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The physical location of industry  
in Canada; a report prepared for the  
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THE PHYSICAL LOCATION  
OF  
INDUSTRY IN CANADA

A report prepared for the Department of Industry  
by G.M. Davison.

October, 1966.

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G.M. Davison.

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INTRODUCTION  
&  
SUMMARY OF FINDINGS

This report presents the findings of a study commissioned by the Minister of Industry to investigate the physical location of industry in Canada. The purpose of the study was to review the research which has been done into the theory and practise of industrial location and to investigate the factors influencing industrial location with particular regard to the effect of physical facilities and area environment. The emphasis of the study has been directed towards those areas which are designated by the Area Development Agency of the Department of Industry.

The study is broken down into three sections: a survey of research into industrial location and regional development; an examination of the location of industry in Canada; and an analysis of the firms which have been active in the incentives program of the Area Development Agency. A general summary of the content and findings of each section is given below.

INDUSTRIAL LOCATION AND REGIONAL DEVELOPMENT STUDIES

The greater part of the information gathered in this section is derived from research done in the United States. The emphasis on American work reflects the small amount of basic research into industrial location done in Canada and the evidence that work in countries other than the United States has little relevance to the Canadian scene because of the contrast in economic, political and geographic conditions.

A brief survey has been made of the field of regional development and location theory. It would seem that these theoretical approaches at their present state of development can contribute very little to an understanding of the influence of physical factors on the location of industry. Attention has therefore been focused on investigating the results of various empirical studies.

A survey of empirical studies shows that three factors are of primary importance in the location of industry: markets, materials and external economies. Labour is sometimes also ranked among the main influences, however, it is probably a factor of lesser importance. There would seem to be no doubt that the location of markets is for most firms of greatest importance, reinforced by the concentration of labour and the availability of external economies in conjunction with many market locations. The source of materials as a prime location factor is becoming less significant as fewer firms are involved directly with the processing of raw materials and the location at the material source becomes less compatible with other location requirements.

The studies, which have been done in the United States in an effort to understand the reason for the shift in American industry towards its markets, provide a useful insight into the factors which can create broad changes in the pattern of industrial location. A movement taking place in the United States over the last sixty years is leading to greater self-sufficiency of regions in their manufacturing production. Three factors appear to be at work: (1) a filling in process as the regional population, supported by resource based industries, becomes large enough to support industries based on local markets; (2) the influence of climate on the location of the aircraft industry and on market development in the South and the West of the United States through the location of military establishments and the migration of retired people; (3) the reduction of short-haul transportation costs relative to long-haul costs achieved through the use of road transport and the effect of this change on an industrial structure based on transport by railways.

Other factors, such as the availability of transportation, utilities, and community facilities are more likely to influence the location of industry only at the local level. It would seem that under idealized circumstances the location of a new manufacturing plant is a three phase process involving the selection of a region which can best provide the primary requirements of the firm; the selection of an area where the basic facilities of production will be available; and finally, the selection of a community which can provide the firm with the best combination of the factors which are important to the operation and well being of the company.



In fact, it would seem that only large companies locating subsidiaries or branch plants are likely to follow this type of a process in selecting a site. Small newly established firms are unlikely to have a wide choice in their location alternatives and their concern is more likely to be with achieving convenient short term productive arrangements.

#### THE LOCATION OF CANADIAN INDUSTRY

The survey of Canadian research into industrial location, and a study of the location characteristics of Canadian manufacturing industry, reveal that the contrast between the Canadian heartland (St. Lawrence and Great Lakes lowlands) and the areas outside the heartland in population size and density, urbanization, and the level of manufacturing activity, is the most important factor influencing the location of economic activities in Canada. The Canadian heartland is 700 miles long, and in most places less than 100 miles wide, yet this small area representing 2.5% of the nation's land mass contains 50% of the Canadian population and 69% of the manufacturing employment. An examination of the changes which have taken place in the relative distribution of population and manufacturing employment over the last forty years shows that, contrary to the experience in the United States, there is no indication of any decline in the importance of the heartland. The failure of the hinterland to grasp a larger share of the manufacturing activities in Canada appears to be related to the relatively small markets that exist outside of the heartland, the inability of the hinterlands to hold their existing population or attract new immigration, the influence on the growth of the Canadian heartland by the United States manufacturing area, and the small number of major centers in the hinterland which can provide a range of external economies to industry.

There seems to be no doubt that the Canadian heartland does provide very real location advantages to most industries and that the hinterland can only effectively compete for industries which will be tied to local resources or where the market threshold is low. It is difficult to conceive of any major change in this relationship until there is a reversal in the movement of population towards the heartland and the hinterland develops more large urban centers capable of providing the external economies available in the heartland.

#### INFLUENCE OF THE AREA DEVELOPMENT PROGRAM ON INDUSTRIAL LOCATION

The active applications received by the Area Development Agency to January, 1966 were reviewed to determine what factors had influenced firms to locate in designated areas. The applications covered eighteen of the twenty standard manufacturing classifications and development could have been in 91 designated areas, ten of which had been removed from designation prior to the time of the analysis due to the improvement in their economic situation.

Capital investment in the designated areas was heavily concentrated in the pulp and paper and the chemical product industries followed by transportation equipment, non-metallic mineral products, electrical products and textile industries. The industries generating the most new employment were in order of importance: transportation equipment, pulp and paper products and the food and beverage industry. Two-thirds of the investment in the designated areas was in industries where the average investment per employee exceeded \$45,000.

The areas designated by the Area Development Agency included nine areas lying within the Canadian heartland and 82 areas outside. Six of the heartland and four hinterland areas have now been removed from designation. The heartland-hinterland division is highly significant in evaluating the effectiveness of the Area Development Program as 52% of the applications, 50% of the anticipated new employment and 46% of the new investment is directed towards the nine heartland areas. The industry establishing in the heartland tends to be quite diverse with an emphasis on fabricating rather than processing operations.

The new investment in the hinterland is rather different. The range of manufacturing activities is much smaller with 50% of the investment going into the pulp and paper products industry and 23% into chemical products while the distribution of the new development is highly localized with a few areas receiving most of the new investment. At the time of the analysis there were many areas which had received no new employment.

A more detailed analysis of the factors influencing the location of the firms active in the Area Development Program was carried out through a survey by mailed questionnaire. This survey revealed that a large amount of the development taking place in the designated areas was the result of local expansions or by developers who were already familiar with the designated areas. Very few of the firms had carried out a wide exploration of alternative areas before choosing a site and many had not, in fact, examined any other areas. This characteristic was more typical of firms locating in the hinterland, as only 4% indicated that they had examined other provinces in their location survey as compared to 23% of the heartland firms.

An evaluation of the effectiveness of the incentives given by the Area Development Agency indicated that the incentives were directly responsible for almost all of the development which was taking place. For nearly half the firms this was due to an acceleration of their plans for undertaking a new development within the designated areas; for one-third the incentives have stimulated or made possible the establishment of a new enterprise; while for one-fifth the incentive has caused the firm to shift the intended location of a new facility to lie within a designated area. This latter effect was twice as likely to happen to firms locating in the heartland as it was to those in the hinterland. The incentives are not stimulating a major shift in industrial activity; only five of 207 firms indicated that without the incentive they would have located in another geographic region of Canada.

The information gained from the survey about location factors revealed that the factors influencing location in the heartland were quite different from those influencing firms to locate in the hinterland. The single most important factor given by firms in the heartland was the Area Development Agency incentive followed by markets, the relation to existing operations and the availability of labour, sites and buildings. The availability of materials was infrequently mentioned as a location factor.

The firms locating in the hinterland indicated that the source of materials was the most important location factor followed by relation to existing operations, markets, and the Area Development Agency incentives. Transportation, services and community facilities were infrequently mentioned as a location factor by either group, although it was observed

that almost all of the firms had chosen a location which would provide them with access to facilities for road transport and many were also situated on a rail siding.

The survey of location factors among firms locating in the designated areas, confirms the previous findings that the heartland has fundamental advantages over the hinterland for industrial location and that the industries which locate in the hinterland are most likely drawn there because of the availability of raw materials. Infrastructure and community facilities are not prime determinates of industrial location and are only likely to influence location within a local area.

#### CONCLUSION AND RECOMMENDATIONS

The results of the investigation into the physical location of industry point to the primary influence of markets, materials and external economies on the location of industrial activities. Physical facilities - transportation, utilities, good community facilities, while important and necessary to most manufacturing operations, are not the factors discouraging industrial location in the designated areas. The central problems of most designated areas are related to low population density and the absence of centers for the location of industry. The indication is that an ad hoc program for the improvement of physical facilities in the designated areas would not in any significant way increase the attractiveness of the designated areas to new manufacturing industry.

The Area Development Agency in its desire to effectively improve the economic conditions in the designated areas may wish to explore the following recommendations:

- 1) An examination into the existing system for determining the amount of the location incentive to ascertain if this system favours capital intensive industries and discourages labour intensive industries and if so, whether this is prejudiced to the objectives of the Area Development Agency.
- 2) The extension of the development incentive program to cover all industrial activities in the hinterland designated areas.
- 3) The establishment of regional development groups with the expertise and financial resources to uncover and exploit new economic opportunities on a regional basis and to develop centers capable of offering scale economics in the areas where the present program is ineffective.

INDUSTRIAL LOCATION  
&  
REGIONAL DEVELOPMENT STUDIES

This chapter draws together the results of a number of studies into the different aspects of industrial location and regional development. The survey provides a useful background for examining the Canadian pattern of industrial development and understanding the processes involved.

Studies into industrial location and regional development are of two types: theoretical studies which are largely concerned with constructing a logical abstract framework for understanding the effect of various economic variables on industrial location; and empirical studies which investigate and attempt to find explanations for the existing patterns of development. The latter studies are of more practical value for the present purpose of determining the significance of infrastructure and local environment on location decisions, however, in order to give a complete, if shallow, coverage of the whole field of industrial location, a brief survey has been made of the work done on location theory.

INDUSTRIAL LOCATION AND REGIONAL DEVELOPMENT THEORY

Regional Development

The theories of regional development and industrial location are naturally closely related, however, regional development theory is primarily concerned with the broad questions of why regions receive new economic development, while industrial location theory is oriented towards the selection of an optimum site for the location of an industry.

Regional development theory may be classified according to whether it follows one of two possible approaches. On one hand there are the theoretical developments concerned with static models - the techniques of analysing the existing industrial development of a region and using this information to predict the development which is likely to occur in the future. The methods used - input-output analysis and multiplier theory, are predictive techniques founded on the extrapolation of the existing economic base of the region; the economic base being those industries which export their products to other regions<sup>(1)</sup>.

The alternative to this approach is to construct a system which is capable of taking into account outside factors which will influence the development of the region. The use of high speed computing machines and the development of mathematical programming has stimulated the construction of dynamic regional development models. Much of the work

(1) See references at the end of chapter.



which has been done in this field has been connected with the problems of developing a regional transportation system for city regions<sup>(2)</sup>. The problems associated with dynamic model building are the immense amount of data required to build up a good model and the need to program within the model many important behavioral considerations. The latter presents a particular problem in light of the present state of knowledge about behavioural characteristics and it has been necessary for model builders to make assumptions about sociological variables whose influence may be fundamental to the working of the model<sup>(3)</sup>. For this reason it may be questioned whether this approach to understanding regional development in reality gives significantly better results; at the same time there can be no doubt that a better understanding of behavioural characteristics will be a useful by-product of this form of research because of the need to obtain realistic inputs to the model.

A short summary cannot do justice to the immense amount of work which is taking place in this field. It would seem, however, that for the purposes of the present study, regional development theory at its current state of development can contribute very little. The economic base techniques of analysis are useful in forecasting and also for determining new manufacturing opportunities<sup>(4)</sup>, however, it is by nature an incomplete account of the factors of regional development and is perhaps least satisfactory to the analysis of regions similar to many of those in the Area Development Program; areas in which the existing industrial

(2), (3) and (4) - see references at the end of chapter.

base is very small. Dynamic models of regional development offer the promise of ultimately providing the best prediction of future levels of economic activity, however, before this happens there will need to be a much better understanding of the basic sociological processes involved in capital investment decision making.

