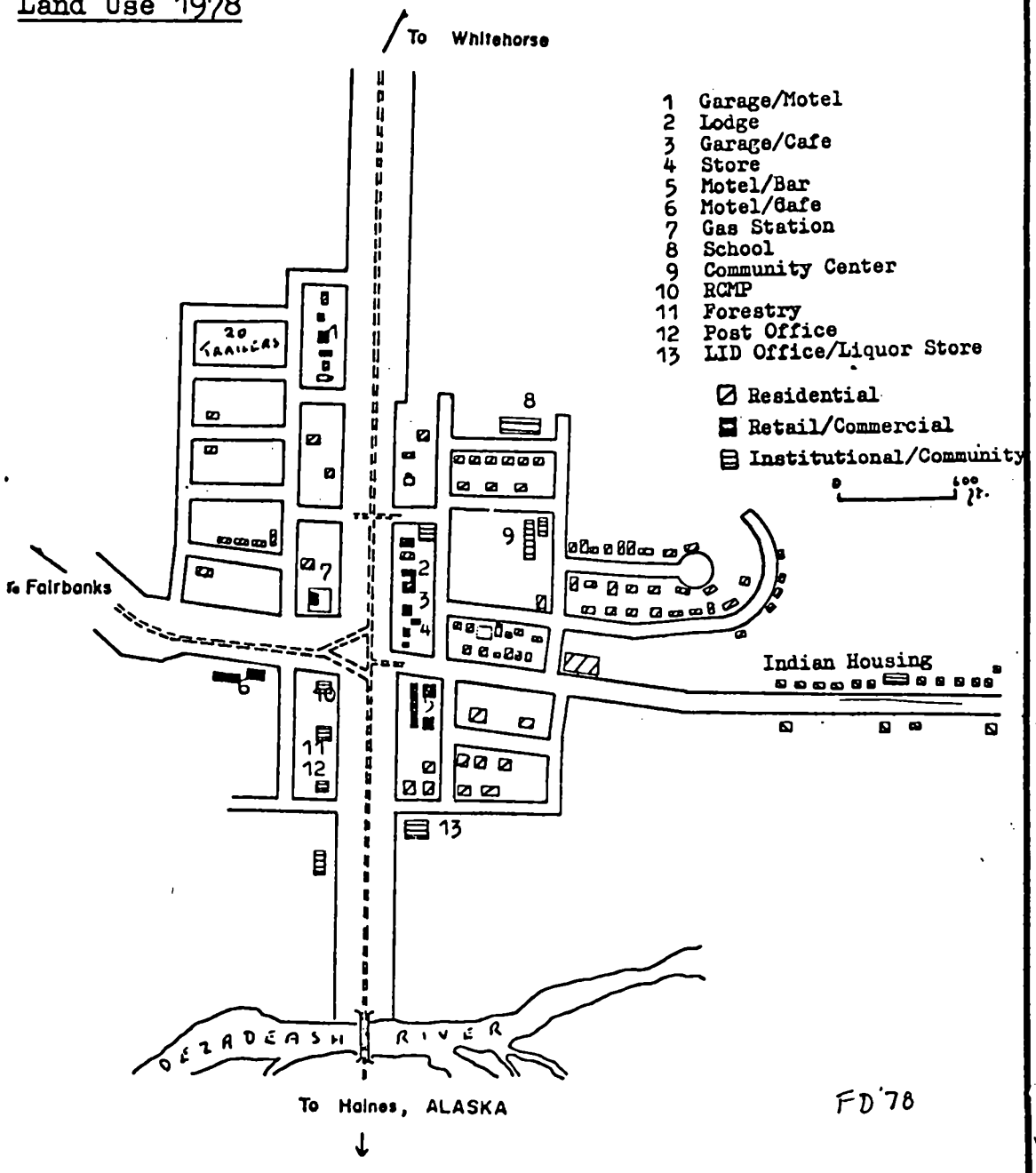
In 1976 at least 50% of the territory's tourist traffic passed through Haines Junction and population increases over the past ten years have been almost exclusively attributable to the settlement's tourist orientation. In 1968 it was estimated that 60% of the community's labour force was employed either on Highway maintenance or tourist oriented services; in 1978 approximately 85% of the wage-labour was in this sector.

Fig.40 SKETCH PLAN OF HAINES JUNCTION 1968



F.D., 1968

Fig.41
HAINES JUNCTION
Land Use 1978



Haines Junction's population increased rapidly through the study period, and it would appear that the official census figures consistently understate the community's size. Acording to Statistics Canada the population increased from 195 in 1966 to 268 in 1976. A low estimate of 1978 population (based on house counts) was 360, and it would appear that the community has had a population in excess of 300 for a number of years.

As with other highway communities a major component of population growth has been the in-migration of Indians, attributable both to the displacement of traditional routes by highway development and the concentration of services and facilities in selected locations. The basic housing stock in the Indian village was constructed in 1965, many of the Indians migrating into Haines Junction at this time coming from Aishihik, Canyon and Champagne, traditional village areas east of the settlement. It would appear that some in-migration of Indians has continued over the past ten years, the Indian component of population rising from a (high) DIAND estimate of 95 in 1968 (Duerden 1971 p 187) to an estimated 135 in 1978.

Increase in non-Indian population is attributable to rapid net in-migration largely in response to the Kluane Park development. In-migration was predonominently from outside the Yukon, while out-migration within the territory was to both Whitehorse and Watson Lake.

