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**LA THÈSE A ÉTÉ
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The Distributive Trades in the Regional Municipality of Sud-
bury (Ontario): An Analysis of Market and Employment Depen-
dence

by

Massimo Gabriele Battistoni

A Thesis
presented to the University of Ottawa
in partial fulfillment of the
requirements for the degree of
Master of Arts in Geography
in
School of Graduate Studies at the University of Ottawa

Ottawa, Ontario, 1979

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ABSTRACT

The majority of the studies done on the Regional Municipality of Sudbury have been orientated towards the mining industry. This is because the mining industry has a great effect upon the economy of the Regional Municipality of Sudbury, and upon the other economic sectors in the Regional Municipality of Sudbury. The thrust of this thesis is not to study the mining industry, but to study the distributive trades of wholesaling and retailing in the Regional Municipality of Sudbury.

The data for the analysis of the distributive trades was collected by the telephone interview technique. This technique proved to be successful because of the overall high response rate.

The theoretical framework used for analysing the distributive trades was central place theory. Central place theory is not only a theory dealing with the spatial organization of towns or cities, but it is also a distributive theory. This is because the concepts of threshold and range are very useful in analysing the distributive trades.

The distributive trades were analysed in terms of their dependence on the exterior and interior markets. First of all, the distributive trades were analysed in terms of their

market areas. The market area analysis revealed that both the wholesale and retail sectors are dependent upon the Regional Municipality of Sudbury; but, the wholesale sector was found to be less dependent than the retail sector. The reason for this is, that the wholesale sector receives a greater percentage of their sales from outside the Regional Municipality of Sudbury than the retail sector.

Secondly, the distributive trades were analysed by economic base analysis. This analysis revealed that employment in both the wholesale and retail sectors are dependent and vulnerable upon the Regional Municipality of Sudbury. Again, as in the market area analysis the wholesale sector was found to be less dependent and vulnerable upon the Regional Municipality of Sudbury than retailing.

RESUME

La plupart des études faites sur la municipalité régionale de Sudbury portent sur l'industrie minière. Ceci, parce que l'industrie minière a un effet important sur l'économie de la région municipale et aussi sur les autres secteurs économiques dans la municipalité.

L'intention de cette thèse n'est pas d'étudier l'industrie minière mais d'analyser les commerces de distribution de détail et de gros dans la municipalité de Sudbury.

Les données pour l'analyse des commerces de distribution ont été collectées par la technique d'entrevue par téléphone. Le succès de cette technique étant la taux de réponses élevées qu'elle suscite dans l'ensemble.

La théorie des places centrales fut utilisée pour analyser les commerces de distribution. Cette théorie n'est pas uniquement utilisée pour l'organisation spatiale des villes et des cités mais aussi comme théorie de distribution de biens et services. Ceci parce que les concepts de seuils et d'aires d'influence sont fort utiles pour analyser les commerces de ce genre.

On a analysé les commerces selon leur dépendance des marchés extérieurs et intérieurs. D'abord, les commerces de distribution sont examinés selon leur aires de marché. L'analyse des aires de marché révèle que les deux

secteurs de gros et de détails dépendent de la municipalité régionale de Sudbury; mais on a trouvé que le secteur de commerce en gros en dépendait moins que le secteur de détail. La raison étant que le secteur de gros a un plus grand pourcentage de ses ventes de l'extérieur de la région de Sudbury que le secteur de détail.

Deuxièmement, les commerces de distribution furent examinés par l'analyse de base économique. Cette analyse révèle que les deux secteurs sont vulnérables et dépendants de la municipalité. De nouveau, on a trouvé que le secteur de gros était moins vulnérable que le secteur de détail.

ACKNOWLEDGEMENTS

The motivation for the research contained in this thesis came from the fact that, the economy of the Regional Municipality of Sudbury at the time of the writing of this thesis was in a depressed state. This was due to the lay-offs in the mining industry in the Regional Municipality of Sudbury. I did not want to see the short term effects that the lay-offs had on the merchants in the Regional Municipality of Sudbury, but I wanted to determine if there was a possibility for the merchants to decrease their dependence upon the Regional Municipality of Sudbury and upon the mining industry over a long term.

Throughout the research and writing of this thesis, I am indebted to Dr. Peter Harrison for his guidance as my thesis advisor. His encouragement and critical comments of my research have been of great help in pushing it to its completion.

My appreciation is extended to the following organizations without whose cooperation the undertaking of this research would not have been possible: Sawchuk and Peach: Architects and Planners; the merchants in the Regional Municipality of Sudbury; and the Planning Branch of the Regional Municipality of Sudbury.

To the University of Ottawa I express my thanks for its assistance which has greatly eased the financial burden of my studies.

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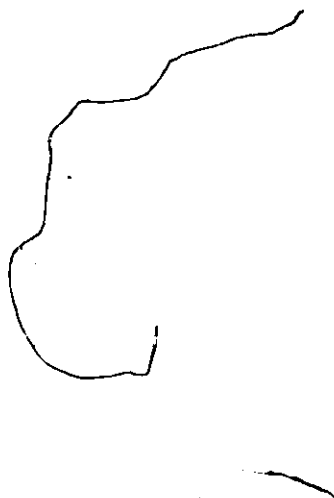
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Chapter I

INTRODUCTION

The Regional Municipality of Sudbury is situated in the rich ore deposits of the Sudbury Nickel Basin. These deposits have constituted the basis of the existence and growth of the mining industry in the Regional Municipality of Sudbury. Because of this, the Regional Municipality of Sudbury has been considered a single industry community. At first this would seem to be somewhat unique because the Regional Municipality of Sudbury is a large metropolitan area (over 150,000 in population). But this is in fact not the case.