### Industrial Location

Industrial location theory has evolved over the last one hundred and fifty years. Its object has been to predict the optimum site for the location of an industry based on the relevant economic considerations. The development of location theory has been the evolution of increasingly complex structures as the theory has expanded to include more factors. Most of the early location theories could be translated into an idealized plan for the distribution of industrial activity<sup>(5,6)</sup>, but as the range of factors encompassed by the theory has increased, the attempt to provide an overall model of development has been abandoned in favour of the consideration of the single firm<sup>(7,8,9)</sup>. It is interesting to note that as location theory has become more complex, and presumably more realistic, the ability to resolve an optimum site for location on theoretical grounds has been reduced. Leon N. Moses after examining - base prices on inputs; transportation rates on inputs and the final product; the geographic position of materials and markets; the production function and the demand function - came to the conclusion "if inputs are substitutable, there is no single optimum location, the optimum location then depends on the scale of operations and the other factors considered"<sup>(9, p.270)</sup>.

(5, 6, 7, 8, 9 - see references at the end of chapter

Location theory is useful in providing an approach to understanding the influence of economic factors and the inter-action of these factors on industrial location. This approach is limited, however, because the large number of factors which must be included in any theory and the difficulty in expressing all location factors in economic terms.

### LOCATION FACTORS

This and the next section on location decisions examine the empirical studies into industrial location and regional development. The studies are predominantly of Canadian or American origin. Although studies from other countries were examined, their results were frequently so different from what had been observed in Canada, it was concluded that industrial location factors depend very much on prevailing physical, economic and political circumstances and that the results from one country are not directly applicable to another. The United States is in several important respects quite different from Canada, however the two countries are sufficiently alike that the similarities and contrasts between location phenomena will assist in understanding Canadian location pattern.

The National Resources Planning Board Study of 1943<sup>(10)</sup> probably is the most thorough and exhaustive single study of the empirical aspects of industrial location. The study was prepared by a number of authors including E.M. Hoover and Sargent Florence and attempts in a number of ways to classify the location factors so as to determine their relative importance. The conclusions of the study were that - "no accurate statement of the relative importance of various locational factors for an

(10) - see references at the end of chapter

industry or even an individual plant is possible" (p.332).

This conclusion would seem as valid in 1966 as it was in 1943. It does seem possible, however, by aggregating statistics about plant locations to uncover the more important factors influencing location, different studies have shown quite general agreement on the importance of a number of factors, usually headed by markets, materials, productive arrangements and labour. The usual form of these studies is to ask a number of firms who have recently established a new plant to identify the factors which were most important in determining their location<sup>(11,12,13)</sup>. This section will briefly examine the various factors which have been identified as important to industrial location.

### Markets

Markets are naturally an important factor in the location of an industry for no plant could exist without a place to sell its products. There are two basic reasons why an industry might wish to locate close to its markets: to minimize transportation costs, or because the nature of the product is such that the producer and consumer must be closely linked (i.e. perishable food products or the manufacture of fashion clothing). Several location studies in the United States have noted and tried to explain the relative shift of manufacturing activities from the North-Eastern States towards a greater conformity with the population distribution of the country. Perloff and Wingo<sup>(14)</sup> have proposed that

(11,12,13,14 - see references at the end of chapter

regions develop initially under the impetus of their resource industries, however, at a later stage the expanding market possibilities in the region result in a "filling-in" as market-oriented industries move from the nation's industrial heartland to the outer regions.

Another study into the shift of American industry towards its markets emphasized the influence of transportation changes. E.M. Hoover in his study of shifts in the location of the United States shoe industry<sup>(16)</sup> showed how the introduction of railways brought about a complete alteration of the location of shoe manufacturers in the United States. Chinitz and Vernon, in a more recent study, show how the use of road transport has, in the United States, altered the pattern of industrial location<sup>(15)</sup>. They found that the industries which moved fastest towards conformity with the overall population distribution were those which grew fastest and where freight costs were an important part of the total cost structure. The shift in the location of American industry appears to be related to the changes in the economics of market distribution brought about by the introduction of road transportation. Road transport has promoted the decentralization of industry by cutting the cost of short hauls relative to long hauls and reducing the advantage obtained by large-scale producers who could obtain cheaper rates from the railways by the shipment of large lots. This trend is unlikely to continue, however, as recent transportation development - co-ordinated services such as "piggy-back" (truck transport by rail) and "fishy-back (truck transport by boat) and the growing use of air freight will reduce the cost advantages of the short-haul compared to long-haul.

*Amy  
Birdie - back?*

(16, 15 - see references at the end of chapter

A study by V.R. Fuchs<sup>(17,18)</sup> emphasizes the influence of climate on market development and the shift in the location of American industry. Climate has been a prime factor influencing the location of the airplane manufacturing industry in the Southern States and the West coast because of the advantage of being able to work outside throughout the year, but it has also had a very important influence on market development as it has affected the location of military establishments and the migration of older people.

The American studies indicate that markets are an extremely important factor in industrial location, however, underlying the shift in the United States of industry towards markets have been factors influencing the growth of markets outside the industrial heartland and changes in distribution costs. The trend towards increasing regional self-sufficiency based on the development of industry to satisfy local markets may be weakened by new transportation developments which reduce the cost advantages of short-haul transportation.

#### Raw Materials

Raw material orientation is usually associated with an industrial process in which there is a transportation saving to be obtained by treating the material at the source and then shipping the product to the market. Although some industries will always be dominated by their resource requirements there has in recent years been a declining need for industries to locate close to raw material sources. This has been due to: the reduction in material costs with the improvement in transportation systems, and the decline of material costs relative to other production costs<sup>(19)</sup>.

(17,18,19 - see references at the end of chapter

Also the number of plants in which raw materials are an important part of the production process has reduced considerably as the chain of processing between raw materials and final products has grown longer and longer<sup>†</sup>. More plants are now minimizing their transportation costs by locating near other plants, rather than near a raw material source<sup>(15)</sup>. In addition, resource orientation is becoming less compatible with other location requirements such as customer service and obtaining necessary labour skills.

#### Agglomeration or External Economies

Agglomeration or external economies are the benefits a firm obtains by locating in the same area with other manufacturing activities. The advantages which a firm may find in these circumstances may be grouped under a number of headings, but they mostly concern ease of access to production inputs and convenient facilities for product distribution. The following quotation about the early development of the electronics industry is an example of the importance of external economies and their particular significance in the early development of an industry -

"In the 1920's, when radio was the principal product of the industry, both product and process were changing at breakneck speed. At that stage, few manufacturers would leave the large metropolitan areas, even though they were high-wage locations. These were the areas where specialists and subcontractors could be drawn in on short notice to meet the changing production needs, and it was a good deal more important to satisfy such needs than to hold down labour costs.

† In United States only one out of five manufacturers directly process raw materials (19 - p.4)

Later, however, as some electronics products were standardized and as the technology of the industry settled down, the possibility of establishing a comparatively self-contained operation in the countryside grew a little clearer. More than that, cost paring became indispensable to survival in some fields. It was at this time, therefore, that electronics plants - especially those manufacturing highly standardized components - began to take to the woods in increasing numbers" (15 p.133).

Agglomeration economies seem to be particularly important in the establishment of new firms or new industries. The National Resources Planning Board Study found - "a disproportionate share of the new plants are established in large industrial cities, but most of the relocations are towards suburbs or smaller towns. Apparently the cities serve to some extent as germinating grounds for new enterprises which frequently move out after getting a start" (10, p.329).

On an even larger scale this effect may be seen in the contrast between the industrial heartland and hinterland of the United States. Perloff and Wingo (14, p.237) found that although decentralization was taking place away from the industrial heartland of the United States, at the same time the development of new products occurred almost exclusively in the heartland; this area seemed to be serving as the

(15,10,14 - see references at the end of chapter



industrial seedbed for the economy. E.L. Ullman<sup>(21, p.164)</sup> in a study of the influence of concentration on regional development found that measuring innovation in terms of the persons per patent filed in each state of the United States, a much lower ratio existed in the industrial heartland and California, in comparison with the rest of the country. The indication is that areas of industrial concentration offer both economic and social stimulants which encourage the development of new industries.

#### Labour

Four different aspects of labour are possible location factors: (1) availability; (2) level of skills; (3) wage rates; and (4) stability, attitude and labour organization. Labour, as with markets, is a necessary prerequisite for most manufacturing operations, however, few studies have indicated labour considerations have been a primary factor, in influencing industrial location, they are usually indicated as secondary factors. There are two main reasons for this:

- 1) Labour Availability - Labour availability has not in general been a major problem. This is related to the mobility of labour and the fact that in recent years in Canada and United States the unemployment rate has never approached rates which have existed in European countries. W.F. Luttrell, for example, found that in Britain the availability of labour was a major factor influencing industrial location<sup>(20)</sup>, however, the unemployment rate in Britain has been at least one-half the Canadian average in the post-war years.

It should also be observed that market locations are normally co-incident with labour market centers and that external economies usually include considerations about the availability of necessary industrial skills.

- 2) Wage Rates - Low wage rates do not seem to have been of great influence on industrial location because often businessmen feel that the savings to be obtained are likely to be transitory and the migration of other industries into the area or the action of unions will soon negate any savings on labour costs. In addition, there are at any one time only a limited number of firms who can take advantage of low wage areas because of their ties to resources, markets or other factors.

#### Other Factors

The examination of markets, raw materials, external economies and labour as location factors indicate that the first three are of primary importance to the location of industry while labour is more frequently of secondary importance. The availability of other factors influencing the location of industry would seem to be important at a different level of site selection. The effect of structural changes in these factors on industrial location is, of course, quite different and the changes brought about by transportation developments have already been examined. Otherwise, the influence of factors such as transportation, power and other utilities is at the local level of industrial site selection.

Transportation facilities of the appropriate nature, for example, are undoubtedly a prerequisite for all types of industry and it has been found that within the United States that every major transportation center is also a significant manufacturing center<sup>(19, p.9)</sup>. Transportation facilities have, however, probably had more influence on the relative size of urban communities than on the distribution of manufacturing activities since the latter have been largely determined by the endowment of regions in natural resources and by the magnitude of their consuming populations<sup>(10, p.15)</sup>.

The availability of power and other utility services would seem to have a similar relationship. These facilities are necessary to the operation of almost all industrial operations, however, in a relatively developed country like Canada, these facilities are so widely available that their influence on location is normally only at the local level. There are, of course, certain manufacturing industries with unusual requirements which might influence them towards areas possessing certain climatic conditions, large sources of cheap power or some other special factor, however, these firms are in the minority.

Information about the influence of location incentives to induce industries to locate in certain areas is almost completely lacking. A study in the United States about the effect of community incentives<sup>(22)</sup> found that these were effective in attracting industry to a community only after the firm had first decided to locate a plant within the general area.

Certain studies have pointed out the influence of personal considerations on location decisions<sup>(13,23)</sup>. Research has indicated that personal factors are fundamentally involved in the location decision of a firm, and this aspect will be discussed in the next section. Personal considerations, however, as they refer to the preferences of the executive's wife or boy-hood memories of an area, are likely to be only relevant at the local level or within the context of an area which can meet the fundamental requirements necessary for the manufacturing operation.

#### LOCATION DECISIONS

This section reviews some of the studies which have examined how firms go about choosing a location for their manufacturing operation.

W.W. Ruttan and L.T. Wallace in their study into the effectiveness of location incentives postulated that the location decision usually occurs as a three-stage process. The first step involves determination of a major geographic region; the second a comparison of specific areas within the general region; and the final step is the selection of specific sites within the area<sup>(22,p.974)</sup>. Other studies have also indicated that the location process is a series of location decisions<sup>(12)</sup>. This approach resolves some of the conflicts which appear in different studies with regard to the importance of various factors and bearing in mind the differences which exist between firms it is possible to construct a conceptual model of the steps involved in a location decision.

