KITIMAT, B. C.
AN EVALUATION OF ITS PHYSICAL PLANNING
AND DEVELOPMENT

by

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Department of COMMUNITY AND REGIONAL PLANNING

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Date September 1965.
ABSTRACT

The new town of Kitimat was built in an undeveloped area on the north-west coast of British Columbia in response to the need for a site for an aluminum smelter, an operation which was located there because of its need for the abundant hydro power which was available in the region. The town was planned under the direction of Clarence S. Stein, who as the author of the Radburn principle, embodied this concept extensively in its physical plan.

It is now more than a decade since the first part of Kitimat townsite was occupied in 1954, and sufficient time has thus elapsed to give some indication of how effective certain aspects of its planning have been. This study attempts to determine whether the planning principles used in Kitimat have been successful and why, as well as to determine whether the planners succeeded in achieving what they set out to do.

There were several methods used in the evaluation - a study of the available literature on Kitimat; numerous personal interviews; a questionnaire type survey of the community; and the personal experience of the author's three years of residence in the community.

The questionnaire type of survey entailed the distribution of 230 questionnaires to residents of the community.
These questionnaires included a total of 28 questions to determine the attitude toward various aspects of the community. Two questions asked what the residents most liked and most disliked about Kitimat and another asked what suggestions they had for its future development.

The results of the study indicate that the basic objectives that the planners initially put forth for the development of the town have been reasonably well achieved. These objectives include firstly, the industrial success of the plant and the importance of a contented work force, and secondly, the importance of family needs as a basis for the Kitimat Master Plan.

The study goes on to analyse various aspects of the physical planning. It puts considerable emphasis on the results of the attitude survey on the assumption that an important factor in the degree of success of a community is the attitude of its residents toward it.

Consideration is given to the effects of the curtailment of the 1957 construction program, and the importance is shown for a staging of development in new towns which allows a good relationship of all areas and uses to each other at all stages of development.

Basically it can be said that the planners of Kitimat achieved much of what they attempted to do through the physical planning concepts which were applied in Kitimat. Certain
aspects of the development have presented problems or have been limited in their degree of success, notably the design and quality of housing, the orientation of some of the housing, and the minor walkway system. However the main elements of the physical planning of the community, including those related to the Radburn principle, have proven quite successful. These include the application of the neighbourhood unit idea, the inclusion of a neighbourhood commercial centre within a neighbourhood, the separation of pedestrian and vehicular traffic as demonstrated by the arterial walkway system and interior park areas, the separation of vehicular traffic by its function; and the exclusion of through vehicular traffic, from the neighbourhoods. With the reservations outlined above, the hypothesis is considered to be valid, namely "THAT THE PHYSICAL PLANNING CONCEPTS USED IN KITIMAT HAVE GENERALLY BEEN SUCCESSFUL."
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INTRODUCTION

New towns have been built in many areas of the world for a multiplicity of reasons. Many new towns were designed to take excess population from large cities, others were created as centres of administration and government, while others form the base for industrial development or utilization of a natural resource. It is this latter category which is most typical of new towns in Canada.

One of the most notable of Canadian new towns is Kitimat, located on the north-west coast of British Columbia. Kitimat was built in response to the need for a site for an aluminum smelter, an operation which requires large quantities of electrical energy at a relatively low cost. The area was endowed with an abundant supply of hydroelectric power which could be tapped by diverting the headwaters of the Nechako River westward via a tunnel through the Coast Mountains.

The site chosen for the smelter and town was at the head of Douglas Channel, a long fiord-like arm of the sea which stretches some 80 miles inland from the waters of Hecate Strait. It was one of few areas on the central or northern British Columbia coast which was reasonably close to such a large source of hydro power and had sufficient level land for a large townsit, and where at the same time rail and highway access could easily be provided to a site at tidewater. The
site was almost completely undeveloped, with no existing settlement pattern to influence or restrain the form of a new town, nor were there any other population centres of any size nearby.

The company responsible for the development of Kitimat was the Aluminum Company of Canada, the principal operating subsidiary of Aluminium Limited. This Canadian Company is one of the world's largest producers of aluminum and has many plants in many countries. The company previously had some experience with new town development at Arvida and Isle Maligne in the Lac St. Jean region of the Province of Quebec, although both of these communities are very different from Kitimat in the sense that they are both parts of larger urban areas and are not independent communities as is Kitimat. It is likely that the experience with Arvida and Isle Maligne, the realization that the living conditions and environment play a large role in the productivity and stability of the work force, and the relative isolation and remoteness of the site were the major factors in the company's decision to provide a well planned community.

The company engaged Clarence S. Stein, working in collaboration with the New York firm of Mayer and Whittlesey to do the planning for the proposed new town. Stein is the author of the Radburn principle, named after the community of Radburn, New Jersey. This principle is based upon the develop-
ment of super-blocks where through traffic is directed around instead of through the local residential area. Within the super-blocks, dwellings are grouped about short cul-de-sac streets. The houses are oriented in reverse of the conventional placement on the lot, with living rooms facing the garden, and kitchens and garages facing the street. Pathways provide uninterrupted pedestrian access to a continuous park strip, leading to large common open spaces within the centre of the super-block. Pedestrian traffic is almost completely separated from automobile traffic. These ideas have been widely used in the planning of Kitimat, where their application has been much more extensive than in Radburn itself.

It is now more than a decade since the first permanent housing was occupied in Kitimat Townsite in 1954. Sufficient time has thus elapsed to look at the community and find whether the planning principles used have been successful. It is the objective of this thesis to study Kitimat in the light of what has actually taken place as compared with what was planned. An attempt is made to find out in what respect the town has been successful, in what respect it has failed, and what its outlook for the future may be.

One of the inadequate phases of new town development is the lack of a follow-up study to determine what features have been most successful and what have not. All too often sweeping statements are made as to the degree of success of
an undertaking without studying the reasons or providing the evidence as to why something is successful or unsuccessful. Often progress is stifled and some excellent forms of development are discarded because it is not understood that some particular and easily remedied feature is causing the problem rather than the development as a whole. One of the most pronounced of human weaknesses is the great tendency to look upon something as being either entirely right or entirely wrong. In reality there are few things in this world which are so clearly defined. Most systems have advantages and disadvantages and it is an intelligent and objective weighing of the factors involved which should provide the most satisfactory answers.

It is with this approach in mind that an attempt is made here to evaluate the planning and development of Kitimat. The community has had its share of criticism, as has the concept of neighbourhood units and the Radburn planning principle. Undoubtedly many of the criticisms have validity, while many others have been made without any attempt to look beneath the surface to find the real answers. Kitimat provides an opportunity to see how the Radburn principle works in practice. Many other features of the town are also important as to their degree of success. The lessons learned from a community such as Kitimat, including those factors which have
proven to be undesirable as well as those which have proven worthwhile, can be very useful for the development of other new towns and also for the future development of Kitimat itself.

While there is considerable general and superficial reference to Kitimat in the literature, there has been very little intensive study of the community. This lack of information is partly due to the remoteness of Kitimat from large population centres and the lack of financial resources and incentive to support the necessary research. In addition to the experience which could be gained about building new towns in remote areas, there is a great deal that could be learned in the sociological field by professional researchers in this field.

Of the existing literature concerning Kitimat, the following four publications are perhaps the most notable: the "Kitimat Townsite Report," which is basically the master plan for the community, and gives the background and detail for the proposed development; "Kitimat, A New City," written by the planners of Kitimat, which describes many aspects of the Kitimat Master Plan; "New Industrial Towns on Canada's Resource Frontier," by Ira M. Robinson, which makes various

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comparisons of the Canadian new towns of Kitimat, Elliot Lake, Drayton Valley and Schefferville; and "A Tale of Two Cities," by N. H. Richardson, which compares Kitimat and its neighbouring city of Prince Rupert, and gives a particularly good general evaluation of Kitimat and many of its features.

There are many diversified aspects to the planning, development and degree of success of a community such as Kitimat, however it is impossible to cover them all here. Nevertheless it is hoped that the subject can be covered in sufficient detail to enlarge upon the knowledge of new town development, and give some additional insight into the problems faced, by an attempt to understand what has happened in Kitimat. Considerable emphasis is placed on evaluation of the physical layout of Kitimat, with particular reference to the Radburn principle and some of its detailed features. In addition to this, however, certain critical factors such as development problems, community attitudes, single enterprise communities and relationship to the region are considered. Basically a thesis of this type could focus entirely on the application of the Radburn principle, especially in view of the limited time and resources available. However, the author lived for several years in Kitimat and had an opportunity to experience some of its advantages and disadvantages at first hand. It

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was therefore considered of benefit to enlarge the scope of the thesis to include a wider but by no means exhaustive analysis of Kitimat, such that certain features of Kitimat which the author has observed, or heard comments thereon from other residents, may be recorded.

In addition to the personal experience of living in the community, the method of approach of the study has entailed an analysis of a considerable amount of literature on the subject, including much information from the Aluminum Company of Canada and the Kitimat Municipal Planning Department. Also many persons were interviewed and 230 questionnaires were given out in the community. A total of 146 questionnaires, or 63.5 percent of those given out, were returned and subsequently analysed as part of the evaluation of the town.

In line with the rather broad approach taken to the study of Kitimat, an hypothesis was formulated which in itself was fairly general. The hypothesis is "that the physical planning concepts used in Kitimat have generally been successful." It is anticipated that the verification or non-verification of this hypothesis is subject to a number of reservations and qualifications, since the complexity of the subject makes it unlikely that such verification or non-verification will be clear cut. The alternative would have been to formulate a number of related minor hypotheses; this was rejected because it would have meant anticipating a
number of problems before they were known to exist, although in retrospect it appears that this rejected approach might still have had merit, since additional information would still have been provided even if the hypotheses were not validated.

The thesis is divided into five separate chapters, each of which encompasses a specific aspect of the study.

Chapter I provides a background of the physical features, climate, history, settlement, resources and external relationships of the region in which Kitimat is situated. Kitimat is, to a greater degree than most other communities, greatly influenced by its surroundings and environment, especially its isolation, imposing mountains and forests, and its climate. It is in an area where the natural beauty can be very impressive during periods of clear weather, but at other times the mild but wet, snowy and overcast winters can become quite oppressive.

Chapter II reviews the background of the decisions leading to the Kitimat development. The roles of the company, the province and the planners are discussed, as well as the evolution of the concepts on which the Kitimat Master Plan is based. The various planning aspects of the Kitimat Master Plan itself are then set forth in some detail.

Chapter III describes some of the problems of development which were oftentimes quite formidable in themselves. In fact many of the basic criticisms levelled at the community
can be directly attributed to the extenuating circumstances and particular economic conditions of the time at which the major part of the development was carried out. This chapter covers the period of construction and development beginning in 1951 and continues up to the existing conditions in the community at the present time.

Chapter IV contains an evaluation of the various features of Kitimat. The evaluation is based upon various sources such as the planning literature available, interviews, questionnaires, personal experience and opinion. Such factors as community attitudes, physical layout, circulation, land use, community structure, and relationship to the region are considered in an attempt to evaluate the overall success of the community.

Chapter V provides a summary of the findings and the conclusions reached. It also considers the future growth of Kitimat and some of the problems it might face, as well as how the lessons of Kitimat's experience can benefit other new towns which may be developed in the future.
CHAPTER I

THE REGION AND KITIMAT

In order to obtain a better understanding of Kitimat and the factors which have affected its planning, development, and degree of success, it is first desirable to know something about the physical setting, climate, history, settlement, economic base, transportation and external relationships of the region. These factors are important in the development of any new town, but especially so in the case of Kitimat and its location in a relatively isolated and undeveloped area.

I. PHYSICAL SETTING

The new town of Kitimat is located about 400 miles northwest of Vancouver in the north coast region of British Columbia. As shown on the map in Figure 1, page 11, it is at the head of the Kitimat Arm of Douglas Channel, a long fiord-like arm of the sea which extends about 80 miles inland from Hecate Strait into the rugged Coast mountains. These Coast Mountains front the Pacific Ocean along the entire western flank of the mainland of British Columbia. They are the eroded remnants of a large granite batholith lying in contact with the older formations to the east, and rise sharply out of the sea, reaching altitudes averaging 6000
FIGURE 1

THE NORTH COAST REGION OF BRITISH COLUMBIA
feet and widths of up to 150 miles. Several thousand years ago, glacial action produced spectacular effects upon the landscape, with the higher elevations having sharp ridges, needle-like peaks, and remnant glaciers. The lower slopes, however, have a softer and more rounded appearance.

The whole north coast is characterized by many long deep inlets, great numbers of islands and numerous channels. There are few areas where there are substantial amounts of relatively flat land. With the exception of the Nass and Skeena Rivers, which form narrow but important corridors through the mountains, most of the water courses of the area are relatively short coastal streams which drain the western slopes of the coast range.

II. CLIMATE

As a result of prevailing westerly winds and the warm waters of the Pacific, the main climatic characteristics of the coastal region of British Columbia are the mild winters, cool summers, and small variations of seasonal temperature. The dominating control of temperature by the ocean is indicated by the small variation from north to south over a distance of 500 miles along the Pacific Coast of British Columbia. For example Prince Rupert at latitude 54° 17′N, has an average January temperature of 35.7°F, which is only 2°F less than Vancouver 500 miles to the southeast.
The West Coast is sheltered by the Coast Mountains from winter cold waves of polar air that sometimes penetrate into the interior of the province from the north and east. Uncomfortable heat in summer is unusual on account of the cool sea breezes which are likely to set in as soon as the land begins to warm up appreciably. As a result temperatures seldom fall below zero in winter or rise above 90°F in summer except far back from the coast.

The precipitation is characterized by wet winters and a well defined summer season minimum. The wet season begins late in September and ends about the middle of March. In contrast there is a marked dry season during the summer months, although it is not as pronounced in the northern area as in the south.

Significant differences occur between the windward and leeward side of the Coast Mountains, between the inner and outer sections of the fiords, and to a lesser degree with latitude. In some of the valleys extending through the Coast Range, a complete transition from maritime climate at the mouth to continental climate in the interior takes place. It is this latter situation which has an effect on the climatic characteristics of Kitimat at the head of Douglas Channel.

Detailed characteristics of Kitimat's climate are given in Table I, page 15. Some criticism has been made of
Kitimat regarding the form of development for such a northern location. To put the aspect of climate into a proper perspective, Kitimat's monthly precipitation, hours of sunshine, and mean temperatures have been graphically compared with the corresponding climate characteristics of Vancouver, Winnipeg and Montreal in Figure 2 on page 16, and Figures 3 and 4 on page 17.

Kitimat has an average January temperature of 27.1°F, which while warmer than any area of Canada other than the B. C. Coast, is about 8 or 9°F colder than the mouth of the 70 mile long inlet. The significant feature here is that Kitimat is still close enough to the coast to have the very pronounced wet winter season, but the small decrease in temperature means that much of the precipitation which comes as rain on the outer coast comes as snow in Kitimat. Some very heavy snowfalls can thus occur in a short period of time, although even in January approximately half of the total precipitation still comes as rain, thus keeping the snow depth low except for a short period after a heavy snowfall. Drifting of snow is encountered only rarely since the snow is usually wet and heavy. Snow generally remains on the ground from about the beginning of December to about the middle of March, which is a shorter period than in most Canadian cities. The winters are not severe but the prolonged periods of rain and overcast weather during the fall
<table>
<thead>
<tr>
<th></th>
<th>Mean of Daily</th>
<th>Mean of Monthly</th>
<th>Absolute Days</th>
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<tr>
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<td>39</td>
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</tr>
<tr>
<td>Dec</td>
<td>30</td>
<td>34</td>
<td>26</td>
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<tr>
<td>Year</td>
<td>44</td>
<td>52</td>
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<table>
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<tr>
<th></th>
<th>Rain Mean Amt.</th>
<th>Snow Mean Amt.</th>
<th>Total (water) Mean Amt.</th>
<th>Bright Sunshine Mean No. of Hours</th>
<th>Freezing Temp. Mean No. of Days</th>
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<td>6.41</td>
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<td>32.4</td>
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<tr>
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<td>4.62</td>
<td>O</td>
<td>17.8</td>
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<td>0</td>
<td>2.26</td>
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<tr>
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<td>0</td>
<td>4.10</td>
</tr>
<tr>
<td>Sept</td>
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<td>0</td>
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</tr>
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<tr>
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<td>47</td>
<td>92.71</td>
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</tbody>
</table>

Average date of last Spring frost - May 8th  
Average date of first Fall frost - October 10th  
Average frost free period - 155 days  

Source: Gonzales Observatory, Victoria, B.C.  
Period from 1954 to 1964 inclusive.
FIGURE 2

COMPARISON OF MEAN DAILY TEMPERATURES IN KITIMAT WITH THOSE IN MONTREAL, VANCOUVER AND WINNIPEG

SOURCE: Kitimat data from Gonzales Observatory, Victoria, B.C. Other data from "Climate of Canada", 1962.
FIGURE 3
COMPARISON OF HOURS OF SUNSHINE IN KITIMAT WITH THOSE IN MONTREAL, VANCOUVER AND WINNIPEG

FIGURE 4
COMPARISON OF TOTAL MONTHLY PRECIPITATION IN KITIMAT WITH THAT IN MONTREAL, VANCOUVER AND WINNIPEG

SOURCE: Kitimat data from Gonzales Observatory, Victoria, B.C. Other data from "Climate of Canada", 1962.
and winter season can be somewhat depressing. The Kitimat growing season, however, is one of the longest in Canada outside of the Pacific coast, and this is accentuated by the long summer days typical of northern locations.

III. INDIANS OF THE REGION

There are three main Indian groups inhabiting the north coast region of British Columbia. These are the Haida on the Queen Charlotte Islands, the Tsimshian in the Nass and Skeena area, and the Kwakiutl in the area between Northern Vancouver Island and the Douglas Channel-Gardner Canal area. This latter group is, however, divided into two separate areas by an isolated intrusion of the Salish known as the Bella Coola. Of particular interest to the new town of Kitimat is the group of Indians living at the Kitamaat Indian Village on the east shore of Kitimat Arm. These Indians, who have a culture and language somewhat different from nearby groups, are a blend of Tsimpsian and Kwakiutl and they speak the Haisla dialect, (all the younger Indians can speak English)

which is one of the three dialect groups of the Kwakiutl. The Haisla is the northernmost of the Kwakiutl group and are best known by their Tsimshian names Kitimat and Kitlope. The other two-dialect groups within the Kwakiutl are the Heiltsuk and the Kwakiutl proper. The name Kitimat comes from the Haisla spelling "Kitamaat", meaning "people of the snow."

The Kitimat Indians have apparently inhabited the site at the head of Kitimat Arm for several hundred years. A story is told of how the Indians came to occupy the site. Apparently a group of Indians known as the Owikeno, who lived at the head of Rivers Inlet, travelled north after a tribal quarrel until eventually they settled at the mouth of a river at the head of Douglas Channel. The river had a good supply of salmon and a run of oolichan in the spring, and they lived there in peace and plenty for many years.

One day they noticed a piece of carved cedar floating down the river, indicating that others were living in the vicinity. They travelled up the valley and met another band of Indians of different appearance and talking a strange tongue. They made friends with the newcomers and invited them to join

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them at the river mouth, where the two groups then lived together, and according to Indian legends, the Kitamaats thus came into existence. Large\textsuperscript{4} states that ethnologically the story is probably substantially correct, for the Kitimat people are a distinct group, resembling yet different from their neighbours to the north and south.

Kitamaat village was little influenced by European culture until 1876 when one of the village inhabitants, a man named Wahus-gumala-yoo who was later baptized Charlie Amos, travelled to Victoria and was converted to Christianity by the Rev. Wm. Pollard. He returned to Kitamaat where, over the opposition of the village shamans, he spread his new found beliefs.\textsuperscript{5} A small log church was built the following year and a native teacher named George Edgar was obtained after a request to Mr. Crosby at Port Simpson. By 1883 a combined school and church was built. In 1893 the first ordained minister in the person of Rev. G. H. Raley came to Kitamaat and the work was greatly expanded. A residential school, a new church and a new mission house was erected.\textsuperscript{6} The church, through the United Church Home Mission Board, is still active


\textsuperscript{6}For more detailed information on the work of the early missions, see R. G. Large, \textit{op. cit.}, pp.102-103.
in the community and has been a major influence in the education and attitudes of the Kitimat Indian people.

Kitamaat Village, which is under the jurisdiction of the Department of Indian Affairs, has its own elected council consisting of a Chief Councillor and five councillors. This body holds office for two years. The village now has a population of 700 persons and is becoming more closely linked to its new neighbour of Kitimat. About 20 of its residents work in the Alcan smelter and a number of others work within Kitimat. The high school students attend school in Kitimat and the elementary school children will do likewise when a new road linking the communities is opened in 1965. Presently the only transportation between the two communities is by boat across Kitimat Arm. The Kitimat Indians are an industrious and relatively well educated group. Their relationship to the new town of Kitimat has been a cordial one and can serve as a good example of how the Indian people can fit in well with the rest of the community when given the opportunity.

IV. EARLY EXPLORATION AND DEVELOPMENT

The first landfall made by European explorers on the northern coast has been credited to the Spanish expedition of 1774 under Juan Perez. In July of that year his small corvette "Santiago" lay off the west coast of the Queen Charlottes, although he made no attempt to go ashore. He was followed by
two more Spanish expeditions in 1775 and 1779.

In 1778, Captain Cook sailed up the west coast as far as the Bering Straits and beyond. Following this voyage there was a great expansion in the sea-otter trade, with trading vessels entering many channels and inlets along the coast.

The first detailed survey was carried out by Captain Vancouver in 1792-93. The first year he worked up as far as Burke Channel and the following year he surveyed much of the area further north, including Douglas Channel, the Skeena River estuary (though the river itself was missed), Observatory Inlet, and the Portland Canal.⁷ A party under Mr. Whidby, the Chief Officer of Captain Vancouver's ship "Discovery", spent a little over a week in the channels and inlets just south of Kitimat. Arriving at the junction of the Gardner Canal and Devastation Channel on June 25th, 1793, they proceeded to explore the Gardner Canal, after which they made their way up toward the present site of Kitimat. They explored Kildala Arm on June 29th and Kitimat Arm on June 30th, after which they rejoined the "Discovery" and travelled northward toward the Skeena, reaching a point near its mouth on July 9th.

One of the first white settlements in the region was Fort Simpson, built at the mouth of the Nass in 1832, and two

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years later moved to a site on the Tsimpian Peninsula north of Prince Rupert. Fort Simpson was regarded by the Hudson's Bay Company as the key post on the northern coast, and was promoted as a result of rivalry between the Hudson's Bay Company on the one hand and the Americans and Russians on the other.

The first systematic exploration of the northern mainland coast was carried out in 1859 by Major Williams Downie, who was impressed by the potentialities of the Skeena Valley as a transportation route. Five years later, in 1865, the Collins Overland Telegraph, which was to link North America with Europe across the Bering Straits and Siberia, reached the Skeena, but in 1866 news came that a cable had been laid across the Atlantic, and the project was abandoned. Many of the workers stayed in the area to look for gold, which in due course was found on the upper Skeena, and by the seventies the rush was on. The Skeena gold rush, however, did not compare with those of the Klondike or Cariboo, and soon many of the frustrated prospectors turned to less colourful occupations such as logging, farming and fishing.

While the salmon run on the Skeena and the Nass Rivers had long served the Indians, the first commercial exploitation of the salmon resource began in 1876 with construction of a cannery on the Skeena estuary. By the 1890's fish canneries were being established at several points along the coast and
rivers. White settlement was firmly established by the end of the century.

The first serious consideration of the Skeena Valley as a transcontinental railway route was given by the Canadian Pacific Railway in the period 1871-85, when a number of possible routes to the coast were surveyed. Although the Yellowhead Pass-Skeena Valley route is the lowest and easiest crossing of the Cordilleran on the continent, the Canadian Pacific Railway chose the southern route because they felt the Vancouver site was the better location for a terminus.

In 1900, two more announcements of railway construction were made. First an American company announced that it would construct a line from Port Simpson to Hudson's Bay. A town-site was laid out at Port Simpson and the speculative sale of land began. Kitimat was the other port which attracted the railroad builders and the Provincial Legislature granted a charter to a group of Victoria and Vancouver businessmen headed

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10 Ibid. p.9.

11 R. G. Large, The Skeena (Vancouver; Mitchell Press, 1957), p.68; and Ibid p.120.
by C. W. D. Clifford to build a railroad from Kitimat to Omineca. The Company was known as the Pacific, Northern and Omineca Railway. A guarantee of a cash subsidy of five thousand dollars per mile went with the charter provided that the sum of one hundred thousand dollars was spent on construction before 1907. Neither of these railway proposals materialized, but the charter of the latter was purchased in 1905 by the Grand Trunk Pacific Railway.

In 1902, plans for a second trans-continental railway took a more concrete form when the Grand Trunk Pacific Railway obtained the sponsorship of Prime Minister Sir Wilfred Laurier. The following year the Grand Trunk Pacific Railway was incorporated and granted extensive concessions by the government. A terminus was planned on the Pacific Coast which would rival Vancouver and take over most of the traffic with the orient, since it would be 500 miles closer than Vancouver to the Far Eastern ports.

It had been the understanding for years that another railroad would eventually be built, and conjecture as to its probable route was a popular sport. In the press, and amongst the citizens generally, the two most favoured sites were Port Simpson and Kitimat, where there was considerable land speculation going on. There was no speculation at a third

\[12\] Ibid p.121
possible site on Kaien Island (Prince Rupert) because the Provincial Government had put a reserve on the land of the Tsimpian peninsula, which was also intended to include Kaien Island. While the Kitimat site had the advantage of easier and shorter access by rail and somewhat better land on which to build a city, the Kaien Island site had the advantage of an excellent harbour, a shorter sea voyage to the orient, and an adequate supply of land which had been put under government reserve. The Provincial Government finally decided that Kaien Island would be the Pacific Coast terminus of the new railway and an order in council was passed selling ten thousand acres to the Grand Trunk Pacific Railway for one dollar per acre. At the same time the Provincial Government reserved one quarter of the proposed townsite for themselves, including one quarter of the waterfront. This latter part of the agreement was the justification given by the Government for their action in the choice of Kaien Island, since they did not own any land adjacent to Port Simpson or Kitimat with which they could make a deal.13 Thus Kitimat was to wait almost another half a century for a railway.