There are many cities in Ontario and in Canada which are greater in population than the Regional Municipality of Sudbury and are also considered to be single industry communities. For example, Ottawa is one of them; having government and government related services as the single industry. There are of course smaller cities than the Regional Municipality of Sudbury which are single industry towns. They are quite evident especially in the area surrounding the Regional Municipality of Sudbury (such as Timmins and Elliot Lake which are mining communities). This shows that the definition of single industry communities is varied amongst different centres and the single

industry does not necessarily have to be from the primary sector.

In the past, the mining industry has meant almost everything to the Regional Municipality of Sudbury. This is because it is the single largest employer of the primary sector in the Regional Municipality of Sudbury. Being the largest employer in the primary sector, employment in the mining industry is vulnerable to fluctuations in the demand for nickel in foreign markets. If the demand for nickel increases, more people will be employed in order to meet these demands and more local purchases will be made - thus contributing to the prosperities of the Regional Municipality of Sudbury.

On the other hand, if demand for nickel decreases, employees will be laid-off. The lay-offs may not be immediate because of the nickel stock piles and investments which the mining industries have accumulated in prosperous times. But eventually, employees will be laid-off, resulting in employees having less money to spend. This will result in a negative multiplier effect filtering through the economy of the Regional Municipality of Sudbury. That is, with employees having less to spend, sales by merchants which provide goods and services to people in the Regional Municipality of Sudbury will eventually decrease. But only sales from inside the Regional Municipality of Sudbury. The merchants' sales from outside the Regional Municipality of Sudbury will not be affected, unless the

type of decline under consideration is wide spread throughout the region.

Despite the obvious importance of the mining sector, the other economic sectors have a similar importance in terms of employment within the Regional Municipality.

Table 2-1 shows the labour force by industry sector for the Regional Municipality of Sudbury. This table reveals that employment in all three major sectors has increased in absolute numbers between 1961 and 1971. But as a proportion of total employment in the Regional Municipality of Sudbury, not all three sectors have fared equally.

The primary sector in 1961 employed 32.7 per cent of the total labour force and in 1971 this had decreased to 23.2 per cent of the total labour force. Table 2-1 reveals that the mining industry is the only example of the primary sector since it employs approximately 98 per cent of the labour force. Therefore, in terms of importance, the mining industry is an important employer in the primary sector. Overall, it is apparent that the primary sector has been increasing at a much slower rate than the other sectors in terms of employment.

The secondary sector employed 18.8 per cent of the labour force in 1961 and 21.2 per cent of the labour force in 1971. The manufacturing industries, as a proportion of total employment in the secondary sector, have decreased from 68.3 per cent in 1961 to 61.8 per cent in 1971. This decrease can be related to the primary sector. Manufacturing related to the mining industries decreased because of

TABLE 2-1

LABOUR FORCE BY INDUSTRY (R.M.S.) 1961 and 1971

Industry Sector	Labour Force 1961	% of Total	Labour Force 1971	% of Total
Primary				
-agriculture	134	1.0	200	1.4
-forestry	134	1.0	40	0.3
-fishing and trapping	3	0.02	0	0.0
-mining	12450	97.98	13945	98.3
Subtotal	12721	32.7	14185	23.2
Secondary				
-manufacturing	4998	68.3	8045	61.8
-construction	2317	31.7	4955	38.2
Subtotal	7315	18.8	13000	21.2
Tertiary				
-transportation, communications & other utilities	2488	13.2	3490	10.3
-trade	6555	34.8	13740	40.3
-community, business and personal service industries	7129	37.8	12545	36.7
-finance, insurance and real estate	994	5.4	1695	4.9
-public administration and defence	1657	8.8	2680	7.8
Subtotal	18823	48.5	34150	55.6
All Industries	38859	100.0	61335	100.0

Source: Statistics Canada, Census of Canada.

the decrease in employment in the mining industries as a proportion of total employment. The construction industry has increased in proportion of total employment in the secondary sector over the same period of time.

The tertiary sector experienced the greatest growth in employment in the intercensal period. In 1961, it employed 48.5 per cent of the total labour force in the Regional Municipality of Sudbury and by 1971, this had increased by over seven percentage points to 55.6 per cent. Therefore in terms of employment, the tertiary sector is unquestionably the largest employer in the Regional Municipality of Sudbury, in that, the tertiary sector employs over 50 per cent of the total labour force in the Regional Municipality.

Table 2-1 shows the tertiary sector divided into its various components. In 1961, the industry which employed the greatest number of people in the tertiary sector was community, business and personal service industries (37.8 per cent of the total labour force in the tertiary sector). This was followed by the trade industry (34.8 per cent of the total labour force in the tertiary sector). But from 1961 to 1971, all industries experienced a decrease in the labour force of the tertiary sector in terms of proportion of total employment, except for the trade industry. The trade industry experienced an increase of approximately six percentage points during this time period to 40.3 per cent of the total labour force in the tertiary sector.