Location Decision Making

<u>Region</u>	<u>Sub-Region</u>	<u>Site</u>
(Markets	(Labour	(Labour
(Materials	(Transportation	(Transportation
(External Economies	(Utilities	(Utilities
(Special Require- ments	(Land Costs	(Land Costs
	(Taxes	(Taxes
	(Local Attitudes	(Local Attitudes
		(Community Facilities
		(Room for Expansion
		(Planning Regulations
		(Location Incentives
		(Existing Buildings

This list is not an exhaustive one, particularly for the factors which may be considered at the site selection stage, however, it shows the relationship of various factors in a process involving the choice of a region, based on considerations of primary production and marketing factors, a sub-region based on considerations of relative costs and the need to provide certain basic facilities for the operation of the plant, followed by a much more detailed examination of these and other factors at the site level. A further elaboration of the factors which are considered at the site level will be found in the McGraw-Hill Plant Site Survey<sup>(24)</sup>. The inclusion of the same factor in more than one stage indicates both the difference in emphasis among manufacturing activities and that various aspects of the same factor may be examined at different levels. For example, at the sub-regional level of selection, consideration would be given to finding an area where there was good rail service, while at the site selection level, the emphasis might be on finding a site which would be adjacent to a rail siding.

(24) - See references at the end of the chapter.

Influence of Firm Size on Location Decision

The three stage process of location decision making would seem to be more typical of firms locating branch plants or subsidiaries than it is of smaller single plant firms. Ruttan and Wallace found that single plant firms seldom gave any considerations to sites outside of their immediate area and that the most important factor influencing the small firms included in their survey was property ownership within the community. A study of why new manufacturing firms located in New England reveals a similar relationship<sup>(25)</sup>. Branch plants locating in New England had, in most cases, done so in response to market, material, or production considerations, whereas 70% of the new firms who established in the area indicated they had done so for personal reasons. It would seem that a new firm is frequently set up in response to an opportunity which the entraneur has observed in his community so that he really has very little choice about where to establish his plant. The requirements of small new enterprises would, in fact, seem to be quite different from those of large companies. The small firm has limited capital resources, is unsure of the success of his venture and is therefore likely to be more interested in minimizing his capital investment and maximizing the flexibility of his production arrangements. The plant of a large company on the other hand will probably represent a sizeable permanent capital investment and the management of the company will be concerned that they are making a good long term investment. They are therefore likely to be more thorough in their location survey, more

(25) - See references at the end of the chapter.

cautious in their location decision and most interested in minimizing their costs over the long term.

### The Irrational Aspects of Site Selection

Even for large plants who follow a step-by-step process in determining the site for their plant, it is unlikely that the location decision process would be completely rational nor is it certain that two identical firms choosing a new location for a plant under identical conditions, but independently of each other, would arrive at the same site. The industrial location operation is too complex and too imprecise to be free from personal factors. The entraneur's attitude in weighing alternative future possibilities or even deciding what are the relevant variables to examine and how to analyse them, will be fundamental to the location decision<sup>(26)</sup>. Studies which have attempted to duplicate the process the businessman must follow in taking uncertainty into account in the light of the probability of different things happening and setting the best course of action, have shown that often there is no single best strategy for the businessman. He may choose to act boldly for big gains or losses, or conservatively for smaller ones; both being rational possibilities with the choice depending on the goals and attitudes of the businessman<sup>(5,p.105)</sup>.

(26,5 - See references at the end of the chapter

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THE LOCATION  
OF  
INDUSTRY IN CANADA

This chapter examined in detail the factors relevant to industrial location in Canada and the pattern of regional development which has taken place over the last forty years.

A convenient starting point for examining the distribution of industrial activity in Canada is a study of the functional structure of Canadian cities<sup>(1)</sup>. This study by J.W. Maxwell of the eighty urban areas in Canada with a 1951 population exceeding 10,000 analyses the functional specialty of each center based on its excess employment in various types of economic activities. He found that manufacturing activities were of overwhelming importance in city functional structures, dominating in 61 of the eighty cities. The other nineteen were dominant in such functions as extraction, transportation, government service or retail trade. Maxwell makes a distinction between the Canadian heartland (the densely populated St. Lawrence-Great Lakes lowlands) and the hinterland (the remainder of the country); within the former there was only

(1) - see references at the end of chapter

one major community where manufacturing was not the dominant function (Ottawa), whereas in the hinterland only one-third of the cities are dominated by this function. Maxwell draws the conclusion that there are fundamental differences between the functional profiles of cities in the heartland and those in the periphery which reflect the major elements of Canadian economic geography. "The heartland enjoying excellent locational relationships for most manufacturing processes - the key urban functions -, is the site of urban concentration as well as manufacturing concentration. The periphery is characterized by huge sparsely settled areas, giving it almost vassal status in its relationship with the heartland" (1, p.95).

David W. Slater has also examined the difference in the economic activities of the heartland and the hinterland areas of Canada (2,3). He finds that "outside of south-central Canada, resource sites and the servicing of local markets appear to be the main explanations of the existence of manufacturing jobs. The evidence is that for many regions, the density of their manufacturing activity seems to vary directly, though not perhaps strongly, with the over-all growth of their resource base," (3, p.412). The changes in the distribution of industry at the regional level have been largely influenced by three factors: the improvement of medium distance communications which has encouraged decentralization and dispersal; the attraction of people and industry to urban areas because of their desire to obtain the services available in large cities; and the trend in manufacturing to continuous-flow processes which has increased the ground floor area and the size of site required by plants. Slater believes, however, that a most important factor discouraging

industrial decentralization is agglomeration economies. He concludes that "most policies aimed at industrial decentralization under-rate the agglomeration economies offered by sites in the large cities under conditions of risk and uncertainty", (3,p.415).

A study by Donald Kerr and Jacob Spelt into manufacturing in Downtown Toronto<sup>(4)</sup> describes the advantages firms may realize by locating in an established manufacturing area. The authors found that despite the apparently run-down appearance of the manufacturing area, it housed a surprisingly young and dynamic group of manufacturing enterprises. The attraction of this location to the firms was almost always due to the presence of external economies.

The Economic Council of Canada has also commented on the importance of external economies - "Of major importance is the concentration of population in fairly small geographic areas in which the most efficient production and distribution is more easily achieved. Moreover, once the process of concentration gets under way, similar powerful forces make it of cumulative importance in growth - production can be scaled still more efficiently to meet enlarging markets; business services and a versatile labour force are close at hand; new technology is more easily developed and exploited; and advanced management skills and enterprise are more readily attracted," (5,p.127).

(3,5 - See references at the end of the chapter

A later study by Kerr and Spelt examines the relative advantages of Southern Ontario for the location of industry based on market potential, transportation costs, labour costs and labour stability<sup>(6)</sup>. They found that metropolitan Toronto had a significant advantage over the rest of Southern Ontario for most of these factors, but for the rest of Southern Ontario the advantages were roughly equivalent and that within this area industry was relatively footloose with non-economic factors having the most important influence on location. It is interesting to note that outside of that part of Ontario known as the Canadian heartland, there was a marked decline in market potential and an increase in transportation costs.

A further dimension has been added to the analysis of Kerr and Spelt into the location advantages of Southern Ontario through the study of the location characteristics of American subsidiary companies in Ontario. D.M. Ray has formulated a relationship between the ability of an area in Southern Ontario to attract American branch plants based on the distance of the area from American centers of manufacturing production, the scale of industrial development in the exporting center, and the intervention of alternative more convenient locations between the exporting center and the prospective receiving area<sup>(7)</sup>. This analysis shows that South Western Ontario has greater opportunities of attracting American subsidiaries than other areas in the province and also reveals the great advantage of the heartland, relative to the rest of Canada in its proximity to the industrial centers of the United States.

(6,7 - See references at the end of the chapter

An analysis of the trend of industrial location in Ontario by K.A.J. Hay during the period 1945-59 shows that relatively little decentralization of industry has taken place<sup>(8)</sup>. The strongest trend has been towards the diffusing of industry from city centers into surrounding metropolitan areas and counties.

The division in Canada between the heartland and the hinterland seems to be so basic to the location of Canadian industry that most Canadian studies have in some way reflected its influence. Roy George has attempted to uncover some of the factors which work to the disadvantage of the hinterland in attracting new manufacturing industry<sup>(9)</sup>. Specifically he wished to determine if the business executives making the decision about locating a new plant were really informed about the relative advantages and disadvantages of the various regions of Canada. A survey was made of 350 firms which had set up manufacturing plants in central Canada between 1959 and 1962 to ascertain what alternative locations had been considered. It was found that 80% of the firms had only looked for a location in one province and only 5% had considered a location outside of Ontario or Quebec. This apparently narrow approach to plant location was remarkably similar for firms of different sizes and activities.

A study of development oriented towards the local level of growth has been carried out by Gerald Hodge in Eastern Ontario<sup>(10)</sup>. The limitations of statistical data made it impossible to study the factors which were common to communities undergoing growth in manufacturing

(8,9,10 -See references at the end of the chapter

employment, however, overall community growth was strongly related to a young population, an economic base devoted to commerce rather than industry and where the adult education level was low. It was found that "the problem of physical development is bound up as much with schools and education as it is with housing, local government, and jobs", (10,p.41). Although the factors affecting industrial development were not analysed in this study, a correlation was found between industrial oriented communities and high levels of capital investment per capita and good local services (10,p.21).

#### LOCATION CHARACTERISTICS OF CANADIAN MANUFACTURING INDUSTRY

A general survey of the important factors affecting the various types of industry in Canada was obtained through consultation with the various branches of the Department of Industry specializing in the development of particular industrial groups. The analysis of this information posed a special difficulty as the range of industrial activities made it impossible to consider documenting the location requirements of each relevant unit of manufacturing activity. The amount of detail which could be provided about location requirements also varied amongst the various branches in relation to the homogeneity or diversity of the industries being considered and the amount of research which had been done on location needs. The emphasis of the analysis has therefore been to deduce the essential characteristics of Canadian manufacturing industry which influence them towards a dispersed or centralized location.

(10 - See references at the end of the chapter

This subject will be discussed under three headings: industrial operation; industrial linkages; and economies of scale.

1. Industrial Operation

One of the most important determinates of location orientation would seem to be the type of industrial operation distinguishing between fabricating and processing manufacturing industries. The fabricating industries are in most cases highly urban oriented. Their material inputs have usually been processed and frequently there are a number of industrial operations required before the product is ready for shipment to final demand. Fabricating industries are therefore highly attracted by external economies - proximity to related manufacturers, the availability of skilled labour, specialized services, and good communications.

The processing industries may also be attracted by external economies, however, they are frequently subordinate to the economies to be obtained by locating in proximity to the raw materials. Processing industries are therefore most likely to be influenced by the source of material supply in their location decision, whereas fabricating industries are likely to be most influenced by external or agglomeration economies.

2. Industrial Linkages

The complementary nature of the operations of certain industries favours the concentration of related firms in one area. This partly explains the continuing and increasing concentration of some industries



in the Canadian heartland. The extent of the linkages established by a particular industry is closely related to the degree of specialization which has taken place. Specialization and interdependence is an evident characteristic of many of the fabricating industries such as automobile and aircraft manufacture or sections of the garment industry. Industrial linkages are not restricted to the fabricating industry, however, some processing industries and, in particular, certain branches of the chemical industry exhibit a similar relationship.

3. Economies of Scale

The economies of scale have a simple and direct effect on the degree of concentration of an industry: if only one or two firms can economically supply the market for a certain product, that industry will necessarily be much more localized than another where there are a number of manufacturers. A firm supplying the entire Canadian market for a particular product will, in the absence of other major location factors, minimize its distribution costs by locating in the Canadian heartland where there is the greatest concentration of population and manufacturing activities.

The survey of the main factors influencing the location of Canadian manufacturing activities indicates that the concentration of manufacturing industry in Canada is based on real location advantages available in the heartland for many companies. The hinterland with a low

population density and a small number of large centers capable of offering external economies comparable to the heartland centers, is seriously handicapped in competing for industries which are not directly related to raw material sources.