In 1968 the settlement was observed to be aligned north-south along the highway, with sporadic development at various locations in a rather indistinct grid plan. A clear segregation of land-use was noted, with the main commercial area adjacent to the Alaska Highway and the non-Indian residential area located on adjacent streets. The government reserve was located south and west of the road junction, with an Indian village located about one quarter of a mile east of the main town. This segregated land-use pattern remained in 1978, although the residential area had expanded considerably and there was perhaps more integration of the Indian population into the main settlement.

TABLE 14

Haines Junction, Range of Services, 1968-1978

	1968	1978
Gasoline Stations	5	5
General Stores	1	1
Motels/Accomodation	2	5
Lodges	1	1
Restaurants	2	3
Tavern/Bar	2	2
Laundry	1	1
Liquor Store	1	1
	15	19

Source: author

The estimated number of non-Indian dwelling units increased from 31 in 1968 to 84 in 1978. At the same time the estimated number of Indian dwellings increased from 11 to 28. Expansion has been physically manifest in a twenty unit trailer park in the north west part of the settlement, and subdivision development east of the commercial strip. Much of the housing expansion is related to the development of Kluane Park, 26 employees of the Parks Branch and their families have been housed in Haines Junction. The balance of the expansion reflects an increase in Indian population.

Economy

The number of activities in Haines Junction increased from 15 in 1968 to 19 in 1978, and as can be seen from reference to table 15 this expansion was in the tourist sector. Population increase has not been accompanied by increase in indigent related services (although expansion of the general store was planned - summer 1978), obviously Haines Junction's proximity to Whitehorse adversely affects this component of the towns economic base, with only 24% of all service transactions taking place in the community as opposed to 72% with Whitehorse.

Of the estimated 105 summer employees in the community 63 were employed in various government agencies, and the balance in the service sector. Expansion of the service sector has not been as great as would perhaps be expected given an increase of traffic on the Alaska Highway from 7,661 in July 1964 to 14,000 vehicles in 1975 (the most recent year for a reliable figure). Employment falls from a summer high of 120 to a winter low of perhaps 80, but gauging the true impact of seasonality on the community's economic base is problematic because a considerable portion of the summer labour force consists of temporary employees drawn from outside the territory.

DESTRUCTION BAY

Destruction Bay lies on the shore of Kluane Lake 57 kilometres north west of Haines Junction. Although it would appear that the community has

excellent tourist potential, lying adjacent to the lake and backed by the 2000 m Kluane Range some two km to the south, it is evident that it has undergone few changes since 1968.

Population

The settlement came into existence following construction of the Alaska Highway as a highway maintenance centre and telecommunications support station. In 1968 Destruction Bay's population was perhaps 80 (based on estimates from electoral list), and given the fact that there was no increase in the number of dwellings in the period 1968-78 the population remained the same. Population levels have been maintained by a flow-through of migrants, the exclusively non-Indian population having strong migratory links with locations outside the territory.

Economy and Land-Use

The main functional base of Destruction Bay, a DPW maintenance area and a motel and gas station complex lie south of the highway. North of the highway is the residential zone of some 22 occupied dwellings constituted of modern bungalow type dwellings built in the early 1960's and bunk houses converted into single family dwellings.

There has evidently been a decline in the community's economic base since 1968, when it was estimated that some 41 persons were employed in Destruction Bay (Duerden 1971 p 194). Both field work and independent research (Foothills 1979 p 7-28) indicated that the 1978 summer employment level was about 30 persons, falling to 17 persons in winter.

BURWASH LANDING

Burwash Landing had its origins as a trading post established in 1904 primarily to trade with the Indians of the Donjek and White Rivers (Cruikshank). The post, located on the shore of Kluane Lake, lay in an area with a long history of at least seasonal Indian occupance. As with other Yukon posts Burwash was visited periodically by groups of Indians for trading purposes,

but no sedentary settlement was established. It was not until the construction of the Alaska Highway, one kilometer to the north that permanent settlement was established in the vicinity of the post.

The community was not listed in the Census until 1956 when its population numbered 45, by 1966 it had (according to Statistics Canada) risen to 69, although by 1968 DIAND gave a much higher figure for just the Indian population (Duerden 1971 p 195). Growth in population since the mid 1960's is partly due to the construction of 15 Indian housing units in Burwash Landing in 1965. In 1976 the census population was 71, of whom 51 were of Indian origin; however increase in the number of Indian dwellings from 15 to 21 between 1968 and 1978 leaves the author to believe that the Indian population is close to 100.

Essentially there are three components to Burwash Landing's land-use, the Indian village which lies on a low cliff on the shore of the lake, the Burwash Landing lodge on the lake shore to the north of the Indian village and the highway oriented activities, namely museum and gas station.

The Indian village overlooks Kluane Lake, with the various dwellings set within a simple street plan (fig). Water for the village is drawn from wells, and the community has a communal wash-house. This part of the settlement has a more coherent social identity than it did in 1968, with strong band organization manifest in Indian language curricula in the kindergarten school, small general store and a relatively high level of band wage employment. The threat of pipeline construction through traditonal hunting and trapping areas seems to have consolidated attitudes in the Indian village and resulted in a high level of band organization.

A substantial portion of economic activity is land-related, while some twenty persons in the community have wage employment, 5 in the lodge (in summer), 9 employees of the Indian Band, and 10 persons employed in crafts and outfitting. The community's service base is narrow with a small store in the

Indian village and the balance of activities, museum and lodge oriented towards tourist traffic. In the summer of 1978 the Indian band was employed in constructing a campsite in hope of augmenting community income from tourism.