The railway company engaged Brett and Hall of Boston, a prominent U.S. firm of landscape architects, to design the new city of Prince Rupert. They planned for a city of 50,000

13 Ibid p.123-124
people on a topographically difficult site consisting of rock, muskeg and dense forest. The first working party landed at the site on May 17, 1906 to begin work on the new city. The construction of the rail line eastward from Prince Rupert began in 1907. The Grand Trunk Pacific soon began to sell lots in anticipation of the tremendous boom which they thought was coming. Streets, sidewalks and utilities were laid in the forest, and within a couple of years of establishment of the town, Prince Rupert had a population of over four thousand, a Council, an apparently firm financial base, electricity, water supply and a telephone system.

The bubble burst in 1912 when Mr. Hays, the general manager of the Grand Trunk Pacific, went down with the "Titanic." With him went all the plans for the future development of Prince Rupert, which strange to say were carried in the president's head and had never been committed to paper. Although the railway was completed in 1914, the great expectations were never fulfilled. Prince Rupert was stagnant and the coming of war destroyed what hope there might have been that the opening of the railway would revive the golden prospects of a few years before. For a quarter of a century Prince Rupert's population remained almost unchanged at about 6,500 people, engaged mostly in fishing and fish processing, and to a lesser extent in government services, logging and sawmilling. The Second World War brought a temporary boom, raising the population to about
20,000, but this decreased to about 8,500 at the war's end. A pulp mill was established in 1951, and by 1961 the population had risen to about 12,000.

Prior to the final decision on the Prince Rupert site, the Grand Trunk Pacific Railway had actually surveyed an alternate route through the valley to Kitimat. Considerable land speculation had taken place at the Kitimat site and along the valley to Terrace as a result of the Grand Trunk Pacific survey, and the previous Pacific, Northern and Omineca Railway proposal. A wharf and a hotel of sorts were built on the shore of Kitimat Arm, a "tote" road was hacked through to Terrace, a grid subdivision plan was registered, a score of lots were sold, and a number of homesteads were developed. However most of the settlers drifted away when Prince Rupert instead of Kitimat was chosen as the rail terminus, although a number remained for some years and made their living hand logging, trapping, fishing and farming. It is stated that at one time the settlers were numerous enough to form a Farmer's Institute and to support a small school. Another article by Rough gives a list of settlers in Kitimat between 1911 and 1915, as obtained from one of the settlers who had lived there in that period.

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14 From an article by S. Rough entitled "Builders of Kitimat" in the Kitimat Northern Sentinel. Date unknown

15 See "Kitimat Life 53 Years Ago" in the Kitimat Northern Sentinel, June 25, 1964. p.12
From this list it appears that there were 35 or more people living there at the time. Such factors as lack of a road to Terrace, enlistment for World War I, accidents, and lack of education facilities for the children soon decreased their numbers and by 1941 all had gone.

When the Kitimat development was started by Alcan, a few parcels of land were still owned privately and had to be purchased by the company. Apart from the remains of several dilapidated buildings, a few overgrown fields and fruit trees gone wild, there are few traces left to-day of the earlier settlers. The natural vegetation in Kitimat grows profusely and nature soon reclaims those areas that man leave untended.

V. PRESENT SETTLEMENT

Settlement in the north coast region is distributed very unevenly, with large sections of the coastal fringe being uninhabited. Over 75 percent of the permanent population on the mainland coast is located in the larger centres shown on the map in Figure 1, page 11, while inland most of the population is distributed in a shoe-string pattern along the main road and rail line.

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There are nine incorporated communities in the area of the map in Figure 1. These are listed below with their 1961 populations:

<table>
<thead>
<tr>
<th>Community</th>
<th>Population</th>
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<tr>
<td>Prince Rupert</td>
<td>11,987</td>
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<tr>
<td>Kitimat</td>
<td>8,217</td>
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<tr>
<td>Terrace</td>
<td>5,940</td>
</tr>
<tr>
<td>Smithers</td>
<td>2,487</td>
</tr>
<tr>
<td>Burns Lake</td>
<td>1,041</td>
</tr>
<tr>
<td>Houston</td>
<td>699</td>
</tr>
<tr>
<td>Telkwa</td>
<td>576</td>
</tr>
<tr>
<td>Hazelton</td>
<td>410</td>
</tr>
<tr>
<td>Stewart</td>
<td>327</td>
</tr>
</tbody>
</table>

These incorporated communities make up a total population of close to 32,000 persons out of a total population for the area shown on the map of a little over 50,000. Besides these incorporated communities, there are several unincorporated settlements in the area. The largest of these, with their 1961 populations, are as follows:

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Population</th>
</tr>
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<tbody>
<tr>
<td>Ocean Falls</td>
<td>3,056</td>
</tr>
<tr>
<td>Bella Coola</td>
<td>895</td>
</tr>
<tr>
<td>Kemano</td>
<td>452</td>
</tr>
</tbody>
</table>

There are also concentrations of Indians near Prince Rupert, Hazelton, Bella Coola, and along the Nass River, as well as adjacent to Kitimat. One source lists a total of twenty Indian communities in the area shown on the map in Figure 1 as receiving income from the fishing industry. Four of these are on the Nass or near its mouth and total 1,606 persons, seven are close to the Skeena, mostly in the Hazelton

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area, and total 2,007 persons, three are within 45 miles of Prince Rupert and total 1,332 persons and two are on Douglas Channel and total 928 persons. One of these latter two is Kitamaat Village adjacent to Kitimat at the head of Douglas Channel. Its population is listed as 697 persons. There are four other villages farther south toward Klemtu and Bella Coola which total 1,816 persons. The source of the population data is not given but it appears to be fairly recent. The list is probably complete as far as the north coast (excluding the Queen Charlotte Islands) is concerned but does not include some of the interior communities, such as one near Moricetown just north of Smithers and another near the northern section of Babine Lake.

VI. ECONOMIC BASE OF THE REGION

The economy of the region is based mainly on resource extraction and primary processing. Forestry is the most important means of livelihood throughout the region. The commercial fishery is important on the coast, while mining is found in widely scattered locations. Agriculture is important only east of the Coast Mountains, there being no farms on the mainland coast and less than fifteen on the Queen Charlotte Islands. Approximately 3,500 persons are engaged in various phases of the forest industry. Another 3,000 inhabitants find employment in fishing and fish processing. Mining and smelting
engages about 3,000 and agriculture about 500 persons. While many people work full time in various employment, there is a common practice to combine incomes, particularly from forestry-fishing or forestry-agriculture. This is possible because the seasonal nature of these occupations demands peak employment during certain months of the year, after which there is a slackening of activity. A brief description of the various aspects of the regional economy follows:

**Agriculture**

Agriculture performs an important stabilizing influence on the population and adds diversity to the economy. Topography has practically ruled out this form of enterprise on the coastal fringe, with most of the farming activity being concentrated in the Bulkley Valley and in scattered locations along the Skeena. The farm population of the region numbers about 2,400, and there are about 30,000 acres of cleared land. Over 100,000 acres of raw land are estimated to be potentially arable. While truck vegetables, fruit, and small volumes of dairy and poultry products are important in the Skeena Valley, agriculture in the Bulkley Valley centres mainly on dairying, beef-raising, and forage-seed production. There is a good

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19 Ibid. p.7
potential for some increase in the amount of farming with Prince Rupert and Kitimat as the main markets.

Fishing

The fishing industry is a major contributor to the regional economy. Prince Rupert, which is the main centre of this activity, is the most important commercial fishing centre north of Vancouver. A large fleet of fishing vessels is based here, and six fish-processing plants are located in or near the city. These plants offer facilities for cold storage, salmon-canning, herring reduction, and several other types of fish-processing. About 2,500 persons are employed at the peak of the fishing season.

Docking and supply facilities exist at several coastal communities which serve as home ports for the fishing fleet. There are fish processing facilities at Butedale, Klemtu, Bella Bella and Namu. Many of the smaller canneries and facilities at other scattered locations have closed down in favour of larger centralized locations.

Five main types of fishery exist. The first and most important is the salmon-fishery. Others are the herring, halibut, ground-fish (cod, sole, flounders, etc.) and shellfish (crabs, shrimps, oysters and clams) fisheries. Trolling for salmon, trawling for ground-fish, and extraction of shell-fish are year round activities. The bulk of the halibut catch is taken during May and June. The salmon-netting season extends
from late June until the end of November, with various peak periods. Herring is normally a fall fishery.

Some idea of the size of the north coast fishery is given in Table II which follows:

**TABLE II**

<table>
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<td>1963</td>
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<tr>
<td>Salmon</td>
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<tr>
<td>Halibut</td>
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<td>24,077</td>
</tr>
<tr>
<td>Herring</td>
<td>172,689</td>
<td>279,155</td>
</tr>
<tr>
<td>Groundfish (excl. halibut)</td>
<td>8,710</td>
<td>9,984</td>
</tr>
<tr>
<td>Molluscs and Crustaceans</td>
<td>2,865</td>
<td>3,737</td>
</tr>
<tr>
<td>Sea Fish (total)</td>
<td>341,091</td>
<td>376,144</td>
</tr>
</tbody>
</table>

Source: Dominion Bureau of Statistics, Fisheries Statistics of Canada (British Columbia) 1965. (DBS catalogue 24-208)

**Forestry**

On the Pacific Coast the environment for forest growth consists of a comparatively cool but long growing period and abundant precipitation. On good sites mature trees attain large size, with volumes averaging 3,000 to 6,000 cubic feet per acre.

On the coastal margin, mixtures of western hemlock, red cedar, and Sitka spruce are typical cover within the sea-level to 2,000 feet altitude range of commercial forests. Along the valley of the Skeena River, cottonwood is a fairly common deciduous tree. Douglas fir, a very important forest species on the southern coast, appears only in sheltered coastal inlets.
as far north as Gardner Canal.

East of the Coast mountains Sitka spruce gradually disappears, while some red cedar and hemlock carry over as far east as the Morice Valley. The tree species most typical of interior stands are alpine fir, white spruce, Engleman spruce and lodgepole pine. Along the Skeena and Bulkley Valleys, broad-leaf species such as alder, cottonwood, and birch appear among the cedar or spruce-cedar stands.

The rich timber resources have promoted extensive logging on the coast, with pulp-logs, sawlogs, and peelers being towed or barged primarily to mills at Port Edward (near Prince Rupert) or on the southern coast. Terrace is also a major sawmilling community. Hemlock and Sitka spruce, as well as balsam fir where accessible, are cut for coastal pulp and paper mills, while cedar is used for poles or shipped to sawmills and shingle mills on the southern coast. Some high quality Sitka spruce and hemlock are also used for saw-lumber. Cottonwood is utilized for pulp, veneer and plywood.

Inland, there is some pulp-log extraction, but sawn lumber is the most important wood product. The most important commercial species are interior spruce, balsam and lodgepole pine. Some cedar is cut for poles along the Skeena Valley.

The Prince Rupert Forest District in 1964 accounted for about 11 percent of the volume of the total forest cut in B. C. There were a total of 165 sawmills operating with an estimated
8 hour daily capacity of 2216 MBF. While the Prince Rupert Forest District is not exactly the same as the region outlined in Figure 1 on page 11, it is close enough to give a good indication of the importance of the forest industry in the area being considered. The amount of the timber cut by species for the Prince Rupert District is given in Table III below:

TABLE III

SPECIES OF TIMBER CUT (IN CUBIC FEET) IN PRINCE RUPERT FOREST DISTRICT IN 1964

<table>
<thead>
<tr>
<th>Species</th>
<th>Prince Rupert Forest District</th>
<th>Coast</th>
<th>Interior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fir</td>
<td>4,688,845</td>
<td>5,145,532</td>
<td></td>
</tr>
<tr>
<td>Cedar</td>
<td>17,785,356</td>
<td>21,945,526</td>
<td></td>
</tr>
<tr>
<td>Spruce</td>
<td>20,896,871</td>
<td>15,690,046</td>
<td></td>
</tr>
<tr>
<td>Lodgepole pine</td>
<td>17,232</td>
<td>18,239,677</td>
<td></td>
</tr>
<tr>
<td>Hemlock</td>
<td>42,704,651</td>
<td>9,052,087</td>
<td></td>
</tr>
<tr>
<td>Balsam</td>
<td>6,607,898</td>
<td>394,385</td>
<td></td>
</tr>
<tr>
<td>Cypress</td>
<td>3,198,492</td>
<td>8,100</td>
<td></td>
</tr>
<tr>
<td>Hardwoods</td>
<td>3,198,492</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cottonwood</td>
<td>1,645,068</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>96,299,728</td>
<td>71,726,036</td>
<td></td>
</tr>
</tbody>
</table>


Mining

While mining is not presently a large contributor to the economy of the region it is of some historical importance. Also certain development programs now underway could change the
Active mining began on several coastal islands in the early 1900's. A period of great expansion began with World War I and reached a peak during the 1920's and early 1930's, when large producers such as the Premier and Big Missouri mines at Stewart, and the Hidden Creek (Anyox) and Bonanza mines on Observatory Inlet were operating. Among the more important minerals which have been produced in the Prince Rupert-Smithers area are gold, silver, copper, lead, zinc, tungsten, cadmium and coal.

The gross value of mining production in 1963 in the Skeena Mining Division was $3,305,525, making a total production to date of $222,000,000. Although mining has been practiced successfully in widely separated sections of the region, the areas of major metallic ore production have been Observatory Inlet and Portland Canal, with Stewart and Alice Arm being the chief mining communities. The Hazelton area has also seen considerable mining activity in the past. A coal deposit has been worked on a small scale near Telkwa, while substantial reserves are known to exist in the upper Skeena watershed.

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There has been little mining activity immediately adjacent to Kitimat, although several prospects were developed about the turn of the century, one of special interest being the Golden Crown, operated by Dunn and Steel. It was located about four miles up Wawlth Creek, which runs into Kitimat Arm near the north end of Kitamaat Village.  

There is an iron ore deposit on Iron Mountain, about 10 miles up the valley from Kitimat, which is likely to be developed sometime in the future. There is also considerable exploratory activity in the vicinity of Terrace, with several findings having a chance of success.  

Mining may soon become important again in the region, especially in the northern section. The Granduc copper mine at Stewart is being readied for large scale production. A large mining and metallurgical complex is proposed along the Iskut River, and many other developments are undergoing intensive exploration. While these projects are somewhat isolated from the settled areas of the region, they will have a substantial effect on it, especially when the Stewart-Cassiar Highway is tied into Highway 16, probably near Hazelton.  

Manufacturing

Manufacturing is becoming increasingly important in the region, chiefly through expansion of existing industries. The

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21 Stan Rough, "Builders of Kitimat" article in Kitimat Northern Sentinel. Date not checked
main categories of manufacturing are aluminum production at Kitimat, pulp manufacture at Prince Rupert and sawmilling and fish processing at several locations. There is also a pulp and paper mill at Ocean Falls 120 miles south of Kitimat. At the time of writing a new kraft pulp mill is being built at Prince Rupert in addition to the existing sulfite pulp mill. It is also likely that new pulp mills will be built at Kitimat and Houston in the near future. The aluminum plant at Kitimat has been and will probably continue to expand at a modest rate. The manufacturing in the region is predominantly of a primary type closely related to the natural resources. The value of manufacturing for Census Division 9, which excludes Ocean Falls and the Smithers area but otherwise is fairly representative of the area shown in Figure 1, was about $120,000,000 in 1961.

Recreation and Wildlife

The region affords excellent opportunities to enjoy out-of-door activities, especially boating and fishing. A myriad of fiord waterways provides sheltered passage for small boats. The numerous streams abound with fresh water fish and spawning salmon in season.

Probably the most popular sporting activity along the coast and islands is salmon-fishing. The two salmon taken on sporting tackle are spring and coho. While spring salmon are fished during most seasons of the year, they appear in greatest abundance during their spawning runs to coastal rivers from
July to September. The peak season for coho salmon extends from September to November inclusive. In addition to the salmon, there are the fresh-water fish which include coastal cut-throat trout and steelhead, both of which spend part of their life span in the sea. Sport fishes in the interior section of the region include Kamloops and steelhead trout, Great Lake Char, Dolly Varden char, and Kokanee.

While blacktail deer and mountain-goat are fairly plentiful on the Coast Mountains, the hunting pressure on these animals is reduced by the limited accessibility, coupled with a highly scattered hunting population. Coastal fiords support large populations of grizzly bear, and these animals often congregate along streams during the salmon spawning season. Black bear are also present in large numbers along the coastal fringe.

Inland there is a greater variety of big game than on the coast. Populations of game animals are not evenly distributed but tend to exhibit local concentrations. Among the big game species are mule deer, moose, mountain goat, caribou, grizzly bear and black bear.

Populations of upland game birds include willow (ruffed) grouse and blue grouse. In general, the northern coast is a good waterfowl area. Several species of migratory ducks and geese winter on the coastal margin of the Queen Charlotte Islands and the mainland and along the Lower Skeena River.
Several species of fur-bearing animals prevail in the region, including beaver, marten, mink, fisher, muskrat, fox, skunk and weasel.

The region has some of the finest scenery in British Columbia and would be a major attraction to tourists were it not so far removed from large population centres. The new ferry service to Alaska has substantially increased tourism, as will the British Columbia Coastal ferries in the future.

The ocean is generally too cold for swimming, although some of the fresh water lakes are often fairly warm during the summer. Lake Lakelse, between Kitimat and Terrace is a good recreational area, and also has hot springs nearby.

VII. TRANSPORTATION AND EXTERNAL RELATIONSHIPS

The Canadian National rail line, which in this area was originally the old Grand Trunk Pacific, extends across the region. As can be seen from the map on page 11, the railway follows the Skeena River Valley from Prince Rupert to Hazelton. It then follows the Bulkley River Valley and other valleys eastward to Prince George and beyond to join the main line of the Canadian National west of Jasper. At Terrace, a branch line extends southward 40 miles along a wide low valley to tidewater at Kitimat.

The principal highway in the region is the Northern Transprovincial Highway No. 16, which follows the same route
as the rail line. Like the railway, a branch highway extends southward from Terrace to Kitimat. Most other roads in the area are short access roads up the various valleys for logging and mining. One of the most significant access roads is that constructed by the Columbia Cellulose Company from Terrace up the Kitsumkalum Valley into the Nass River Valley. Another road which will have considerable significance for the region is the Stewart-Cassiar Highway. In the future this will be linked via the Kispiox Valley to the Northern Trans-provincial Highway at Hazelton, and probably along the Nass and Kitsumkalum Valleys to Terrace.

Scheduled year round steamship service is provided from Vancouver to the Queen Charlotte Islands, Kitimat, Prince Rupert, Alice Arm and Stewart. The myriad of sheltered waterways provides good water routes to the communities, and for some of the smaller communities, water or air transportation is the only means of access. The Alaska ferry system links the Alaska communities with Highway 16 at Prince Rupert.

Daily air-line service is maintained by Canadian Pacific Airlines from Vancouver to Prince Rupert and Terrace. Pacific Western Airlines serve some of the smaller communities from Prince Rupert. Kitimat is served by the airport at Terrace.
CHAPTER II

PLANNING OF KITIMAT

I. INITIATION OF THE PROJECT

The Kitimat development was undertaken by the Aluminum Company of Canada ("Alcan"), the principal operating subsidiary of Aluminium Limited, a Canadian company with its headquarters in Montreal. The operations of the parent company are international in scope, encompassing a large number of subsidiary and affiliated companies in about thirty different countries. In 1964 it had close to 55,000 employees, of whom close to 18,000 were in Canada.¹ It is the largest producer of aluminum in the non-communist part of the world, accounting for over 15 percent of the total, or approximately 1,000,000 tons per annum.

The decision of Alcan to choose the north coast of British Columbia as the site for a large aluminum smelter was influenced by the large potential supply of cheap hydro-electric power in the area. The aluminum reduction process requires enormous quantities of electrical energy - up to 20,000 kilowatt-hours for every ton of aluminum produced, which makes it necessary that an aluminum smelter be close to

an ample source of power. Where the source of power is far from raw materials and markets, and this is almost always the case, a cheap means of bulk transportation is also a prime requirement. Furthermore an aluminum smelter, especially one such as that envisaged, is a very large scale operation, and requires a large amount of land both for the industry itself and the community or part thereof which it supports. In essence then, the main criterion for site selection is an abundant supply of cheap electrical power close to a spacious and developable site which can be provided with deepsea docking facilities and road and rail transportation.

The power possibilities of the north coast area of British Columbia were investigated by the provincial government in the periods 1928-31 and 1937-39 and confirmed the possibility of a large amount of power available through diversion of water from high level lakes into several of the salt water inlets which penetrate deep into the mountains. In 1948, at the request of the provincial government, Alcan initiated field studies of potential power sites along the coast. They investigated three sites - Bute Inlet, about 150 miles northwest of Vancouver; Dean Channel, about 150 miles farther up the coast from Bute Inlet; and Gardner Canal, 100 miles southeast of Prince Rupert and 400 miles northwest of Vancouver.
Initially, the company was mainly interested in the Bute Inlet location, which would produce about one million horsepower by utilizing waters from Chilco Lake and the Homathko and Southgate Rivers. However it became evident that this project would probably destroy very valuable salmon runs and attention was turned to the other two sites. Upon further study it became evident that it would be feasible to combine the Dean Channel scheme, which would have tapped Eutsuk Lake, with the Gardner Canal scheme, which would tap Tahtsa Lake. By this combination, with some tributary systems added, a power development of about 2½ million horsepower could be realized. Furthermore it was indicated that there would be no serious conflict with fish. The project would involve damming the chain of lakes and reversing the flow of water through a 10 mile tunnel from Tahtsa Lake to the Kemano River, 2600 feet below.

At Kemano, there was no room for an aluminum smelter and its accompanying townsite, but at the head of Douglas Channel, about fifty miles to the northwest, lay the wide and heavily forested Kitimat Valley, (see Figure 7, page 64), extending about 40 miles from tidewater to the Skeena River valley at Terrace, where there were existing rail and highway facilities. Kitimat offered all the essentials and most

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of the desirable features for a smelter location. There was ample space, a good ice free harbour for ocean shipping, and road and rail connections with Terrace could be readily made over the 40 miles of quite easy terrain. The only major difficulty with this site was the 50 mile transmission line which would be required over Kildala Pass from Kemano.

The company then asked for the right to obtain and develop the project. Public hearings were held at Wistaria (on the north side of Ootsa Lake) on October 24, 1949 and at Victoria on October 30, 1949. The company obtained approval from the comptroller of water rights for British Columbia on December 16, 1949, subject to approval of plans and specifications and any necessary legislation. The final decision to go ahead with the project was made on April 21, 1951.

II. THE PLANNERS OF THE TOWN AND THE PLANNING METHODS

While the physical and economic feasibility problems were thus overcome, the human problem remained. The proposed plant, to be located in almost virgin wilderness forty miles from the nearest town, would require a workforce of thousands, and to obtain and keep a contented workforce would mean providing living conditions that would compare favourably with those obtainable in the cities and towns to the south.
The company attached considerable importance to provision of a well planned community to serve their industrial facilities. In September 1951, they engaged Clarence S. Stein to direct and co-ordinate the various aspects of planning and developing the community. Stein is the author of the Radburn plan, and has been a strong proponent of planned orderly development of "greenbelt" communities in the United States. He was a founder of the Regional Planning Association of America in the early twenties and its president for many years. Under Stein's direction, the work of assembling data and reports on Kitimat's physical planning and operation were divided into two phases.

Stein made arrangements for studies by specialists in legal controls, public health, recreation, local government, housing, commerce and business, and river basin controls. The physical aspects and preparation of the master plan itself were assigned to Mayer and Whittlesey and their associate, Milton Glass, who were a New York firm of architects, engineers and town planners. They also assumed responsibility for studies by specialists on highways and transportation, site and utilities, building materials and methods, schools,

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4 See Kitimat Townsite Report
landscaping and climate control. In addition to the consultants and the team of specialists, a company planning division was created for liaison and continuing action.

The apparent advantage of the organizational arrangement set up was opportunity for all the experts to interact with each other as the planning progressed, rather than the more usual method of each following the other and thus often being bound by the decisions made by his predecessors. The physical planning and functional planning were thoroughly integrated from the beginning and they thus shaped each other. 

For example, as stated by the Oberlanders, the functional plan for education was expressed in terms of school administration, composition of schools, optimum size and number of classes and students, by grade. This was translated into a physical plan showing number, location, and sizes of school sites - relating these to parks, transportation and health clinics.

III. AIMS AND OBJECTIVES

The basic objective of Alcan in building the town of Kitimat was the provision of a community for their employees

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which would be attractive and provide a good living environment. They recognized that a stable and contented work force was an essential part of the efficient operation of a large industrial plant, especially in a strange and isolated location such as that proposed.

Clarence S. Stein's initial interpretation of Alcan's purpose gives an insight into the thinking behind the development:

The purpose of Kitimat is the industrial success of the plant. That success will depend on the degree that workers are content, that they like living in Kitimat. Unless the town can attract and hold industrial workers, there will be continuous turnover and difficulty, interfering with dependable output.

The workers must find Kitimat more than temporarily acceptable. They must be enthusiastic about it as a particularly fine place in which to live and bring up their families. It must become the place they want as homeland, the town they are going to make their own.  

Stein elaborated further on the problems of climate, remoteness and strangeness and their effect on the people. He also stressed that "family needs, above all else, form the basis of the Kitimat Plan. It is the family man, whose wife and children have a desirable home in a community they

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6 Kitimat Townsite Report, A compilation of reference materials and reports, 1951-1852, assembled under the direction of Clarence S. Stein (New York: January 16, 1952) Section 1.3.
like, who throws out his anchor and stays. . . ."  