It would seem also that the factors influencing the location orientation of industry are changing in a way that will further decrease the attractiveness of many areas in the hinterland. There is reason to believe, for example, that the processing industries are becoming less resource oriented due to the introduction of less costly shipping techniques for raw materials and the decline in material costs relative to other production costs. The use of more sophisticated production machinery is resulting in less use of skilled manual workers and more use of workers with formal technical training; attracting these workers who have frequently obtained their training in urban areas into remote areas can pose great difficulties. For these reasons, the rationalization and consolidation of production facilities, which is taking place in many of the resource based industries, is resulting in a centralization of manufacturing, usually to the detriment of the smaller communities. It is evident also that the increase in the number and complexity of inter-industry linkages, resulting from greater specialization and the development of substitutional products is not beneficial to areas which have little or no industrial base.

HEARTLAND - HINTERLAND CONTRASTS AND CHANGES

It is apparent that the heartland - hinterland division in Canada is endemic to the physical location of manufacturing activities in Canada. This Section examines the differences between the heartland and the hinterland and the trend in the distribution of manufacturing industry between these two areas.

The Canadian heartland, defined geographically as the St. Lawrence - Great Lakes lowlands, is a strip of land extending 700 miles from Windsor to Quebec, and varying from a few miles to 100 miles in width. This land mass occupies only 2.5% of the nation's land area yet in 1961 contained nearly 50% of the Canadian population and 69% of the manufacturing employment. Statistics are not available to show the exact concentration of the various industrial groups within the heartland, however, the provinces of Quebec and Ontario produced 80% or more of the value of manufacturing production in fifteen of the twenty standard industrial classifications and 90% or more in ten, (Appendix 1). Compared to the American heartland, the Canadian heartland is relatively much smaller and more concentrated in its content of the nation's people and manufacturing activities.

Changes in the Heartland - Hinterland Relationship 1921 - 1961

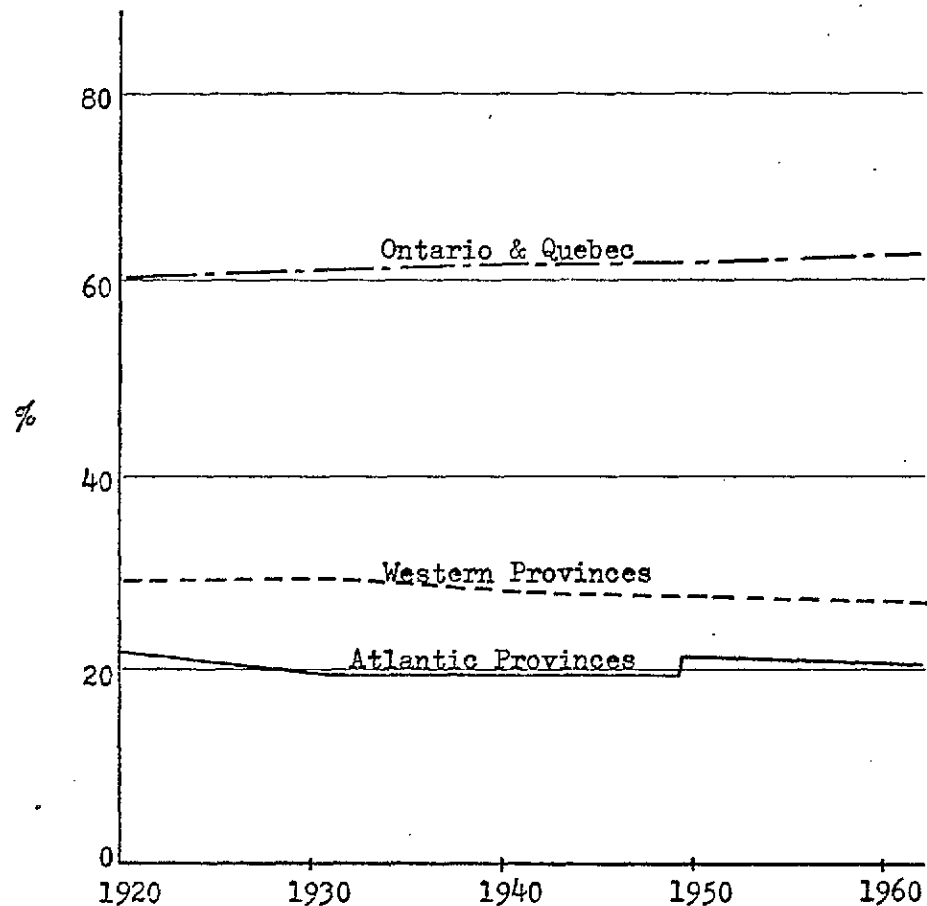
The above figures are striking in their indication of the great differences between the Canadian heartland and the hinterland, but of even greater interest are the changes which have been taking place in

the distribution of Canadian population and manufacturing activities between the two areas. The changes in the distribution of population and manufacturing employment between different regions of Canada for the periods 1921-1961 are shown in Figures 1 and 2. It has not been possible to show the exact distribution between the heartland and the hinterland, however the graphs do show the continuing dominance of Ontario and Quebec over the other regions of Canada. Between 1921 and 1961 there was in real terms a six fold increase in the volume of manufacturing production in Canada<sup>(11)</sup>, and yet during that same period the distribution of manufacturing employment among the main regions of Canada had changed by little more than two percent. Over the forty year period Quebec has increased its share and Ontario lost, however, the two provinces have at no time had less than 80% of the total manufacturing employment in Canada. The Atlantic Provinces have, in spite of the addition of Newfoundland in 1949, declined and in 1961 had 4.8% of the total employment while the western provinces have apparently made up what the Atlantic Provinces lost and in 1961 had 14.9% of the total manufacturing employment in Canada. The total change over the forty years in all three regions has, however, been very small and there is no indication that decentralization of manufacturing industry from the heartland to the hinterland is taking place in Canada.

The changes in the distribution of population among the regions of Canada is highly significant in understanding the absence of change in the distribution of manufacturing employment. The population of Canada between 1921 and 1961 has more than doubled and yet most of this population

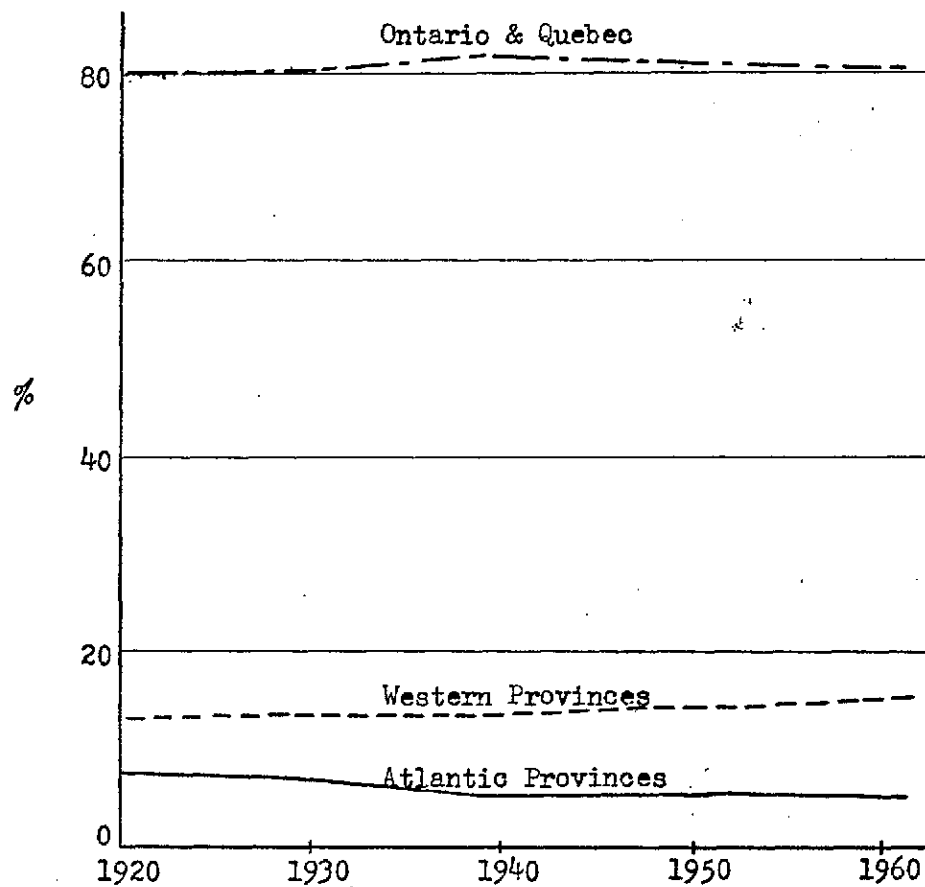
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FIGURE 1: DISTRIBUTION OF POPULATION



Source: 1961 Census

FIGURE 2: DISTRIBUTION OF MANUFACTURING EMPLOYMENT



Source: General Review of the Manufacturing Industries of Canada, 1961.

increase has gone to the central provinces while the Atlantic and Western Provinces have been losing their proportion of the total population. The period 1951-61 indicates that this relative population loss in the West has nearly stopped, however, the Atlantic Provinces have continued to decline.

An analysis by the Economic Council of Canada shows a similar phenomena with regard to the differences in regional income. During the period 1929 to 1964 the average personal income in each region in the United States shifted towards a greater equality of incomes in all regions. In Canada there has been almost no change in the inter-regional differences in personal income and although there was in 1929 a smaller disparity between regions in Canada than in the United States, by 1964 this situation had been reversed<sup>(5)</sup> p.103,104).

#### TRENDS IN REGIONAL DEVELOPMENT IN CANADA

In order to predict future trends in regional development in Canada, it is necessary to understand past trends. A useful approach towards this objective is to observe the reasons why the Canadian heartland, which is both smaller and more concentrated in its share of the nation's population and manufacturing activities than its American counterpart, has not paralleled the decentralization taking place in the distribution of population and manufacturing employment. The following factors are suggested as being most important in creating the difference between the development of the two countries: regional market size; changing population distribution, the influence of the United States heartland, and

(5 - See references at the end of this chapter

the selectivity of industrial decentralization. These factors are discussed in more detail below.

1. Regional Market Size

There is a considerable difference in the size of the regional markets in Canada and those in the United States, in Canada the smallest regional market is approximately two million people whereas in the United States it is nearly eight million people. The decentralization of industry towards regional markets is a function of market size but in Canada the hinterland has not had a sufficiently large population to stimulate any major decentralization of activities from the heartland.

2. Changes in Population Distribution

The most important contrast in the development of Canada and the United States has been the changes in the relative population concentration of the heartland. There has been in Canada a movement out of the hinterland, with the reduction in workers required in primary industries because of technological improvements and the failure of the Atlantic Provinces to find a stable economic base. Internal migration has therefore been towards the heartland while at the same time most new Canadians have tended to settle in central Canada. The United States, on the other hand has seen a shift in population concentration from the North-East to the South and West. There are undoubtedly several factors at work in stimulating this movement in the United States, however, a central cause would seem the

attraction of the temperate climate in the areas which are growing the fastest.

3. The Influence of the United States Heartland

The fact that the Canadian heartland lies adjacent to the centers of American manufacturing activity, has undoubtedly had a great effect on the development of this area of Canada. It is the logical location for American companies establishing subsidiaries in Canada because of the market potential and its proximity to parent plants. On the other hand it is unlikely that the Canadian heartland has had a very significant effect on the location of industrial activities in the United States.

4. Selectivity of Industrial Decentralization

Industrial decentralization in the United States has been a selective process involving the growth of large regional production centers, often at the expense of surrounding rural areas and nearby small towns(12,p.140). Canada at its present stage of development has a small number of regional centers located outside of the heartland which are of sufficient size to offer a range of external economies. This lack of urban centers is particularly prominent in the areas designated under the Area Development Program. The 1961 Census shows that 57% of the population of Canada lived in communities of 20,000 or over and yet only 14% of the 3.6 million people living in the designated areas are within these communities. Within the boundaries



of the 81 designated areas there are only eight communities of this size.

#### SUMMARY

The Canadian heartland, containing nearly 70% of the manufacturing activities and 50% of the population, and lying adjacent to the great industrial belt of the United States has locational advantages which can only be surpassed by the hinterland for those firms who are closely tied to their source of raw materials or where the market threshold is low. There seems to be little doubt that the key to decentralization of industry is a larger consumer population in the hinterland. Market considerations and agglomeration economies appear to be foremost among location factors. Regions without a large and growing market and major centers of population cannot expect to appeal to more than a very small number of the new manufacturing activities.