BEAVER CREEK

Beaver Creek was brought into existence by the Alaska Highway, serving as the Canadian customs post close to the Canadian-USA border, and its growth has been related to this function and its fortuitous location as a breakpoint on the journey between Whitehorse or Haines and Fairbanks. The community, founded in the early 1950's has a number of transient oriented activities - a lodge, two motels, two restaurants and three gas stations. Although tourist traffic has increased markedly over the past ten years there has been no corresponding increase in the number of related activities.

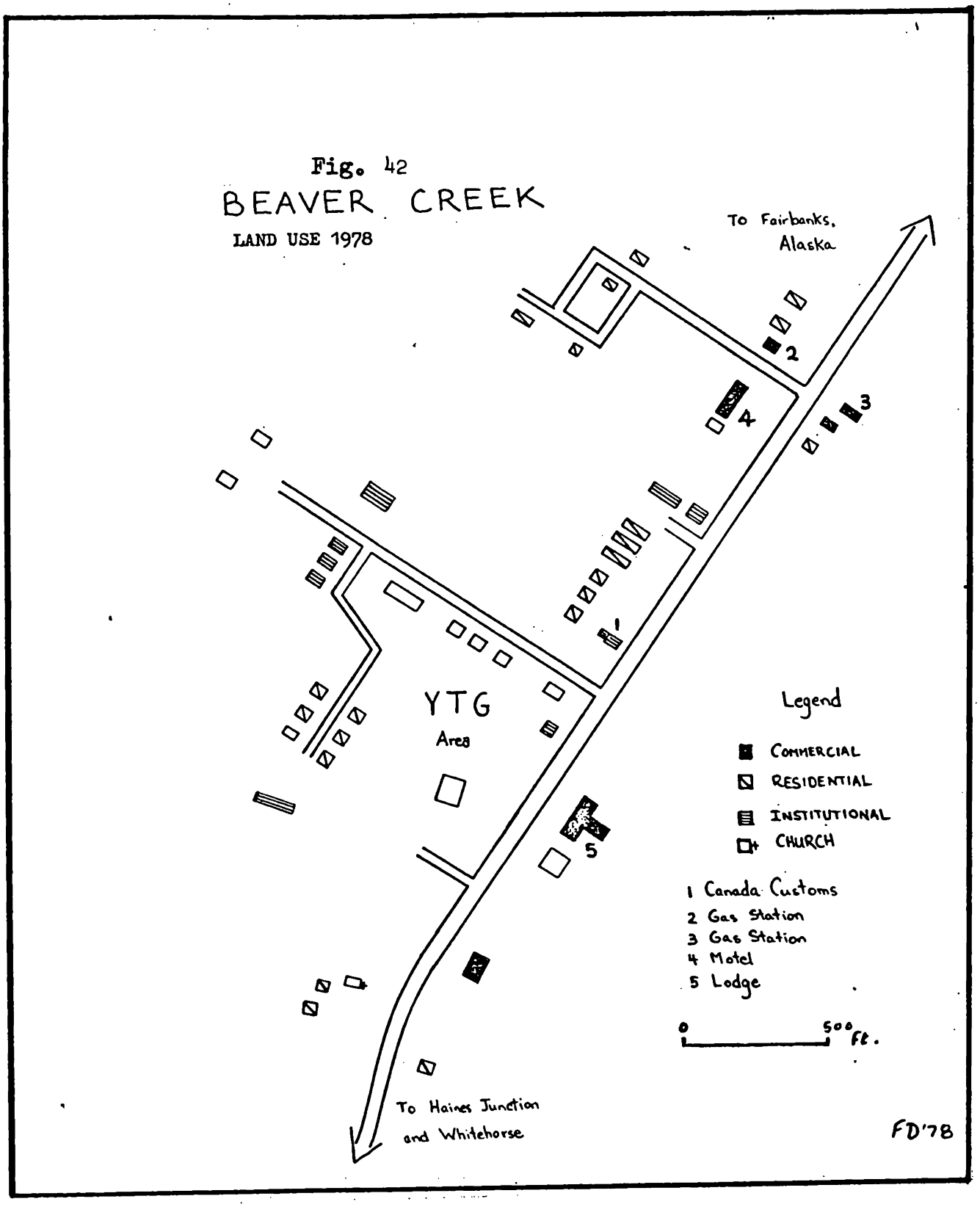
One possible reason for the community's stagnation is the general unattractiveness of the townsite, essentially consisting of a featureless plain cleared of bush. The settlement clusters along both sides of the Alaska Highway, with the various commercial activities adjacent to it (fig 42). Located on the south side of the highway is the residential area, with government housing in the east, south of the DPW depot and private housing in the west. In the summer of 1978 there were 23 occupied residences in the community,[1] and although the population is given as 150 (Foothills 1979 p 7-27) the year-round population is evidently substantially less than this - perhaps as few as 100.

Employment fluctuates greatly through the year as tourist traffic volumes vary on the Alaska Highway. In summer some 60 persons are employed in transient oriented activities, and 22 employed in various government agencies. The total employment level falls to about 25 in winter. The summer labour force is composed mainly of students and temporary employees from outside the territory- consequently it would appear that collapse of various activities

Fig. 42

BEAVER CREEK

LAND USE 1978



in winter does not result in high unemployment levels in the community.

Despite the relatively high summer population there is no general store in Beaver Creek (although one is being constructed) and much of the retail interaction, consequently is with Whitehorse (table 7).