While these aforementioned objectives were the primary ones for the town, it must be remembered that Alcan's primary objective for the development as a whole was the profitable production of aluminum. This latter objective is ultimately the restraining one is determining how far the company could or would go in non-returnable financial participation in the town. The objectives for the town development would have to be balanced against the cost of such participation.

The attitude of Alcan toward the form and quality of development they saw for the town itself can perhaps best be expressed in a speech by Mr. J. B. White, Vice President in charge of Personnel for Alcan:

No modern large-scale business can be successful without a loyal, competent and happy work force . . . . We want the very best possible living and working conditions at Kitimat . . . . We are not real estate operators nor are we politicians. We are not seeking to make money out of townsite developments nor do we wish to run a company town, but we do want the future residents to enjoy adequate town planning and community development.

We are interested in building neither palaces nor monuments but we are extremely anxious to avoid a shack town . . . . We must not be extravagant or encourage the community to be extravagant. Through proper planning we will try to avoid many needless mistakes and expenses of haphazard growth . . . .

Once underway the destiny of the town will be in the hands of the local citizenry . . . .

7Ibid.
Whatever the outcome, the company's responsibility will decrease over the years until it occupies a position similar to any other reliable and responsible citizen. . . .

We want to see housing standards meeting National Housing Act requirements. We don't wish to provide or build housing ourselves. We hope we can induce contractors and private builders to build all the houses. That of course is difficult, and we may not meet with success. There are not many builders, even including government and other lending institutions, prepared to finance and erect the required housing in a new community of this kind. Nor will many of our workmen likely have the money initially or the desire to build houses for themselves. We know that many people will be anxious to build sub-standard houses and will be distressed with us when they are not permitted to do so.

Alcan acknowledged that it had some responsibility in the provision of a well-planned town, and was prepared to enter heavily into the financing and supervision of the town in its early stages to ensure that it was properly serviced and equipped. At the same time, however, it felt that the day to day responsibility of operating a town the size of Kitimat was not the business of the company, and it wished to withdraw from these activities and encourage the community to stand on its own feet as soon as possible.

The decision of the company to take this approach to the development of the town was undoubtedly influenced by its previous experience with community development, particularly at Arvida in Quebec, the site of one of the company's aluminum

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smelters. Arvida was founded in 1926 by Alcan, and shortly thereafter was incorporated as a city. However Alcan retained ownership of almost all of the town's real property until 1954, when they reversed their policy and began a successful house selling campaign and generally attempted to abandon the roll of landlord and land developer. The latter decision, according to one who was directly involved in the program, "was chiefly motivated by our conviction that property owners are happier and consequently more stable employees; the Company's desire to avoid the multiple headaches which are involved when an employer is also the landlord; and our policy . . . of making Arvida a normal community in every sense of the word."  

This same policy implemented in Arvida was followed from the outset at Kitimat. Alcan displayed a keen desire to create a democratic community and avoid a company town.

IV. CONCEPTS INVOLVED IN THE PLANNING OF KITIMAT

The basic concepts involved in the planning of Kitimat derived from the garden cities of England, the Radburn principle, the Greenbelt city, and the neighbourhood unit

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concept of community relationships and activities. To analyze Kitimat and its physical planning, it is first desirable to have some understanding of these basic concepts.

**Garden City Idea**

The idea of the Garden City was set forth by Ebenezer Howard in 1898. He was disturbed by the depressing ugliness, haphazard growth, and unhealthful conditions of cities, particularly some of the old English factory areas. In his book he described a town in which the land would remain in the single ownership of the community. The dwellings would be located about a large central court containing the public buildings. The shopping centre would be on the edge of the town and the industries on the outskirts. The city would have a population of some 30,000 people in an area of 1000 acres. Surrounding the entire city would be a permanent belt of agricultural land of 5000 acres.

Ebenezer Howard was to see his ideas realized when the Garden City Association was formed in 1899. In 1903 the First Garden City Limited, a limited dividend society, obtained 4,500 acres of land 34 miles from London and began the city of Letchworth. It was designed for a maximum population of 35,000 with an agricultural belt of 3,000 acres. In

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10 Ebenezer Howard, *To-morrow* (first edition; London, 1898.)
thirty years this town grew to a population of 15,000, with more than 150 shops and sixty industries, and had paid five percent dividend on the invested stock. At a later date a second garden city, Welwyn, was started. The site was 2,400 acres and it was designed for a population of 40,000. In fifteen years it had a population of 10,000 and fifty industries.

Another feature which distinguished the Garden Cities of Letchworth and Welwyn was the control of development and growth as contrasted to the haphazard growth of the speculative city. Zoning determined the use of specific areas and only those uses were permitted - only factories and workshops were built in the industrial zones and only shops in the commercial zones. In the speculative town any use of a lesser economic character is often permitted in its zoning provisions; dwellings are found in industrial and commercial zones, and these mixed uses are often a major reason for the sad state of the urban environment. In the Garden City, open spaces remained for development as the need arose and for the appropriate use provided in the plan.

One of the most significant aspects of the Garden City idea is the effect that it has exerted on other town planning developments. In the United States, notably in the work of

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Clarence Stein and his associates, it has produced such planned communities as Radburn and Baldwin Hills. There have not been many of these communities, but they in turn have had considerable effect on the designs of the frankly commercial developments.

**Radburn Idea**

Inspired by the Garden City idea, the City Housing Corporation acquired a vacant site in New Jersey, within commuting distance of New York City. On this site Henry Wright and Clarence Stein planned the community of Radburn. They introduced the idea of "superblocks," ranging from 30 to 50 acres in size, in which through traffic was eliminated. The traffic streets surrounded rather than traversed the areas. Short local streets, mostly culs-de-sac, were closed at the interior end, but connected at the outer end with the peripheral traffic artery which surrounded the whole superblock. Within the superblocks, or neighbourhoods, was an internal park "core" or "greenway" and an internal system of pedestrian paths completely separated from automobile traffic routes. This was in contrast to the arrangement in the English garden cities where the park was used as a green belt to surround the outer edges of the neighbourhoods and to set the neighbourhoods apart.

The houses in Radburn were oriented in reverse of the
conventional placement on the lot, with kitchens and garages facing the road and living rooms turned toward the garden. Pathways leading along the garden side of each house, opposite to the street, provided uninterrupted pedestrian access to the continuous park strip, which in turn led to the common open spaces within the centre of the neighbourhood, where elementary schools and facilities for daily shopping were also located. At certain locations the park and footpath system extended out to the peripheral traffic streets, where an underpass connected it with the park and footpath system of the next superblock.

The plan for Radburn allocated space for industry, shopping, and apartments, but permanent green space surrounding the town, typical of the English garden cities, was not incorporated.\textsuperscript{12}

Radburn was planned for a population of 25,000.\textsuperscript{13} However the community was an early victim of the depression and never became the complete town it was designed to be. Figure 5, page 57, shows the proposed layout of part of the community and the portion thereof which had been built by 1929.\textsuperscript{14} This was close to

\begin{itemize}
\item \textsuperscript{12}Ibid. p.125
\item \textsuperscript{14}Robert B. Hudson, Radburn, A Plan of Living (New York: American Association for Adult Education, 1934) p.4.
\end{itemize}
FIGURE 5

PLAN OF A SECTION OF RADBURN

the community attained in its planned form. Only about 300 housing units were built (as compared to over 2,200 presently in Kitimat). Regardless of the pros and cons of the Radburn idea, it is unfortunate that the original plan of Radburn was not completed to the point where the idea could have been properly evaluated. This is particularly so in view of the fact that some features of Radburn, such as the arterial walkway system and pedestrian linkages to schools and shopping, are fully effective only when the scale of the development is relatively large. The newer development now surrounding Radburn is typical of much of present day subdivision design which has little form or focus.

The Greenbelt City

The Greenbelt City shares the Radburn traffic plan but emphasizes that a city should be preplanned to a maximum growth and surrounded by a permanent forest and farming greenbelt which is not to be violated by amorphous strung-out development.

Beginning in 1935, the Resettlement Administration in the United States planned four "greenbelt towns," three of which were built - Greenbelt near Washington, D.C., Greenhills near Cincinnati, and Greendale near Milwaukee. The general

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15 See aerial photograph of the area as it is to-day in C. Tunnard and B. Pushkarev, *Man-Made America: Chaos or Control?* (New Haven: Yale University Press, 1963) p.20
layout of Greenhills is shown below in Figure 6.

FIGURE 6
GENERAL LAYOUT OF GREENHILLS, OHIO

SOURCE: Gallion, The Urban Pattern

The designs for the greenbelt towns were inspired by Howard's Garden City idea, but they were satellite communities rather than self-contained towns, with the sources of employment for the residents being in the near-by cities. Each was surrounded by a belt of permanent open space, part
of which could be farmed or gardened. A full complement of shopping, school and recreational facilities was included in each town. The superblock was generally a basic element and the continuity of pedestrian circulation was well provided for. The same features are apparent in Greenbelt and to a lesser extent in Greendale.

Neighbourhood Units

The concept of neighbourhood units is one which has developed out of a practical necessity to restore a recognizable and more workable form to the physical organization of a city. It has also been presented as a nucleus for the restoration of human values which had dissolved in the indistinguishable mass of the industrial metropolis, although this latter sociological purpose has been seriously questioned as to its effectiveness.

According to Gallion, the neighbourhood unit is not a sociological phenomenon and embraces no particular theories of social science. It is simply a physical environment in which a mother knows that her child will have no traffic streets to cross on his way to school, a school which is within easy walking distance from the home. It is an environment in which the housewife may have an easy walk to the shopping

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centre where she may obtain the daily household goods, and the man of the house may find convenient transportation to and from his work. It is an environment in which a well equipped playground is located near the home where the children may play in safety with their friends; the parents may not care to maintain intimate friendship with their neighbours, but children are so inclined and they need the facilities of recreation for the healthy development of their minds and spirits.

Clarence A. Perry was one of the first to give some consideration to the physical form of the neighbourhood unit. He described the neighbourhood unit as that populated area which would require and support an elementary school with an enrollment of between 1,000 and 1,200 pupils, which would mean a population of between 5,000 and 6,000 people. If such a neighbourhood unit were developed as a single family dwelling district with a population density of 10 families per acre, it would occupy about 160 acres and have a shape which would make it unnecessary for a child to walk more than one-quarter mile to school. About 10 percent of the area would be allocated to recreation, and through traffic arteries would be confined to the surrounding streets, internal streets being limited to service access for residents of the neighbourhood. The unit

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17 Ibid. p.280.
would be served by shopping facilities, churches, a library, and a community centre, the latter being located in conjunction with the school. The shopping facilities were situated at intersecting traffic streets on the outside corners rather than at the centre of the unit.

Clarence S. Stein's concept of the neighbourhood unit had much similarity to that of Perry. The elementary school was at the centre of the unit, although the walking distance to the school could be up to one-half mile. Also a small shopping centre for daily needs was located near the school. Most residential streets were suggested as cul-de-sac or "dead-end" roads to eliminate through traffic, and park space flowed through the neighbourhood in a manner reminiscent of the Radburn plan.

There have been many variations in the form and size of a neighbourhood unit, depending on the authority. The essential characteristics, however, have been fairly consistent. Basically it represents a unit of the population with common needs for educational, recreational, and maintenance facilities, and it is the standards for these facilities from which the size and design of a neighbourhood emerge.

\[18\]
Ibid. p.279
This section is a description of the Kitimat Master Plan and some of its features. It is presented without regard to what ultimately happened or whether the features were successful, but represents what the planner's envisaged in their original design concept.

The Kitimat Master Plan was formulated under very rushed conditions. In fact the evolution of the plan covered a period of less than six months from the appointment of Stein in September 1951 to the presentation of the master plan drawings and report in February, 1952, although detailed planning continued after that.

**Site Selection and General Layout**

The area selected for the townsite is about 3 to 6 miles up the valley from the head of Kitimat Arm, and is on the opposite side of the Kitimat River from the industrial facilities. Figure 7 on page 64 shows a picture of the valley looking north from the head of Kitimat Arm, and illustrates the virgin heavily forested nature of the wide valley prior to the beginning of the Kitimat development.

The townsite is located along the top and on the south slope of a 350 feet high predominantly gravel ridge which extends from the east side of the main valley to a rock slope on the east bank of the Kitimat River at the bridge site. On
FIGURE 7
VIEW OF KITIMAT VALLEY LOOKING NORTH

FIGURE 8
GENERAL MASTER PLAN

the north this elevated area is bounded by Hirsch Creek and the low lying land beyond, while on the south side the old flood plain of the Kitimat River extends between the townsite and the tidal flats of Kitimat Arm.

The area encompassed most of the reasonably good land for townsite purposes near the Kitimat River delta. While there are large areas of virgin land available in the valley, the economically developable area was limited by such factors as river flooding and sewerability within one system. The total area in the townsite location available for reasonably economical residential use was about 2,750 acres. This includes area reserved for grade schools, internal parks and neighbourhood centres. This townsite area was in addition to the approximately 1,800 acres selected for industry on the west side of the river. The general location and the relationship of these areas to each other and to the other features of the site are shown on the "GENERAL MASTER PLAN" in Figure 8, page 64.

The planning of the townsite hinged to a large degree on the choice of a site for a bridge across the Kitimat River to link the townsite with the industrial facilities. The crossing point selected was at the rock outcropping at the western end of the elevated gravel ridge on which part of the

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Kitimat Townsite Report February 29, 1952, Section 6.0
townsite was to be built. Once the bridge site was settled it was possible to go ahead with the general planning of the neighbourhoods and the mapping out of the access roads to the townsite.

The proposed townsite area was a complex of irregular buildable areas which strongly influenced the overall layout of the community. Basically the townsite is on three main levels. There is a lowland area south of the ridge which has an elevation of 50 to 100 feet, a higher area north of the ridge which has an elevation of about 250 to 300 feet, and a highland area east of the other areas which has an elevation of about 500 to 600 feet. These areas are shown on the "MASTER PLAN OF THE TOWNSITE" in Figure 9, page 67. Many of the features of the townsite are also shown on this plan and some of these will be outlined in the following parts of this chapter.

Residential Areas

The planning for the residential areas was based strongly upon the neighbourhood concept as outlined previously in the review of the planning concepts involved in Kitimat. According to the Kitimat Planners, the best neighbourhood size was one that could support a local shopping centre and an elementary school as the focal points of local culture. These

FIGURE 9
MASTER PLAN OF THE TOWNSITE

SOURCE: Kitimat Townsite Report.
facilities should not be more than one-half mile from any of the households in the neighbourhood. They considered the neighbourhood optimum to be about 1,200 families, which would support one supermarket plus competitive food stores in the same centre, and two elementary schools of 300 to 500 pupils. The minimum which could support one supermarket and school was considered to be about 500 families. This minimum would be socially desirable only under favourable circumstances of density, income, location and natural physical boundaries. The maximum figure of 1,800 families was limited chiefly by the distance of the more remote households from the schools and neighbourhood centre.

Every neighbourhood, in addition to having its own schools and a neighbourhood shopping centre, was to be surrounded by a peripheral traffic artery which carried traffic around rather than through the neighbourhoods. These traffic arteries which were peripheral to the neighbourhoods were also the main routes connecting the different areas and functions of the town. They were designed to have a speed limit of forty miles per hour to move traffic quickly. Local access to the homes in the neighbourhood extended inward from the peripheral traffic routes in the form of loops or cul-de-sacs. These local access routes were of no use to through traffic and were to have a speed limit of twenty miles per hour.
The internal circulation system of the neighbourhood, and the whole of the town, was a pedestrian greenway system, which widened into parks at the centre of the neighbourhoods, and served to interconnect home, local shopping centre, school and recreation areas of all sorts and sizes ranging from yard to park to wild ravine to surrounding greenbelt. Underpasses were to connect greenways and provide a safe way to school, where grades permitted.

The townsite was divided into ten neighbourhoods, most of which had their own neighbourhood centre, public schools and churches. The areas of each of these neighbourhoods varied from 150 to 400 acres and were to embrace populations of from 1,800 to 6,000 persons. Their size and shape was greatly influenced by the topography and the rather complex arrangement of irregular buildable areas. The development of the town was to be carried out in four stages, with certain neighbourhoods scheduled for each stage.

The ten proposed neighbourhoods shown on the plan (Figure 9 on page 67) are listed in Table IV, page 70. This table includes their areas, population and densities, along with their position in the proposed staging program. Neighbourhood "B" was broken down into four sub-areas for the staging. The neighbourhoods were to be developed in their alphabetical order, although a possible alternate order was given for the first half of the development. The figures given in the table
### TABLE IV

**NEIGHBORHOOD DEVELOPMENT AND STAGING**

**RECOMMENDED ORDER:**

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Area (Acres)</th>
<th>Density* Families per Gross Acre</th>
<th>Families</th>
<th>Population</th>
<th>Total Workers</th>
<th>Stages &amp; Workers at Each Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>280</td>
<td>5.1</td>
<td>1420</td>
<td>5700</td>
<td>1775</td>
<td></td>
</tr>
<tr>
<td>B-I</td>
<td>65</td>
<td>5.0</td>
<td>325</td>
<td>1300</td>
<td>405</td>
<td>2180-I</td>
</tr>
<tr>
<td>B-II</td>
<td>170</td>
<td>5.0</td>
<td>850</td>
<td>3400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-III</td>
<td>65</td>
<td>5.0</td>
<td>325</td>
<td>1300</td>
<td></td>
<td>1840</td>
</tr>
<tr>
<td>B-IV</td>
<td>100</td>
<td>3.0</td>
<td>300</td>
<td>1200</td>
<td></td>
<td>4020-II</td>
</tr>
<tr>
<td>C</td>
<td>300</td>
<td>4.5</td>
<td>1350</td>
<td>5400</td>
<td></td>
<td>1680</td>
</tr>
<tr>
<td>D</td>
<td>285</td>
<td>4.5</td>
<td>1300</td>
<td>5200</td>
<td></td>
<td>1625</td>
</tr>
<tr>
<td>E</td>
<td>150</td>
<td>3.0</td>
<td>450</td>
<td>1800</td>
<td></td>
<td>7325-III</td>
</tr>
<tr>
<td>F</td>
<td>335</td>
<td>4.5</td>
<td>1500</td>
<td>6000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>250</td>
<td>4.5</td>
<td>1130</td>
<td>4500</td>
<td></td>
<td>1400</td>
</tr>
<tr>
<td>H</td>
<td>280</td>
<td>3.0</td>
<td>850</td>
<td>3400</td>
<td></td>
<td>1060</td>
</tr>
<tr>
<td>I</td>
<td>145</td>
<td>3.0</td>
<td>450</td>
<td>1800</td>
<td></td>
<td>560</td>
</tr>
<tr>
<td>J</td>
<td>280</td>
<td>4.0</td>
<td>1150</td>
<td>4600</td>
<td></td>
<td>1440</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4420</strong></td>
<td></td>
<td><strong>45600</strong></td>
<td></td>
<td></td>
<td><strong>14220</strong></td>
</tr>
</tbody>
</table>

*Density is calculated on the basis of buildable land, excluding gullies and ravines, including grade schools and park and community center areas, and roads inside the neighborhood.

**ALTERNATE ORDER FOR FIRST 3 STAGES:**

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Area (Acres)</th>
<th>Density Families per Gross Acre</th>
<th>Families</th>
<th>Population</th>
<th>Total Workers</th>
<th>Stages &amp; Workers at Each Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>280</td>
<td>5 plus</td>
<td>1420</td>
<td>5700</td>
<td>1775</td>
<td></td>
</tr>
<tr>
<td>B-I</td>
<td>65</td>
<td>5</td>
<td>325</td>
<td>1300</td>
<td>405</td>
<td>2180 - I</td>
</tr>
<tr>
<td>C</td>
<td>300</td>
<td>4.5</td>
<td>1350</td>
<td>5400</td>
<td></td>
<td>1680</td>
</tr>
<tr>
<td>B-II, B-III</td>
<td>235</td>
<td>5.0</td>
<td>1475</td>
<td>5900</td>
<td></td>
<td>3860 - II</td>
</tr>
<tr>
<td>B-IV</td>
<td>100</td>
<td>3.0</td>
<td>1300</td>
<td>5200</td>
<td></td>
<td>1625</td>
</tr>
<tr>
<td>D</td>
<td>285</td>
<td>4.5</td>
<td>1300</td>
<td>23500</td>
<td></td>
<td>7325 - III</td>
</tr>
</tbody>
</table>

**SOURCE:** Kitimat Townsite Report.
for the number of workers are for total employment in the community, including service employment. The four stages of the development are co-ordinated with the growth of employment in the basic industry, as outlined on page 78.

Neighbourhood "A" was the first proposed for development. It was expected that at this initial stage there would be many childless or small families and many single workers. Consequently this first neighbourhood was planned for a high proportion of multiple units. Later development in other neighbourhoods would have a higher proportion of single family dwellings. The Kitimat Townsite Report lists the following distribution of house types for Neighbourhood "A" which was to be built first, and Neighbourhood "D" which was to be built during Stage III.

<table>
<thead>
<tr>
<th>House Type</th>
<th>Neighbourhood &quot;A&quot;</th>
<th>Neighbourhood &quot;D&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single or detached</td>
<td>17%</td>
<td>60%</td>
</tr>
<tr>
<td>Twin</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>Group or row</td>
<td>43%</td>
<td>10</td>
</tr>
<tr>
<td>Apartments</td>
<td>17%</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Later decisions for Neighbourhood "A", however, resulted in 41% single family dwellings, 23% twin houses, 12% row houses and 25% apartments. This change is discussed later in Chapter IV.

Commercial Areas

The Master Plan envisaged the commercial needs of Kitimat
being provided for at a City Centre and a number of neighbourhood centres.

The City Centre was to be the downtown retail and business area, and also the cultural, entertainment and government centre where most activities of city wide interest would be drawn together. It included the city hall, public library, auditorium, museum and generally most other uses normally found in central business districts except for certain service, storage and supply businesses, repair shops, auto sales and the like, which were to be contained within the Service Centre, to be described later. The plan for the City Centre as it was originally proposed is shown in Figure 10 on page 73.

The proposed City Centre was designed around a series of interconnected squares and malls, and like the residential areas, provided for maximum segregation of vehicles and pedestrians. Parking areas surrounded the centre but were somewhat separated from each other by prominent buildings and green areas, in contrast to the continuous sea of parking surrounding the typical shopping centre. As shown in the accompanying plan, the City Centre was to be built in four stages corresponding to the staged development of the rest of the community.

The City Centre is not located geographically central to the town, although it was meant to be functionally central in the sense that it is located so that almost all traffic between the city and the industrial and service centres would pass by
FIGURE 10

ORIGINAL PLAN OF CITY CENTRE

it. Furthermore it is about the only point where the topo-
graphic features allow the upper and lower areas to be properly
related to each other by the circulation system.

Neighbourhood commercial centres were located in most
neighbourhoods and were intended primarily to offer convenience
goods, daily necessities and services, such as food, general
merchandise, hardware, drugs, meals and refreshments, beauty
and barber shops, shoe repairs and similar uses, but on a
scale that would not conflict with similar facilities in the
City Centre. Conversely the City Centre contained some
facilities such as food stores for daily necessities bought in
connection with central shopping trips. Each neighbourhood
centre also had local recreational facilities, although again
on a much lesser scale than at the City Centre.

Provision was made for the "F" neighbourhood centre to
expand into an upper centre for the east end of the city if
the need arose. This would be something more than a neighbour-
hood centre but much less than the City Centre. On the other
hand the "C" neighbourhood centre was subordinated because
this neighbourhood was so close to the City Centre. The
importance of giving the City Centre an early start was
emphasized in the Master Plan. The size of the neighbourhood
centre in Neighbourhood "A", which was to be the first develop-
ed, was initially to be built to only about two-thirds of its
ultimate size until the City Centre was well established.
Service Centre

The Service Centre represents a concept where an area is set aside for warehousing, heavy and light commercial uses, and light and service industry. It is designed to accommodate the uses so often found in the older commercial areas of established cities, but which would not be compatible with the proposed City Centre and neighbourhood centres. The general plan for the Service Centre is shown in Figure 11 on page 76.

More specifically, the types of uses that would be considered as suitable for this area can be summarized as follows:

1.) Railway-oriented uses, including a hotel, warehouses, and wholesale establishments.

2.) Extensive users of land, including lumber yards, automotive dealers, and storage yards.

3.) Service industries, including automotive repairs, cleaning, laundry, printing, painting, electrical repairs, contractor's yards and many similar uses.

4.) Independent light industries.

5.) Commercial establishments serving principally the day to day needs of people working in the Service Centre, including lunch rooms and branch banks.

The Service Centre is located west of the Kitimat River Bridge, on the road joining the plant and the townsite. It is also on the rail line which goes to the smelter and port facilities. When the location was decided on it was anticipated that the highway would come down the west side of the valley, such that all traffic coming to either the townsite or the
FIGURE 11

PLAN OF SERVICE CENTRE

SOURCE: Kitimat Planning Department.
plant would first come through the Service Centre. Also it was thought that the railway would play a larger role in servicing the community.

**Industrial Area**

The industrial area, as shown in Figure 8 on page 64, encompasses an area of about 1,800 acres along the west side of the valley and adjacent to Kitimat Arm. Generally the site is flat and low, but abundant gravel is available nearby for fill to improve the site area.

An area of approximately 1,500' x 12,000' was laid out for the Alcan smelter and its related port facilities. Also land was left for a possible pulp mill and other industries between the Alcan smelter and a proposed levee along the west side of the Kitimat River flood plain reservation. This arrangement allowed for suitable rail and port facilities to serve the industry.

A feature of this location for the heavy industry is that the prevailing winds generally blow parallel to the direction of the valley, so that any smoke blowing up the valley follows the west side of the valley and very rarely drifts over the townsite.