The hinterland regions of Canada have not had any particular advantages relative to the heartland to encourage the process of decentralization which has taken place in the United States. The heartland has continued to take an even larger percentage of the overall population over the last forty years at the expense of the prairies and the Atlantic provinces. The growth of the central provinces relative to the rest of Canada may now be slowing down but there is certainly no evidence of a reversal in the trend. The growth of the heartland relative to the hinterland is, in effect, increasing the attraction of the heartland as a location for manufacturing industry. The existing distribution of manufacturing activity in Canada is unlikely to shift towards decentralization until a change is effected in the sluggish population growth of the hinterland.

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THE INFLUENCE  
OF THE  
AREA DEVELOPMENT PROGRAM  
o n  
INDUSTRIAL LOCATION

The Area Development Agency was set up to develop and administer special measures to foster economic and industrial expansion in certain designated areas of Canada<sup>(1)</sup>. In September, 1963, manufacturing industries were offered tax incentives to locate their plant in one of the thirty-five national employment survey areas \* which had been designated on the basis of continuing high unemployment. By August, 1964, ten of the original areas were removed from designation because of the improvement in their economic situation, however, a new criteria for designation was adopted which included: under-employment, slow employment growth and low family incomes, with the result that 57 new areas were added which, with the 24 areas designated under the initial program, made a total of 81 areas. The coverage of the program increased from 7 $\frac{1}{2}$ % to 16% of the Canadian labour force. At the same time capital grants were made available to manufacturing companies setting up new facilities or undertaking substantial expansions in the designated areas.

\* later reduced to thirty-four through the combination of two areas.

(1) See references at the end of the Chapter.

The areas designated under the original program consisted of two economic groups: those dependent primarily upon the industrial development of natural resources and those largely characterized by manufacturing industry. The effect of the extended criteria for designation, together with the removal of ten areas from designation, has largely removed from the program those areas primarily engaged in manufacturing so that the areas in the present program are much more homogeneous. The areas are generally characterized by a low level of industrial development, dependence on resource based activities and remoteness from major urban areas.

This chapter examines the factors which have influenced firms to establish their plants in designated areas including the effect of the incentives offered by the Area Development Agency and the importance of infrastructure and community facilities. Following the findings of previous sections of this study on the importance of the heartland-hinterland division on industrial development, a distinction will be made throughout the analysis between firms who have located in designated areas in the hinterland or in the heartland.

RESPONSE TO THE AREA DEVELOPMENT PROGRAM

The Area Development Agency up to January 23, 1966 had received 517 applications which are broken down as follows:

1. Active*	374	73%
2. Reserved**	33	6%
3. Rejected or Withdrawn..	<u>110</u>	<u>21%</u>
	517	100%

\* Applications which are approved or under consideration.

\*\* Applications which have been suspended or are under special consideration.

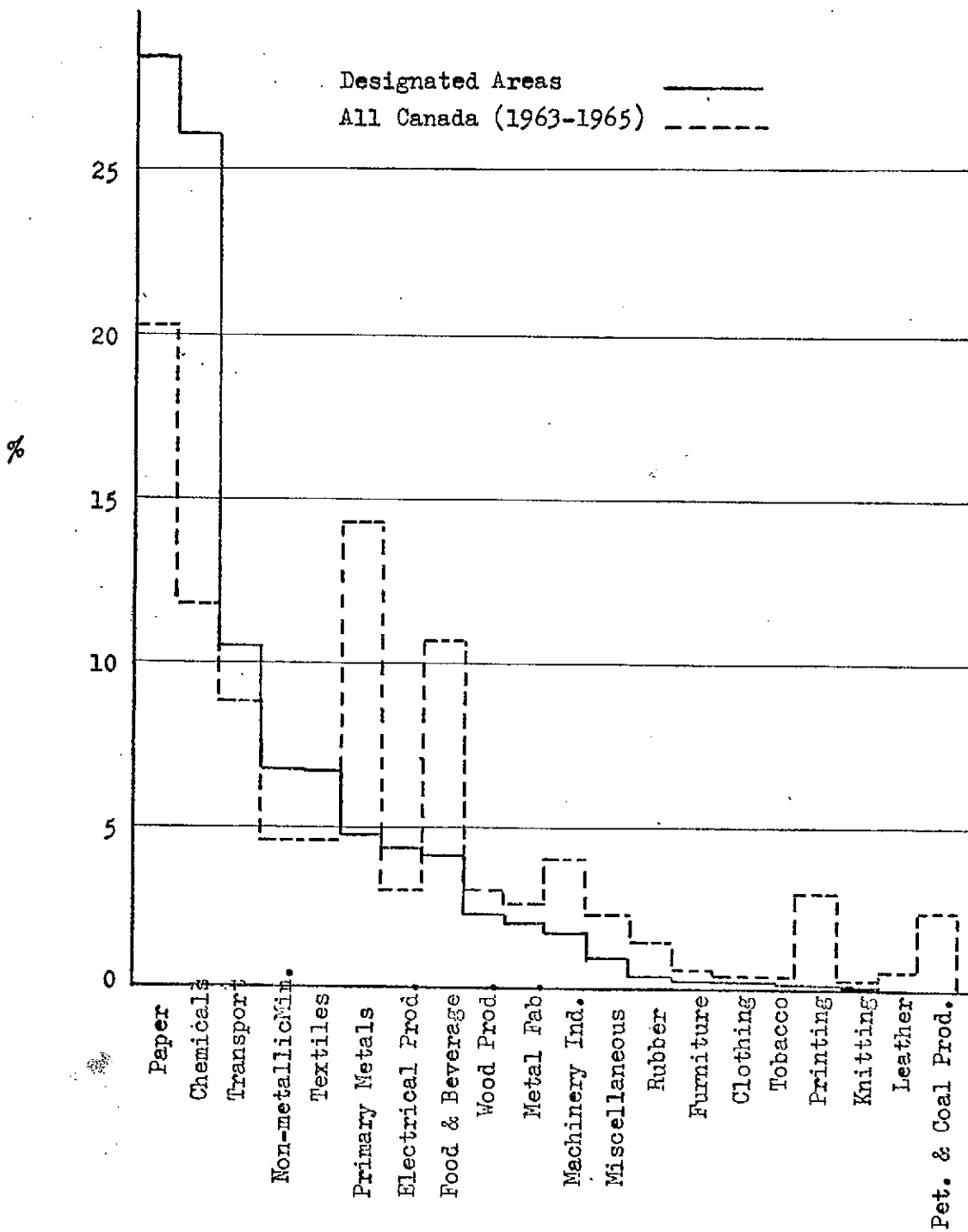
The 374 active applications have been examined in two stages; first a determination of the general characteristics of the industries and their geographical distribution, and second a more detailed investigation of the firms through the use of a mailed questionnaire.

1. Capital Investment

An analysis of the active applications indicates that the proposed development covers eighteen of the twenty standard industrial classifications: the leather goods and petroleum and coal products industries being excluded. The investment by manufacturing group is shown in Figure 3 together with the distribution of investment for all Canada for the period 1963-1965. The most striking aspect of the distribution of capital investment in the designated areas is the high proportion concentrated in pulp and paper and chemical products industries. These two industries account for 55% of the total investment. Other industries in which investment has been high relative to the national distribution are: non-metallic mineral products, textiles, electrical products and the transportation equipment industries. The major Canadian industries under-represented are the food and beverage and the primary metal industries.

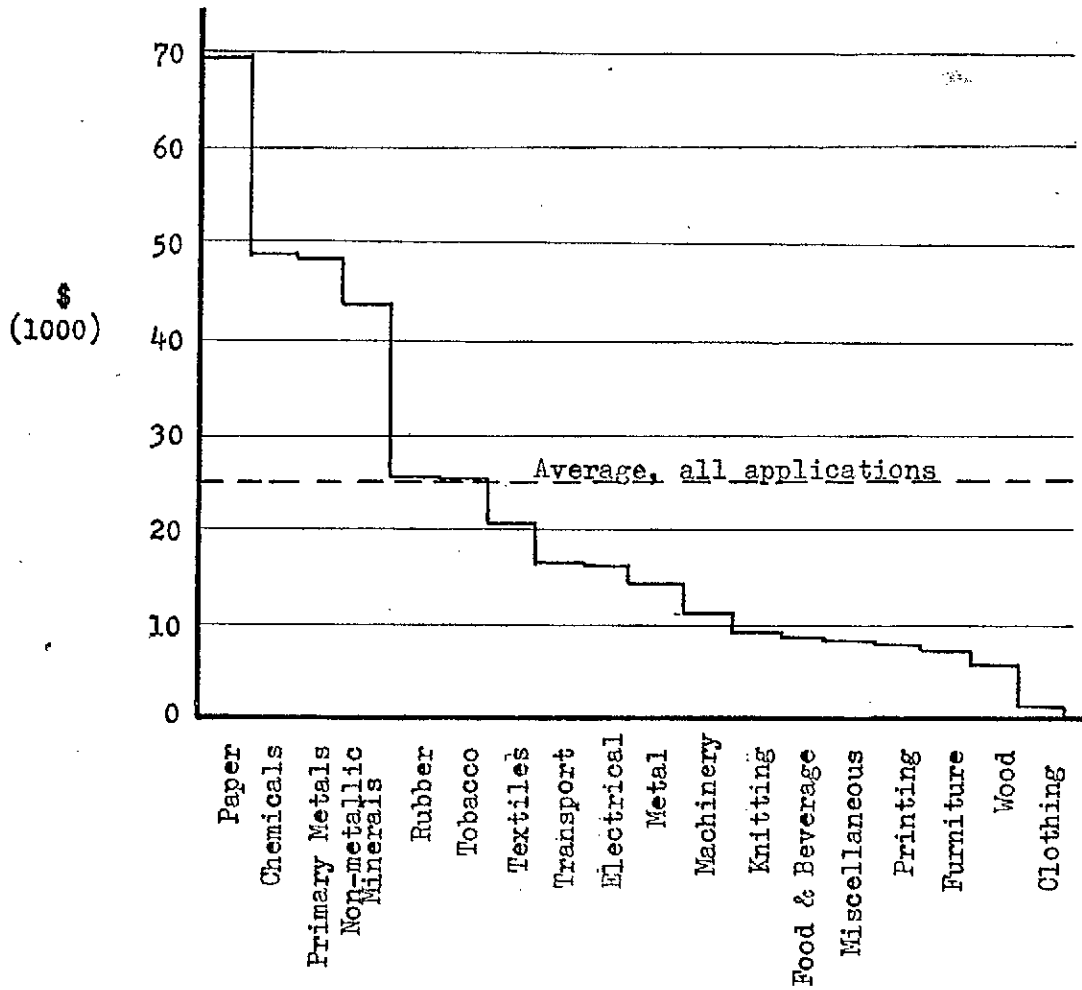
The average capital investment per employee by industrial group (Figure 4) shows a resemblance to the distribution of capital investment. The average capital investment per employee has been \$25,000 but for the chemical products industry it was \$69,000, the pulp and paper industry - \$47,500 and non-metallic minerals - \$45,000. Two-thirds of the capital investment has been in industries where the average investment per worker is \$45,000 or over.

FIGURE 3: DISTRIBUTION OF CAPITAL INVESTMENT -  
DESIGNATED AREAS & ALL CANADA



Source: Active Application to Jan. 23/66,  
Capital & Repair Expenditure Manufacturing Industries,  
Dominion Bureau of Statistics.

FIGURE 4: CAPITAL INVESTMENT PER EMPLOYEE - DESIGNATED AREAS



Source: Active Applications to Jan. 23/66.

2. Employment

The employment to be provided in various industrial groups, as indicated by the active applications, is quite different from the pattern of capital investment (Figure 5). The largest new source of employment will be in the transportation equipment industry, followed by pulp and paper and the food and beverage industries.