In 1971 the mining industry employed 13,945 people and the trade industry employed 13,740 people. This reveals that the trade industry is less directly dependent upon the mining industry because employment in the mining industry remained fairly constant from 1961 to 1971, whereas employment in the trade industry increased during the same time period. This raises a series of questions which are of great importance - especially for the research on which this thesis is based.

For example, how dependent is the trade industry (composed of wholesaling and retailing) upon the mining industry in terms of sales and employment? How vulnerable is it upon the economic structure of the Regional Municipality of Sudbury? What are the linkages between the trade industry and their external markets? What are the linkages between the trade industry and their internal markets of the Regional Municipality of Sudbury?

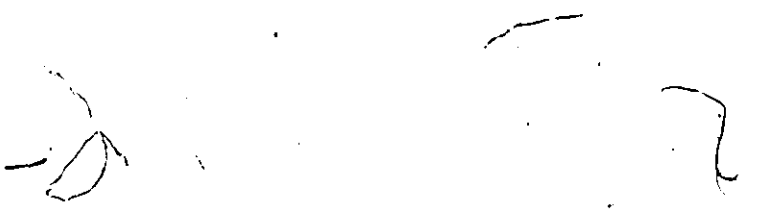
Therefore this thesis will try to answer the above questions by analysing the distributive trades of wholesaling and retailing in the Regional Municipality of Sudbury to determine their dependence and vulnerability of sales and employment on exterior markets and interior markets.

With the announcement of the mining strike in September 1978, (a strike which continued until May 1979), the City Centre Management Corporation which manages the merchants in the City Centre, estimated that their members

would experience up to a 50 per cent decrease in sales during the strike. During the strike, the business community claimed that it encountered hard times. But were the hard times as bad as they thought? The C.C.M.C. later indicated that in reality, the 50 per cent decrease in sales was an over-estimation and that the mining strike did not play as great a role as they expected. The C.C.M.C. had sales increases of 12-14 per cent in the twelve months before the strike, their per annum equivalent sales were one per cent below the sales of the previous year. Sales were down but not as greatly as had been expected.

Why did sales not decrease as greatly as thought? Perhaps because the trade industry is not as dependent upon the mining industry and the purely local market as one would think. Other sectors in the economy, and external markets, are also important in terms of the amount of sales by wholesaling and retailing in the Regional Municipality. This suggests that a study of the dependence of these activities on the local market is in order. Therefore this thesis attempts to develop a framework for understanding these questions of dependence and also attempts to analyse the specific case of the distributive trades in the Regional Municipality of Sudbury.

It is believed that wholesaling and retailing are central place functions. This is because a central place is



considered as a supplier of goods and services to the surrounding region and to the centre itself.

From this it is evident that the surrounding region is dependent upon the central place for goods and services. This situation however, can be reversed. The question that can be asked then is:

How dependent is the central place as the supplier of goods and services, upon the surrounding region and the centre itself for its existence?

This question can be clarified in terms of the basic and non-basic interpretation of urban functions. The goods produced or sold within a centre may be divided into two categories: those consumed within the centre itself, and those consumed outside the centre.

Although the city-serving production is an important employer of the urban labour force, an urban centre's survival ultimately depends upon the performance of basic or city-forming production which brings income into a centre from the outside, thus providing a fundamental means of existence.

In most instances, the basic (city-forming) and non-basic (city-serving) activities are classified aggregately. That is, only certain activities are classified as basic and non-basic. Basic activities deal basically with primary industries such as manufacturing and extractive industries. Non-basic activities deal mainly with the tertiary activi-

ties such as wholesaling, retailing, and government institutions. Non-basic industries are rarely recognized as being also basic as well as being non-basic. This therefore, makes them basic and non-basic within themselves.

Therefore, the purpose of this thesis is to determine how dependent the distributive trades of wholesaling and retailing in the Regional Municipality of Sudbury are on external and interior markets in terms of sales and employment. It is believed that there is a cause and effect relationship between the basic and non-basic sectors, in that, if employment increases or decreases in the basic sector, the non-basic sector will increase or decrease proportionately. However, the orientation of the research in this thesis is not to examine so much the cause and effect relationship of basic and non-basic sales in the distributive trades of wholesaling and retailing, but more to determine their dependency on exterior and interior markets.

The organization of the remainder of this thesis will consist of first setting out the theoretical orientation for the research. This will be followed by an empirical analysis of the distributive trades in the Regional Municipality of Sudbury. Chapter 2 highlights the major theoretical aspects for analysing the distributive trades in the Regional Municipality of Sudbury. The following chapters will then develop indepth themes dealing specifically with each chapter. Chapter 3 deals with the data collection procedure and re-

sults of the survey taken of the distributive trades. Chapter 4 is a market area analysis. This chapter delineates the market areas for the distributive trades in the Regional Municipality of Sudbury. The market areas were delineated in terms of drawing power in per cent of sales from outside and inside the Regional Municipality of Sudbury. The major market areas constituted the area from which the wholesale and retail categories received over 50 per cent of their sales. The secondary market areas constituted the area from which the remaining sales come. This chapter then discusses the dependency of the wholesale and retail categories in terms of their per cent of sales from outside and inside the Regional Municipality of Sudbury. Chapter 5 is an economic base analysis. This chapter proportions employment in the distributive trades in terms of basic and non-basic sales. A ratio of dependency is then calculated for employment to show how dependent employment is upon sales to the exterior and interior markets. Then, the ratio of dependency is computed into a coefficient of vulnerability in order to measure the vulnerability of employment on exterior and interior markets on a scale from zero (0) to one (1). The final chapter, Chapter 6, is the conclusion. This chapter summarizes the findings of the research and makes recommendations to improve future studies. The thesis contains four appendices. Appendix A contains the wholesale and retail categories which are found in the Standard Industrial Classifica-

tion. Appendix B is the revised questionnaires for the wholesale and retail sectors. Appendix C contains thirteen maps showing the delineated market areas for the wholesale categories, and Appendix D contains twenty-three maps showing the delineated market areas for the retail sector.