The rate of development of the community as a whole was tied directly to the rate of development of the basic industry. The four stages of the townsite program were based
on a smelter size of 2 potrooms at Stage I, 4 potrooms at Stage II, 6 potrooms at Stage III and 12 potrooms at Stage IV, employing a total of 1,000, 1,800, 2,600 and 5,100 men at each respective stage. A pulp mill was also included as a possibility, with employment in the plant and the logging operations estimated to be 600 men at Stage II, 1,200 men at Stage III, and 1,200 to 1,800 men at Stage IV.
CHAPTER III
DEVELOPMENT AND GROWTH OF KITIMAT

I. COMMENCEMENT OF WORK

As soon as the go ahead was given to the Kitimat project, work was started on both the power development and the facilities at Kitimat. The work at Kemano and the Kenney Dam were major undertakings in themselves. This thesis however is concerned primarily with the townsite development at Kitimat.

Kitimat involved many problems not normally encountered in an industrial development. The only access to the site was by air or sea. The general contractor, Kitimat Constructors, a group of eight major construction companies, moved into the area in mid April of 1951 to establish a beach camp. The first camp buildings were ready for occupancy early in May and additional workmen were brought in as quickly as the camp facilities could be expanded. By the end of the summer, a temporary wharf, a camp of winterized bunkhouses, a sawmill, and considerable clearing and roadwork had been completed.

Most of the work in 1951 was directed toward preparing the accommodation and facilities for the construction workers and the site for the smelter. By December, however, a good tote road had been built four miles up the valley to an excellent supply of gravel. A temporary bridge was erected over the Kit-
imat River and preparations were made to extend the road through to the townsite area.

Little had been done regarding the townsite until Clarence Stein was appointed Planning Co-ordinator for the town on September 6, 1951. About two weeks later, Stein, Mayer, Whittlesey and several of their consultants, along with P. E. Radley and other officials of Alcan, arrived in Kitimat for an inspection of the site for the town. During the next few months considerable preliminary work was done, leading to the presentation of Mayer and Whittlesey's final townsite report about the end of February, 1952, a little more than five months after the townsite planning was initiated.

II. DEVELOPMENT OF THE TOWNSITE

Development of the townsite actually started in January 1952 with clearing for the townsite camp adjacent to the east approach of the proposed Kitimat River Bridge. Early in June the main road location was slashed out between the bridge site and the proposed City Centre. In July, clearing was started in Neighbourhood "A" and 134 acres had been cleared by the end of the year.

Location of lots in Neighbourhood "A" was started the last week in June of 1953 and streets were surveyed in the

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first subdivision area at the north-east corner of Haisla and Kingfisher in preparation for a start on sewer and water mains. Location of the Minette Bay road to provide secondary access to the Townsite for building materials was started early in July. During the month, field engineering work confirmed main road and sewer right-of-ways, and provided data for final layouts of the first housing area and the Neighbourhood Centre. Construction of permanent roads began during the last week of July.

Construction of the first permanent housing units was started early in September 1953, along with foundations for the neighbourhood commercial building. By the end of December, walls and roofing were in place on some 45 housing units.

These first housing units were completed, and except for sewer and water connections were ready for occupancy by mid February, 1954, about six months after they were started. Arrangements were completed with the Johnson-Crooks and Hullah construction companies for construction of 360 housing units in 1954, which along with those already built and some private units, would bring the total close to 475 housing units by the end of 1954. Work had also been going on at the Nechako (Neighbourhood "A") Centre and by November the supermarket opened, and by the end of the year all the stores and offices in the commercial building were occupied. Previously the people had to do their shopping at the temporary shopping
facilities at the Smeltersite Camp.

During March 1955, clearing began in Neighbourhoods "B" and "C". The townsite program was carrying on at an accelerating pace, and before the end of the year the contract was awarded for the first commercial building at the City Centre. The clearing program was not much more than a year ahead of construction in some sections. Clearing was being speeded up to get into a position where townsite development of an area would be on a three year basis, with land clearing, general engineering design, and initial planning and sub-division work in the first year; grading, installation of roads and municipal services, final planning and sub-division work and design of buildings in the second year; and construction of buildings and installation of local improvements in the third year.

The plan for the City Centre was changed somewhat in 1955 from the plan shown in Figure 10 on page 73 when subsoil tests indicated poor foundation conditions on parts of the site. Also a more detailed and up to date study was undertaken when parking problems became apparent following the actual development. This resulted in the plan dated 1957 which is the current plan for the development of the City Centre.²

Work continued at a rapid pace on all aspects of the townsite development. The large number of construction workers

²Kitimat Townsite Report, 1960. p.viii
in addition to the smelter workers made the provision of adequate housing critical. Housing was being constructed somewhat in advance of the actual smelter needs and being used in the interim by construction workers.

On October 31st, 1957, just several weeks after the highway was opened to Terrace, Alcan had to suspend all construction on the Kitimat project because of changes in the aluminum markets. This resulted in the layoff of several thousand construction workers and was a severe blow to the community. Figures obtained from the Alcan Property Department for May 1958 showed 132 houses vacant out of a total of 1,576, and 217 apartments vacant out of a total of 515. Furthermore, temporary accommodation for about 3,000 construction and other single personnel was left partly empty. No more project housing has been undertaken since the cutback in 1957, although well over 100 private houses have been built since that time. Private house building is now increasing, as the community is growing again at a modest rate, reflecting some increase in smelter employment and more logging activity in the Kitimat Valley.

Figure 12 on page 84 shows the present stage of development of the community in relation to the ultimate size as envisaged by the Master Plan, whereas Figure 12A on page 84A outlines the presently developed areas in more detail and gives locations of some specific uses. Figures 13 and 14 on page 85 show aerial views of Nechako (A) and Kildala (C) Neighbourhoods as they now exist. A limited amount of development has also
PRESENT STAGE OF DEVELOPMENT

- Developed areas.
- Undeveloped neighbourhoods (Streets in part of Whitesail neighbourhood are partly serviced only. No housing.)

FIGURE 12
PRESENT STAGE OF DEVELOPMENT
FIGURE 13

VIEW OF NECHAKO NEIGHBOURHOOD (NEIGHBOURHOOD "A")

FIGURE 14

VIEW OF KILDALA NEIGHBOURHOOD (NEIGHBOURHOOD "C")
City Centre is at right corner
taken place in the Whitesail (B) Neighbourhood but this is not shown in the photographs.

III. ORGANIZATION OF THE MUNICIPAL GOVERNMENT

It was a policy of Alcan that Kitimat would become a self-governing community and not a company town, and that it should do this as soon as reasonably possible in its development.

The consultant's report of April 24th, 1952 on Local Government recommended that Kitimat be incorporated as a district municipality which would have an elected Council consisting of a Reeve and six Councillors as the executive and governing body, together with a municipal manager appointed by and responsible to the council for the administration of all public services. At the time of the report, Victoria was the only British Columbia city with the municipal manager form of municipal government.

In the fall of 1952, Alcan applied to the B. C. Legislature for the incorporation of the area as a district municipality. However there was a need for special legislation in the initial period since the existing provincial legislation made no provision for setting up a municipality before the people

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3 Kitimat Townsite Report, Section 8.11, p.1. April 24, 1952. (Consultant's Report.)
were there. It could not have been financed as an unorganized territory.

In March, 1953, Kitimat was incorporated as a district municipality by a special Act of the provincial legislature. The municipality which was set up encompassed an area of 39,250 acres and included the townsite, the smelter, the main valley plain of the Kitimat River to four miles north on the Kitimat-Terrace highway, and the mountain sides adjacent to the townsite and the smelter.

Some of the details which the Kitimat Incorporation Act 4 provided for were:

1.) Interim qualifications for members of council and voters until the regular municipal election in December, 1954.

2.) The appointment of a Municipal Manager as the chief administrative officer.

3.) Additional borrowing power during the first three years of the municipality's existence. It permitted the district council to borrow up to $50,000 as operating expenses until the municipal revenues for the year 1953 were made available, and up to five million dollars for capital outlays. This special authority was later extended to 1961.

4.) Authority to purchase major road improvements and the Kitimat River Bridge, which had been constructed by Alcan in anticipation of the incorporation of the municipality.

4 See Appendix "B" for the full copy of the Act.

5.) Authority for the Council to make, alter, and repeal one comprehensive general by-law, instead of a number of separate by-laws, dealing with different municipal subjects. This comprehensive by-law, known as the Kitimat Municipal Code, was suitably indexed and cross-referenced and contained all the regulatory legislation adopted by the Council. Furthermore any addition and amendments would fit readily into the framework it had established.

6.) Miscellaneous matters concerning the first assessment roll, the first budget and rate by-law, and initial short-term borrowing.

7.) A final section whereby "All the provisions of the 'Municipal Act', the 'Municipal Elections Act', and the 'Municipalities Incorporation Act', and of all other Statutes and laws applicable to district municipalities shall apply to the Corporation of the District of Kitimat, except as otherwise provided by this Act."

The first action of the newly created municipality was to hold an election for a reeve and six councillors. To implement the Act, the Aluminum Company, as sole owner of the land, legally transferred land to certain people to qualify them as candidates for office. These candidates were selected from among the Company's employees in Kitimat and from independent businessmen who had arrived in the community. The original voter's list was made up of 121 people who met the requirements of the Act. With the preliminaries out of the way, Kitimat voted on April 30th, 1953. Mr. Wilbur Sparks became Reeve by acclamation and Messrs. B. S. Baxter, E. G. Cronk, G. M. K. Davis, P. W. Hallman, G. T. Malby and Dr. P. G. Margets were elected
Councillors.  

Some of the first actions of the Council were to adopt immediately a by-law establishing the Kitimat Municipal Code and setting out the procedure of council meetings, a by-law providing for the appointment of a municipal manager and the definition of his powers and duties, and a by-law authorizing the borrowing of money to finance the initial operating expenses of the new town.

IV. FINANCING OF TOWNSITE DEVELOPMENT

One of the greatest single obstacles to new town development is the large initial capital expenditure required for items such as roads and utility services before there is any tax money to pay for them. In the case of British Columbia there was no provision for direct capital loans from the government, and as mentioned previously it was necessary to enact special legislation setting up the municipality and giving it special borrowing powers in its early period. Since this procedure was time consuming it was not completed to the point where it was effective until many aspects of the townsites development were underway.

To ensure that the town was properly launched, Alcan

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assumed responsibility for undertaking the engineering surveys; for clearing the land in the first neighbourhoods; for building the initial housing accommodations; and for installing certain essential utilities and services.

Final adoption of the first money by-laws to provide for the purchase of the services already constructed or under construction by Alcan was stalled until early 1954 because of technical difficulties and government procedures. When this was cleared, a syndicate of four financial houses headed by A. E. Ames and Company marketed the towns debentures.

When the development was well underway and the municipality was functioning, servicing costs of the residential lots were shared about equally between the land developer and the municipality.

The Aluminum Company, as land developer, paid the cost of land clearing and of the initial topographic surveys and planning studies. The land developer was also responsible for constructing local access roads and for the cost of local storm drains.

The municipality built the main roads, pedestrian paths, sewer and water lines and main drains. Curbs and gutters and paving were installed under local improvement proceedings with

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the benefitting properties paying about half the cost.

Some indication of the relative proportions of the overall costs paid by Alcan, the Municipality, and other sources is given in one of Alcan's Progress Reports. For the period 1952 to 1955, Alcan paid $11.6 million, the Municipality paid $4.6 million, and others paid $12.3 million. If the construction had continued to 1961 as planned, the estimates for total overall expenditures were $33.8 million for Alcan, $23.3 million for the Municipality, and $110.8 million for others, for a grand total of $167.8 million for townsite development. Costs were rising rapidly however, and it is likely that by 1957 actual costs were considerably exceeding these estimates. Alcan's total anticipated investment of $33.8 million was to have been 40% for second mortgages on housing, 45% on land development, and the remaining 15% on power distribution, commercial buildings and other items. Presumably some of the expenditure such as that for land development, power distribution and commercial buildings was recoverable through sale of land, power, rentals, etc. However the 40% for second mortgages on housing was effectively a grant to the Alcan employees to compensate for the high building costs. While these second mortgages were to be amortized, they were offset by a housing bonus which more or less compensated for the second mortgage.

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payments. Although Alcan's total expenditures on that portion of the townsite actually built were not obtained, the figures up to 1955 plus the estimates for 1956 and 1957 indicated something over $22 million, which while only a little over 5% of Alcan's expenditure on the Kitimat smelter and the related power development, were still very substantial. A breakdown of the distribution of the actual expenditure was not obtained but probably would have been somewhat similar to the anticipated distribution mentioned for the overall estimate.

V. LAND OWNERSHIP POLICY

Considering Alcan's industrial property and the undeveloped land it retains, Alcan is and will likely remain the largest land owner in Kitimat. In line with the new housing and land ownership policy instituted in Arvida, however, Alcan sought to dispose of its non-industrial holdings, apart from undeveloped land, as quickly as possible in Kitimat.

One of Alcan's consultants\(^9\) suggested that the Company ought to retain ownership of the land in the proposed commercial centre and adopt a policy of leasing lots to individual businessmen, arguing that this would ensure a greater control over development. Alcan rejected this recommendation and instead decided to sell commercial land to individual enter-

prises, while requiring that their plans conform to Kitimat's Master Plan. The company did, however, become involved in commercial building construction and subsequent leasing of commercial space to tenants.

In the case of housing, it was necessary at the outset to build a certain number of temporary houses for construction workers and a few permanent dwellings for key personnel, most of which are still in use and owned by the Company. In the main, however, the Company encouraged home-ownership. To make it possible for employees to build and own their homes in Kitimat, Alcan

1.) offered second-mortgage loans in order to substantially reduce the down payments required by the Central Mortgage and Housing Corporation.

2.) paid a special monthly bonus toward house financing to make up for the differential between Vancouver and Kitimat building costs. A house costing $11,000 in Vancouver sold for at least $14,000 in Kitimat. The severe shortage of skilled labour at the time and the rush involved to get the job done was a serious problem with respect to costs.

3.) agreed to repurchase the home at a predetermined depreciation rate anytime within ten years if someone wished to sell and leave town.

VI INDUSTRY AND EMPLOYMENT

As mentioned previously the smelter construction was one of the first phases of the work at Kitimat. While the smelter construction program is not part of the subject of this thesis, the aluminum plant is the economic base of the community and
any change in this reflects directly upon the community.

Construction at the aluminum smelter began in 1951 with clearing and preparation of the smeltersite. By July of 1954 the first section of the smelter was ready for operation, with more soon to follow. The starting dates of the various pot-lines were as follows:

<table>
<thead>
<tr>
<th>Date</th>
<th>Pot-line</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 15, 1954</td>
<td>Line 2</td>
</tr>
<tr>
<td>Sept. 20, 1954</td>
<td>Line 1</td>
</tr>
<tr>
<td>Mar. 13, 1956</td>
<td>Line 3</td>
</tr>
<tr>
<td>June 11, 1956</td>
<td>Line 4</td>
</tr>
<tr>
<td>Nov. 1956</td>
<td>Line 5</td>
</tr>
</tbody>
</table>

In May of 1956, before the completion of Line 4, the contract for the construction of Lines 7 and 8 was awarded to Sagimat Construction. About a year and a half later, however, on October 31st, 1957, the smelter construction was curtailed due to a decrease in the projected demand for aluminum, and the two lines under construction were not completed. Alcan's expenditures at the time of curtailment represented a total of about $440,000,000. Of this amount about $225,000,000 had been invested in the smelter and townsite, while most of the remainder represented the cost of power development and transmission facilities.

The construction force, including that building the townsite, was soon without work. While no figures were obtained

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10 Alcan Kitimat-Kemano 1954-59, pp.19-20; and "Kitimat-Kemano Project's Decade of Life", Kitimat Ingot, April 26, 1961, pp.3-6.

on the number of persons so affected, the following estimate\textsuperscript{12} gives an indication of the total employment in Kitimat at about May 1st, 1957, or about six months before the construction work was curtailed.

\begin{tabular}{|l|c|}
\hline
Alcan & 3100 \\
Sagimat (Alcan construction firm) & 1000 \\
Crawley & McCracken & 381 \\
General and Housing Contractors & 1187 \\
Professions (teachers, clergy, doctors, etc.) & 123 \\
Stores, Businesses and Services & 1131 \\
\hline
Total & 6922 \\
\hline
\end{tabular}

It is likely that close to 3,000 employed persons out of this total were directly affected by the 1957 cutback, although few of these were associated with the smelter production operation.

The smelter production was not curtailed until a slide cut the transmission line from Kemano about the middle of December 1957. When the smelter was restarted about a week later the production was resumed at a little less than 90\% of total operable capacity. It remained at this rate until 1959, when it dropped to about 70-75 percent for several months. Soon after this, however, conditions began to improve and by the spring of 1960 the previously completed portion of the aluminum plant was back up to full capacity and construction work was resumed at a modest rate on the unfinished Lines 7 and 8,

\textsuperscript{12}Editorial in \textit{The Kitimat Ingot}, February 21, 1957, p.2.
employing between 100 and 200 men. This modest rate of construction has carried on fairly steadily over the past five years to the present time. Half of Line 8 was put into production on February 28, 1964 and the other half will probably be started by the summer of 1966. This will raise the capacity of the Kitimat smelter, now the world's third largest, to about 232,000 tons of aluminum per year.

The best indicator of the effect of changes in the aluminum plant on the community is the number of people it employs. The total smelter employment by year from the smelter startup in 1954 to date is shown in Figure 15 below.

![Graph showing smelter employment from 1951 to 1965](image)

**FIGURE 15**

**KITIMAT SMELTER EMPLOYMENT**

SOURCE: Alcan Kitimat Works.
The figures used for the plotting of the graph are those representing smelter employment at December 31 each year. The employment is now increasing again, although it is still lower than in 1956 and 1957. This is due, however, to a considerable improvement in the efficiency of operation, since the production is now appreciably higher than it ever was during the peak employment in 1956 and 1957.

An aerial view of the smelter, looking to the southeast, is shown in Figure 16 on page 98. The group of buildings on the left include potlines 7 and 8 which were incomplete after the 1957 construction cutback, although as previously mentioned they are now partly in operation and partly under construction. The picture was taken in 1962.

There has been considerable talk of a pulp and paper mill for Kitimat. Allowance was made for such a development in the population estimates outlined in the Master Plan. In 1951 Alcan and the Powell River Company jointly formed the Kitimat Pulp and Paper Company to develop a mill in Kitimat, but nothing was done prior to the 1957 curtailment, after which the demand for pulp and paper slacked off as did the demand for aluminum. In October 1963 Alcan stated that it might join forces with Japanese interests to build a $70 million dollar mill. Two months later MacMillan Bloedel and Powell River Company (MB & PR) proposed an $86 million dollar mill, with later expansion into newsprint with a total estimated
FIGURE 16

VIEW OF KITIMAT SMELTER

FIGURE 17

VIEW OF SERVICE CENTRE
expenditure of $150 million dollars. Part of the company's application for timber was opposed by counter proposals from two other companies and the Kitimat proposal was not awarded sufficient timber by the B. C. Government for MB & PR to feel justified in going ahead. Shortly after, however, Eurocan put in an application and Crown Zellerbach has put in a counter-proposal. At the time of writing, Kitimat is awaiting the outcome of the B. C. Government's decision to see if it will finally obtain a second major industry. Hooker Chemicals had also proposed an $8 million dollar caustic-chlorine plant, but with the smaller pulp mill proposals this is not so likely to go ahead.

VII. POPULATION

The population of Kitimat grew very rapidly during the early years of its development to an estimated peak of about 12,000 to 13,000 prior to the suspension of construction at the end of October, 1957. It then decreased fairly abruptly to a minimum of about 8,000 and remained there for two or three years, and since about 1960 it has been increasing slowly to its present figure of about 9,500.

Figure 18 on the following page illustrates these population changes.
The figures used to draw the population curve are from the 1956 and 1961 census, and from various estimates made by several sources. Apart from the census figures, there may be some degree of error in the estimates, thus the curve at any particular point may not be too reliable. It does, however, show the general trend and magnitude of the changes. School enrolment has also been included to observe the effect of the suspension of construction, although it is not a reliable indicator of the growth of the community, especially in the case of Kitimat where the number of small children is disproportionately large.
CHAPTER IV

AN EVALUATION OF KITIMAT

The evaluation of a community is a very complex undertaking and can involve a very broad range of considerations. A community may be successful in any number of ways, such as in efficiency of development, stability of its economic base, provision of adequate housing for its people, efficiency and desirability of its layout of land uses and functions, and the happiness and the attitudes of the people within it. Some of these aspects may have been planned and purposely implemented, while others may have developed as the result of a natural growth process within the various social, cultural, physical and economic limitations imposed by the particular community or the society as a whole. The degree of success of a community or any of its features may be very different in one person's view than in that of another. Basically then, it is evident that the comprehensive evaluation of a community is a difficult objective to carry out with any degree of reliability, especially since the summation of the degree of success of the various aspects is so difficult to measure.

In studying Kitimat, only a few of the many aspects of the community can be covered in a study of this sort. Emphasis is therefore given to those that are related to the community planning concepts involved in its development, particularly
the success of the application of the Radburn principle. Also features of Kitimat are examined which make it different from other communities of a similar size. An attempt is made to understand some of these differences and to determine how well they have succeeded in practice.

The Aluminum Company and the Planners originally had certain aims and objectives in the development of Kitimat. Basic among these was the industrial success of the plant, which while primarily dependent on external factors not related to the individual community, was nevertheless greatly dependent on the degree to which the workers would be content in their isolated environment. While this latter consideration is very much a social one, it is related in many ways to the physical planning and development of the community itself. Thus considerable emphasis has been put into finding what many of the residents of the community think of it as a place in which to live.

Stein stated in his outline of objectives that:

Family needs, above all else, form the basis of the Kitimat Plan. It is the family man, whose wife and children have a desirable home in a community they like, who throws out his anchor and stays.

The Kitimat Plan is designed to meet the needs of young and growing families. Its basic principles have been tried out for many years in the Green Towns, planned for children's safety and peaceful home life.  

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The degree to which these objectives have been attained in Kitimat is studied and some attempt is made to determine the influences which specific aspects of the physical planning and development of the community have had upon their attainment.

Consideration is also given to whether the Company's policies and actions were the best ones under the circumstances, with respect to the necessity to develop a profitable operation, and also with respect to the public interest.

Constructive answers to these questions can be of considerable benefit in the planning of similar developments in the future.

I. SURVEY METHODS

Several approaches were used to evaluate the physical planning and development of Kitimat. Firstly, the author and his family lived in Kitimat between the spring of 1960 and the fall of 1962, and had an opportunity to observe various aspects of the community first-hand. He also worked for several months in 1956 in Vancouver with Alcan's town planning group working on the Kitimat townsite planning, as well as several months at the Kitimat smelter in 1957. Secondly, comments and comparisons were obtained from the literature about Kitimat and other new towns in other locations. Thirdly, many persons were interviewed who were active or interested in
the development and administration of the community. Lastly, a questionnaire type of attitude survey was made of a sizeable cross-section of the community. Much of this latter aspect of the study, along with some of the interviewing, was accomplished in a field study at Kitimat in May 1964.

Description of Attitude Survey of the Residents

A questionnaire was formulated to determine the attitude of the residents of Kitimat to the community as a whole and to various features of its planning and development. It contained questions asking what they thought of the community, walkways, street layout, house orientation, etc., and generally pertained to the residential areas with which this study is primarily concerned. The last six specific questions, however, were included at the suggestion of the municipal planner to obtain some measure of typical attitudes toward several problems which were controversial in the community at the time of the survey. While they do not have direct relevance to the principle objectives of this study, they do give an indication of attitudes toward certain municipal regulations which have planning implications, and they have thus been included in the evaluation. There were also three general questions relating to likes, dislikes, and suggestions, which were particularly useful as a source of attitudes toward the community, and ideas for future development. A sample questionnaire
is contained in Appendix C on pages 204 and 205, while a copy of the introductory letter which accompanied the questionnaire is included as Appendix B, on page 203.

A random sample was selected from the local telephone directory by choosing every eighth name. This resulted in a sample population of 217, which while a somewhat arbitrary size, was considered adequate to give significant results even if the returns happened to be low. It was also about the maximum number that could be handled in the time available.

A second sample was a select one comprised of members of the Municipal Council, The Advisory Planning Commission, and three past members of the Municipal Council, making a total of 16 in the sample. It was considered that this would provide a sampling of the opinions of persons who were or had been very active in the community, and whose ideas could be quite significant in the final survey question relating to suggestions for future development. About half of these persons were also interviewed personally. Three of them were also included in the random sample.

The questionnaires were distributed in person to each recipient, who was informed of its purpose and requested to complete and return it. Each questionnaire was accompanied by an introductory letter and a stamped self-addressed envelope.

In cases where the selected person had moved from the listed address, the questionnaire was left with the people then
residing at the address. Where no contact could be made at an address, the questionnaire was left at the immediately adjacent house. While this latter method is not good practice in sampling procedure, it was necessary because insufficient time was available for return visits in most of the cases. No attempt was made to keep close track of all the names of persons filling in the questionnaires, although most were recorded. There was no way of knowing which member of the family filled the information in. The location of the dwelling, however, was recorded accurately. Each questionnaire contains a number in the upper right hand corner which is keyed to a set of cards showing the house number, street, type of dwelling, etc. The reception received when the questionnaires were delivered to the dwellings was quite favourable once it was clarified that nothing was being sold. Most appeared very interested in questions regarding the community, and this is borne out by the high rate of return of the questionnaires. Other methods of distribution of the questionnaires could have been used but it is felt that delivering them in person provided an opportunity to briefly explain the purpose of the study and express appreciation for any co-operation which the people could give.