3. Distribution of Employment and Investment

The active applications cover the ten provinces and as of January represented an investment of \$719M and employment for 28,500 workers. The distribution of employment by area is given below:

Table 1: Distribution of New Employment Among Designated Areas

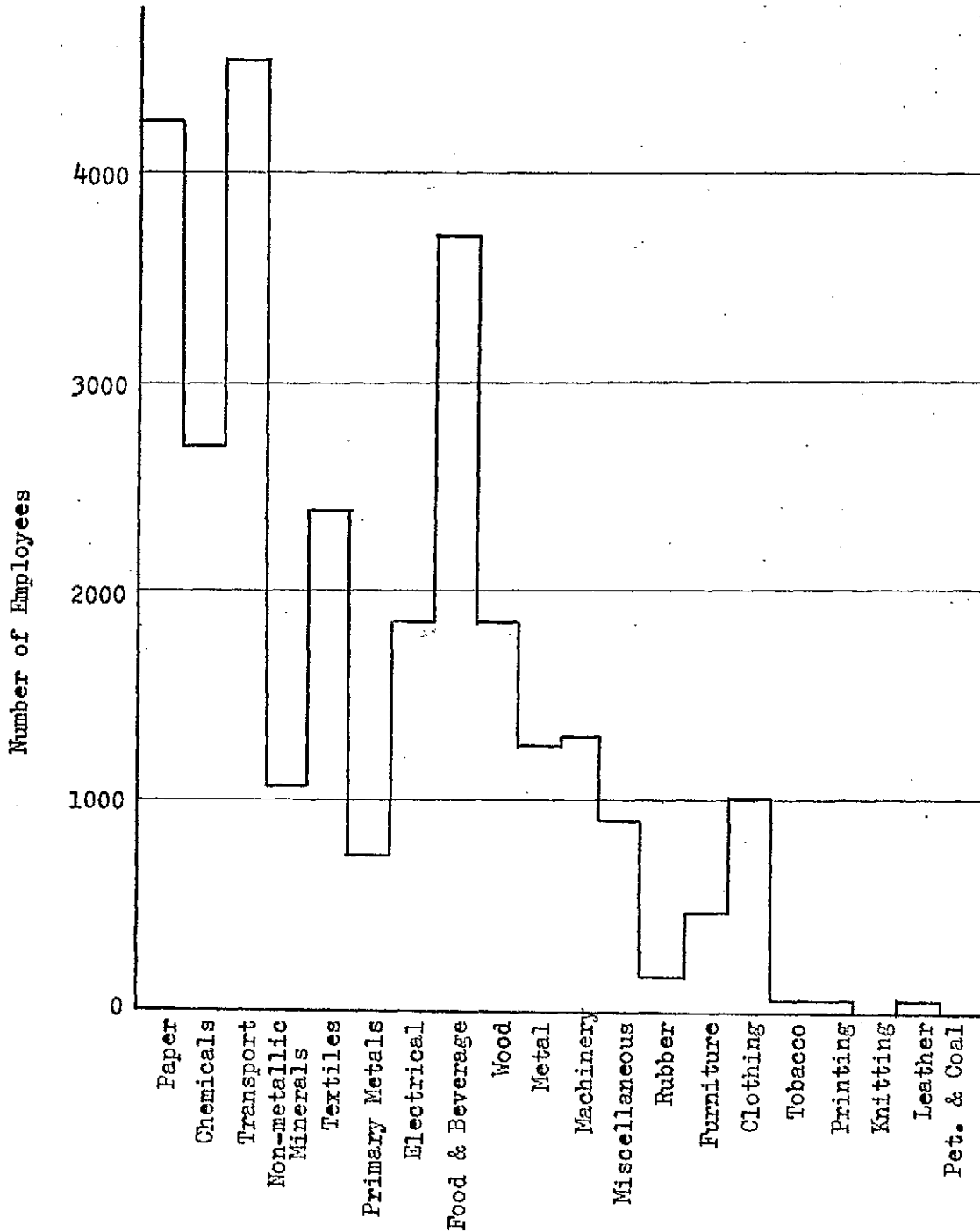
<u>Original Program</u> (34 areas) *		<u>Revised Program</u> (81 areas)	
Jobs	Areas	Jobs	Areas
0	4	0	24
1 - 50	5 (1)**	1 - 50	14
51 - 100	3	51 - 100	15
101 - 200	6	101 - 200	12
201 - 500	6 (2)	201 - 500	10
501 - 1000	3 (2)	501 - 1000	3
1001 - 2000	3 (1)	1001 - 2000	3
over 2000	<u>4 (4)</u>	over 2000	<u>0</u>
	34 (10)		81

\*\* Number of areas no longer designated

\* Sydney Mines & Sydney N.E.S. areas combined to form one area.



FIGURE 5: EMPLOYMENT IN DESIGNATED AREAS BY MANUFACTURING INDUSTRY



Source: Active applications to Jan.23/66

The areas which have received the most employment are predominantly the nine National Employment Service areas lying within the Canadian heartland <sup>\*</sup>. These areas have received 52% of the applications, 50% of the new employment and 46% of the capital investment. The heartland is also receiving a much wider range of industrial activities than the hinterland; there is to be investment in excess of one million dollars in thirteen of the twenty standard industrial groups with three industries receiving two-thirds of the total investment.

The hinterland in contrast has two industries which are to receive 73% of the total investment and 96% of the investment will be directed towards six industrial groups. <sup>(table 2)</sup> With the exception of the chemical products and non-metallic materials industries, the pattern of investment between the heartland and the hinterland are quite different. As would be expected, most of the new development to take place in the heartland is to be in fabricating industries, while most of the investment in the hinterland will be in resource oriented industries.

- \* St. Jean
- Cornwall
- Brantford
- Chatham
- Windsor
- Wallaceburg
- Midland
- Collingwood
- Owen Sound

Table 2: SIX LARGEST INDUSTRIAL GROUPS - HEARTLAND & HINTERLAND

	<u>Heartland</u>	
	Investment (\$M)	%
1. Chemical products	96.8	29.6
2. Transportation equipment	73.7	22.5
3. Textiles	47.2	14.4
4. Electrical products	28.1	8.6
5. Non-metallic Materials	18.9	5.8
6. Machine Industries	<u>11.8</u>	<u>3.6</u>
	276.5	84.5

	<u>Hinterland</u>	
	Investment (\$M)	%
1. Pulp and Paper	194.4	49.7
2. Chemical Products	90.5	23.1
3. Non-metallic Materials	27.4	7.0
4. Primary Metals	25.4	6.5
5. Food and Beverage	24.6	5.7
6. Wood Products	<u>16.2</u>	<u>4.1</u>
	378.5	96.1

A more detailed examination of the developments scheduled for each industrial group reveals that with the exception of the food and beverage and the wood products industries, the development in the hinterland is to be highly localized. A few areas will receive most of the benefits while as of January, 1966 a large number of designated areas were to receive no new employment.

The overall distribution of new development taking place under the Area Development Program for the 81 designated areas included in the Program in January, 1966, show five areas with 55% of the capital investment<sup>\*</sup>, seven areas with 50% of the new employment<sup>\*\*</sup>, while 24 areas had no new employment and an additional 29 which were to receive less than one hundred new jobs.

#### EFFECTIVENESS OF AREA DEVELOPMENT INCENTIVES

A survey was undertaken by the Area Development Agency to determine the effectiveness of the Area Development Program and to examine the factors which influence firms in the choice of a plant location. The firms which had as of January 23, 1966 active applications with the Area Development Agency were contacted either by mail or personal interview and requested to complete a questionnaire (Appendix II). Close to 80% of the firms contacted returned questionnaires of which about 85% or 218 were satisfactorily completed. These were representative of the total active applications with respect to industrial activity and geographic location<sup>(2)</sup>.

\* Midland  
Owen Sound  
Bathurst  
Causapscal  
Sydney

\*\* Midland  
Owen Sound  
Collingwood  
Bathurst  
Causapscal  
New Glasgow

(2) - See references at the end of the Chapter.

The following sections present the analysis of the questionnaire with regard to: type of firms; the process of site selection; location factors; the influence of location incentives; and the problems experienced by firms in designated areas.

1. Type of Firm

The firms responding to the questionnaire were coded into one of three groups: a local expansion; a branch or subsidiary of a parent company; and an entirely new enterprise. The results of this analysis are presented in Table 3.

TABLE 3: TYPE OF FIRM

	Heartland no.	%	Hinterland no.	%	Total no.	%
Local Expansion	47	40	50	50	97	45
Subsidiary	47	40	26	26	73	33
New Enterprise	<u>24</u>	<u>20</u>	<u>24</u>	<u>24</u>	<u>48</u>	<u>22</u>
	118	100%	100	100%	218	100%

This analysis shows that the type of development most frequent in the designated areas is the expansion of a plant already located within the area. The major difference between the heartland and the hinterland is the apparent greater attraction of the heartland for subsidiaries or branch plants. Most probably there would be a high correlation between these subsidiaries and American ownership<sup>(3)</sup>.

(3) See references at the end of the Chapter.

## 2. Site Selection

The firms were asked two questions relating to the selection of a site; one dealt with their prior experience in the area and the other about the extent of their location survey. The analysis of these two questions is presented below.

TABLE 4: PRIOR KNOWLEDGE OF THE AREA WHERE NEW PLANT IS LOCATED

	Heartland		Hinterland		Total	
	No.	%	No.	%	No.	%
No Knowledge of Area	46	43	21	25	67	35
Familiar with Area	<u>62</u>	<u>57</u>	<u>63</u>	<u>75</u>	<u>125</u>	<u>65</u>
	108	100%	84	100%	192	100%

TABLE 5: EXTENT OF LOCATION SURVEY

	Heartland		Hinterland		Total	
	No.	%	No.	%	No.	%
No Other Areas	25	25	25	36	50	30
Other Communities	18	18	17	25	35	21
Other Areas in Prov.	33	34	24	35	57	34
Other Provinces	<u>23</u>	<u>23</u>	<u>3</u>	<u>4</u>	<u>26</u>	<u>15</u>
	99	100%	69	100%	168	100%

The two tables above indicate much the same thing and are consistent with the analysis of the type of firms active in the Area Development Program. A large percentage of the development taking place in the designated areas is related to local firms already familiar with

the areas. This situation is more typical for firms in the hinterland than those locating in the heartland. Although the results to the question on the extent of the location survey are not suitable for exact interpretation - the definition of what constitutes a location survey is a subjective judgment made by each firm; it would certainly seem that most firms have not explored a very wide range of alternatives before choosing a location for their plant. The firms in the hinterland were significantly less active in this regard and this difference is probably even greater than shown in Table 5 when it is considered that 31% of the hinterland firms failed to complete this question compared to 15% of the firms locating in the heartland. That fact that only 4% of the firms locating in the hinterland examined another province in their location survey discourages the belief that the incentives given by the Area Development Agency are effectively stimulating the decentralization of industry.