Chapter II

FRAMEWORK FOR ANALYSING THE DISTRIBUTIVE TRADES

2.1 INTRODUCTION

Locations compete to serve as centres for the marketing of goods and services that some areas cannot supply themselves. This competition produces a 'supposed' regular pattern of central place size and location. These patterns provide the best access for the most people at the least effort, thus satisfying the dual goals of maximizing the utility of places and maximizing interaction at least cost (Morrill, 1974).

2.2 CENTRAL PLACE THEORY: A DISTRIBUTIONAL THEORY

Christaller provided a simple theory of an entire system, or landscape of central places, predicting ideal numbers, spacing, and arrangement of a hierarchy of places ranging in size from a local hamlet to the central metropolis (Morrill, 1974). The central place concept is a theory of spatial organization and distribution. There is a balance that exists between the location of a place and its customers. The fundamental question of central place theory is the optimum spacing or separation of sellers and consequently, the places where they are located.

Foremost among Christaller's assumptions is the one that towns act as central places for the country side. Carter (1972,p.71) indicates that "Centrality, the degree to which a town serves its surrounding area can only be measured in terms of goods and services offered". There are variations in quantity as well as quality of goods and services offered, there are different orders of goods and services for some are costly and purchased or needed infrequently and will need large populations to sustain them; others are everyday needs and will require small populations. This raises the question of dependency. This may be interpreted in terms of how dependent are the sellers of goods on sales outside and inside the area being studied.

From these two concepts comes the idea of threshold population and range of a good or service. The threshold is defined as the minimum population that is required to bring about the offering of a certain good for sale or sustain any service; in economic terms, this means the minimum demand to make such an offering viable. Assuming uniformity of income, consumption and taste, it can be measured in terms of population numbers.

Morrill (1974,p.260) defines threshold in a much simpler definition, "In central place theory, the minimum level of sales needed to attain profitability".

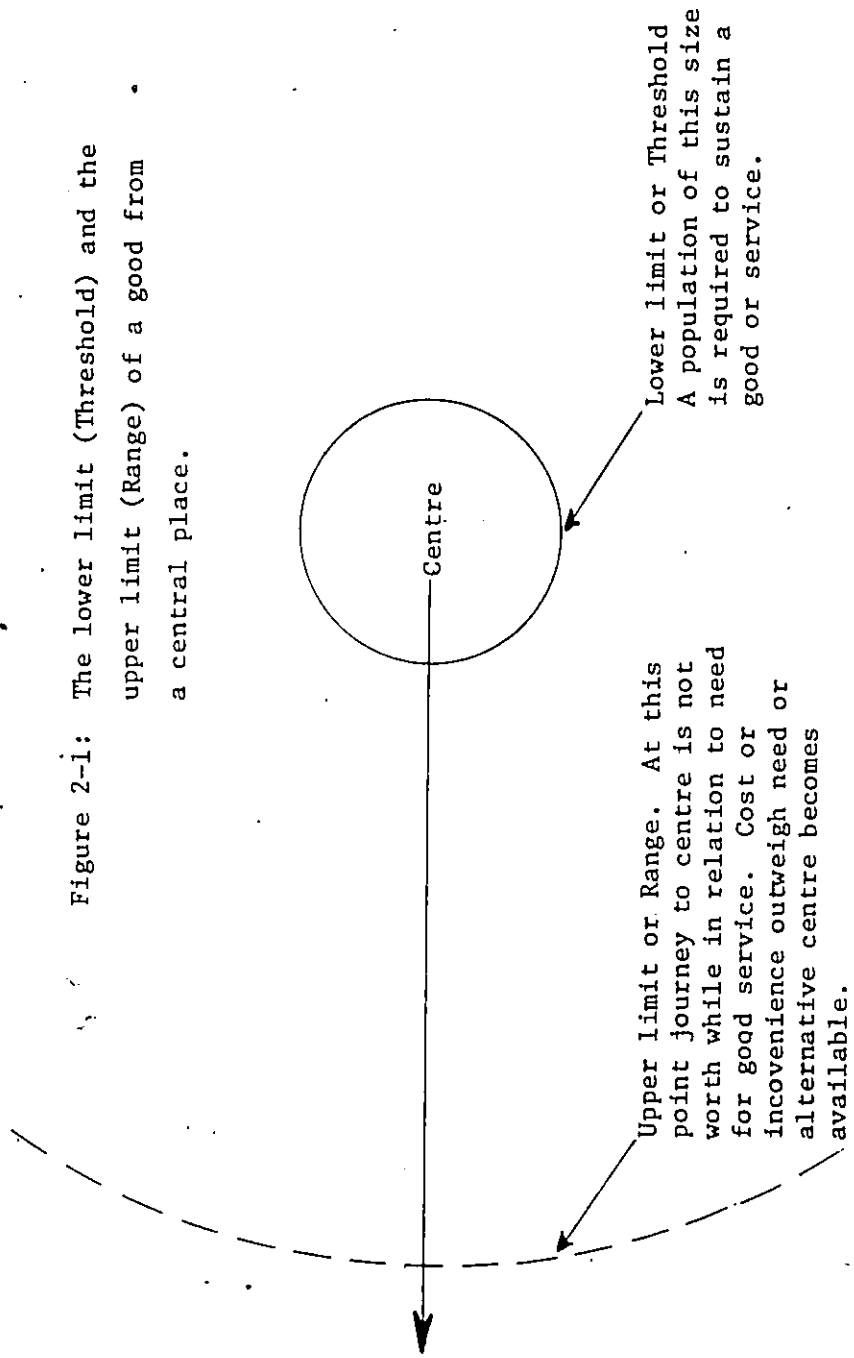
Range of a good or service is the maximum distance people will travel to purchase a good or service offered at a