Return of Questionnaires

The return of the questionnaires is considered quite good, especially since no follow-up was used for non-responsive
other than one advertisement in the Kitimat Northern Sentinel about a week later thanking those who had returned the questionnaires, and asking those who had not returned them if they would please do so. The number of questionnaires returned is given below:

<table>
<thead>
<tr>
<th></th>
<th>Number Distributed</th>
<th>Number Returned</th>
<th>Percent Returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sample</td>
<td>217</td>
<td>134</td>
<td>61.8</td>
</tr>
<tr>
<td>Select sample</td>
<td>16</td>
<td>14</td>
<td>87.5</td>
</tr>
</tbody>
</table>

The non-responses were not followed up with further letters and copies of the questionnaires, primarily because names were uncertain and mailing addresses were unknown. Mail service in Kitimat is by Post Office box number rather than by street address, and while these postal box numbers could likely have been obtained in most cases by asking, it was felt best not to over-stress the idea of attaching a name to the results of a specific questionnaire, and instead leave a certain amount of anonymity to the questionnaire without destroying its usefulness for a degree of sample stratification later. Apart from a possible follow-up on the non-responses, the names and mailing addresses were not important, and since the number on the questionnaire made it possible to correlate it with house location and type, any desired sample stratification relating to these latter items could be done later.

The results of the questionnaire returns have been used
quite extensively in this chapter on evaluation. A summary of the replies to Questions 5 to 25 inclusive, of both the random and select samples, is given in Appendix D on pages 206 to 208, although detailed discussion and evaluation is included later in this chapter. All these questions in the main table are of the "yes" or "no" type except Question 5, which allowed a 3 choice rating of "good", "average" and "poor" for Kitimat as a place in which to live. The number of times a question was left blank or not clearly marked is also listed, since a large number of non-responses to a certain question may indicate that it was not clearly stated, or that the respondents had reservations about it or no strong feelings one way or the other.

There were three open-ended questions (No.'s 26, 27 and 28) at the end of the questionnaire which were intended to identify what the main features were that the residents liked and disliked about the community, and what suggestions they had for its future development. The responses to these questions are summarized in Appendices E, F, and G. The two questions regarding likes and dislikes were each filled out in 93 percent of the returns, while 65 percent had suggestions for future development, some of which were filled out in considerable detail. Most of the respondents listed a number of things they liked and disliked about the community and these have been analyzed under "ATTITUDES OF THE RESIDENTS TOWARD KITIMAT"
which follows this section. Suggestions for future development were numerous and are discussed under the relevant subjects of this chapter.

II. ATTITUDES OF THE RESIDENTS TOWARD KITIMAT

One of the most important aspects of any community is whether its residents find it a desirable place in which to live. It is the answer to this question which at least partly determines the degree to which the Kitimat Master Plan objectives of a contented work force and the provision for family needs are fulfilled. To find out how the Kitimat people feel about their community, several questions which were related to this subject were included in the questionnaire.

General Attitude

A direct question (No. 5) was asked "What do you think of Kitimat as a place in which to live?" Three spaces marked "good", "average" and "poor" were available for the respondents opinion, the results of which were:

<table>
<thead>
<tr>
<th></th>
<th>Good</th>
<th>Average</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sample</td>
<td>92</td>
<td>38</td>
<td>4</td>
</tr>
<tr>
<td>- Percent of total</td>
<td>68.6</td>
<td>28.4</td>
<td>3.0</td>
</tr>
<tr>
<td>Select sample</td>
<td>10</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>- Percent of total</td>
<td>71.4</td>
<td>28.6</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Over two-thirds of the inhabitants indicated that they think Kitimat is a good community in which to live and most of
the other one-third think it is average. The number of respondents who claim it is poor is surprisingly low. While the terms "good", "average" and "poor" are relative and must be interpreted with reservation, it is significant that the general opinion is relatively good and there is very little animosity toward the town, although there may be many criticisms of individual features. The question gave no indication of why the respondents felt the way they did.

Kitimat is different from other communities in many respects and people often require time to accept something that is different. With this in mind, an attempt was made to determine if there was any correlation between the respondents thought of the town and how long they had lived there. Figure 19 below gives the results of this analysis.

FIGURE 19
EFFECT OF LENGTH OF RESIDENCE ON REPLY TO QUESTION NO. 5 ASKING OPINION ON KITIMAT AS A PLACE IN WHICH TO LIVE
While the resident's opinion of the community appears generally good, the graph in Figure 19 shows an improvement in this opinion with a longer period of residence. Years 5 and 6, reflecting very little Alcan hiring for two years after the suspension of construction in the fall of 1957, and years 11 and 12, reflecting the early construction period before the smelter began operation, have insufficient replies to be very significant. The other years show a fairly consistent improvement in the number of "good" answers as compared to "average" with increasing length of residence.

The reason for this trend is uncertain and could represent people becoming used to the community and feeling more a part of it. On the other hand there may be a certain natural process of selection going on whereby people who dislike the community eventually depart, leaving a higher proportion of the more satisfied ones. A combination of these factors is probably responsible.

Another question (No. 6) indicating attitude toward Kitimat was "Do you think Kitimat is a good place to bring up children?", the results of which were:

<table>
<thead>
<tr>
<th></th>
<th>Random sample - No. of replies</th>
<th>Select sample - No. of replies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Percent of total</td>
<td>90.3</td>
<td>5.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Random sample - No. of replies</th>
<th>Select sample - No. of replies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>121</td>
<td>7</td>
</tr>
</tbody>
</table>
The reply to this question was more unanimous than any other except the one expressing approval of the main walkway system. There were more than 17 "yes" answers for each "no" answer in the random sample, while the answers in the picked sample were all "yes". There could be many reasons why they consider Kitimat a good place to bring up children, such as the quality of the school system, the exceptional opportunities for outdoor recreation and play, the mixing of children from many different backgrounds, the relative safety of the park and walkway systems and the low incidence of juvenile delinquency. The replies to the question certainly indicate a general agreement amongst the residents that Kitimat is a good community for children. There is, however, no basis for comparing this reaction with that of other communities, since the question is of a type that might normally receive a high percentage of favourable replies.

Another factor which may have some significance is the comparatively low labour turnover rate at the Alcan smelter. To what extent this is due to the community and to what extent it is due to company attitudes toward its employees is uncertain. Compared to many other companies however, Alcan is generally very fair-minded toward its employees and this has probably been an important factor, especially when one considers that many of the jobs in an aluminum smelter are much hotter and dirtier than in many other industries.
When the questionnaires were circulated in the community in May 1964, it appeared likely that the MacMillan, Bloedel and Powell River Company would build a large pulp and paper mill in Kitimat. This probably acted as a morale booster in the town, because there is a very strong desire for another industry to provide more variety and stability to the community. Unfortunately, the company was not awarded sufficient timber by the provincial government to carry out its planned development and the project failed to materialize. Recently however, Eurocan Pulp and Paper Company has made application for timber to support a pulp mill and the hopes are up again. It is likely that some of the resident's opinions of Kitimat as a place in which to live rise and fall with the chances for diversification of Kitimat's economic base, since a broadening of the economic base would bring more people and consequently better community facilities and less feeling of isolation, promote more competition and provide a better choice of goods in stores, and bring more opportunities for employment.

The reasons for the general attitudes in Kitimat are probably best exemplified by the responses to Questions 26 and 27 asking what is liked most and disliked most about living in Kitimat. An analysis of the replies to these questions is presented below.

**Favourable Comments about Kitimat by Residents**

Question 26 is an open-ended question asking "What do
you like most about living in Kitimat?" All 146 returned questionnaires were used for this part of the evaluation. The question was answered by 93% of the respondents, with an average of 2.7 items listed in each case.

It is somewhat difficult to evaluate this question, as well as questions 27 and 28 which are of the same type, because the responses were stated in so many different ways. The comments were extracted and separated into different groupings, although the nature and variety of these comments often require generalizations and the results must be interpreted accordingly.

The detailed analysis of the results of question 26 is given in Appendix E on page 209. The items mentioned most often by the residents as being liked were the condition of the community, especially its tidiness and cleanliness, and the recreational facilities and natural environment. These two general categories were each mentioned in one manner or another by almost half of the respondents. Nearly one quarter of the respondents said they liked one or more aspects of the general physical planning layout of the community. An almost similar number indicated they liked the people. Other general aspects of the community which the respondents stated they liked, listed in the order of the most frequently mentioned item, are the steady work, community atmosphere, education facilities, municipal services and government, streets and
walkways, good place for children, shopping lay-out, and community activities, as well as a number of miscellaneous comments. Each of these categories is broken down to a further degree in Appendix E. Needless to say, there is a certain amount of overlap between different groupings and there is some arbitrary choice involved in each.

The analysis does however give a general indication of different aspects of the community which the residents like, although the items which are mentioned more infrequently toward the end of the list may not necessarily agree with the opinion of the majority of the people.

Unfavourable Comments about Kitimat by Residents

Question 27 is an open-ended question similar to the previous one, except that it asks the opposite question, namely, "What do you dislike most about living in Kitimat?" It was answered by about the same number of respondents as was question 26, although the number of items mentioned was somewhat less, with an average of 2.2 in each case.

The answers are analysed and divided into groups in the same manner as is done for the previous question. The same limitations apply to the analysis of this question as apply to question number 26, since while the question is the opposite, its format is similar. In general, the "dislikes" seemed to refer more often to some specific item than was the
case with the "likes", which tended to be more general.

The detailed analysis of the results of question 27 is given in Appendix F on page 211. The item mentioned most frequently as being disliked is the climate, which is noted by 42 percent of the respondents who answered this question. Isolation is mentioned frequently, with 33 percent of the answers containing this item. Also mentioned frequently, in decreasing order, were housing, commercial facilities, cost of living, certain features affecting the appearance of the town, some aspects of the general physical planning and layout, company town atmosphere, lack of public transportation, the street and walkway system, certain municipal services and regulations, and a large number of other miscellaneous items. A large number of the responses in the preceding general categories refer to some specific feature, and some qualification is generally needed to interpret the results. A reference to the detailed breakdown in Appendix F is required to put the comments into their proper perspective, since many comments in a group refer only to one specific item in that category, whereas the respondent may agree with other aspects of the group containing his comment. A comparison of the "likes" of question 26 with the "dislikes" of question 27 indicate many differences of opinion.
Suggestions given by Respondents for Future Development of Kitimat

Question 28, the last one on the questionnaire, is an open-ended question asking the respondent "Do you have any suggestions for planning the future development of Kitimat, and if so what are they?" About 65% of the respondents answered this question, with a total of 206 suggestions, or an average of about 2.2 suggestions for each person answering the question. Some of the responses were in considerable detail, often covering the whole back of the second page.

The analysis is even more difficult than in the other two previous questions because the suggestions tended to be written out in greater detail and had to be simplified and extracted for analysis. One paragraph often contained a number of suggestions. The results should therefore be interpreted in very general terms only. It is apparent that some of the suggestions are quite contrary to the majority opinion and should be considered in broad terms only.

Where significant numbers of respondents have commented on a certain item, however, it would indicate that a good cross-section of the community feel improvements could be made. This is somewhat different from the question on "dislikes", where some items such as climate and isolation were mentioned frequently but nothing much can be done about them.

The detailed analysis of the results of question 28 are given in Appendix G on page 214. The suggestions are generally
grouped into related categories.

Where suggestions concern items already covered in questions 5 to 25 inclusive in Appendix D on page 206, a note to this effect has been included along-side the comment.

Housing was the most frequently mentioned subject, with a total of 39 suggestions. More than half of these suggested either better housing design, quality or variety. Recreation was the next most popular item with 28 suggestions, mostly for more and better recreational facilities and specific types of such facilities which the community might use. Commercial facilities were mentioned almost as often as recreation, especially the need for more stores and competition. Suggestions regarding features affecting the appearance of the town appeared a total of 25 times, or the same number of times as suggestions for commercial facilities. The suggestions regarding appearance included 17 references to putting wiring underground, which was the most frequently mentioned single item in the entire list of 206 suggestions. The rest of the suggestions relating to appearance of the community were for more tree planting and landscaping. There were 22 suggestions concerning streets and walkways, 14 suggestions for various municipal services (mostly sewage and garbage disposal), 9 suggestions on the general physical planning and layout (5 of which suggested developing according to plan), 8 suggestions regarding municipal regulations, and 8 suggestions regarding the
need for more industry. Many other miscellaneous suggestions were given, some of which are listed in Appendix G.

The most frequently mentioned suggestions have considerable value for the further development of Kitimat or any other new community, as do several of the less frequently mentioned items. The list also gives an insight into sources of dissatisfaction within the community, as well as a certain desire for improvement of items such as recreational facilities, although this latter item is high on the list of "likes" in question 26. The list of suggestions tends to separate some of the complaints which can at least partially be rectified in new development from those relating to aspects such as climate which people complain about but yet can do little to change, apart from creating an environment which decreases their impact on the people.

III. GENERAL PHYSICAL PLANNING LAYOUT

AND DEVELOPMENT

There are several considerations which are important in trying to determine whether the general physical layout envisaged by the Master Plan was a good one. Topography was a controlling factor, and while the site is not particularly rugged, it is cut by a number of ravines and steep slopes which restrain the form of the community. Another consideration is that the Master Plan made provision for a community of up
to 45,000 persons if a pulp mill were made part of the economic base. While this size seems a long way from attainment now, there is no reason why the planners should have planned for less with the terms of reference that they were given at the time. Thus the question of whether the community is well designed in its physical layout must be at least partially considered in terms of whether the ultimate layout is a good one and whether the staging was properly done to give a balanced and well designed community at every stage.

Another consideration is the basic philosophy underlying the design itself. Richardson states that Stein had two courses which he could have adopted: to adapt to geography and climate or to adapt to people and culture. He states that the former would have meant probably a tight design, a huddling to-gether of people and buildings about a compact, perhaps multi-levelled centre, a solution as has been adopted in Northern Sweden and has been proposed in other parts of Canada. Instead Stein chose the latter and assumed that the people of Kitimat would be the same sort of people as those of Vancouver or Winnipeg or Toronto, living as far as possible in the same way. Thus he adopted the Radburn principle as the basic design for the community. As Richardson mentions,

But social values and habits are facts to be faced as much as are snow and muskeg, and less easily overcome;

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and this being so Stein's application in Kitimat of the principles which he had pioneered in Radburn to permit peaceful co-existence between man and machine was not only sensible but perhaps inevitable.

The first alternative mentioned by Richardson, that of building a tight design and huddling the people together in deference to the geography and climate, has been mentioned by a number of other writers in the form of a criticism of the low density design for such a northern community. However, a study of the climate characteristics of Kitimat, and the personal experience of living through three Kitimat winters, leads the author to believe that the stress put on the lack of consideration in the overall design for the northern climate is somewhat misleading. While the climate is one of the major dislikes of the Kitimat residents, the problem is not so much one of snow and muskeg, but rather the depressing rain and overcast skies during much of the fall and winter season. The Kitimat winters are less severe and of shorter duration than say those of Winnipeg or Montreal and the climate restrictions on outdoor activity in Kitimat are probably no greater than in these other communities, if as great. The design problem for this type of climate is more related to quality and design of housing, and adequate canopies and covered areas, malls and walks within the commercial areas than it is to residential densities. The arguments for a high versus a low density have the same validity in Kitimat as in any other Canadian city where land is not scarce. All this is not to say however that
there is not a real need for new design concepts and perhaps high densities in northern areas with a truly northern climate. It is merely to say that in Kitimat's case the climate is no more a consideration in determining what the overall density should be than in most other Canadian communities.

The final stage of the Master Plan for Kitimat, when viewed in relation to the topographic restraints, seems well designed and functional. The neighbourhoods are fairly well related to each other and the idea of higher speed peripheral arterials bounding the neighbourhoods, with continuity within an overall system, is good and has worked well in the sections which have been developed.

The Kitimat Master Plan envisaged the City Centre with the neighbourhoods separately dispersed around it. The relationship of the adjacent residential areas to the City Centre was somewhat limited, although there was a de-emphasis of the Neighbourhood "C" Centre in view of the proximity to the City Centre and the daily needs that it would also supply.

An interesting alternative to the aforementioned arrangement is that which was planned for the proposed new town of Hook. Although this new town of 100,000 persons was not actually built, the planning which went into it reflected many ideas based upon experience with other English new towns.

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The Hook plan included the basic features of the Radburn principle such as the concept of super-blocks and the separation of pedestrian and vehicular traffic. However it rejected the idea of separate neighbourhoods within the inner section of the town, although it retained three neighbourhoods in the outer areas. A strong linear central area was planned, parts of which would project outwards along the main pedestrian routes into the inner residential areas. The central area was to be fully integrated with housing in and around it and would be designed as the town's main pedestrian meeting place. It was hoped that the proposed arrangement would help achieve a high degree of urbanity within the town.

The opportunity to use an arrangement similar to that envisaged for Hook would have been severely limited by topography in Kitimat. Furthermore much of the close relationship of the town centre to the adjacent residential areas in Hook was achieved by using a spine road through the main centre rather than a ring road around it. Thus the adjacent residential areas could be intimately linked to the central area rather than cut off from it by major traffic streets, although properly located grade separated pedestrian crossings would minimize the problem in the latter situation. The town centre in Hook was to be multi-levelled and built over the spine road, allowing a free movement of pedestrians back and forth. A
system like this would likely be very expensive to provide, although a high density would offset some of the cost. Nevertheless a closer and stronger linkage of adjacent residential areas to the main centre is a concept worthy of serious consideration in new town development.

The 1957 suspension of construction in Kitimat is a pointed example of how the growth of a new town can come to an abrupt halt. It demonstrates the importance of the proper staging of development so that the community is well balanced and designed at all periods in its growth.

As previously outlined in Table IV on page 70, the scheduled staging of the Kitimat neighbourhood development was firstly "A", secondly all of "B", and thirdly "C", with a possible alternative of firstly "A", secondly "B-I", thirdly "C" and then "BII" and "B-IV". The actual development followed the latter alternative most closely, although "C" was developed somewhat ahead of "B-I". This change seems justifiable in that it gave a better interim relationship to the City Centre. If the original order of development had been followed and the work suspended at the same relative point, the City Centre would have been itself in the lower area with no residential development near it. This would have been worse still if the Neighbourhood "B" centre had been developed. The early development of Neighbourhood "C" helped to strengthen the City Centre, which even now is weak because much of its function
is dissipated in other locations, particularly in the Service Centre and in the Nechako Centre.

A point which was mentioned in one of the Kitimat interviews was that the townsite development could have been started a year earlier, but it was not realized that the work would take as long as it did. If this had been done it might have reduced the crowding in housing during the construction period and helped the City Centre get a better start. In view of the 1957 curtailment of construction, however, it is perhaps fortunate that this was not done if it meant that a greater number of housing units would have been completed.

IV. CIRCULATION SYSTEM

Separation of Pedestrian and Vehicular Traffic

The separation of pedestrian and vehicular traffic is one of the distinguishing features of the Radburn plan which has been applied quite extensively in Kitimat, especially in Neighbourhood "A". While much of the walkway system in the existing Kitimat residential areas is incomplete, the general concept of separating pedestrian and vehicular traffic is sufficiently developed to give a fairly good idea of its degree of success.

Although there has been considerable criticism of the Radburn principle, it is significant that many of the more notable planning schemes in many areas of the world have used
it or some of its features, although usually in a higher density form of development than that at Kitimat. In particular, the concept of separating pedestrian and vehicular traffic has been used frequently in many developments, but often on too limited a scale and without proper continuity and linkage with focal points to be fully effective.

The proposal for Hook new town, which as mentioned previously was not actually built, but reflected much of the experience gained from English new towns up until 1961, came up with the following conclusions:

(i) No child should have to, or even be tempted to, cross any road other than the smallest development (access) road or cul-de-sac, between home and school or bus stop. A clear separation between vehicles and pedestrians within the catchment area (quarter-mile radius) of the primary school is essential.

(ii) While complete separation by levels is desirable and possible in the central area, it is unlikely to be an economic possibility in housing areas, except at points of exceptionally high density, major road footpath crossings, or steeply sloping ground.

(iii) The horizontal separation of pedestrians and vehicles, by a development or modification of the Radburn system, in a form compatible with the general aims of the plan, is, therefore, the best basis for the planning of residential areas.  

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4 London County Council, op. cit., p.35.
In Kitimat, the pedestrian system is separated from the vehicle routes by an arrangement where peripheral traffic arteries carry traffic around rather than through the neighbourhoods. Local access routes to the homes extend inward from the peripheral traffic routes in the form of loops or cul-de-sacs, and generally do not interfere with the internal pedestrian walkway system. Figure 13 on page 85 shows an aerial view of the Nechako Neighbourhood and illustrates this principle of separation of vehicle and pedestrian traffic.

Walkway System

The question of providing for pedestrian movement, especially in residential areas, is a somewhat contentious one in many respects. It is often said that people will not walk in this age of the automobile and that the car is used even for a two block trip to the corner grocery. One must consider, however, that in practically all of present day urban development, especially in North America, the provision for pedestrian movement is so unsatisfactory and incomplete that it is only natural that few people will walk even a short distance. This brings up the question of whether people do not walk because they inherently dislike walking and would rather ride, or whether they are discouraged from walking because the facilities for pedestrians are so inconvenient and unpleasant. It would seem that a combination of these factors is responsible rather than just solely the former as is so often inferred. Further-
more a considerable proportion of pedestrian movement consists of young children going to school, a factor very seldom considered in the typical residential lay-out, although it can be easily provided for with no extra difficulty or cost if good physical design procedures are used.

Pedestrian circulation in Kitimat is provided for by a well defined walkway or pedestrian greenway system. Basically this system can be divided into two parts. Firstly there are the minor walkways (many of which are uncompleted) which serve the individual houses and act as feeders to the arterial system. These minor walkways are on the opposite side of the houses to the local access street. Secondly there are the main arterial walkways which generally have a fair degree of continuity and lead to the commercial areas, recreation facilities and schools at the centre of the neighbourhood, as well as to other parts of the residential area. Examples of this pedestrian system are shown in Figure 20 on page 129.

The general impression obtained by the author after living in Kitimat was that the arterial walkway system was very successful and a definite asset, although the minor walkways between the houses were not used as frequently as intended. This same opinion was expressed by most of the persons who were interviewed. To verify this observation, however, several questions related to this subject were included in the questionnaire. The respondents were first asked whether they
Many minor walkways are undeveloped and serve no useful purpose.

Others are developed and may be occasionally used.

But some of the continuous arterial walkways serve their function very well and are one of the most successful features of the residential layout.

FIGURE 20

PEDESTRIAN CIRCULATION
liked the minor walkways, whether they affected their privacy, and whether they helped to keep the children off the street. They were then asked whether they liked the main public walkways and whether they would prefer sidewalks along the street only, or along the street with walkways cutting through at the end of loops and culs-de-sac to the schools and shopping.

Minor Walkways. Question 8 asked "Do you like the minor public walkways running along your rear property line?" and was answered as follows:

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
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<tbody>
<tr>
<td>Random sample - No. of replies</td>
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<td>41</td>
<td>9</td>
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<tr>
<td>- Percent of total</td>
<td>62.6</td>
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<td>6.7</td>
</tr>
<tr>
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<td>6</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>- Percent of total</td>
<td>42.8</td>
<td>42.8</td>
<td>14.3</td>
</tr>
</tbody>
</table>

The response to this question was more favourable toward these minor walkways than was expected, with twice as many respondents in favour of them as opposed to them in the random sample, and an equal division of opinion in the select sample. The question, however, was not a very well worded one, especially since many of the houses do not have these minor walkways, and also since there is some ambiguity in the use of the word "rear". Most Kitimat residents were probably aware of what was meant, although it may not have been clear whether the question referred to the specific situation at their dwelling or to the general situation in Kitimat. This question was also left blank.
more times than some of the others, indicating some ambiguity or a feeling that it did not apply to the respondents particular case.

It should also be remembered that there may be a tendency to associate the minor walkways system with the reverse orientation of housing, and since this latter feature is generally disliked, the minor walkway system would likewise be unfavourably considered. Basically, however, the overall pedestrian circulation system would be little affected by the house orientation.

A total of 43 of the respondents actually had minor walkways along their rear property line. This group was somewhat more in favour of them, with 2.6 "yes" replies for every "no" reply. It was noted that the replies were more favourable where the minor walkway connected conveniently to an arterial walkway which gave convenient access to schools or shopping.

Many homes have not provided direct access to the walkways. This is often the case when the street provides a more direct route to a destination. A further problem arises in winter, since Kitimat often experiences a number of quite heavy snowfalls. Keeping individual accesses open to the walkway system entails shovelling out a second route from the house, since the exit to the street generally has to be shovelled out anyway. Furthermore many of the minor walkways are not cleared of snow if residents, and school children in particular, can just
as easily use the local street to reach the arterial walkways.

It is interesting to note that there have recently been several petitions from home owners to have uncompleted minor walkways constructed. There were two petitions in 1963, two in the first half of 1964, and the author is aware of one more since then. This last one is that which is shown as being undeveloped at the top of Figure 20 on page 129. These requests for development of minor walkways probably reflect a desire for better pedestrian access and a wish to do away with an unusable and sometimes unkempt area adjacent to the person's property. These minor walkways are developed on a local improvement basis with an equal sharing of costs between the affected homeowners and the municipality. They are amortized over a period of 10 years.

Comments have sometimes been made that the walkways affect a person's privacy. Question 9 asked "Do you feel that these minor public walkways affect your privacy?" and was answered as follows:

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<th>Yes</th>
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<tbody>
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<td>Random sample - No. of replies</td>
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<td>7</td>
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<tr>
<td>- Percent of total</td>
<td>28.4</td>
<td>66.4</td>
<td>5.2</td>
</tr>
<tr>
<td>Select sample - No. of replies</td>
<td>4</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>- Percent of total</td>
<td>28.6</td>
<td>57.1</td>
<td>14.3</td>
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</tbody>
</table>

The majority of respondents evidently do not feel that their privacy is affected by the minor public walkways.
The local residential streets in Kitimat appear to be a favourite play area for children. Question 10 asked "Do you feel these minor public walkways help to keep the children off the street?" The replies were:

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<th>Yes</th>
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<td>Random sample - No. of replies</td>
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<td>70</td>
<td>8</td>
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<tr>
<td>- Percent of total</td>
<td>41.8</td>
<td>52.2</td>
<td>6.0</td>
</tr>
<tr>
<td>Select sample - No. of replies</td>
<td>3</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>- Percent of total</td>
<td>21.4</td>
<td>71.4</td>
<td>7.1</td>
</tr>
</tbody>
</table>

A majority of the respondents evidently feel that the minor public walkways are not particularly effective in keeping the children off the street. The extent to which the minor walkways serve this function is at least partly dependent upon the amount of play area the children have adjacent to their home. In some places the walkways between the houses are narrow and fenced on both sides, whereas in other cases there is ample green area, especially at the ends of loops and along the interior park strips. In the latter case the open space is well used by the children, whereas in cases where there is little open space except the street and private yards, the children are more likely to use the street.