A number of communities have not been discussed in this section of the work, namely the dominantly Indian communities of Old Crow, Pelly Crossing, and Upper Liard. They do not easily fit into any of the described groupings, while there were some difficulties obtaining relevant data. Despite the cooperation of the CYI it was felt that intensive research activity was not desirable, especially in the light of feelings among members of the Indian population in the aftermath of the Lysyk Inquiry[1].

It appears from a somewhat subjective standpoint, that the quality of life enjoyed by the inhabitants of predominantly Indian settlements is certainly no worse, and in some respects probably better than the quality of life Indians enjoy in dominantly non-Indian communities. An examination of the current status of Old Crow, drawn mainly from a synthesis of existing material[2], as opposed to field work, serves to illustrate the impact of the persistent expansion of the non-Indian ecumene on native settlements.

There has been a tendency to romanticize the quality of life in relatively isolated Indian communities; Old Crow is no exception, and the village has become a mecca for anthropologists, sociologists and archeologists. The settlement, however, represents no 'natural state', it developed in the early 1900's following the establishment of a post on the north bank of the Porcupine River some 480 km above its confluence with the Yukon and movement of population into the post in the aftermath of a smallpox outbreak (Harrington 1960 p 5). In 1978 the population was estimated to total 200, (Lysyk p 164) of which 185 were of Indian ancestry.

Until the 1950's the settlement prospered as an isolated Indian community with a strong land based economy tied predominantly to Muskrat harvest. Old Crow's isolation was physical - in terms of linear distance and travel time to Dawson or Whitehorse, and cultural, with an almost exclusive Indian population pursuing a traditional lifestyle at a time when the other settled

areas of the Yukon were becoming increasingly dominated by the non-native economy.

Over the past twenty years the community has become increasingly caught in the expanding high-speed communications web, with air transport and electronic communication putting it into relatively easy contact of other centers, hastening the introduction of new technology, ideas, and economic values.

These incursions into the traditonal lifestyle led to a number of changes in community life. Until the 1960's the community had a strong seasonal component, with population living there only for part of the year and spending the winter in outlying camps. As with other settlements (notably Ross River and Teslin) this seasonal pattern has now broken down, Stager (1973) noting that in the 1930's and 1940's there were perhaps nineteen seasonal camps; by 1960 there were five and by 1973 none. The hunting/trapping hinterland of the community was 25,000 square miles in the 1930's and 40's, by 1960 it was 15,000 square miles, decreasing to 1500 square miles by 1973 (Stager p 50); as the average length trap lines decreased so did the general level of land-based activity. These changes are attributable to the increase in wage employment (53 persons out of a non-white[3] population of 183 were employed in wage activities in 1973), availability of store-bought commodities and the use of snowmobiles in hunting and trapping, with greater reliance of Old Crow as a central base.

Activity levels in terms of employment in Old Crow seem to be high. Despite its diminution the land-based economy provides over 50% of food consumed, and in terms of replacement value constituted (in 1973) 30% of earned community income[4].

Dependence on store-bought commodities is relatively high despite orientation towards a land-based economy, and change in shopping behaviour in the period 1960-1973 is indicative of increasing links with the rest of the

territory. In 1960 80% of the population purchased more than half their needs in the community store; by 1973 this figure had fallen to 50%, with an increasing number of purchase being made directly or via mail order from Whitehorse (Stager p 91).

Communications development had a major land-use impact in Old Crow. A runway was constructed in 1970, and is located in such a manner that the townsite is effectively sandwiched between the runway and the Porcupine River. The annual rate of bank erosion of the Porcupine is about 3 meters p.a. (Grainge 1972). Prior to airport construction the community adjusted to river bank erosion simply by constructing new buildings where old ones disappeared or were threatened. The location of the runway prevents such adjustment taking place, and if future expansion were required would physically divide community.

Apart from the obvious changes discussed there are a number of problems of a social nature in Old Crow. Despite the apparent high level of economic activity 25% of the settlement's cash income comes in the form of pensions and welfare. In the early 1970's there was an increase in the volume of alcohol related offences or violent crime; in 1968 there were 16 criminal offences in Old Crow, of which 14 were related to drink or violence; by 1972 the number of offences had risen to 69, of which 64 were drink or violence related.

These problems may have arisen due to the pressures arising from increased contact with the outside world and various transformations in non-land and cultural relationships engendered by changing consumption patterns and various example effects. In testimony at the Berger Inquiry it was stated that even the presence of researchers in Old Crow created tensions in the community (Berger 1975 p 1570).

The described lifestyle and problems in Old Crow are similar to those described in Ross River (Sharp 1977) and in settlements on the Alaska Highway (Cruikshank 1977), where major events, the Anvil development and highway construction, had a sudden and marked impact on Indian lifestyle.

Although no events on the same scale have taken place in the vicinity of Old Crow the described problems are symptomatic of the breakdown accompanying increasing contact with various values and institutions of the non-Indigenous population.

Notes

1. The general consensus was that the Indian way of life had been 'over-researched', that research had not always been in their best interests, and that intrusion by outsiders was causing stress in some communities.
2. This section relies heavily on Stager's 1973 study of Old Crow.
3. The author found some ambiguity in Stager's 1973 population statistics. 'Non-White' refers to all inhabitants of Indian ancestry.
4. Earned community income consists of wage employment income, income from sales of furs and handicrafts, and replacement value of meat and fish obtained. It excludes pensions, social assistance and other allowances.