central place; at some range from the centre the inconvenience of travel measured in time cost, and trouble will outweigh the value or need of the good or service.

It is possible from the above to isolate two limits in relation to each good or service. One can be called the lower and the other an upper limit. The lower limit is determined by the minimum demand necessary to ensure a commodity or service is offered, (the threshold); the upper limit is the point beyond which a good will no longer be obtained from a centre, (the range) (Figure 2-1).

It follows that the threshold of a good sets a minimum value upon a range of a good. In spatial demand terms, this means that the quantity of a good declines as distance from the supplier increases (Marshall, 1969). The quality of the good declines with distance because, the good would not be profitable at large distances from the supplier. Also, as distance increases, there would be more intervening opportunities available for people to buy the good. In the case of a high order good, demand for the good may increase with distance from the supplier. This is because, higher order goods are located in central places and assuming a hierarchy of places, there would be no intervening opportunity for people to buy the good. Therefore, people will come from greater distances to buy the goods needed. The range of a good is thus seen to have an upper and lower limit. This upper limit is determined by the maximum distance consumers

Figure 2-i: The lower limit (Threshold) and the upper limit (Range) of a good from a central place.



Source: Carter, Harold, The Study of Urban Geography, Edward Arnold Publishers, London, 1972, p. 72

will travel to obtain a good, and the lower limit is determined by the good's threshold. This is important because different goods have different threshold values. For example, bread has a lower order or threshold than television sets and television sets have a lower threshold than services of a psychiatrist (Marshall, 1969). Also Carter (1972, p.80) states "every good sold, every service offered will have a different lower and upper limit, and a different threshold and range". Therefore goods may be ranked according to their threshold.

Low order or convenience goods sold by general stores, gas stations, etc., are found in most small communities. These low order good type stores have low thresholds which indicate that they have smaller market areas than higher order goods. Ackerman (1978, p.381) indicates "that lower-level goods will be offered in more places and will have smaller thresholds population resulting in smaller trade areas".

Alternately, higher order goods are found in more central places, having higher thresholds and larger market areas.

The existence of low order goods offered in more places and higher order goods in fewer centres, hints towards the presence of centrality. That is, a centre selling higher order goods would seem to be the central focus of an area where people would go to for goods that are not readily available in the smaller centres.

2.3 CENTRALITY

Towns enable people to 1) exercise control from a central place, 2) have a centre for the exchange of goods, and 3) process resource materials efficiently. The first two items constitute in a broad sense, service or 'central place functions' - those provided from a centre for a surrounding territory or hinterland.

2.3.1 Measurement of Centrality

Attempts to measure centrality have been defined in different terms at a number of different levels. Some have dealt exclusively with the functions the town performs for the tributary area as measured by physical establishments such as shops and offices; others have simply used size as a measure by population totals.

The importance but not the centrality of a town could be measured by its population. It is true that given the conditions of classical central place theory, there is an absolute correlation between population and centrality, but in the real world the large range of non-central place functions adds to the population (Carter, 1972).

Stated previously, Carter (1972) indicated that centrality can only be measured in terms of goods and services offered. The following are different ways in which some authors tried to define centrality.

Davies (1969) did a study for 202 S.M.S.A's in the United States using various variables which measure centrality. He used correlation to show the degree of association between eight variables which measure centrality. Davies used population size along with seven business indices: 1) total retail sales; 2) shopping goods sales; 3) merchant wholesale sales; 4) other wholesale sales; 5) business service receipts; 6) demand deposits of banks; and 7) total deposits of banks.

Davies found that the coefficients were so closely related that it is highly unlikely that there was any significant difference between them. He concluded that, population size is just as suitable a measure of total business importance or centrality than any of the various selected business indices.

In this context if population size correlates highly with business indices, the use of population size combined with business indices can give a more sensitive measure of centrality.

In another study, Siddall (1961) used wholesale-retail ratios to measure centrality. Siddall measured the centrality of fifty-six standard metropolitan areas in the United States of over 300,000 population.