**Arterial Walkways.** While the effectiveness of the minor public walkways is questionable, the arterial walkway system appears to be an unqualified success and a distinct asset in the residential areas. Question 11 asked "Do you like the main
public walkways to the shopping centre and schools?" and was answered as follows:

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<tr>
<td>Random sample - No. of replies</td>
<td>126</td>
<td>5</td>
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<td>3</td>
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<tr>
<td>- Percent of total</td>
<td>94.1</td>
<td>3.7</td>
<td>2.2</td>
<td></td>
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<tr>
<td>Select sample - No. of replies</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>- Percent of total</td>
<td>85.7</td>
<td>7.1</td>
<td>7.1</td>
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There were over 25 respondents in favour of the main walkways to each one opposed in the random sample, with 12 in favour to one opposed in the select sample. This was the most unanimous answer to any question on the questionnaire. In addition to the questionnaire responses, the personal interviews unanimously favoured the main arterial walkways.

The next question asked "Would you prefer sidewalks along the street only?" The replies were:

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<tr>
<td>Random sample - No. of replies</td>
<td>26</td>
<td>106</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>- Percent of total</td>
<td>19.4</td>
<td>79.1</td>
<td>1.5</td>
<td></td>
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<tr>
<td>Select sample - No. of replies</td>
<td>2</td>
<td>9</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>- Percent of total</td>
<td>14.3</td>
<td>64.3</td>
<td>21.4</td>
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While there may have been some confusion in this question as to whether it meant sidewalks along the street in place of the walkways between the houses, or whether it also meant in place of the arterial walkway system, the large majority of the respondents indicate that they do not prefer sidewalks along
the street only. This question verifies a strong preference for at least a partial separate walkway system.

In future development, it would be quite feasible to retain the main arterial walkway system, but replace the minor walkways between the houses with sidewalks on the local streets. These sidewalks on each street could then cut through at the ends of the loops and culs-de-sac to join the main arterial walkways. Since this is the most reasonable alternative if minor walkways between houses are not provided in future development, the questionnaire included the following question to ascertain the opinions of the respondents on this modification: "Would you prefer sidewalks along the street, but also with walkways cutting through at the ends of the loop streets and culs-de-sac to the schools and shopping?" The replies to this question were:

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<tr>
<td>Random sample</td>
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<tr>
<td>No. of replies</td>
<td>94</td>
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<tr>
<td>Percent of total</td>
<td>70.1</td>
<td>28.4</td>
<td>1.5</td>
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<tr>
<td>Select sample</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of replies</td>
<td>9</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Percent of total</td>
<td>64.3</td>
<td>28.6</td>
<td>7.1</td>
</tr>
</tbody>
</table>

Over two-thirds of the respondents indicated a preference for sidewalks along the local streets rather than between the houses, provided that the main arterial walkway system is retained.
While the residents of Kitimat are very strongly in favour of the arterial walkways, no survey was done of the actual amount of usage involved. The only data available is from a survey done of the Nechako Neighbourhood in 1957 by the Kitimat Planning Department. Phone calls were made to 230 households, taking in every street. From the answers received it was learned that while 58 percent owned a car, 60 percent did most of their travelling in the Nechako Neighbourhood on foot. Twenty-two percent walked or rode on a 50-50 basis. Eighteen percent usually took their car. The reasons for walking varied from "Have to - Mr. Smith has the car at the plant all day" to "We enjoy the exercise and the baby must have his airing." Whatever the reasons, the survey showed nearly two out of every three contacted in the survey had the walking habit. While car ownership is now much higher than when the survey was done in 1957, indications are that considerable walking is still done in the Nechako Neighbourhood.

In summary, it is evident that the main walkway system generally serves its function quite well, especially as a means of ensuring the safety of the children on their way to school. It is also well used for trips to community and shopping facilities at the neighbourhood centre, and is well suited to those

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5 Kitimat Planning Department, A Walkway Programme for 1958, Kitimat: December 1957. Appendix "D".
persons who wish to walk for an outing or visit friends. The environment is quite pleasant for the pedestrian when completely separated from vehicular traffic. One of the reasons the arterial walkway system works well, especially in the Nechako Neighbourhood, is that it has been carried out on a large enough scale to serve a number of purposes. Many applications of the Radburn plan in other locations have been on too small a scale and have provided walkways which are not used to any great extent because they do not lead anywhere in particular. To be successful the arterial walkways must link with the main focal points, maintain good continuity, be reasonably direct and free of conflict with other uses, and preferably be in a pleasant environment. While certain modifications may be desirable, the arterial walkway system in Kitimat is an unqualified success and should definitely be continued in future Kitimat development.

The system of minor walkways has been less satisfactory, however, and in many cases could be replaced by short walks from the ends of loops and culs-de-sac to the arterial walkways.

Street System

The Kitimat street system can be classified into local streets which serve the homes, minor and major collectors which feed the neighbourhoods, and limited access arterial routes which surround the neighbourhoods and connect with various
functions throughout the town. The local access streets extend inwards from the peripheral arterials in the form of loops or culs-de-sac, but do not cut through the neighbourhoods. The system has functioned quite well and the peripheral arterial system is particularly effective in moving traffic quickly between different areas of the town. Photos showing examples of the different street categories are included in Figure 21 on page 139.

The widths of the different categories of street are as follows:

- **Local streets**  - 50 ft. street allowance with 24 ft. pavement.
- **Minor collector**  - 60 ft. street allowance with 32 ft. pavement.
- **Major collector**  - 80 ft. street allowance with 32 ft. pavement.
- **Limited access**  - 132 ft. street allowance with 32 ft. pavement. This can later be widened to a four lane divided street.

The width of the local residential streets is generally not excessive in view of the local climatic conditions. During periods of heavy snow there is sometimes little turning room for entry to driveways which slope up from the street. Also the most efficient method of snow removal on residential streets is to push the snow from each side to the centre with a plow, where it is then removed by a rotary blower. Any lesser pavement width would render one side of the street
Major collector route separates two superblocks of Neighbourhood "A" and also serves the Neighbourhood Centre.

Peripheral arterial streets with limited access surround the neighbourhood and move traffic rapidly.

FIGURE 21
AUTOMOBILE CIRCULATION
unusable during the plowing operation. This system works well because no snow is pushed into driveway entrances. No cars are allowed to park on the streets overnight and thus there is no interference with snow clearing operations.

A considerable number of the local residential streets are in the form of culs-de-sac, although the loop streets are more prevalent. The loop streets have generally been more satisfactory, especially in winter when some difficulty has been encountered at the ends of the culs-de-sac with the plowing of snow. The loop street does not offer complete separation between vehicular and pedestrian traffic, but since only local traffic is involved this is not a serious problem, and it has the advantage that the movement of traffic is continuous.

There has been some criticism of the distance that one must sometimes drive to reach a destination which may be only a short distance away in the same neighbourhood. However the advantage of keeping through traffic out of the residential areas, as well as the advantage of a free flow of traffic on the arterial routes, considerably outweighs the disadvantage encountered when one must drive around the neighbourhood to reach a location which is only a short distance away in a direct line.

To determine whether the residents feel the street system is a good one, two questions relating to this subject
were asked on the questionnaire. The first (question 14) asked "Do you like the overall street layout?", and was answered as follows:

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<td>17</td>
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<td>- Percent of total</td>
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<td>12.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Select sample - No. of replies</td>
<td>12</td>
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<td>1</td>
</tr>
<tr>
<td>- Percent of total</td>
<td>85.7</td>
<td>7.1</td>
<td>7.1</td>
</tr>
</tbody>
</table>

Generally the acceptance of the street pattern is good. To verify this question, a second one (No. 15) was included which asked "Would you prefer a rectangular street system?", with the following result:

<table>
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<tr>
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<th>Yes</th>
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</tr>
</thead>
<tbody>
<tr>
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<td>107</td>
<td>4</td>
</tr>
<tr>
<td>- Percent of total</td>
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<tr>
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<td>12</td>
<td>0</td>
</tr>
<tr>
<td>- Percent of total</td>
<td>14.3</td>
<td>85.7</td>
<td>0.0</td>
</tr>
</tbody>
</table>

The large majority of Kitimat residents, by a margin of about five to one, state that they do not prefer a rectangular street system. No attempt was made to correlate the replies with the length of time the respondent had lived in Kitimat, although this could be significant in that many of the people first coming to a community are used to the grid system and take time to become accustomed to something else.
In summary, it can be said that apart from a few minor problems such as snow clearing at the ends of culs-de-sac, the street system as developed in Kitimat has proven quite satisfactory. Most of the residents agree with it and indicate by a large majority that they prefer it to a grid system.

V. RESIDENTIAL AREAS

Some aspects of the Kitimat residential areas have already been discussed in the sections of this chapter on the general layout and the circulation system. The subject is a broad one and time does not permit a detailed study of many of the features of the residential areas. However some of the more contentious items such as residential density, housing types and housing orientation are covered.

Residential Density and Housing Types

Kitimat has been criticized by some writers on its low density development and what appears to be a transplanting of suburbs of southern cities into a wilderness area. It is inferred that the development should have been a more compact one and contained much less single family housing. Basically a higher density would have involved cutting down on the green areas, decreasing lot sizes, providing more multiple family housing, or any combination of these.

The planned densities in the Kitimat neighbourhoods varied from a low of 3.0 families per gross acre to a high of
just over 5.0 families per gross acre, as outlined in Table IV on page 70. The neighbourhoods where development has taken place to date, namely "A", "C", and "B", were planned to have densities ranging from 4.5 to a little over 5.0. The density is calculated on the basis of buildable land, excluding gullies and ravines, but including grade schools, park and community centre areas, and roads inside the neighbourhood. Most lot sizes are about 6,000 square feet or a little less, with a depth of 100 feet and a width of about 60 feet. Lots at the ends of culs-de-sac and loops are generally a little larger, while lots for row housing are smaller. Thus lot sizes are not large when compared to typical Canadian subdivision standards. The green areas within the neighbourhoods do however have a significant effect in contributing to a low overall density. Figure 22 on page 144 and Figure 23 on page 145 show the existing buildings and lots in each neighbourhood and give some idea of lot sizes in different areas and the distribution of dwellings, as well as an indication of the amount of interior park area. The specific areas designated for each type of dwelling are best illustrated on the zoning maps included in Appendix H on page 217.

When Neighbourhood "A" was originally planned it was to contain 1,412 dwelling units, of which 17% were to be single family houses, 22% were in twin houses, 43\(\frac{1}{2}\)% in group or row houses, and 17\(\frac{1}{2}\)% in apartments. Actual development resulted in
EXISTING DEVELOPMENT IN NEIGHBOURHOOD "A" (NECHAKO) AND PART OF NEIGHBOURHOOD "B" (WHITESAIL)
EXISTING DEVELOPMENT IN NEIGHBOURHOOD "C" (KILDALA)
41% single family houses, 23% twin houses, 12% row houses and 25% apartments. The change was an increase in single family houses and apartments at the expense of row houses. It resulted in a lower overall density for the neighbourhood, although some of this decrease in density may also have been due to some changes made in the physical layout of the area.

While the change in the planned proportion of each housing type in Neighbourhood "A" has been criticized as decreasing what may already have been too low a density, there are two specific points which should be mentioned.

The first point is that the proportion of each housing type as planned for Neighbourhood "A" did not represent what the planners envisaged for the community as a whole. The high proportion of multiple family housing in the first neighbourhood, i.e., Neighbourhood "A", was meant to accommodate the expected high initial proportion of small families and construction personnel, many of whom would not be remaining in Kitimat. Later neighbourhoods to be developed were to have much less multiple family housing. For example Neighbourhood "D" was to have only 10% apartments and 10% row housing. While no actual figures were obtained, the present proportion of multiple family housing in the developed areas is probably greater than what the planners would have recommended for the community as a whole if it had progressed to its later stages of development.
The second point to be mentioned is that in spite of criticisms that Kitimat may have too high a proportion of single and two-family dwellings, the multiple family dwellings have had much higher vacancy rates from the 1957 construction cutback up to the present time. Close to half of the apartments have been empty during this period. Table V on page 148 has been included to show housing occupancies by type in the period 1958 to 1964 inclusive. Vacancy rates were high for the apartments and the 1956 project houses, whereas they were almost nil for the private houses and fairly low for the 1954 project houses. While these figures give some indication of demand, it would be misleading to rely too heavily upon them because abnormal cost factors have considerably distorted the situation. For example prices of project houses were fixed and reflected the cost of construction rather than their value in a free market. During the construction period the housing contractors were asking more and more for their houses and prices were rapidly becoming very unrealistic. Consequently a 1956 project house was much more expensive than an otherwise comparable 1954 project house, resulting in a much lower vacancy rate for the 1954 houses as shown in Table V.

The almost nil vacancy rate for the private houses is only partly accounted for by their superior quality as compared to the project houses. An equally important reason is that the prices of most of these private houses were operating in a free
### TABLE V

**HOUSING OCCUPANCIES BY TYPE**  
(1958 to 1964 inclusive)

#### NON-RENTAL UNITS

<table>
<thead>
<tr>
<th>Year (May 1)</th>
<th>Project Houses</th>
<th>Privately Built Houses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Built 1954</td>
<td>Built 1955</td>
<td>Built 1956</td>
</tr>
<tr>
<td>1958</td>
<td>420</td>
<td>22</td>
<td>342</td>
</tr>
<tr>
<td>1959</td>
<td>369</td>
<td>73</td>
<td>277</td>
</tr>
<tr>
<td>1960</td>
<td>375</td>
<td>67</td>
<td>251</td>
</tr>
<tr>
<td>1961</td>
<td>424</td>
<td>18</td>
<td>293</td>
</tr>
<tr>
<td>1962</td>
<td>438</td>
<td>4</td>
<td>313</td>
</tr>
<tr>
<td>1963</td>
<td>436</td>
<td>6</td>
<td>316</td>
</tr>
<tr>
<td>1964</td>
<td>439</td>
<td>3</td>
<td>336</td>
</tr>
</tbody>
</table>

**SOURCE:** Alcan Property Department.

#### RENTAL UNITS

<table>
<thead>
<tr>
<th>Year (May 1)</th>
<th>Apartments</th>
<th>Alcan Houses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958</td>
<td>72</td>
<td>24</td>
</tr>
<tr>
<td>1959</td>
<td>37</td>
<td>59</td>
</tr>
<tr>
<td>1960</td>
<td>50</td>
<td>46</td>
</tr>
<tr>
<td>1961</td>
<td>90</td>
<td>6</td>
</tr>
<tr>
<td>1962</td>
<td>63</td>
<td>33</td>
</tr>
<tr>
<td>1963</td>
<td>64</td>
<td>32</td>
</tr>
<tr>
<td>1964</td>
<td>76</td>
<td>20</td>
</tr>
</tbody>
</table>

**SOURCE:** Alcan Property Department.
but inflated market, whereas the purchase price of project houses remained fixed in spite of high vacancies. Naturally project house prices could not be dropped to a point where all houses would be filled, because the housing supply exceeded the demand. The abnormal pricing situation does however partly explain the very low vacancy rate for the private housing.

A further distortion in the housing market was caused by the program of providing bonuses to Alcan employees to offset the high housing costs. This policy was fine for the employees but created imbalances in the price structure which made it difficult for other non-company people.

The whole subject of housing prices is an interesting one as it affects Kitimat. The subject is too lengthy to cover adequately in this thesis, but it presents problems which have important implications for new towns in isolated areas.

It is evident from the foregoing that caution must be used in interpreting vacancy rates of housing as an indication of demand for specific housing types, especially in cases where artificial price factors have not been applied uniformly. Sufficient information is not available about the situation in Kitimat to determine whether the disproportionately high vacancy rate in apartment units is greatly influenced by pricing policies which do not reflect the relative cost of providing apartment housing as compared to other types. It generally appears, however, that the majority of people in Kitimat desire
a single family or at least a semi-detached house in preference to apartment or row housing accommodation. Good design of multiple family dwellings could have a considerable effect on preferences, but in the absence of significant improvements in these types of dwellings, and in view of the large number of vacant apartments in Kitimat, the proportion of multiple family dwellings should not be increased in spite of criticisms of Kitimat by several writers inferring the contrary.

There are many opinions as to what form housing should take in a new town such as Kitimat. These opinions range all the way from primarily single family dwellings to compact developments comprised entirely of high density apartment units. The latter suggestion for a very high density has often been proposed for northern new towns, and it has some validity in a severe climate. However it is not valid in the case of Kitimat any more than it would be say in a community in southern Ontario or British Columbia. Furthermore in a case such as Kitimat there is no alternate choice for the residents, and to force all people to live in a type of housing they may not like could have serious repercussions on the success of the community. The choice of a high proportion of low density dwellings for Kitimat appears to have been the proper policy to follow under the circumstances.

The quality of housing design and construction was a factor which received far too little consideration in Kitimat,
partly as a consequence of the very rushed conditions and the severe shortage of skilled labour during the construction period. Most of the houses were built by private developers, mainly from the Vancouver area, who were generally left to build as they saw fit. The standards of construction were those imposed by the National Housing Act as a condition of N.H.A. financing. As Richardson states:

In terms of space, Kitimat houses and apartments are quite acceptable; in terms of solidity of construction they are no better than N.H.A minimum, which is not high; in terms of appearance they are at best undistinguished and at worst quite bad.6

While the appearance of much of the housing leaves much to be desired, it is improving as the residents provide more variety in colour and trim. The landscaping is becoming more evident and the vegetation is growing higher and hiding many of the poor design features. The apartment buildings however, are sadly lacking in any adequate attempt to improve their appearance by landscaping and tree planting. In fact the appearance of the town as a whole could be greatly improved by a more intensive program of planting selected types of trees in many locations. Overhead wiring is another major eyesore detracting from the appearance of the community. The most frequently mentioned single suggestion on the questionnaires

returned by the residents was that the wiring be put underground.

Lack of variety in design is another obvious shortcoming, especially in apartments. In a total of about 60 apartment buildings there are only three different types. In any future apartment development, consideration should also be given to the garden apartment to provide better accommodation for the many families with children.

Orientation of Housing

One of the features of the Radburn principle is that the living areas of houses face away from the street and onto an interior green area and walkway system. The majority of Kitimat housing, especially the project housing, has been oriented in this manner. It is however, one of the most contentious aspects of the development and warrants study in some detail.

The Radburn principle as it applies to single family housing visualizes the dwellings fronting onto common green areas away from the street, providing places for children to play and people to walk with no conflict with vehicular movement on the streets. The proper functioning of this system requires that either a substantial public green area be provided or that at least part of the private yard space be unfenced and available for common usage. Although this criterion is at least partially satisfied in Kitimat at the ends of loops, culs-de-sac and along park strips, it is not
satisfied in the majority of cases where there is only a relatively narrow walkway allowance between the private lots, most of which are in turn fenced off from the walkway. In this latter situation there is no more advantage in having the house face away from the street than there is in any other type of residential area layout.

In order to ascertain the attitudes of the residents to this particular innovation, a question (No. 7) was included in the survey on this subject, and asked "Would you prefer the house facing the street rather than away from the street?" The replies were:

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Left</th>
<th>Blank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sample</td>
<td>102</td>
<td>25</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>- Percent of total</td>
<td>76.1</td>
<td>18.7</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td>Select sample</td>
<td>9</td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>- Percent of total</td>
<td>64.3</td>
<td>28.6</td>
<td>7.1</td>
<td></td>
</tr>
</tbody>
</table>

The results indicate a strong preference for the housing facing the street, although most of the respondents actually lived in housing which faced away. However, while there were 4.1 persons in the random sample preferring an orientation facing the street for each person preferring a reverse orientation, and a similar but less pronounced preference of 2.3 to 1 in the select sample, there were still a total of 29 replies favouring an orientation away from the street.
It is evident that a number of factors are important in consideration of what is the best house orientation on a lot. These include direction of view and open space, relationship to other buildings, as well as the design of the dwelling itself. An attempt is therefore made to determine to what extent the Kitimat preference is influenced by the particular site characteristics of the respondent's dwellings.

The returns from both the random and select samples were pooled and those relating to houses which faced away from the street were stratified into three groups. The first included those which faced only a walkway (not necessarily developed) and another house beyond, with no green area or park strip between except the privately owned yard space. The second group included those which faced upon a park strip, ravine or other substantial green area, and were generally at the ends of loops or culs-de-sac. The third group included those which had an excellent view in the direction away from the street, such as looking down Kitimat Arm from the south side of the Nechako neighbourhood. Question No. 2, which asked "Would you prefer the house facing the street rather than away from the street?" was answered by the three groups as follows:
<table>
<thead>
<tr>
<th>Respondent's house facing walkway only</th>
<th>Yes</th>
<th>No</th>
<th>Blank</th>
</tr>
</thead>
<tbody>
<tr>
<td>- No. of replies</td>
<td>47</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>- Percent of total</td>
<td>81.0</td>
<td>13.8</td>
<td>5.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Respondent's house facing green areas</th>
<th>Yes</th>
<th>No</th>
<th>Blank</th>
</tr>
</thead>
<tbody>
<tr>
<td>- No. of replies</td>
<td>21</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>- Percent of total</td>
<td>65.6</td>
<td>31.2</td>
<td>3.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Respondent's house facing excellent view</th>
<th>Yes</th>
<th>No</th>
<th>Blank</th>
</tr>
</thead>
<tbody>
<tr>
<td>- No. of replies</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>- Percent of total</td>
<td>33.3</td>
<td>50.0</td>
<td>16.7</td>
</tr>
</tbody>
</table>

The results from the stratified samples above indicate a more favourable attitude toward a "reverse" orientation of the house when there is some attraction in the direction it is facing. This finding is what one would expect and merely verifies the idea that the site characteristics of a particular lot are important considerations in the question of house orientation. It is significant that where there is no specific amenity beyond the lot boundary, where the houses face a walkway only, the respondents are almost 6 to 1 in favour of the houses facing the street.

Nothing was included in the questionnaire whereby an indication could be obtained as to why the people generally preferred a house orientation facing the street. While some of the feeling may be attributed to the fact that this is the way most houses normally face and people often take time to accept something they are unaccustomed to, there are a number of other factors which should be considered.
One consideration regarding house orientation is that most of the activity is still directed toward the street. In much of the Kitimat situation, the open space as represented by the distance between houses is greater on the street side, allowing for a freer view in the direction of the street.

It was also pointed out that the treatment of aesthetics is more difficult when the house is facing away from the street. In Kitimat the reverse orientation has contributed to a poor housing appearance from the street side, although good house design could overcome much of this problem. The preponderence of mass built project housing is probably more to blame for the poor appearance than is the house orientation itself. Poorly sited and designed garages and carports also detract from the street appearance. Clotheslines were a forgotten item and the lack of distinction between what is front and back of a house often results in clotheslines out both directions. Proper control at the beginning could have kept them in sideyards. Even though most Kitimat people have clothes dryers, occasional airing of clothes is important to the average housewife.

The orientation of most of the houses away from the street has not proven very successful in Kitimat and the indiscriminate application of this principle should be avoided in future development unless the houses are specifically sited and designed for this innovation. Most important is the question of good individual house design and a greater
consideration of the merits of each site. Housing which is specifically designed for a reverse orientation can be reasonably successful in most cases, and the principle can be quite advantageously used where a good view is obtained in the direction away from the street, or at the ends of loops or culs-de-sac abutting open green areas. Multiple family housing developments, especially where open space is not privately utilized by each unit could also function well with this arrangement. It is not satisfactory however, merely to take a house of normal design and simply reverse the direction it faces. Kitimat's problem is at least partially that of a prototype house sited in a standardized way on each lot, without regard to house grouping or the characteristics of each site.

Mr. J. E. Dudley, who was manager of real estate and development for Kitimat Townsite for Alcan during the construction period, mentioned in an interview that the reverse orientation of housing can evolve with any street pattern, and that it is not necessarily governed by physical planning. This is a valid point and brings up the basic question of whether the orientation of single family housing is really important in terms of the other elements of the Radburn principle. In most cases in Kitimat it would probably have little effect on the walkway system, interior park areas, general layout and
neighbourhood units.

VI. COMMERCIAL AREAS

As was mentioned previously in the description of the Master Plan, the commercial needs of Kitimat were to be provided for at a City Centre and a number of neighbourhood centres, although certain service, storage and supply businesses, repair shops, auto sales and the like were to be contained in the Service Centre. To date development has taken place at the City Centre, Neighbourhood "A" Centre, and at the Service Centre.

The first commercial facilities to be built in the townsite were those at the Neighbourhood "A" Centre. Also a hotel and a number of other businesses were started in the Service Centre prior to the City Centre development. The development of certain uses in these other locations would not have been of much significance to the City Centre if the 1957 curtailment of construction had not taken place. With little more than two residential neighbourhoods developed however, the result is that the City Centre is now somewhat weak as the main focal point within the town.

The existing City Centre is by no means subordinate to the Neighbourhood "A" Centre or the Service Centre, but it is lacking in several uses which are basically central area functions for the present size of community. Examples are the
hotel and liquor store in the Service Centre, the library and theatre in the Neighbourhood "A" Centre, the YMCA at the west side of Neighbourhood "C", and the Municipal Hall on the south side of Neighbourhood "A". While there is considerable activity at the City Centre during shopping and office hours, it is much quieter in the evenings than what it would be if it contained the hotel, theatre, library and YMCA.