11. CONCLUSION - FUTURES FOR SETTLEMENT IN THE YUKON; A CRITICAL APPRAISAL

At the outset the stated aim of this work was to describe the structure of the settlement system of the Yukon Territory and examine the various factors influencing settlement in the period 1968-78. A further aim was to introduce a more dynamic approach to the study of northern settlement based on the observation that settlement and economy are intractably linked, and that consequently identification of various inter-community transactions would provide insights into growth and development in the north on a regional scale. The analysis in this final chapter moves from summary of the salient features of the Yukon's settlement system through to discussion of the extent to which current processes are beneficial to the territory's populace and critical evaluation of possible development strategies for the Yukon.

The evolution of the settlement pattern continued through the 1970's much as it was described in 1969 (Duerden 1971). Overall population increased at a less than natural rate and the shift in balance of population from the northern inhabited Yukon to the south continued. The most economically viable communities were purpose-built single enterprise towns (Clinton Creek, Elsa, Faro) while in highway locations nodal settlements (notably Haines Junction and Watson Lake) grew partly as a result of increased tourist traffic and fortuitous location; intervening non-nodal communities stagnated.

Relict mining centers, Dawson City and Mayo Landing, gained in population. In the former center this was largely attributable to growth in tourism and government activity, while in the latter increase in Indian population occurred. Despite these increases the communities continued to have problems, Dawson's economy failing to benefit from the Clinton Creek development, while Mayo Landing mainly survives due to various types of government support.

Two settlements were established at the start of the study period, Clinton Creek and Faro. Clinton Creek was forecast to have a life-span of 25 years; 10 years after inception it reverted to a 'green-field' site, the only settlement failure in the study period. An increasing portion of the Yukon's

population come to live in Whitehorse, which continued to grow in population, spatial dimensions, and in its role as the major service centre for the territory. The city's growth has been related to its nodality, established range of goods and facilities and (compared with other locations in the Territory) relatively moderate climate. Overall a major component of territorial population growth was in-migration, the only sector of the Territory's population sustaining itself through natural increase being the Indian sector. The population of most settlements has been maintained by a 'flow-through' of migrants mainly from outside the territory who have resided there for a few years and then moved on; usually back to locations outside the Yukon.

It is clear from the analysis presented elsewhere in this work that the settlement system of the Yukon is a very 'open' system, with individual settlements often linked more directly to locations outside the territory than locations within it. However, the system does display a greater degree of closure than one would perhaps expect in a northern region, and a higher degree of closure than other regions in northern Canada. The role of Whitehorse as primate city in the system, the generator and receiver of the vast majority of intra-Yukon migrants, the recipient of consumer expenditures and the focal point for higher order services is characteristic of this, as is the observation that some communities have greater migratory contact with locations inside the territory than outside it.

The internal interaction and interdependence that does exist results from a number of factors. Many settlements evolved to support the mining industry in the central northern Yukon (Duerden 1976) and historically their fortunes have been closely related. More recently the development of the all-weather highway system linking all locations except Old Crow has transformed relative space and brought communities into closer proximity with each other and with Whitehorse, concomittantly increasing the potential for interaction between

locations. As highway links have proliferated so settlements have become more integrated in the system, with growth taking place at nodal locations in the highway network[1]. A final determinant of internal interaction is the presence of the major service center of Whitehorse at the focal point of communication in the territory. With a comprehensive range of goods and services, combined with its distance from competing centers outside the territory it serves as an intervening opportunity for expenditures that would otherwise take place outside the Yukon and as a starting point and finishing point for migrants within the Yukon. The process of settlement development and change summarised thus far appear quite innocuous, with a dominantly migrant population providing a basis for economic vitality in a sparsely populated area of Canada. More detailed investigation of the structure of the settlement system and various intra-Territorial and extra-Territorial transactional relationships, however, indicates that the settlement system and related economy have not developed in the best interests of all the Yukon's population. It is clear from analysis presented earlier in the work that there are four sub-groups of settlement, all inter-related to some extent, but each having different characteristics in terms of inter-community linkages, built form, and quality of life. A summary of the processes at work in each group serves to highlight some of the major settlement problems in the Yukon.

The first of these groups consists of the single enterprise communities. These purpose-built towns (Elsa, Mayo, Clinton Creek) are linked very strongly in terms of migration, capital flows and commodity flows to the outside world. They are in the truest sense 'instant towns', created on the Yukon equivalent of green-field sites. Their populations contain a high proportion of single males, and largely drawn from outside the Yukon; population levels are maintained by rapid through-put of migrants who in most instances stay for considerably less than five years. The Indian population of the single enterprise communities is negligible, although Faro did have a policy of

attempting to attract Indian labour (Sharp 19[illegible] p[illegible] 6).

As illustrated in Chapter 3 there are very few economic links between mining communities and other communities in the territory. Industrial links are virtually non-existent, and the flow of expenditures from payrole income is either within the single enterprise communities, Whitehorse, or outside the Yukon.

The second settlement group consists of older communities with ethnically (Indian and non-Indian) mixed populations. Such communities are either relict mining centers which undergo periodic revivals (Dawson, Mayo) or old established communications oriented centers (Carcross, Carmacks). From the standpoint of migration these settlements tend to interact more with locations in the territory than outside it, their populations being split between long-term Yukon residents and a highly mobile population. Disparities in quality of life in the communities in this group are reflected in the employment structure, largely made up of government employment, retail activity (in Dawson), part-time employment, land-based activity and welfare. Disparity is also reflected in blight and visible variation in the quality of housing.