Siddall reveals that wholesaling and retailing are not the only measures of centrality, but are perhaps two of the most important. He compared the number of wholesale trade

workers to the number of retail workers in large cities to obtain a measure of centrality. Siddall used statistics which were readily available and found that for the United States as a whole, the ratio of wholesale workers to retail workers is 1 to 4.3 or in other terms, 18.8 percent of the trade workers (wholesale plus retail) are employed in wholesale trade. If the figure is higher than 18.8 percent for a city or area, it is assumed that wholesale workers are serving the needs of a population outside the city or area, and if the figure is lower than 18.8 percent, it is assumed that the city or area is making some of its wholesale purchases outside the city or area. The statistics Siddall used were the same as if he were to ask each wholesaler in a city what percentage of his trade was for consumers outside the city or area.

Siddall concludes that if a city's wholesalers are largely concerned with extra-city sales, it could be expected that other services are concerned largely with the hinterland, therefore giving the city a high degree of centrality and dependence.

Bennison (1978) modifies the use of location coefficients to measure centrality formulated by Davies (1967) for the Thessaly region in Greece. He collected data on the number of functions and functional units in the 166 settlements of which 153 did not contain central place functions. He identified 88 functions, which 55 were classed as retail and 33 as non-retail.

The first step in the modification is to calculate a centrality ratio for each function in each settlement of the region from the formula

$$CR_{is} = F_{is}/P_{st},$$

where CR_{is} = centrality function i in settlement s

F_{is} = number of functional units of function i in settlement s as a percentage of the total number of functional units of i in region r

P_{st} = population of settlement s as a percentage of total population of region r .

If the centrality ratio has a value greater than 1.0, this is taken to indicate that there are functional units of functions which are surplus to the demand for that function by population of settlement itself. It is therefore assumed that this surplus is supported by demand originating outside the settlement. If the centrality ratio is less than 1.0, then the demand for the function in the settlement is considered to be not fully met by the functional units in the settlement. If the ratio is equal to 1.0, supply and demand of the function are considered to be in equilibrium.

The second step was to weight each of the centrality values by the centrality ratio:

$$WC_{is} = C_{is} * CR_{is},$$

where WC_{is} = weighted centrality values of function i in settlement s ,

C_{is} = centrality value of function i in settlement s .

Bennison indicates that for computation, the first two steps may be combined in one formula:

$$WCis = (Cis^2 * Pr) / (Ps * 100),$$

where Pr = total population in region r ,

Ps = population of settlement s .

The third stage is to standardize each of the weighted centrality values by expressing each weighted centrality as a percentage of the total weighted centrality values of that function:

$$SWCis = (WCis / \sum_{j=1}^n WCij) * 100,$$

where $SWCis$ = standardized weighted centrality value of function i in settlement s ,

n = total number of settlements in region r .

This reduces all of weighted centrality values to a common base, thus ensuring that any very high weighted centrality value which may be produced by the location of a functional unit of an infrequency occurring function in a small settlement will not lead to a great distortion of the weighted functional index.

The final step in the derivation of the weighted functional index is the addition of all standardized weighted centrality values for each settlement:

$$WPs = \sum_{i=1}^f SWCis,$$

where WPs = weighted functional index of settlements,

f = total number of functions in settlements.

With this method, Bennison found that eight settlements ranked by functional index clearly act as central places for a wide range of functions. He also found that retail functions were more uniformly distributed than non-retail functions; and that lower weighted indices indicated that settlements are more limited in centrality.

In all the above measures of centrality, the authors use retailing and wholesaling largely for the measure of centrality. This indicates that wholesaling and retailing are basically good measures of centrality and that they are central place activities. Wholesaling and retailing will be looked at separately in order to show that they are central place activities.

2.3.2 Wholesaling as a Central Place Activity

Two basic theories have been developed to explain the location of wholesale establishments; gateway theory and central place theory.

Vance (1970) has found wholesaling to be a gateway activity while others have found wholesaling to be a central place activity.

Gateway theory assumes that wholesalers' locate at a major transportation centre between their suppliers and customers to minimize total transportation cost for the customer. Central place theory assumes that wholesalers locate in the centre of their trade areas to minimize transporta-

tion cost between their establishments and their customers - with no concern for the transportation cost for delivery from suppliers.

Wholesale trade is both spatially and economically efficient, and it is a necessary intermediary between the manufacturer and the retailer (Morrill, 1974). Wholesale trade is concentrated in the largest centres, although not only the size of the centre, but also the relative location of the centre is important.

Goss (1976) found that the location of wholesale establishments in the United States reveal certain patterns. The largest S.M.S.A.'s have the largest number of wholesalers, the largest individual establishments, and the greatest variety of wholesalers by both method of operation and variety of goods sold.

Goss reveals that the Census Bureau in its Census of Business recognize six types of wholesale establishments. These are: 1) agents and brokers; 2) manufacturer's sales offices; 3) manufacturer's branch offices; 4) merchant wholesalers; 5) petroleum wholesalers; and 6) farm product assemblers.

In contrast, Revzan (1961) and Bucklin (1972) agree on five groups or classifications of wholesalers. These are: 1) merchant middleman groups; 2) manufacturer's sales branches and offices; 3) petroleum bulk plants; 4) merchandise agents and brokers; and 5) assemblers of farm products.

Revzan and Bucklin combine manufacturer's sales branches and offices, whereas, the Census Bureau leaves them separate.