### 3. Location Factors

The questionnaire asked firms to indicate the factors which were of primary or secondary importance in the location of their plant. While the results to this question point out general differences between the heartland and hinterland and in most respects follow the findings of other location studies, it should be observed that specific conclusions about the relative importance of the various factors of location should not be drawn from a survey of this nature, particularly with regard to the importance of infrastructure and amenity factors. This is because

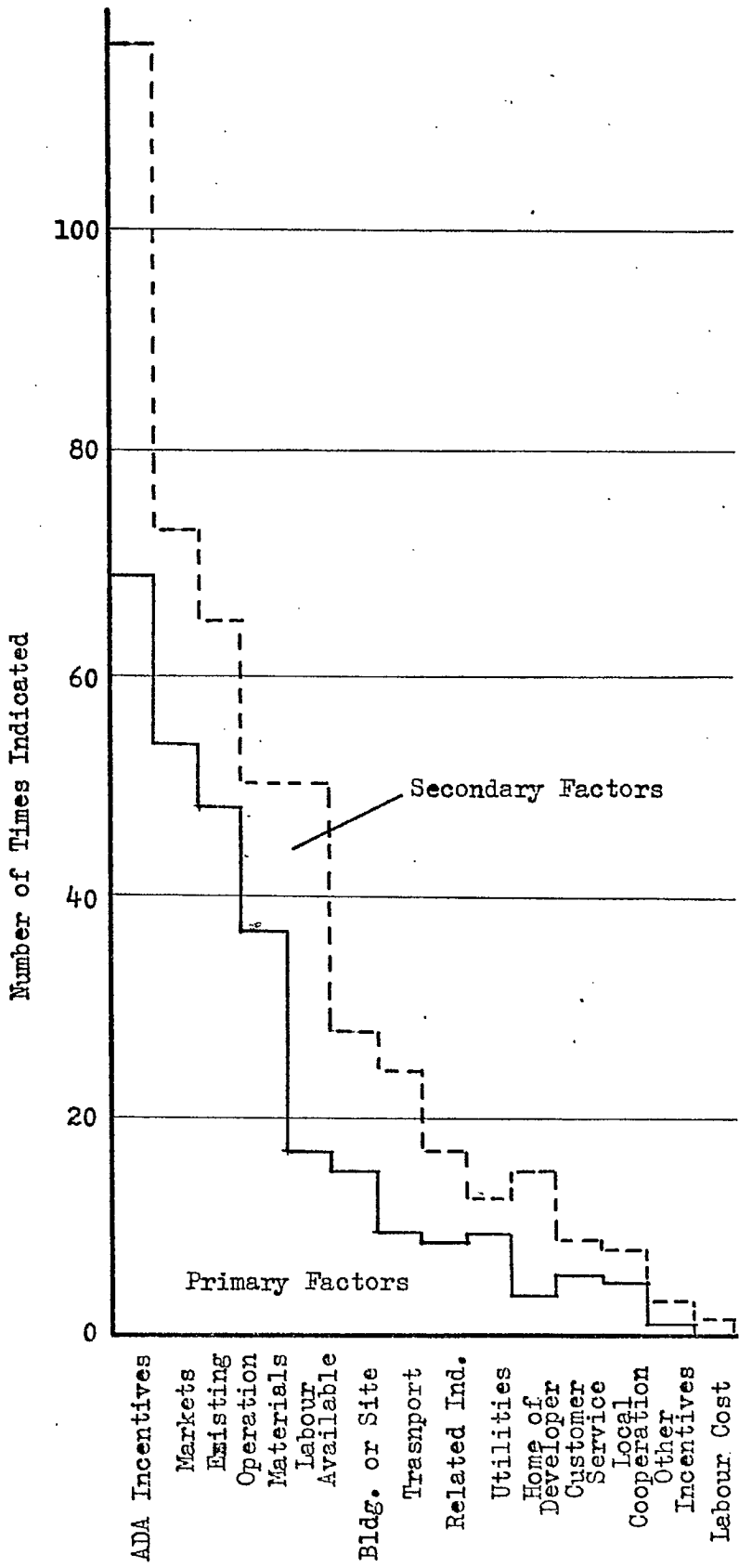
of the impossibility of adequately exploring the many factors affecting industrial location and evaluating or eliminating subjective bias when using a mailed questionnaire. For example, many of the questionnaires were directed towards someone in the financial department of the larger firms because they had been responsible for making the original application to the Area Development Agency; it is quite likely that their understanding of the location factors affecting the firm's decision may be quite different from the general manager's. It is also impossible to know if the omission of a factor means that it wasn't necessary or that no location was examined which did not include that factor.

The information given by firms with regard to location factors is presented in Figures 6, 7 and 8. The replies indicate that the Area Development Agency incentive was the most important single location factor followed in importance by markets, relation to existing operations, and materials. The availability of labour is shown as a less important primary factor but an important secondary factor. Factors mentioned less frequently are transportation, infrastructure and community facilities.

The relative importance of the various factors is, however, quite different between those industries locating in the heartland and those establishing in the hinterland. The primary location factors indicated by firms in the heartland were: Area Development Agency incentives, markets, and the relation to existing operations followed by the availability of labour, buildings and sites. The influence of materials was very small. The firms locating in the hinterland indicated



FIGURE 6: LOCATION FACTORS IN DESIGNATED AREAS



Source: Survey of active applications received by Jan. 23/66

FIGURE 7: LOCATION FACTORS IN HEARTLAND DESIGNATED AREAS

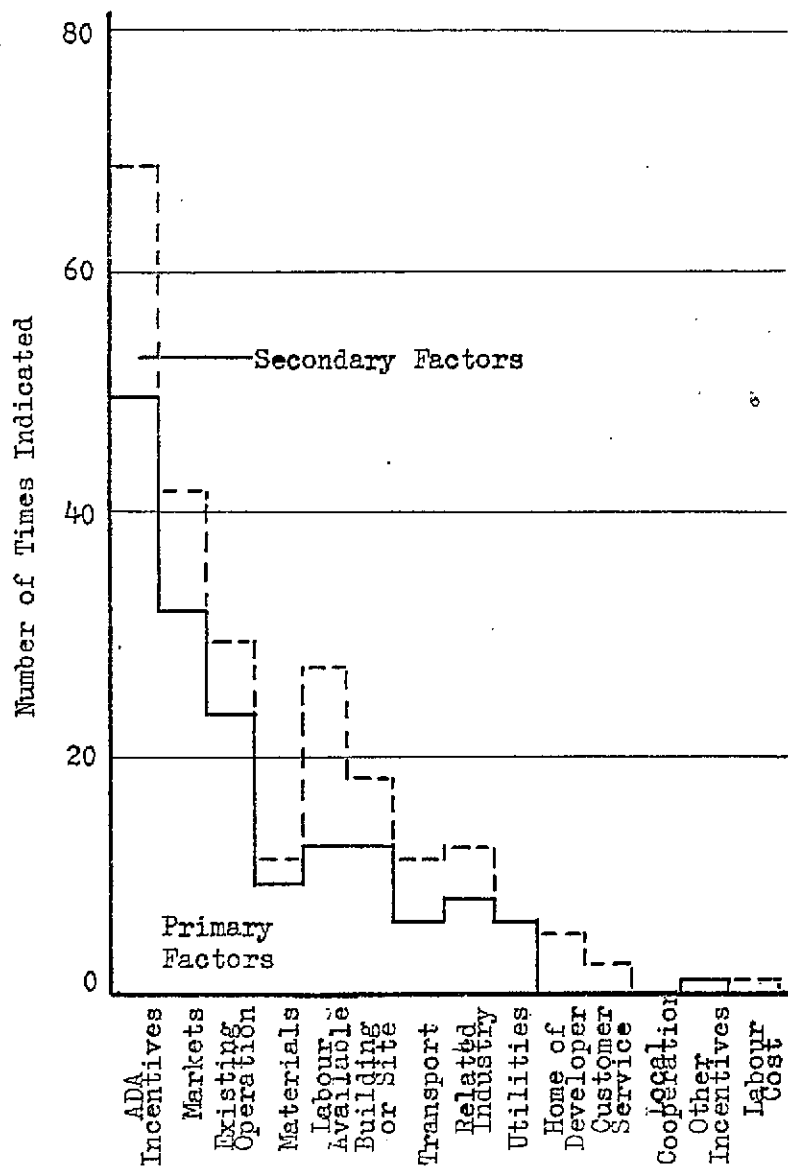
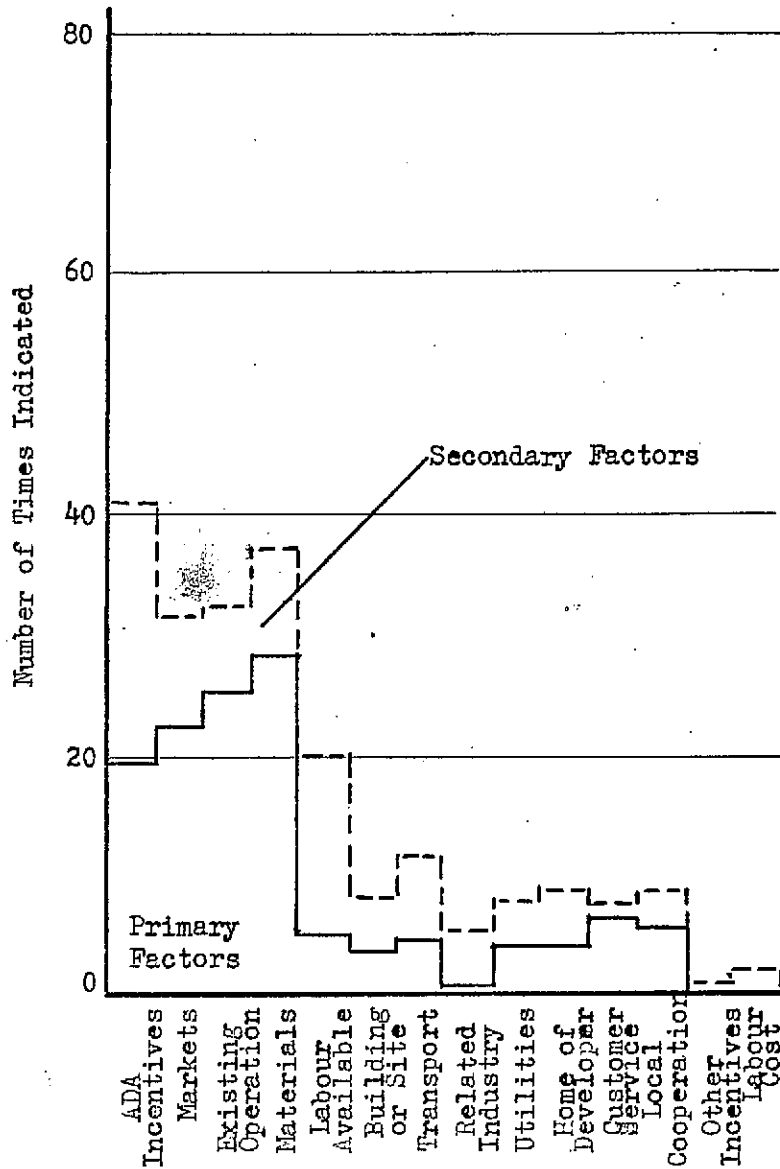


FIGURE 8: LOCATION FACTORS IN HINTERLAND DESIGNATED AREAS



Source: Survey of active applications received by Jan. 23/66.

four major location factors which were in order of importance: the availability of materials; relation to existing operations, markets; and the Area Development Agency incentives.

A further question about the requirements of firms with regard to transportation facilities revealed the overwhelming importance of road transport. This is shown in the table below.

TABLE 6: TRANSPORTATION REQUIREMENTS

	Heartland	Hinterland	Total
Rail: terminal siding	23)55 32)	27)70 43)	50)125 75)
Road Transport	105	89	194
Air Transport	13	4	17
Sea Transport	11	24	37

It is apparent that there are significant differences in transport requirements between firms who have located in the heartland and those in the hinterland. Rail transport is required by more firms in the hinterland than in the heartland, road transport is equally important in both areas while air transport was predominantly required by firms locating in the heartland. The greater demand for sea transport facilities amongst the hinterland firms probably reflects the wider availability of these facilities amongst the designated areas in the hinterland.

4. Effect of Area Development Incentives on Firms

The questionnaire asked firms what effect the Area Development incentives had on the development and location of their new plant. The response to this question indicated that the incentive, where it was effective, did one of three things: (1) it stimulated or made it possible for an entrpreneur to create a facility which otherwise would not have come into existence; (2) it shifted the planned location of a plant to a location within a designated area; and (3) it accelerated the development of a facility which was to have been developed within a designated area at a later date. The analysis of the response to this question is given in the table below:

TABLE 7: INFLUENCE OF AREA DEVELOPMENT INCENTIVES

Effect of Incentive	Heartland		Hinterland		Total	
	No.	%	No.	%	No.	%
Created new plant	33	30	33	35	66	32
Shifted Location	27	24	11	11	38	18
Accelerated Development	48	43	47	49	95	46
No Effect	<u>3</u>	<u>3</u>	<u>5</u>	<u>5</u>	<u>8</u>	<u>4</u>
	111	100%	96	100%	207	100%

The firms indicated that the Area Development incentives have been effective in stimulating economic development in designated areas, mostly by accelerating planned developments within the designated areas but also through stimulating the formation of enterprises which otherwise

would not have taken place. The development incentives are not to any major degree shifting the location of firms to the designated areas, particularly not in the hinterland designated areas. Those firms who have shifted their location to a designated area have in most cases only moved from a neighbouring area. A further question established that there were just five firms who, without the incentive, would have located in a completely different region of Canada.