In three of the settlements (Dawson, Mayo, Carcross) segregation of population is less visible than it was in 1968, although it still exists, with well defined areas of Indian occupance in all settlements. Despite increased housing construction by both Indian bands and the Yukon Housing Corporation obvio housing problems remain. In Dawson much of the Indian population lives in standardised log houses crowded onto a barren lot at the northern end of the waterfront; in Mayo the relocation of a component of the Indian population from their traditional location at the western end of the settlement has not solved the Indian housing problem, substandard housing still remaining in the west and being occupied on vacation (BCRH 1975).

A further settlement group consists of communities which have grown following highway construction. This includes Watson Lake, Teslin, Ross River,

Haines Junction, Destruction Bay and Beaver Creek. Non-Indian population of these communities is mainly employed in communications and tourist oriented activities and has strong migratory links to locations outside the Yukon. The Indian population moved into the highway oriented settlements as a result of selective location of government facilities, provision of housing, increased dependence on consumer goods and the break-down of the traditional land-based economy as a result of part time industrial-type employment and the example effect of non-Indian consumption patterns.

The process of Indian population movement into highway communities is well documented by Cruikshank and Sharp (1977). Accompanied by disease, displacement of traditional life-style and economy, and alienation in recipient communities it appears as a brutal process. It is a strange paradox that the growth of Ross River was brought about by the nearby Faro development, yet it would appear that the community's Indian population gained little from what was heralded as the Yukon's greatest growth stimulus. Conceivably the perceived benefits of sedentary existence in Ross River - schooling, consumer goods, medical facilities, the possibility of employment were outweighed by displacement of traditional life-style and lack of anticipated economic opportunities.

The final settlement group consists of these communities with an almost exclusive Indian population - Burwash Landing, Pelly Crossing, Upper Liard and Old Crow. Economically these settlements are strongly tied to traditional land-based activity, and probably as a function of their relative isolation from southern-oriented economic activities contain the least demoralised and most independent Indian populations in the Territory.

The physical impact of settlement has not been a focal point of this work, but is relevant to any discussion of settlement problems insomuch as vegetation, water quality and aesthetic qualities of landscape are modified

by human occupance. Over the past seventy years man has modified the territory's landscape in various ways and in a manner which is completely out of proportion with its historic population densities.

The Yukon and its tributaries drain 55% of the Yukon, and every settlement except Upper Liard, Watson Lake and Haines Junction lie in the Yukon Basin. Water quality has been impaired by domestic polution, with largely untreated sewage falling into the Yukon. In some respects this is no great problem, populations are small, river discharges large, and some settlements can obtain their water from one river and deposit their sewage into another. Despite these observations it is discouraging to note that Lake Labarge is polluted, while at various locations on the Yukon tourists are extorted to be wary of drinking the water.

Water quality has also been threatened by industrial pollution, a by-product of the mining industry. The high-grading of ores, which may be rendered necessary by the economics of mining in isolated regions results in the storage of low grade ores with leeching potentially resulting in pollution of parts of the Yukon River system. Pollutants from the Elsa operation have found their way into the Stewart River in the past (Star 2?/12/79) while concern has been expressed about the leeching of stored low grade ores from the Faro operation.

Deforestation resulted from tremendous demands for fuel and building materials, especially in the early years of the century. This influences wild-life harvests. It is especially notable in the northern part of the study area where landscape recovery tends to be slow. Around Dawson secondary vegetation is much in evidence, the Faro townsite, burnt over in 1967 is still barren, while an area destroyed by forest fire in the vicinity of Ross River in 1925 has still not recovered.

Finally the landscape has been affected by the general blight and decay of abandoned mining endeavours. In the Klondike miles of river bed have been modified by dredging; the waste from the Anvil mine is stored in large

ponds on a sub-tributary of the Pelly River[2]. In the Keno mining area the relict infrastructure of abandoned mines aboads, with attendant rubbish dumps and abandoned machinery; the most striking feature being the gutted remains of Calumet on a bleak hillside above Elsa.

It could be argued that there is no cause for concern about the described environmental indiscretions. The Yukon is a distant and isolated region and few people are liable to see the worst of these abuses of the physical environment, moreover the most visible of the excesses occurred in the half century following the Klondike Rush when environmental issues were by no means as important as they are today. However the abuses are representative of a historically cavalier attitude towards landscape and environment bred by the abundance of open space and, until relatively recently, lack of government concern over environmental quality in the north.[3]

It is evident from the foregoing discussion that the benefits of development in the Yukon in the period 1968-78 have largely gone to those elements of the population drawn into the territory as either mining employees or government (Federal and Territorial) officials as opposed to Indians or long-term indigents. Clearly the mid 1960's population of the territory was not large enough to support a major mining development on the scale of Clinton Creek or Faro without substantial in-migration; on the other hand the benefits of such developments are not manifest in any network of economic linkages or related large-scale employment of Yukoners or indigents outside Whitehorse. Despite the assertion that mining has a 'multiplier of two' or the claim that resource industries were worth $10,000 per capita in 1976 there is an obvious spatial inbalance in the quality of life; an inbalance manifest in variations in employment levels and housing conditions. It is rather a paradox that mining settlements grow; relatively wealthy populations pass through the Territory, yet relict centers such as Dawson and Mayo with their abandoned lots

dilapidated buildings, and demoralised Indian populations remain unchanged. Equally it is somewhat perturbing that the true indigenous population has not benefitted in any visible way from the fabled benefits brought by mining.