This classification is important in understanding the functions they perform. Agents and brokers, manufacturer's sales offices, and manufacturer's branch offices are considered to have higher order functions (Goss, 1976). This is because they are extremely specialized as to the variety of products carried and the variety of customers served. This specialization usually results in the need to serve large trade areas with a high sales volume, particularly in the case of agents and brokers and sales offices which do not physically handle products sold to the customer and thus have sales as their only function.

Merchant wholesalers, petroleum wholesalers, and farm products assemblers are considered to have lower order functions. This is because they handle the products they sell, often delivery is to the customer themselves. They also provide additional services for the customer such as advertising, inventory, stocking, and repairs.

Goss (1976) in the study he did on wholesaling in New England, found that all agents and brokers in New England are located in the largest S.M.S.A's. Manufacturer's sales offices and branch offices are located only in S.M.S.A's with over 200,000 people; and merchant and petroleum wholesalers are found in almost all cities with over 10,000 people and even in smaller places.

Generally speaking, large cities have a greater variety of wholesale trade establishments in terms of types of goods sold than do smaller cities. Goss discovered in New England, wholesalers of amusements, furniture, apparel, books(publishers) and art are sold primarily in S.M.S.A.'s with over 600,000 population; while automobile parts, hardware, groceries, petroleum, tobacco products, and alcoholic beverages were found in all cities and S.M.S.A.'s with over 40,000 people. Therefore large centres will have a greater variety of wholesalers than smaller centres, not only because they have more retailers and a larger population; but also because of agglomeration economies, they have a greater variety of manufacturers, better transportation facilities and the purchasing offices of large construction companies and government agencies. Then because of agglomeration economies, there will be a tendency for marginal costs and average costs to decrease with increasing volume of output (economies of scale). Wholesaling in small centres are generally limited to serving low order retailers, the limited number of local manufacturing companies and construction companies, and local agriculture and other primary industries if they are present.

Wholesaling appears to meet the conditions of threshold and range in central place theory. Wholesaling in almost every case has roughly circular or semi-circular trade areas as opposed to elongated gateway trade areas (Goss, 1976).

Having circular or semi-circular trade areas indicates that wholesaling is a central place type function.

2.3.3 Retailing as a Central Place Activity

Of the many central place activities, retailing is the most important and the most obvious (Morrill, 1974). An individual spends much time and money buying goods from the many shops and using the repair services located in central places.

The essence of retail and service business, is the clustering of establishments in market centres visited by surrounding consumers (Berry, 1967). Cities and towns may arise as specialized producers, but many are supported exclusively as market centres; thus being more or less a cluster of retail and service centres located in a place that provides a convenient point of focus for consumers who visit to purchase the goods and services they require.

As in wholesaling, larger cities will have a greater variety of retail establishments in terms of types of goods sold than small cities. Small centres sell low order goods such as alcoholic beverages, tobacco and groceries. In the large centres, higher order goods will be sold along with lower order goods found in smaller centres (Caus et al, 1972). In any centre, there is a variety of different retail stores or retail mix. The smaller the centre, the less re-

tail mix there will be. This is because the smaller centre cannot provide some services profitably such as furniture stores appliance stores, hardware stores, etc. These activities are said to have greater threshold requirements than activities located in smaller centres (Berry, 1967). Larger centres provide the same activities as smaller centres and more. Larger centres provide such services as offices, stores such as jewellery stores, clothing stores of all kinds from both specialized stores, junior department stores, and provide entertainment such as movie houses, and so on.

The trade area basically depends upon the different type of establishment provided from the centre. Not all establishments will have the same trade areas because some goods have a greater range than others. That is, people will travel further to buy a good in a central place that is not provided in the town they come from.

In retailing there is frequent contact between the retailer and the consumer, and many retailers deliver many of the goods that they sell to consumers. Many retailers service the goods that they sell to consumers. This necessitates that the retailer be near the customer for fast service, either by sending out repairmen, or the customer brings the product into the original place of purchase. This is related to the value of the product. If a toaster breaks and need repair, it might cost more to repair the

toaster than to buy a new one. Then on the other hand, if repairs seldom occur (for example on a refrigerator) there would be no need for frequent contact between the retailer and customer.

Goods that require frequent physical contact between retailer and customer will promote a central place type of trade area. This trade area as in wholesale, is roughly circular or semi-circular (Goss, 1976), and that market areas of higher level centres are greater than those of lower level centres for the same order of goods (Berry, 1967).

2.4 TRADING AREA CONCEPT

Activities tend to congregate or cluster in space for mutual benefit (Morrill, 1974).

Therefore, larger centres will have more establishments and business types, offer more goods and services and do a greater volume of business than smaller centres.

As discussed earlier, each good or service that a store in a centre provides has an upper and lower limit. The upper limit is called the range and the lower limit is called the threshold. The range is the maximum distance over which a seller will offer a good or service; or from which a customer will travel for it. The threshold is the minimum level of sales needed to attain marginal profitability.

The upper and lower limit of goods or services depend very much on the type of good or service that is offered.

There are a variety of goods or services offered; ranging from low order goods and services (convenience goods) to high order goods and services. Low order goods and services are goods that are used frequently, such as groceries or gasoline. High order goods and services are goods that are not used frequently, such as the services needed from a lawyer.

Low order goods or services have lower threshold and range values than higher order goods. This is because they need a smaller population to make them viable.

Usually low order goods and services are located in smaller centres and in large centres. Only high order goods and services are located in large centres because of the larger population needed to maintain marginal profitability.