The above problem was not so much an oversight in the planning of the town but rather a result of specific circumstances and a matter of the town development being stopped at a somewhat critical stage. If the next two or more neighbourhoods on the schedule had developed, then the City Centre would have been a prime focal point and far stronger than any neighbourhood centre. On the other hand if the development had stopped upon completion of Neighbourhood "A" there would have been a tendency for the Neighbourhood "A" centre to develop excessively to the detriment of a future City Centre. As things have happened, there is some inconvenience at the present time, but the problem will disappear as the community grows, provided of course that uses whose proper location is in the City Centre are not allowed to develop at other locations. The situation illustrates clearly the importance of an early start on the central area in new town development, as well as the need for a staging program which keeps all areas and functions properly related to each other at all stages of the town growth. This
is particularly important because it is never certain that the
growth will be continuous or completed to the ultimate stage
planned.

Ideally the City Centre should be developed first and
the first residential areas related closely to it. Admittedly
there were difficulties in doing this effectively in Kitimat
and there were a number of good reasons for the sequence of
development which was followed. The Kitimat planners emphasized
the importance of early development of the City Centre in the
Kitimat Townsite Report, although it is unlikely that serious
consideration was given to the possibility of the construction
program coming to an abrupt halt at such an early stage.

Every effort should be made to strengthen the position
of the City Centre as the central focus of the community.
Furthermore the present City Centre has too much similarity to
a shopping centre complex with large areas of parking around it.
This latter aspect of the existing centre, along with its
weakness as a central area, is to a great extent responsible for
the commonly heard complaint about the lack of a "main street".
The development of pedestrian malls and squares to give a sense
of enclosure and protection from the wind and rain, and to
provide better areas of pedestrian circulation would help achieve
a greater feeling of urbanity. Also car parking areas should not
be allowed to become too extensive without being separated by
buildings and greenery. The plan for the City Centre provides
for much of this in the later stages of development. However the uncertainty regarding the future growth rate may bring about a tendency to disregard certain elements of the City Centre plan as growth slowly takes place. While modifications in siting of buildings are inevitable, the basic principles of enclosed malls, good pedestrian circulation, and separation of pedestrian and vehicular traffic should be respected. The present City Centre development has not progressed far enough to illustrate the advantages of these concepts and they could easily be forgotten.

While Kitimat's ultimate planned for population of 45,000 people may seem far away, a population of 25,000 to 30,000 is well within reach if a pulp mill is built and if the aluminum plant is expanded to the capacity determined by the available power. Assuming that such industrial development takes place, and the probability is good that it eventually will, the first residential expansion should logically take place on the already partially serviced lots in Neighbourhood "B". After that however, expansion should take place starting in the western part of Neighbourhood "D" in order to strengthen the City Centre. No neighbourhood centres should be provided in either of these neighbourhoods until they are both well along with their development. A policy such as this would do much to strengthen the City Centre. After this point is reached however, the development of more neighbourhood centres would be of less significance
to the City Centre.

The Neighbourhood "C" centre is the only developed
neighbourhood centre in Kitimat and the concept has proven
quite workable, provided that a proper relationship to the
central area facilities is maintained.

A problem which was occasionally mentioned in the
interviews concerns the degree of control which should be
exercised in a City Centre development such as Kitimat. For
example it is claimed that some businesses have moved to Terrace
because of excessive control in Kitimat. Since Terrace is
nearly 40 miles away, the problem is not too serious for Kitimat,
but it could be significant in other new town developments
if older communities are closer, such as has happened at the
site of another Alcan smelter at Arvida in the province of
Quebec. Another question concerns how the little man gets
started in business if he has little capital. Also tight
control in the commercial areas results in greater pressure for
home occupations, which is a factor of some significance in
Kitimat. These are questions with uncertain answers, except
to say there is an optimum situation where what is most desirable
in terms of aesthetics and good development is balanced against
what is most desirable for an efficient business and adequate
competition to avoid monopoly situations detrimental to the
community. Similar problems arise as to what are reasonable
land pricing and land tenure policies for commercial areas. They
too are important in the ability of business to complete as well as being a factor in promoting pressure for certain uses to locate elsewhere in the community, such as in the Service Centre instead of the City Centre.

Complaints are common in Kitimat about the commercial facilities and the lack of competition, and the resultant poor choice of goods and poor service. While some of these complaints are exaggerated, others have validity. The greatest hope for improvement here is for another industry, which would mean more people and give greater diversity to the community. Too much dependence on one industry makes smaller service type businesses more reluctant to invest money in a community.

VII. INDUSTRIAL AREAS

The Kitimat industrial area, situated on the west side of the valley at the head of Kitimat Arm, is well suited for a large scale industry such as an aluminum smelter. When the smelter reaches its ultimate size it will stretch for a distance of two and one half miles, so that a large continuous flat area was a prime requirement. The site is physically well removed from the townsite, but only a few minutes away by car. Prevailing winds are usually parallel to the direction of the valley, so that smoke from the smelter hugs the west side of the valley and seldom drifts toward the townsite. The site chosen for the smelter is the most logical one available.
While the aluminum plant expansion was seriously curtailed in 1957 and expansion since 1960 has taken place at only a modest rate, the probability is good that the operation will eventually expand up to its full capacity of 550,000 tons. Present capacity is 212,000 tons per annum and construction work is in progress to bring it to 232,000 tons by the summer of 1966. If the smelter expands much further, the second tunnel will be required at the Kemano power station. Since much of the capital cost of providing the extra electrical power has already been expended on facilities such as the Kenney dam, the marginal cost of this second increment of power should be much lower than the first, especially if the work is done under less rushed conditions.

Further expansion of the aluminum plant will of course depend on the world demand for aluminum and the degree to which restrictions are imposed on aluminum imports by other countries. It should be remembered however, that Kitimat is only one unit of Aluminium Limited's total operation, and an expansion of Kitimat to its ultimate capacity would represent only about a 30% increase in their total ingot capacity and perhaps a 5 to 10% increase in their total integrated aluminum operations. If the need arises the company has substantial resources behind it to increase the Kitimat operation.

As mentioned on page 97, a pulp and paper mill has been proposed on several occasions for Kitimat. Alcan itself has
actively sought to interest such an industry in the town. At the time of writing there are two applications to the B. C. Government for timber for such a development.

In the original plan for the industrial area, space was left for a future pulp mill. However it appears that the forest companies prefer a site at Emsley Cove, about 5 or 6 miles down the inlet from the smelter. This would involve extending the road and railway down the west shore of Kitimat Arm to the new site. This will mean a separation of the industrial area, but since the author is not familiar with the reasons for such a choice of location, it is not possible to comment reliably about it. Site requirements such as adequate space, good foundation conditions, adequate water supply and a good log handling area and wharfage area on the waterfront are important considerations for a pulp and paper mill.

If a pulp mill is built at Emsley Cove it is imperative that the Kitimat Municipal boundaries be extended to include it and that its workers live in Kitimat. The MacMillan Bloedel and Powell River Company, prior to their decision not to go ahead with their pulp mill proposal because they were awarded insufficient timber, were planning to have their plant within a revised Municipal boundary. Presumably the new applicants have the same intentions for inclusion of their operation within the Municipality. This should in fact be a condition attached
to the awarding of the timber resources by the Provincial Government.

Assuming that the aluminum plant eventually expands to its ultimate capacity, and a pulp mill is built, the basic employment within Kitimat would likely reach about 6,000, comprised of 5,000 in the aluminum plant and 1,000 in the pulp mill and logging. In 1961 the ratio of the basic industry employment to the total population was about 0.26. This figure now appears to be about 0.22 and may go a little lower as the community grows larger. If the ratio is assumed to read 0.20, the total population of the community would be about 30,000 for a total basic employment of about 6,000. This would seem to be a more realistic population estimate for the anticipated economic base than was the Master Plan estimate of about 45,000. The rapid development of the northern areas of B. C. and the potential of Kitimat as a deepsea port could however affect this and could mean a more diversified economic base and a larger population in the longer term.

VIII. RECREATIONAL AREAS

One of Kitimat's assets is the opportunity for various recreational pursuits, particularly those related to the outdoors. Almost half of the attitude survey respondents mentioned recreation or the natural environment as one of the things they most liked about Kitimat. These favourable comments received
on recreation and natural environment, as listed in Appendix E, are:

- Scenic beauty of area 23
- Closeness and accessibility to outdoors and nature 19
- Good recreational facilities and sports 13
- Good fishing and hunting 7
- Good playgrounds for children 4
- Fresh clean air 4
- Mild climate 3

Total 73

While the results of this list must be balanced against the list of "dislikes", it is evident that a large proportion of Kitimat residents feel that the recreational facilities and natural surroundings are among the most desirable assets of the community.

The town generally appears well endowed with community recreational facilities, although no attempt was made to compare it with other similar size towns. There were however, many suggestions relating to improvement or addition of recreational facilities, such as the development of a park with a zoo, the need for a seaside recreation area, and the need for a golf course.

The Kitimat Master Plan envisaged a recreational area adjacent to Minette Bay. The Bay is now being and will likely continue to be used for log booming. There is no reason why however, the north end and west side of the Bay cannot be retained and developed as a park like area where it is possible
to approach the water close to the town. This is especially so in the longer term as the community grows.

Kitimat is close to the sea but public access to it leaves much to be desired. If a pulp mill is developed at Emsley Cove the west side of Kitimat Arm will be accessible at least as far south as the pulp mill. This provides an ideal opportunity to select a good site such as Bish Creek and set aside an area which can in the long term be developed into a large first class seaside recreational area and park, encompassing facilities for picnicking, camping, boat launching and other recreational pursuits, as well as a marina. This could be a Municipal or a Provincial undertaking and could be developed gradually provided that the area is set aside and not logged.

The Kitimat area is now well endowed with large trees and dense tall forest. What is often forgotten however, is that this will someday disappear. Several conservation areas should be set aside to at least provide a reminder of what once covered the whole valley. These should be in topographically interesting locations and usable as small scale wilderness parks. Examples could be a strip along Hirsch Creek for some distance above the bridge, and encompassing the canyon section; an area encompassing Robinson and Kitelse Lakes; the valley below Claque mountain which is being developed as a skiing area; and the suggestion of a first class park area down the
inlet toward the proposed pulp mill. Also several of the areas between and adjacent to the neighbourhoods should be retained in their unlogged state.

IX. POPULATION STRUCTURE

The subject of population structure is a broad one and will not be covered in any detail in this study. The only aspect which will be discussed is the problem of the imbalance of the age structure, which is of particular significance to new towns.

A new town built under circumstances such as Kitimat typically has a population structure somewhat different from normal. Figure 24 on page 170 shows a population pyramid drawn from the 1961 census data for Kitimat, and a comparison with a similar one for the whole of British Columbia. Figure 25 on page 171 compares the marital status of the Kitimat population with that of other selected B. C. communities. The most notable thing about the Kitimat population structure at the time of the 1961 census was the small number of elderly people, the large number of people in the prime child-bearing age, the small number of teen-agers, and the very large proportion of young children.

The people migrating to a new community usually include a high proportion of young married people. If the migration period is fairly short, the result is a pronounced bulge in the
FIGURE 24

COMPARISON OF KITIMAT AGE STRUCTURE
WITH THAT OF BRITISH COLUMBIA

FIGURE 25

COMPARISON OF MARITAL STATUS OF KITIMAT RESIDENTS WITH THAT OF OTHER SELECTED B.C. COMMUNITIES

population structure for the younger group, most of whom are in turn at the optimum age for child bearing. There is a resulting concentration of social needs into a series of wave crests that arise from the movement of the two initial age group peaks (0-5 years and 20-30 years) through the whole age cycle. The urgent primary school need that co-incides with initial home building is followed by a secondary school "bulge" and then a teen-age problem. The need for work and housing for the second generation follow each other closely and form the next critical period. Finally when the first generation grows old, a rapid expansion in the social provision for elderly people is required. Unless wholesale migration occurs, it may take several generations for the initial unbalance to work itself out.

The aforementioned situation is very typical of that in Kitimat. This is reflected in recent very large increases in the demand for certain school facilities, even though the total population has not increased proportionately. This "bulge" in the population will make itself evident throughout the range of community social needs in the manner outlined in the previous paragraph. The development of more industry in the community at the present time, such as the proposed pulp mill, would do much to smooth out the pronounced "bulge".

Imbalances in the population structure can present considerable problems to a community, as Kitimat is now finding
out in the heavy demand for increased school facilities. It is evident that in the development of any new town, serious efforts should be made to arrive at a balanced initial population intake, so that heavy but temporary demands are not put onto certain community facilities as the population bulge passes through the different age groups.

X. RELATIONSHIP TO THE REGION

The plan for Kitimat envisaged a town with an ultimate population of about 50,000 people, built to serve an aluminum smelter and perhaps a pulp mill. The town is located in a wide valley providing easy access to the sea. This wide low valley joins the valley of the Skeena, which provides an easy corridor through the coast mountains. Transportation links are developed along this corridor and a whole hinterland lies in this north-central area of British Columbia. Access to this hinterland from Kitimat is easy, and likewise from Prince Rupert. The two communities of Kitimat and Prince Rupert are the only locations on the whole north coast of British Columbia where large scale port facilities can be developed fairly easily and where there is ample room for a fairly large city.

The time may not be ripe for development of this interior region, for which Kitimat or Prince Rupert are logical access points to the sea, but the day will eventually come when development does take place on a larger scale. Transportation
links and port facilities will become more important. Projects such as the Stewart Cassiar Highway when linked to Highway 16 at Hazelton will do much to change the region. A number of large scale mining developments presently under way will make their contribution to the economy of the larger region.

The preceding remarks may be too optimistic for Kitimat or Prince Rupert and they may never become major cities. In fact Prince Rupert has waited half a century for its boom which has not yet arrived. The fact remains however, that these communities can and probably will play an important role in the future development of the northern interior areas. The question then arises as to whether it is valid to plan Kitimat for an ultimate population based on an aluminum smelter and a pulp mill only, when its location is also well suited to providing for other activities which may well take place in the future. Kitimat is in a very different position from most northern new towns because in the long term the community may well have a greater opportunity to diversify its economic base, depending on the course of events in the north and central areas of British Columbia.

This brings up the problem of regional planning in the development of new communities. There was no consideration of how the new town of Kitimat would fit into the development of the region. This is no criticism of Alcan, who in fact probably did far more than most companies would do to provide a desirable
community for the residents. Even if a private corporation were to consider the place of a new community in regional development, it would probably be quite ineffective since it normally does not play a part in the decision making process regarding resource development policies, location and provision of public transportation systems and various other factors which are important in determining the form that regional development will take. The only body that could function effectively in comprehensive regional development would be the Provincial Government. They are the ones who can best ensure, where possible, that communities are well related to the region and have a more diversified economic base. One of the most outstanding examples of where the Provincial Government can do this is in the location of pulp mills. In the case in point, Kitimat could be left as a single enterprise community, and a pulp mill could be built as a single enterprise community somewhere else. The result would be that neither community would be as desirable a place in which to live as they would otherwise have been if they had been located together, complementing each other and providing better community facilities for both. In situations such as this there is a critical need for planning on a regional basis. The present policy toward resource development is excessively oriented toward a single purpose approach, where each development is considered only within its own narrow terms of reference, without due
regard to its external costs and benefits to other segments of the society.
CHAPTER V

SUMMARY AND CONCLUSIONS

The new town of Kitimat was built in an undeveloped area on the north-west coast of British Columbia in response to the need for a site for an aluminum smelter, an operation which was located there because of its need for the abundant hydro power which was available in the region.

Kitimat is significant as an example of the planning of a new town. First of all the town was planned under the direction of Clarence S. Stein, who as the author of the Radburn principle, embodied this concept extensively in its physical plan. Kitimat therefore gives an opportunity to determine how well the principle works in practice when applied on a large enough scale to allow some of its features to function properly. Kitimat is also significant in that it is located in a relatively undeveloped area and was built under the typical rushed conditions of a large scale construction project. Many of the problems it encountered in its development are pertinent in the development of other new towns in isolated areas.

It is now more than a decade since the first part of Kitimat townsite was occupied in 1954, and sufficient time has thus elapsed to give some indication of how effective certain aspects of its planning have been. This study attempts to determine whether the planning principles used in Kitimat
have been successful and why, as well as to determine whether the planners succeeded in achieving what they set out to do.

Summary of the Study

There were several methods used in the evaluation - a study of the available literature on Kitimat; numerous personal interviews; a questionnaire type survey of the community; and the personal experience of the author's three years of residence in the community.

One of the first steps in determining whether the planners have been successful in what they tried to do is to consider their initial objectives and determine whether these have been achieved. Stein interpreted Alcan's basic objective as being the industrial success of the plant. How well this has been achieved in economic terms is not known since it is an internal accounting matter and from outside the company there is no way of knowing how well a particular unit of a much larger operation is doing financially. The plant is operating efficiently however and is presumably an economically competitive operation, although the high construction costs during the inflationary period in which much of the facility was built could entail some initial disadvantage.

A big factor in the basic objective of the industrial success of the plant is the degree to which the workers are content and like living in Kitimat. The general opinion expressed in the survey of the community is that it is a
relatively good place in which to live. There does not appear to be any significant animosity toward either the town or Alcan, although there are several problems with respect to housing which are apparent, and the wet and overcast fall and winter season and the relative isolation are undesirable features of the location. These latter environmental factors are, however, somewhat offset by the scenic beauty of the area and the excellent opportunities for outdoor recreation.

The basic objectives also stressed that "family needs, above all else, form the basis of the Kitimat Plan . . . ." The evaluation indicates that Kitimat is an excellent community in which to raise children and this opinion is expressed by a large majority of the residents. The separation of pedestrian and vehicular traffic, the adequate play areas, and the walkway systems to schools are features of the plan which are definite assets for the children.

The results of the study indicate that the basic objectives initially put forth for the development of the town have been reasonably well achieved.

The next part of the evaluation consists of a study of various aspects of Kitimat, particularly those related to the Radburn principle, and an attempt to determine how successful they have proven and why.

The general layout of the community as a whole was found to be good and it functions well. The concept of bounding
the neighbourhoods by arterial traffic streets but keeping through traffic out of the centre of the neighbourhood is excellent. There have been criticisms of the community and its lack of consideration for the climate in its physical plan. While these criticisms have some application to some of the housing, and certain aspects of the commercial areas such as lack of adequate canopies and partially enclosed areas, they were not found to be valid in the overall physical plan. The argument that Kitimat should have been a compact high density community because of its climate has no more validity for Kitimat than for any other Canadian community.

Criticisms have been put forward by some writers that Kitimat is merely a transplanting of suburbs of southern cities into a northern area. On closer scrutiny however, the Kitimat residential area layout has very little similarity to normal subdivision designs in other areas, and appears to be far superior in practice. On the other hand the quality and design of the project housing leaves much to be desired. The criticism is basically an opinion that there should be more high density development and better housing design. The latter point regarding design is valid, but the former regarding density does not appear to have validity in view of existing conditions. Although some modifications might have been desirable, Stein's concept of a low density development appears to have been the proper one to follow under the circumstances.
The separation of pedestrian and vehicular traffic is a decided asset as far as the arterial walkway system is concerned. While many of the minor walkways between the houses are not well used, the arterial walkway system is one of the most successful features of the residential layout. It is well used and the survey results indicate the residents are almost unanimously in favour of it.

The orientation of the houses to face in the direction away from the street is generally disliked by the residents, although the preference is considerably influenced by the house location. Poor house design is perhaps as much at fault here as is the orientation of the house. Basically the orientation of the house does not prove itself to be important with respect to the other elements of the Radburn principle.

Poor quality and design of much of the project housing has been detrimental to the community. The quality of housing is a very important factor in the development of any new town and can contribute to considerable dissatisfaction if it is not good.

The concept of a neighbourhood commercial centre has been quite successful in the case of Neighbourhood "A". However, there is a problem of weakening the City Centre in the initial stages. In Kitimat's case, the City Centre is not nearly as strong a focal point within the town as would be desirable, and should be strengthened as much as possible by ensuring that uses
which belong there do not locate elsewhere.

The 1957 curtailment of the construction program clearly illustrated the need for a staging of development in new towns which allows a good relationship of all areas and uses to each other at all stages of the development. It is never certain that growth will be continuous or that the ultimate stage of development will be reached.

An analysis of the degree of success of the various planning features of Kitimat is important for the community because it will likely be expanding at a modest rate for the next few years. Decisions are thus necessary as to what policies to follow in various aspects of the development. It is likely that the community will soon obtain a pulp mill, which along with the gradual expansion of the aluminum plant, will require more housing and community facilities.

The Master Plan for the community is a good one and its main features should be retained in future development, although certain features such as the minor walkways have not been very successful and could be replaced by sidewalks along some of the streets and short connections from the ends of loop streets and culs-de-sac to the arterial walkway system. This modification could be tried in one area to determine its desirability. The arterial walkway system, however, should definitely be continued in future development.
Limitations of the Study

The study covered a number of different aspects of Kitimat and consequently involved a subject which was very broad in scope. This was done purposely since it was considered that with the author's experience of having lived several years in Kitimat, there would be some benefit in recording many thoughts and observations about the community. Normally however it would have been preferable to study some narrower aspect of the subject more comprehensively.

The survey questions used on the questionnaire were generally very subjective as far as the respondents were concerned. This was intentional since one of the basic assumptions in the study was that an important factor in the degree of success of a community is the attitude of its residents toward it. This approach reflected the social nature of the basic objectives for the development of the community as put forth by Stein, which in turn were intended to be at least partly satisfied by certain physical planning aspects of the Master Plan. An alternative or supplementary approach to the survey could have entailed more objective questions giving quantitative results for such items as the actual degree of usage of the walkway systems or the shopping habits of the residents as they affect the neighbourhood centre versus the City Centre.
Suggestions for Future Study

There are a number of specific features of Kitimat which have considerable significance for new town development and which could be studied in further detail to determine what problems were faced and their implications. One of the most important ones in Kitimat's case is the question of how housing should be provided and what policies should be followed with respect to pricing. The question is an important one for any new town which develops rapidly in an isolated area. There are many lessons to be learned from Kitimat on this subject both with respect to what should be done and what should not be done. More can often be learned from situations where problems have arisen than with situations where everything has progressed smoothly. The people involved in this aspect of the Kitimat development would have many comments on what pitfalls to avoid, and it is certain that they would approach many aspects of the provision of housing for Kitimat in a different manner were they to repeat the task with their present knowledge. Many of the problems arose out of the inflationary economic conditions and the extreme shortage of skilled labour during the construction period. Nevertheless policies regarding the provision of housing were a big factor and the recording of the problems and implications could be valuable.

Another study of merit might be the comparison of certain aspects of Kitimat with the equivalent aspects of another
selected community in a somewhat similar environment. An example would be Prince Rupert. Much of the evaluation of this present study gives an indication of the attitudes of the residents toward certain subjects but gives no indication of what the feeling would be if certain variables were changed.

Validity of the Hypothesis

Basically it can be said that the planners of Kitimat achieved much of what they attempted to do through the physical planning concepts which were applied in Kitimat. Certain aspects of the development have presented problems or have been limited in their degree of success, notably the design and quality of housing, the orientation of some of the housing, and the minor walkway system. However the main elements of the physical planning of the community, including those related to the Radburn principle, have proven quite successful. These include the application of the neighbourhood unit idea, the inclusion of a neighbourhood commercial centre within a neighbourhood, the separation of pedestrian and vehicular traffic as demonstrated by the arterial walkway system and interior park areas, the separation of vehicular traffic by its function, and the exclusion of through vehicular traffic from the neighbourhoods. With the reservations outlined above, the hypothesis is considered to be valid, namely "THAT THE PHYSICAL PLANNING CONCEPTS USED IN KITIMAT HAVE GENERALLY BEEN SUCCESSFUL."
BIBLIOGRAPHY
BIBLIOGRAPHY

A. BOOKS


**B. PUBLICATIONS OF THE GOVERNMENT, LEARNED SOCIETIES, AND OTHER ORGANIZATIONS**


C. PERIODICALS


Sparks, W. H. "Kitimat Townsite Development," The B. C. Professional Engineer, October, 1953, pp. 29-32.


D. UNPUBLISHED MATERIALS


Kitimat Chamber of Commerce. Kitimat To-day. 1958.


Household and Housing Characteristics for District of Kitimat. 1961 Census.


Master Plan for Service Centre, Kitimat. August 17, 1953.


E. NEWSPAPERS


Kitimat Northern Sentinel. Kitimat, B. C.

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APPENDIX "A"

KITIMAT INCORPORATION ACT

CHAPTER 49

An Act providing for the Incorporation of The Corporation of the District of Kitimat.

(Assented to 27th March, 1953)

HER MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of British Columbia, enacts as follows:--

Short title. 1. This Act may be cited as the "Kitimat Incorporation Act, 1953."

2. It shall be lawful for the Lieutenant-Governor in Council, by Letters Patent under the Great Seal, to incorporate into a district municipality forthwith, under the name of "The Corporation of the District of Kitimat," in accordance with the ensuing provisions, the tract of land described as follows, that is to say; Commencing at the south-east corner of Lot 309, Range 4, Coast Land District, being a point on the westerly high-water mark of Kitimat Arm; thence due east to the middle line of said Kitimat Arm; thence north-easterly in a straight line to the north-west corner of Indian Reserve No. 11, being Lot 1022, Range 4, Coast Land District; thence easterly to the north-east corner of said Indian Reserve No. 11; thence due east to a point due south of a point due east two and one-half miles from the north-east corner of Lot 6199, Range 5, Coast Land District, thence north to said point; thence due west to the north-east corner of said Lot 6199; thence westerly along the northerly boundary of said Lot 6199 to the north-west corner thereof; thence westerly in a straight line to the north-east corner of Lot 6087; thence westerly along the northerly boundaries of Lots 6087, 6088, 6089, 6090, 6091, 6092, 6093, and 6094; thence due west one and one-half miles; thence due south to a point due west of the south-west corner of Lot 309, Range 4, Coast
Alteration of boundaries.