A further problem is the territory's dependence on government expenditure. Growth in some communities has been almost exclusively due to government employees, many of which are drawn from outside the territory. In other communities the economic base is tied almost exclusively to government employment. Because government is the largest payroll the tertiary sector of the economy, and thus the retail service base of a number of communities, is tied to government expenditure in terms of both payrolls and various forms of welfare payments.

From another perspective there are problems of service delivery; because communities tend to be small and dispersed services are provided at lower than optimum threshold levels or not at all. On one hand the provision of services becomes costly, on the other quality of life (health, education) suffers because the desired level of service is not available.

The described problems have arisen partly because of the very geography of the Yukon, and partly as a result of attitudes towards northern development. One attitude most prevalent in the 1960's when much of the contemporary economy and infrastructure were developed was that large scale economic developments will automatically have universally beneficial effects and industrialisation will reinvigorate the north regardless of cultural concerns or traditional economic pursuits. A former government official wrote of a flight from the Faro site in 1968,

> 'they caught a glimpse of a deserted group of cabins at the little old community of Ross River sleeping in the sun just a few miles from Anvil.... being brought back to life again by the sound of Canada's

second century - heading north.' (Whyard 1968 p 21).

The other relevant attitude is that of the mining companies who are primarily concerned with running a profitable business; in the Yukon they are involved in high cost, relatively high risk ventures distant from the market for their product. Their interests in quality of life or regional development are primarily related to productivity and profitability. This attitude is characterised in the Faro development, where increased emphasis on housing for families as opposed to bunk house accomodation is essentially aimed at achieving economies via reducing labour turn-over; the probably resultant overall improvement in quality of life (in terms of community stability, population mix) is thus related to a narrow economic goal.

Between them the described attitudes are characteristic of the ascendancy and dominance of an economy based on a technological appraisal of resource as opposed to the more traditional, essentially ecological[4], approach based on renewable resource. Because the two approaches involve different modes of production, measures of value and spatial support system they are in conflict. Technological resource development has encroached on ecologically oriented resource development without generating adequate benefits for the Indian population (other than perhaps indirectly supporting welfare) or providing any compensation for displacement of their economy.

A re-orientation of the idea of northern development is required, moving it away from what it has become, namely the development of resource extractive activities in the north for the benefit of the south. First it must be recognised that almost any type of northern development is going to be resource related, and outside the reinvigoration of Indian land-based economy, will be based on non-renewable resource. Inevitably such development will be in the interests of the market where resource is consumed, but it should be planned in such a manner that direct benefits are generated equitably in the exploited region while adverse environmental impact is minimised.

Earlier it was stated that effects of locational policies are manifest within settlements and because settlements are linked to some extent the impact of specific decisions may be transmitted between communities. Settlement policies are thus of considerable importance in eleviating described problems. Such policies include attitudes towards migration, decisions to encourage or discourage growth in specific locations through economic incentive, the provision of infrastructure (roads, social capital) in specific locations to encourage growth, and land-use controls. If structure of the settlement system (such as described in the main body of this work) is known then it should be possible to predict with a degree of certainty the probable effect of any policy or policies adopted.

A number of different approaches can be taken to the solution of contemporary settlement problems. Five are identified here, although the five are not mutually exclusive - the optimum approach may be the combination of approaches. They are presented here with a critical evaluation of each.

i) The current strategy. By either design or accident the Single Enterprise Communities are separate from the existing settlements. The advantage of this is that the rest of the system is insulated from the periodic 'boom-bust' cycle of mining. Disadvantages include the described inbalance in terms of the distribution of the benefits of mining development, and waste due to the duplication of townsites, facilities, and capital expenditures.

ii) Location of the Labour force employed in mining ventures in existing settlements. In the schema envisioned here the labour force from Clinton Creek would have resided in Dawson, the Elsa labour force would reside in Mayo Landing, and the Anvil Labour force in Ross River. Economies would initially

be gained from the use of an established townsite in a known, surveyed, location. Local employment would be generated during the construction phase, with increased population during the operation phase bringing into existence a wider range of goods and services. This would reduce costs which are currently incurred due to duplication of services.

A major problem confronting this approach relates to the Indian population. Because historically the results of Indian/non-Indian contact have been somewhat adverse it may be felt desirable to keep the Indian population separate from any large influx of wage-earning mining employees. The counter argument to this is that the damage to Indian culture has already been done (Ross River, Alaska highway communities etc), and increasing the availability of outside services can do nothing but improve the well-being of the Indians.

A further consideration is the economic costs of such a strategy to the mining companies. They would have to weigh the savings on cost of townsite preparation (and possible reduction in labour turn-over rates) against the cost of commuting to the mine-site over the life of the mine.

iii) A growth pole policy. Introduction into mining centers of activities that will have forward and/or backward economic linkages with activities in other locations in the territory, with growth in the center thus being transmitted through the settlement system. As this work illustrates, inter-community economic linkages are very weak and unlike other areas of the north (notably northern Scandinavia) there is not enough diversity in the economic base, nor a large enough population, to make such a policy workable.

iv) Growth Center Policy. The essential idea is that by concentrating population in centers most conducive for growth (a diverse economic base, nodal location) costs can be minimised through shared facilities; delivery of government services and consumer goods can be vastly improved because critical population threshold levels are passed, while the cumulative demand of increased population stimulates economic activity. Growth center policy would go hand in hand with a policy of 'strategic withdrawal', with population

moving out of what would be deemed to be uneconomic settlements into the designated growth centers. This would be achieved by selective location of government facilities and grants and removal of government facilities from the declining communities. A somwhat similar policy was pursued in the Yukon in the 1950's and early 1960's when Indian settlements by-passed by the new highways were depopulated, the population moving to highway locations where housing, schools and medical facilities were provided.