5. Problems of Locating in a Designated Area

Twenty-three percent of the firms stated that they had encountered unusual problems in setting up their plant in designated areas. There was no evident regional bias among the firms encountering difficulties. More than half of the problems centered around labour - usually with regard to skills but also with regard to availability. Inadequate transportation facilities or infrastructure was mentioned by a further third while most of the remainder had encountered problems in obtaining finance.

SUMMARY

This analysis of the effectiveness of the Area Development Program, shows that it has been extremely successful in the areas located within the Canadian heartland. The incentive has accelerated the development plans of firms in the area, created new development opportunities and in one-quarter of the cases attracted plants from other areas. The nine heartland areas have attracted one-half of the new development and, in fact, the program had up to January, 1966 brought the greatest benefits to the most prosperous areas of Canada.

The Area Development Agency program in another respect seems to favour the industrial heartland over other areas of Canada. The largest proportion of the incentives given under the program have been to industries in which the capital investment per employee is very high, in fact the method for determining the amount of the location incentive favours capital intensive facilities. Although this type of facility may provide greater benefits to the local area in plant construction employment over one that is less capital intensive facility, most of the investment is more likely to be channelled back to the Canadian heartland or abroad for the purchase of plant machinery and equipment.

The incentives given by the Area Development Agency have been much less effective in stimulating economic development in the hinterland. A few areas have received large scale benefits under the program based on the exploitation of a natural resource or the expansion of an existing industrial base, however, in January, 1966 the majority of the areas had received an insignificant amount of new development under the Program. It is apparent that the effect of the location incentives has not been to stimulate the movement of industry from the heartland to the hinterland, but has accelerated the plans of firms wishing to develop a new plant in the area or has made it possible for new developments to take place which otherwise would not have been contemplated. Exactly half of the new plants in the hinterland are the result of an expansion of a local industry. Areas without a local industrial base on which to build new development or a major resource supply ripe for exploitation have fared very poorly.

The question about the importance of physical facilities and local environment has not received a direct answer, however, the evidence seems to support the hypothesis developed in Chapter Two that these facilities are not a major determinate of location but a firm at the local level will choose only those locations which can provide it with a satisfactory level of basic services and within the choice available obtain the best operating conditions. It will be noted that while transportation, utilities and community facilities were infrequently mentioned amongst location factors, firms did locate where they could obtain truck transport and in a large number of cases rail transportation which for 60% meant a rail siding.

The results of this analysis of the firms active in the Area Development Program substantiates the earlier findings of this study that the central problem to be overcome in stimulating the development of manufacturing activities in the hinterland are the smallness of the regional markets outside of the hinterland and the lack of opportunities to obtain agglomeration economies. In comparison with the pervasive influence of these factors on the location of industry, physical facilities and area environment are very minor location factors.

CHAPTER FOUR REFERENCES:

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## C O N C L U S I O N

The object of this study was to provide the Area Development Agency with a review of the literature on industrial location and to advise the Agency on the influence of physical facilities and area environment on industrial location.

It was found that there were three major factors influencing the distribution of manufacturing activities on a national scale. These factors were markets, raw materials and external economies. Of the three, the influence of markets is the most important factor for the largest number of firms; raw materials are becoming less important as a location factor and external economies are of prime importance to small firms or new industries. The availability of labour or low wage rates are usually factors of secondary importance in the location of a firm.

Physical facilities - transportation, power and other utilities; and community facilities are important only at the secondary level of site selection. Within the horizon which will satisfy the prime location requirements, companies will select a location which offers the best base facilities and the lowest costs in meeting their requirements; locations without the necessary facilities will be ignored. The influence of infrastructure and area environment on industrial location is therefore predominantly at the local level of site selection.

A second object of this study was to examine the physical location of industry in Canada with particular regard to the areas designated by the Area Development Agency.

It was found that the most dominating and pervasive influence on the location of Canadian industry is the extreme concentration of population and manufacturing activities which has developed in that small area of Canada defined geographically as the St. Lawrence River and Great Lakes lowlands. Over the last forty years there has been a seven fold increase in manufacturing in Canada and yet Ontario and Quebec have, during that period, retained over 80% of the total manufacturing employment and an increasing proportion of the total population of Canada. The slow growth of markets outside of the heartland and the limited number of centers there which can provide external economies comparable to the heartland has meant that most new industry going to the hinterland have been resource oriented. A reversal in this trend is only likely to take place when the hinterland can attract more of the population growth than the heartland and as the hinterland develops more large urban centers.

The incentives to manufacturing industry offered by the Area Development Agency have been very effective in stimulating the development of new industries in the designated areas lying in the heartland, however, only three of the 81 designated areas are now located in the heartland. It is the other 78 areas lying in the hinterland where the program of the Area Development Agency has had a much poorer record of achievement in stimulating new manufacturing developments. Major new employment opportunities have only been created in a few areas which had

an industrial base on which to build new developments or where there was a resource which was ripe for development. The incentives are not attracting industry to move from the heartland to the hinterland but are in most cases accelerating the plans of firms who had been planning a new facility in a designated area.

#### RECOMMENDATIONS

The following recommendations are made to the Area Development Agency with the hope that they will be of use to the Agency in evaluating and improving its program to increase the economic opportunities within the designated areas.

- 1) The implimentation by the Area Development Agency of an ad hoc program to improve physical and community facilities within the designated areas is unlikely to increase, in any significant way, the attraction of the designated areas for new manufacturing industries. Although satisfactory physical facilities are a basic requirement for manufacturing industry, it does not appear that the lack of these facilities is related to the failure of areas to attract new industry.
- 2) The Area Development Agency should review its method of determining the amount of the development incentive to ascertain if the incentives program is favouring capital intensive manufacturing industry and not attracting the development of labour intensive industry; and if so if this system is prejudicial to the objectives of the Area Development Agency.

- 3) In view of the difficulties in stabilizing and expanding the population in the hinterland regions - the key to gaining a large share of the nation's manufacturing activities, and recognizing the absence of opportunities for the development of manufacturing industry in many of the hinterland designated areas, the Area Development Agency should attempt to expand the job opportunities in the hinterland areas by extending the location incentives to cover all industrial activities which create new employment in these areas.
  
- 4) Having regard to the long-standing problems of many of the hinterland designated areas and the continuing decline of these areas over a number of decades, the Area Development Agency might consider the advantages of stimulating a more active development program in these areas through the establishment of regional development groups with the expertise and financial resources to uncover and exploit new economic opportunities on a regional basis and to develop centers capable of offering scale economies in the areas where the present program is ineffective.

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VALUE OF MANUFACTURING PRODUCTION IN CENTRAL PROVINCES, 1961  
(Selling value of factory shipments)#

	<u>All Canada (\$M)</u>	<u>Ontario and Quebec (\$M)</u>	<u>%</u>
1. Tobacco Products	335	335	100
2. Rubber	331	322	97
3. Leather	291	279	96
4. Electrical Products	1,206	1,154	96
5. Knitting Mills	219	205	94
6. Miscellaneous	575	539	94
7. Textiles	1,896	1,761	93
8. Machinery	640	591	93
9. Clothing	802	720	90
10. Transportation Equipment	1,961	1,776	90
11. Chemical Products	1,434	1,267	89
12. Primary Metals	2,806	2,406	86
13. Metal Fabricating	1,493	1,265	85
14. Furniture	362	304	84
15. Printing	872	708	81
16. Non-metallic Minerals	675	523	78
17. Paper Products	2,206	1,586	72
18. Food and Beverage	4,905	3,337	68
19. Petroleum & Coal Production	1,220	767	63
20. Wood	<u>1,035</u>	<u>363</u>	<u>35</u>
	<u>24,243</u>	<u>19,285</u>	<u>80</u>

# General Review of Manufacturing Industries of Canada,  
Dominion Bureau of Statistics, September 1965.

AREA DEVELOPMENT AGENCY - DEPARTMENT OF INDUSTRY

QUESTIONNAIRE

INDUSTRIAL LOCATION INCENTIVES

PART I - PLANT LOCATION

File No. \_\_\_\_\_

1. What factors prompted your company to locate in this area?

(a) Primary considerations \_\_\_\_\_

(b) Any secondary factors \_\_\_\_\_

(c) Has the management of your plant had previous acquaintance with the community or area in which you located which might have influenced your location decision?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, please explain \_\_\_\_\_

2. Before selecting your actual plant location, did you consider other sites?

If so, please indicate by giving names of:

(a) Other regions in Canada \_\_\_\_\_

(b) Other areas in the same province \_\_\_\_\_

(c) Other communities in the same general area \_\_\_\_\_

3. Which of the following factors were most important in your decision to locate in this particular area? (Please number in order of importance.)

Markets \_\_\_\_\_

Raw Materials \_\_\_\_\_

Labour \_\_\_\_\_

Customer Service \_\_\_\_\_

Transportation \_\_\_\_\_

Area Development Agency Incentives \_\_\_\_\_

Other Federal Government Incentives \_\_\_\_\_

Industrial Sites or Buildings \_\_\_\_\_

Utilities (power, water, sewage disposal) \_\_\_\_\_

Community Facilities \_\_\_\_\_

Provincial or Municipal Incentives \_\_\_\_\_

Climate \_\_\_\_\_

Other \_\_\_\_\_

File No. \_\_\_\_\_

PART II - INCENTIVES

4. Without the Area Development Agency incentive:

(a) Would your firm have established a new plant? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, were your plans accelerated by the incentive program?

Yes \_\_\_\_\_ No \_\_\_\_\_

(b) Would your firm have located in a designated area? Yes \_\_\_\_\_ No \_\_\_\_\_

If not, where might it have located? \_\_\_\_\_

5. Did your company receive other locational incentives or assistance to establish your plant in its present location? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, what was the nature of the incentive or assistance and whom was it given by?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Were these other incentives or forms of assistance critical in your decision to open a new plant or in your choice of a site?

\_\_\_\_\_  
\_\_\_\_\_

6. Do you consider Area Development Agency incentives as useful as anticipated?

Yes \_\_\_\_\_ No \_\_\_\_\_

(a) If not, why not? \_\_\_\_\_

(b) What other forms of government assistance might have been more useful?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. Did your company experience any unusual problems in moving into a designated area?

Yes \_\_\_\_\_ No \_\_\_\_\_

If so, please explain \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

PART III - IMPACT OF YOUR COMPANY IN THE DESIGNATED AREA

8. Stage of Development: Planning  Trial Production   
 Under Construction  Commercial Production

9. Employment:

- (a) Annual average employment \_\_\_\_\_ Male \_\_\_\_\_ Female \_\_\_\_\_  
 (b) Administrative and Supervisory \_\_\_\_\_ Production and Related \_\_\_\_\_  
 (c) If your operation is seasonal, during which months is the peak period? \_\_\_\_\_  
 What is your total employment at the peak period? \_\_\_\_\_  
 (d) Number of employees hired from the designated area \_\_\_\_\_  
 (e) Number of employees transferred from your other company operations \_\_\_\_\_  
 (f) If records are available, please state the percentage of new employees who were unemployed at the time of hiring \_\_\_\_\_%.  
 (g) Number of work hours per average work week \_\_\_\_\_  
 (h) Total annual salary and wage bill \$ \_\_\_\_\_

10. Supply and Distribution

Please give percentage breakdown of expenditures and markets in the columns below:

Location of Expenditures & Sales	Machinery & Equipment	Buildings	Raw Materials and Components	Markets by Sales Volume
(a) Solely within the designated area	_____	_____	_____	_____
(b) Outside (a), but within the province	_____	_____	_____	_____
(c) Outside (a) and (b), but within Canada	_____	_____	_____	_____
(d) Outside Canada	_____	_____	_____	_____
Total = 100%				

11. Production:

Total annual value of factory shipments \$ \_\_\_\_\_

12. Transportation:

Check those transportation facilities used for supply and distribution

- Rail terminal facilities  Air   
 Rail siding  Water   
 Highway

Please give the name of the company official whom we can contact for further information or clarification of any of the above items. \_\_\_\_\_