3. Redefinition or alteration of the boundaries of the municipality may be effected under the provisions of the "Municipalities Incorporation Act."

Matters to be specified in Letters Patent

4. The said Letters Patent shall specify all matters referred to in section 7 of the "Municipalities Incorporation Act," and shall also specify the matters that are contained in sections 5 to 15, inclusive, of this Act.

Qualifications of Reeve and Councillors.

5. Prior to the regular annual election in December, 1954 the Reeve and Councillors shall be elected from those registered owners of real property in the municipality who are British subjects of the full age of twenty-one years and have resided within the territorial limits of the municipality for the period of three months immediately preceding the day of nomination.

Qualifications of voters.

6. (1) Any of the following persons shall be entitled to have his name entered on the list of voters, and if his name is so entered, he shall be entitled to vote at any municipal election held prior to the regular annual municipal municipal election in December, 1954, that is to say:-

(a) Any person, male or female, who is a British subject of the full age of twenty-one years and has been resident within the territorial limits of the municipality for not less than six months immediately preceding his having filed with the Returning Officer a declaration to that effect not less than one week before the closing of the list of voters.
APPENDIX "A" (continued)

(b) Any person, male or female, who is a British subject of the full age of twenty-one years and is, on the tenth day preceding the closing of the list of voters, the owner of land within the territorial limits of the municipality, and any corporation which is on such day the owner of land within the territorial limits of the municipality. For the purpose of this section, "owner" shall have the meaning assigned to it by the "Municipal Act."

(2) A corporation shall vote only by its duly authorized agent, whose authority shall be filed with the Returning Officer not less than one week before the closing of the list of voters, and who shall be a resident of the Province and a British subject of the full age of twenty-one years.

7. The assessment roll of the municipality for the year 1953 shall be prepared in accordance with the provision of the "Municipal Act," except that it shall be returned not later than the last day of the month following that in which the first election is held, and the Court of Revision shall be held on the eighteenth day of the month next ensuing, and the roll shall be completed and authenticated not later than the last day of the month in which the Court of Revision is held.

8. Upon completion and authentication of the assessment roll as aforesaid, the Council shall, on or before the fifteenth day of the month following that in which the assessment roll is authenticated, pass a by-law or by-laws as provided for in section 264 of the "Municipal Act" imposing a rate or rates upon all land or land and improvements within the municipality.

9. The chief administrative official of the municipality shall be a Municipal Manager, who shall be appointed by the Council and shall exercise such powers as may be by by-law delegated to
him pursuant to the "Municipal Manager Act": and if the by-law so provides, the Reeve may delegate to the Municipal Manager any one or more of those powers vested in the Reeve by clauses (a), (b), and (d) of section 27 of the "Municipal Act."

10. The Council may by by-law, at any time prior to the day specified in section 8, incur liabilities by borrowing such sum or sums of money, not exceeding in the whole fifty thousand dollars, as may be required for the purpose of carrying on the business of the municipality until the revenues for the year 1953 are available for that purpose; and any liabilities so incurred shall be repaid out of the revenues for the year 1953.

11. In order that the municipality, during its initial period of growth, may meet its requirements for heavy capital outlays, including those for local improvements and school purposes, the Council may, prior to the thirty-first day of December, 1955, by by-law, with the assent of the electors and notwithstanding the provisions of clause (a) of section 106 of the "Municipal Act," borrow by the issue and sale of debentures not more than the principal amount of five million dollars in the aggregate: Provided that during the calendar year 1953 not more than two million five hundred thousand dollars of the said principal amount shall be borrowed, and that during the calendar years 1953 and 1954 together not more than four million dollars of the said principal amount shall be borrowed. The provisions of this section shall not derogate from the borrowing powers of the municipality under section 106 of the "Municipal Act."

12. (1) The Council, within one year from date of incorporation or such further period as the Lieutenant-Governor in Council may determine, may by by-law, with the consent of the Lieutenant Governor in Council, declare to be public
works of general benefit to the municipality such bridges or sidewalks, or improvements to roads within the municipality as may have been constructed or partially constructed, and may provide for the reimbursement of the cost thereof to the person or persons constructing such works. In the case of uncompleted works contracted for prior to the election of the first Council, the Council may in the same by-law, or in another by-law with like consent, assume the payment of all moneys lawfully payable under any contract or contracts for the construction of such uncompleted works.

Municipal Code.

13. In addition to the power given by the "Municipal Act" to revise and consolidate the by-laws of the municipality, the Council may, instead of passing separate by-laws in the exercise of its various powers, make, alter, and repeal a comprehensive general by-law (to be known as the "Kitimat Municipal Code") dealing with all such matters within its jurisdiction as the Council shall think fit to include therein.

Town Planning.

14. The Council shall appoint a Town Planning Commission under the provisions of the "Town Planning Act."

Agreements concerning joint financing and use of public buildings.

15. The municipality shall have power from time to time to enter into agreements with any Official Trustee or any Board of School Trustees, having jurisdiction within the territorial limits of the municipality, relating to the joint construction, use, and operation of such public buildings and other public facilities for such purposes and upon such terms and conditions as the Council and such Official Trustee or Board of School Trustees considers in the best interests of the municipality and of the persons residing therein, and such Official Trustee or Board of School Trustees shall, with the approval of the Department of Education, have the power to enter into such agreements.
16. (1) All taxes levied under the "Taxation Act" and the "Public Schools Act" for the year 1952, and for any years prior thereto, upon real property within the territorial limits of the municipality shall be collected in the manner provided in those Acts.

(2) All taxes imposed under the "Taxation Act" and the "Public Schools Act" for the year 1953 upon real property within the municipality shall be deemed to be cancelled and annulled; and all such taxes that have been paid shall be refunded by the Provincial Collector of Taxes to the person who has made payment.

17. All the provisions of the "Municipal Act," the "Municipal Elections Act," and the "Municipalities Incorporation Act," and of all other Statutes and laws applicable to district municipalities shall apply to The Corporation of the District of Kitimat, except as otherwise provided by this Act.
Dear Sir or Madam,

I am doing a study on Kitimat as part of the requirement for a degree in Community and Regional Planning at the University of British Columbia and I am interested in determining just how successful certain aspects of the planning and development of Kitimat have been. I lived in Kitimat for about three years and therefore have some idea of its advantages and disadvantages. However, I would also like to get some idea of how other persons feel toward certain aspects of its planning, since the success of a community is to a large extent determined by whether its people find it a good place in which to live.

A knowledge of what features of a town have been most successful, and conversely what features have not can be important in the development of other new towns, as well as the further development of Kitimat itself.

I would very much appreciate it if you would fill in the attached questionnaire and return it in the stamped and addressed envelope which I have provided. To keep it short, the questionnaire relates primarily to residential areas, with which I am mainly concerned at present. No names or addresses of any individuals answering the questionnaire will be mentioned in the study. It is only meant to show the general attitudes of the residents of Kitimat toward the items listed.

Sincerely,

Stan Endersby,
Graduate Student,
Community & Regional Planning
University of British Columbia
ATTITUDE SURVEY
APPENDIX "C"

1.) How many years have you lived in Kitimat? __________.

2.) How many years have you lived in the present dwelling? __________.

3.) Where did you live before coming to Kitimat? __________.

4.) How many children do you have of school and pre-school age? __________.

5.) What do you think of Kitimat as a place in which to live?
   Good __________. Average __________. Poor __________.

PLEASE CHECK YES OR NO FOR THE FOLLOWING:

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<th>YES</th>
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<tr>
<td>6.) Do you think Kitimat is a good place to bring up children?</td>
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<tr>
<td>7.) Would you prefer the house facing the street rather than away from the street?</td>
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<tr>
<td>8.) Do you like the minor public walkways running along your rear property line?</td>
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<td>9.) Do you feel these minor public walkways affect your privacy?</td>
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<td>10.) Do you feel these minor public walkways help to keep the children off the street?</td>
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<td>11.) Do you like the main public walkways to the shopping center and schools?</td>
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<td>12.) Would you prefer sidewalks along the street only?</td>
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<td>13.) Would you prefer sidewalks along the street, but also with walkways cutting through at the end of the loop streets and culs-de-sac to the schools and shopping.</td>
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<td>14.) Do you like the overall street layout?</td>
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<td>15.) Would you prefer a rectangular street system?</td>
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<td>16.) Do you feel that the main recreational facilities should have been in the City Centre?</td>
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<td>17.) Would you like to have rear lanes?</td>
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</tr>
<tr>
<td>18.) Do you feel the need for local stores within walking distance of your home?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### APPENDIX "C" (continued)

<table>
<thead>
<tr>
<th>Question</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. Would you prefer businesses such as repair shops (appliances, TV, etc.) in the City Center rather than the Service Center?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Do you feel there is a serious traffic problem at the Haisla-Lahakas intersection?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Do you feel that existing suite regulations (one housekeeping suite in each dwelling unit) are desirable?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Should the number of lodgers in a house be restricted?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Should occupations such as beauty parlours, barbers and dental mechanics be allowed in homes?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Should billboards continue to be banned?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Should construction of trailer facilities for tourists be the responsibility of the Municipality?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### GENERAL QUESTIONS

26. What do you like most about living in Kitimat?

27. What do you dislike most about living in Kitimat?

28. Do you have any suggestions for planning the future development of Kitimat, and if so what are they? (Use back of sheet if necessary.)
### APPENDIX "D"

RESPONSES TO QUESTIONS 5 TO 25 OF ATTITUDE SURVEY

(See Appendix "C" for original form of questionnaire)

NOTE: The figures which are not underlined indicate the number of returned questionnaires answered as shown, while the underlined figures indicate the corresponding percentages.

<table>
<thead>
<tr>
<th>NO.</th>
<th>QUESTION</th>
<th>RANDOM SAMPLE</th>
<th>SELECT SAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>What do you think of Kitimat as a place in which to live?</td>
<td>Good 92 68.6</td>
<td>10 71.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average 38 28.4</td>
<td>4 28.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poor 4 3.0</td>
<td>0 0.0</td>
</tr>
<tr>
<td>6</td>
<td>Do you think Kitimat is a good place to bring up children?</td>
<td>YES 121 90.3</td>
<td>14 100.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO 7 5.2</td>
<td>0 0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEFT 6 4.5</td>
<td>0 0.0</td>
</tr>
<tr>
<td>7</td>
<td>Would you prefer the house facing the street rather than away from the street?</td>
<td>YES 102 76.1</td>
<td>9 64.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO 25 18.7</td>
<td>4 28.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEFT 7 5.2</td>
<td>1 7.1</td>
</tr>
<tr>
<td>8</td>
<td>Do you like the minor public walkways running along your rear property line?</td>
<td>YES 84 62.6</td>
<td>6 42.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO 41 30.6</td>
<td>6 42.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEFT 9 6.7</td>
<td>2 14.3</td>
</tr>
<tr>
<td>9</td>
<td>Do you feel these minor public walkways affect your privacy?</td>
<td>YES 38 28.4</td>
<td>4 28.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO 89 66.4</td>
<td>8 57.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEFT 7 5.2</td>
<td>2 14.3</td>
</tr>
<tr>
<td>10</td>
<td>Do you feel these minor public walkways help to keep the children off the street?</td>
<td>YES 56 41.8</td>
<td>3 21.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO 70 52.2</td>
<td>10 71.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEFT 8 6.0</td>
<td>1 7.1</td>
</tr>
<tr>
<td>11</td>
<td>Do you like the main public walkways to the shopping centre and schools?</td>
<td>YES 126 94.1</td>
<td>12 85.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO 5 3.7</td>
<td>1 7.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LEFT 3 2.2</td>
<td>1 7.1</td>
</tr>
<tr>
<td>Question</td>
<td>Random Sample</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>---------------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Would you prefer sidewalks along the street only?</td>
<td>YES NO LEFT</td>
<td>BLANK</td>
<td>BLANK</td>
</tr>
<tr>
<td>12</td>
<td>26 106 2</td>
<td>19.4 79.1 1.5</td>
<td>14.3 64.3 21.4</td>
</tr>
<tr>
<td>Would you prefer sidewalks along the street, but also with walkways cutting through at the end of the loop streets and culs-de-sac to the schools and shopping?</td>
<td>94 38 2</td>
<td>70.1 28.4 1.5</td>
<td>64.3 28.6 7.1</td>
</tr>
<tr>
<td>Do you like the overall street layout?</td>
<td>113 17 4</td>
<td>84.3 12.7 3.0</td>
<td>85.7 7.1 7.1</td>
</tr>
<tr>
<td>Would you prefer a rectangular street system?</td>
<td>23 107 4</td>
<td>17.2 79.8 3.0</td>
<td>14.3 85.7 0.0</td>
</tr>
<tr>
<td>Do you feel that the main recreational facilities should have been in the City Centre?</td>
<td>72 59 3</td>
<td>53.8 44.0 2.2</td>
<td>42.8 50.0 7.1</td>
</tr>
<tr>
<td>Would you like to have rear lanes?</td>
<td>40 83 11</td>
<td>29.8 61.9 8.2</td>
<td>21.4 78.6 0.0</td>
</tr>
<tr>
<td>Do you feel the need for local stores within walking distance of your home?</td>
<td>78 51 5</td>
<td>58.2 38.1 3.7</td>
<td>50.0 50.0 0.0</td>
</tr>
<tr>
<td>Would you prefer businesses such as repair shops (appliances, TV, etc.) in the City Centre rather than the Service Centre?</td>
<td>83 47 4</td>
<td>61.9 35.1 3.0</td>
<td>35.7 50.0 14.3</td>
</tr>
<tr>
<td>Do you feel there is a serious traffic problem at the Haisla-Lahakas intersection?</td>
<td>94 38 2</td>
<td>70.1 28.4 1.5</td>
<td>50.0 42.8 7.1</td>
</tr>
<tr>
<td>Do you feel that existing suite regulations (one housekeeping suite in each dwelling unit) are desirable?</td>
<td>97 33 4</td>
<td>72.4 24.6 3.0</td>
<td>71.4 21.4 7.1</td>
</tr>
<tr>
<td>Question</td>
<td>RANDOM SAMPLE</td>
<td>SELECT SAMPLE</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>---------------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td>Should the number of lodgers in a house be restricted?</td>
<td><strong>120</strong> 14 0</td>
<td><strong>14</strong> 0 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>89.5 10.4 0.0</td>
<td>100.0 0.0 0.0</td>
<td></td>
</tr>
<tr>
<td>Should occupations such as beauty parlours, barbers and dental mechanics be allowed in homes?</td>
<td><strong>45</strong> 84 5</td>
<td><strong>5</strong> 8 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>33.6 62.6 3.7</td>
<td>35.7 57.1 7.1</td>
<td></td>
</tr>
<tr>
<td>Should billboards continue to be banned?</td>
<td><strong>113</strong> 16 5</td>
<td><strong>14</strong> 0 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>84.4 11.9 3.7</td>
<td>100.0 0.0 0.0</td>
<td></td>
</tr>
<tr>
<td>Should construction of trailer facilities for tourists be the responsibility of the Municipality?</td>
<td><strong>84</strong> 43 7</td>
<td><strong>4</strong> 10 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>62.6 32.2 5.2</td>
<td>28.6 71.4 0.0</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX "E"
RESPONSES TO QUESTION 26 ASKING RESIDENTS WHAT THEY LIKE ABOUT KITIMAT

1.) Condition of community

- Clean, tidy, well kept 56
- Landscaping, lawns and green areas 6
- No slums or shacks 4
- New town 4
- Modern housing 3

2.) Recreation and natural environment

- Scenic beauty of area 23
- Closeness and accessibility to outdoors and nature 19
- Good recreational facilities and sports 13
- Good fishing and hunting 7
- Good playgrounds for children 4
- Fresh, clean air 4
- Mild climate 3

3.) General planning and layout

- The planning of the town 9
- General layout 8
- Schools are convenient 4
- Close to work 3
- Layout of parks 3
- Miscellaneous comments on layout 8

4.) People

- Friendly people 13
- International flavour (many nationalities) 6
- Well behaved and law abiding people 6
- The people (miscellaneous) 7
- Relatively unstratified society 2

5.) Work

- Jobs, steady income, security 27
<table>
<thead>
<tr>
<th>Section</th>
<th>No. of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Community atmosphere</td>
<td></td>
</tr>
<tr>
<td>- Relatively quiet tempo of life</td>
<td>14</td>
</tr>
<tr>
<td>- Lack of congestion and heavy traffic</td>
<td>4</td>
</tr>
<tr>
<td>- Small town atmosphere</td>
<td>3</td>
</tr>
<tr>
<td>- Miscellaneous</td>
<td>2</td>
</tr>
<tr>
<td>7. Education</td>
<td></td>
</tr>
<tr>
<td>- Good schools</td>
<td>19</td>
</tr>
<tr>
<td>8. Municipal services and government</td>
<td></td>
</tr>
<tr>
<td>- Good municipal and community services</td>
<td>15</td>
</tr>
<tr>
<td>- Good municipal government</td>
<td>2</td>
</tr>
<tr>
<td>- Good municipal regulations</td>
<td>2</td>
</tr>
<tr>
<td>9. Streets and walkways</td>
<td></td>
</tr>
<tr>
<td>- Walkways and sidewalks</td>
<td>7</td>
</tr>
<tr>
<td>- Street system</td>
<td>4</td>
</tr>
<tr>
<td>- Peripheral traffic arteries</td>
<td>2</td>
</tr>
<tr>
<td>- Circulation system</td>
<td>2</td>
</tr>
<tr>
<td>10. Children</td>
<td></td>
</tr>
<tr>
<td>- Good place to raise children</td>
<td>11</td>
</tr>
<tr>
<td>- Safe place to raise children</td>
<td>3</td>
</tr>
<tr>
<td>11. Commercial areas</td>
<td></td>
</tr>
<tr>
<td>- Layout of shopping facilities</td>
<td>6</td>
</tr>
<tr>
<td>12. Community activities</td>
<td></td>
</tr>
<tr>
<td>- Active organizations</td>
<td>4</td>
</tr>
<tr>
<td>- Many activities for all</td>
<td>4</td>
</tr>
<tr>
<td>13. Miscellaneous</td>
<td></td>
</tr>
<tr>
<td>- Unstated conveniences and facilities</td>
<td>8</td>
</tr>
<tr>
<td>- Progressive community</td>
<td>2</td>
</tr>
<tr>
<td>- Miscellaneous comments</td>
<td>10</td>
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</tbody>
</table>

TOTAL "LIKES" RECORDED 366
### APPENDIX "F"

**RESPONSES TO QUESTION 27 ASKING RESIDENTS WHAT THEY DISLIKE ABOUT KITIMAT**

<table>
<thead>
<tr>
<th>NO. OF RESPONSES</th>
</tr>
</thead>
</table>

1.) Climate
- Climate, bad weather 48
- Rain 10
- Snow 3 61

2.) Isolation
- Isolation 40
- Only one road out of town 4
- Not many places to go 2
- Other 2 48

3.) Housing
- Poorly designed and built houses and apartments 15
- Lots too small or houses too close 4
- Similarity of houses 3
- Other 12 34

4.) Commercial facilities
- Lack of competition in stores 12
- Poor choice of goods 9
- Poor quality of produce and meat 3
- Not enough stores 3
- No service station open after 9 p.m. 1
- Other 3 31

5.) Cost of Living
- High cost of living 14
- High rents and housing costs 4
- Apartment rent increases with length of tenancy 1 19

6.) Features affecting appearance of town
- Overhead wiring 8
- Lack of tree planting and landscaping 3
- Junk left around 2
APPENDIX "F" (continued)

<table>
<thead>
<tr>
<th>NO. OF RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Garbage cans at &quot;front&quot; door</td>
</tr>
<tr>
<td>- Other</td>
</tr>
</tbody>
</table>

7.) General planning and layout

<table>
<thead>
<tr>
<th>NO. OF RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- No &quot;main street&quot;</td>
</tr>
<tr>
<td>- Town is too spread out</td>
</tr>
<tr>
<td>- Other</td>
</tr>
</tbody>
</table>

8.) Company town atmosphere

<table>
<thead>
<tr>
<th>NO. OF RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Company town atmosphere</td>
</tr>
<tr>
<td>- One industry town</td>
</tr>
</tbody>
</table>

9.) Public transportation

<table>
<thead>
<tr>
<th>NO. OF RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- No bus service</td>
</tr>
</tbody>
</table>

10.) Street and walkway system

<table>
<thead>
<tr>
<th>NO. OF RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Street layout</td>
</tr>
<tr>
<td>- Crosswalk almost over underpass at theatre</td>
</tr>
<tr>
<td>- Other</td>
</tr>
</tbody>
</table>

11.) Municipal services

<table>
<thead>
<tr>
<th>NO. OF RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Poor sewer system</td>
</tr>
<tr>
<td>- High taxes</td>
</tr>
<tr>
<td>- Poor garbage dump</td>
</tr>
<tr>
<td>- Other</td>
</tr>
</tbody>
</table>

12.) Municipal regulations

<table>
<thead>
<tr>
<th>NO. OF RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Building and zoning regulations too inflexible</td>
</tr>
<tr>
<td>- Personal freedom too restricted</td>
</tr>
<tr>
<td>- Other</td>
</tr>
</tbody>
</table>

13.) Limited entertainment and social activities | 3 |

14.) Lack of recreational, swimming facilities | 3 |

15.) Too many foreign languages spoken | 3 |

16.) No mail delivery | 2 |
<table>
<thead>
<tr>
<th>NO. OF RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. Price of power</td>
</tr>
<tr>
<td>18. Undisciplined dogs at large</td>
</tr>
<tr>
<td>19. Social segregation</td>
</tr>
<tr>
<td>20. Miscellaneous single comments unrelated to each other</td>
</tr>
</tbody>
</table>

TOTAL "DISLIKES" RECORDED 298
APPENDIX "G"

RESPONSES TO QUESTION 28 ASKING FOR SUGGESTIONS
FOR FUTURE DEVELOPMENT OF KITIMAT

NO. OF SUGGESTIONS

1.) Housing

- Need better style and more variety in housing
- Use better material in housing
- Larger and more varied lot sizes
- Houses should face street (See question 7 of Appendix "D")
- No more project houses
- Build garages with all houses
- Need more houses with basements
- Build houses better suited to the climate
- More variety in apartment unit size
- Apartments need play areas for small children
- Other

2.) Recreation

- More recreational facilities, parks, play areas, etc.
- Improve recreation facilities
- Need better swimming facilities
- Develop park with zoo
- Need a seaside recreation area
- Develop fisherman's wharf and marina
- Build a golf course
- Improve soccer facilities
- Other

3.) Commercial facilities

- Need more stores and more competition
- Develop a "main street"
- Need a hotel at the City Centre
- Need Provincial building at City Centre
- Need an all-night gas station
- Other
APPENDIX "G" (continued)

<table>
<thead>
<tr>
<th>NO. OF SUGGESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

4.) Features affecting appearance of town

- Put wiring underground  
- Plant more trees  
- More landscaping

5.) Streets and walkways

- Streets should have sidewalks (See questions 12 and 13 of Appendix "D")  
- Traffic control at main intersections  
- Provide lanes (See question 17 of Appendix "D")  
- Complete walkway to Service Centre  
- Provide direct access from Post Office to Kildala Neighbourhood  
- Build scenic road down Hirsch Creek to Kitimat River to bridge  
- Need another Kitimat River bridge further downstream  
- Other

6.) Municipal services

- Need better sewage disposal system  
- Relocate garbage disposal area  
- Provide better drainage for future housing  
- Need municipal garbage incinerator  
- Provide brighter and more modern street lighting  
- Other

7.) General planning and layout

- Develop according to plan  
- Other

8.) Municipal regulations

- More control on junk and clutter  
- Less restriction on business  
- Other
APPENDIX "G" (continued)

<table>
<thead>
<tr>
<th>NO. OF SUGGESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
</tr>
<tr>
<td>- Need more industry</td>
</tr>
<tr>
<td>10.) Need public transportation system</td>
</tr>
<tr>
<td>11.) Need vocational or technical school</td>
</tr>
<tr>
<td>12.) House numbers should also face walkways</td>
</tr>
<tr>
<td>13.) Need public rest room in City Centre</td>
</tr>
<tr>
<td>14.) Control ribbon development</td>
</tr>
<tr>
<td>15.) Need convention facilities</td>
</tr>
<tr>
<td>16.) Miscellaneous individual suggestions</td>
</tr>
</tbody>
</table>

TOTAL SUGGESTIONS RECORDED 206
LEGEND
INDUSTRIAL DISTRICTS
M1 MANUFACTURING AREAS
M2 SERVICE CENTER AREAS
GREENBELT DISTRICTS
G2 INSTITUTIONAL AREAS
G5 AGRICULTURAL-FOREST AREAS
FLOOD PLAIN DISTRICTS
F1 FLOOD PLAIN AREAS

AMENDMENTS

This is the north west section of sheet I of the "Zoning Map of the District of Kitimat" referred to in by-law No. 439 passed by the Municipal Council this 9th day of October 1962.

Reeve

Clerk to the Corporation
Dated Oct. 22 1962
N2 residential areas allow one-family and two-family dwellings

N3 residential areas allow one-family, two-family, and terrace dwellings

N4 residential areas allow two-family, terrace and apartment dwellings
APPENDIX "H" (continued)

N1 residential areas allow one-family dwellings

N2 residential areas allow one-family and two-family dwellings

N4 residential areas allow two-family, terrace and apartment dwellings
APPENDIX "H" (continued)

N2 residential areas allow one-family and two-family dwellings

N4 residential areas allow two-family, terrace and apartment dwellings
THIS IS THE SOUTH WEST SECTION OF SHEET 1 OF THE "ZONING MAP OF THE DISTRICT OF KITIMAT" REFERRED TO IN BY-LAW No. 439 PASSED BY THE MUNICIPAL COUNCIL THIS 9TH DAY OF OCTOBER 1962

REEVE

CLERK TO THE CORPORATION
DATED OCT. 22 1962

ZONING - DISTRICT OF KITIMAT