Outside Whitehorse growth centers would initially be selected on the basis of nodality and past growth performance. Because using this criteria alone would preclude settlements in the northernpart of the territory from being designated growth centers (ie Dawson City, Mayo Landing) a further criteria would be ability to provide services for an expanded population. Conceivably growth in such centers could be encouraged by the decentralisation of government offices from Whitehorse.

Some of the problems facing the growth center strategy are similar to those facing the location of mining based populations in established settlements. Further problems would be inter-community bickering over growth center designation and opposition from those settlements scheduled for closure.

v) Development of Indian Communities. The final policy is predicated on a number of observations made in this work concerning the structure of the Yukon's settlement system, and the future of the Indian population in the light of impending land claims settlement. Non-Indian population growth in the Yukon has taken place due to in-migration in response to mining development and increase in the size of the government sector. It would appear that the benefits of apparent growth in the Yukon have gone to in-migrants employed in technological resource exploitation as opposed to the Indian population, while the Indian population which has benefitted most from post-War economic development has been that component of the land based population least affected by it.

Facetiously it could be suggested that the best way the Indian population could have gained from developments in the territory over the past ten years would have been by maintaining the size of government bureaucracy in the Yukon at mid 1960's level and investing money that would have gone in government payrolls directly into community enterprises. Government expenditure essentially resulted in inducing population to move into the Yukon from the outside, the most direct beneficiaries of such expenditures thus have tended to be in-migrants as opposed to indigent Yukoners.

It appears that the quality of life for Indians, in terms of employment, social cohesion and community morale is somewhat higher in such settlements as Old Crow, Pelly Crossing and Burwash Landing than in non-Indian dominated communities[4]. Life in these exclusively Indian communities, however, is by no means idyllic. They have numerous social problems, their economies have a considerable welfare component, and the land-based economy is (at current levels of production) by no means self-sufficient. Given the failure of the Indian population to benefit substantially from life in non-Indian settlements, and given the relatively improved quality of life in Indian communities a possible settlement policy is one that promotes the development of separate, dominantly Indian settlements.

The development of viable Indian settlements depends on land-claims settlement and the maintenance of the land-based economy. Although, as discussed in Chapter 3, data on the land-based economy of the Yukon are lacking Brody[5] has indicated that communities in British Columbia on the southern section of the Alaska Highway are almost self-supporting in terms of their land-based economies. Both Aasch (1977) and Jellies (1977) have draw attention to the revenues that could be generated by Indian groups either in the form of compensation or as economic rent for resource ventures on Indian lands.

The promotion of Indian economic interests or the development of dominantly Indian settlements is not a romantic 'back to the land' notion, essentially it

implies the recognition of geographic realistics. First, that as technological resource development with its associated infrastructure has expanded the more ecologically oriented Indian economy has been displaced, either because of social changes (example effects of consumption, sedentary settlement, welfare, etc) or because of environmentally related factors. The second reality is that the Indian population does have a legitimate claim to land in the Yukon, and on that land they should be entitled to pursue the economic activity with which they can derive what they perceive to be the greatest benefit. Such activity may be land-based renewable resource activity; equally it may be mining. The fact that traditionally their most viable activity has been renewable-resource related does not preclude the Indian population from participating in technologically oriented resource exploitation, either through some type of economic rent arrangement or directly through labour.

Although a number of social changes may have to be considered, such as the improvement of service delivery to Indian communities, two economic measures can be identified which would make a fundamental contribution to the economic and cultural re-vitalisation of such communities.

a) Land Use controls. The demarcation of large areas of land around Indian settlement sites[6], in which at least surface land use would be controlled by the Indian population in their own economic interests.

b) Provision of investment for Indian enterprises. At one level this would be provision of capital for the basic infrastructure for a re-vitalised subsistence economy; at another it could be the provision of funds for capital equipment to be utilised in commercial renewable resource activity. Equally, investment should be available for Indian non-renewable resource ventures.

Investment could come from three sources. First, something along the lines of the Yukon Heritage Fund (Lysyk p 150), with revenues for pipeline development being used to revitalise land-based activity. Secondly, if non-renewable resource development were to take place, funding could come as compensation for the use of land; the Indian population could obtain some

form of economic rent - a practice not ucommon in an open economy. Another possible source of capital is direct government grants. Ideally the philosophy behind government provision of capital would be that from a benefit-cost standpoint it is cheaper in the long-run to provide large scale but short-term funding to establish a self-supporting economy and reduce dependence on various forms of on-going support (welfare, social security, unemployment pay) than it is to maintain the present level of such expenditures.

Notes

1. From a more abstract standpoint the growth of nodal communities could be explained by use of graph theory and various gravity models depicting variations in potential for interaction in the settlement system.
2. Rose Creek.
3. Government concern with the northern environment has increased greatly over past few years. In the Yukon this is seen in the fact that when the Clinton Creek operation ceased the townsite reverted to a 'green-field' site. It seems, however, that little has been done to remedy past environmental indiscretions.
4. In some respects the term 'ecological approach' is a misnomer. Although the traditional Indian economy is renewable resource oriented it could be argued that no great ecological damage resulted from this activity mainly because Indian populations were so small and game, generally, abundant.
5. Hugh Brody - Personal communication.
6. Such areas should be large enough to at least provide the basis for a renewable resource based economy.

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