In central place theory people living in smaller centres will usually buy low order goods found in that centre. This is because of the inconvenience of travelling to larger centres to buy goods readily available in the centre which they come from. However, the larger centre may be substituted for the smaller centre if goods in the larger centre are being offered at a much lower price. In this case, the inconvenience of travel time and distance will be offset by the goods being offered at lower prices. This brings about the concept of spatial demand.

Usually the greater the value of an item, the larger the area from which it will attract potential customers (Gist, 1968). This is because higher priced goods are less likely to be intensively distributed. This means that the number of stores that handle the good will be limited. The more intense the distribution of goods, there is likely to be more competing goods which can be substituted. Also the higher the price of goods they will be looked at more carefully before being purchased for the 'best buy'. Therefore people will be willing to travel to more distant centres for the purchase.

2 In some instances, stores are unique in terms of the physical products they sell (e.g., antique stores), therefore attracting buyers from much distant areas. Then again, instead of being unique in terms of goods sold, the store may be unique by 'virtue'. That is some stores may offer specialized services that others do not (e.g., made to measure suits from men's stores).

5 The hypothesis discussed in the above indicates that higher order goods usually have larger market areas than low order goods, and that higher order goods usually have a greater spatial demand. It also implies that there is a hierarchy of urban places. This is the concept that urban centres together with their trade areas, may be grouped into distinctive levels of functional importance, and that the individual consumer will travel to smaller closer places for

everyday purchases and to larger, more distant places for less demanded goods. Scott (1970, p.12) also indicates " ... that the greater the centre, the more extensive will be the market area, and the greater the specialization in service provisions".

All of the above implies that all activities depend for support on the final consumer market which is generally scattered (Morrill, 1974).

2.5 CENTRAL PLACE ACTIVITIES AS CITY-FORMING ACTIVITIES

Central place activities may be further classified by the consideration of basic and non-basic interpretation of urban functions (Marshall, 1969). The good produced or sold within a centre may be divided into two categories: those consumed within the area itself and those consumed outside the area.

The term non-basic or city serving refers to the production and sale of goods consumed within the area itself, while the term basic or city-forming refers to the production and sale of goods which are exported beyond the centre's boundaries.

Although city-serving production is an important employer of the urban labour force, an urban centre's survival ultimately depends upon the performance of city-forming rather than city-serving activities. It is the city-forming activities which bring income into a centre from the

outside, thus providing its fundamental means of existence. A central place, then, is simply a centre viewed as a direct supplier of goods to consumers living outside the centres physical boundaries or political boundaries (Marshall, 1969).

This shows that the surrounding area is dependent upon the central place for goods and services. It does not show however, how dependent the central place is on the surrounding area and the centre itself for its existence.

In most cases, basic (city-forming) and non-basic (city-serving) activities are categorized separately. That is, only certain activities are classified as basic and non-basic.

Basic activities deal mainly with primary industries such as manufacturing and extractive industries. Non-basic activities deal mainly with the tertiary sector such as wholesaling, retailing, and government institutions. What is rarely recognized, is that, tertiary activities are

also basic, in that, they also serve and sell goods to outlying centres. This makes them basic and non-basic within themselves. For example, retailing is considered as a non-basic service, but retailers also sell their goods outside a centres boundaries. Therefore, they are also basic and non-basic in goods that they sell, even though they are not usually classified as basic industries.

Basic and non-basic activities can be clarified further by the writings of Douglas North (1964) and Charles Tiebout (1964).

North maintains that a regions growth is closely tied to the success of its exports, either through the improved position of existing exports relative to competing areas or the result of the development of new exports. The point that North makes is that, the concept of export base is the major variable in determining regional growth and the concept of export base is a long run concept.

Tiebout on the other hand believes that there is no reason to assume that exports are the sole or even the most important variable in determining regional growth. He believes that such items such as business investment, government expenditures and the volume of residential construction may be just as important with respect to regional growth as exports. Tiebout believes that the concept of export base and the fuller concept of regional growth determination which includes other variables is a short run concept.

The purpose of this study is to analyse the distributive trades (wholesaling and retailing) in the Regional Municipality of Sudbury to determine how dependent they are on external and interior sales, and how these sales influence employment in wholesaling and retailing.

The analysis will be done by using economic base analysis. The economic base analysis will determine what percentage of the sales of the wholesaling and retailing establishments are basic and non-basic. Also, market or trade areas for the establishments will be delineated and ana-

lysed. The methods used for economic base analysis and market area analysis will be discussed further in the chapters that deal specifically with these topics.

2.6 CONCLUSION

Central place theory is a valuable concept to explain distribution of goods and services from a central place. The economic base theory, is the tool by which distribution can be analysed. The economic base theory reveals the link between a central place and the surrounding area.

The following chapter will deal specifically with the method used for data collection.

Chapter III

DATA COLLECTION PROCEDURE AND RESULTS

3.1 INTRODUCTION

There are various methods for data collection. If the data required is readily available, it can be found in various secondary sources. One of the major sources is in publications distributed by federal governments, provincial governments and local governments. These would come in the form of census publications, annual, monthly, and weekly publications, planning reports in cases of local governments and so on.

If the data needed is not available in publications, then the researcher must gather the information for his own study or research by other means. He must then conduct a survey of his own to gather the data required.

First of all, the researcher must determine if he is to gather the information by personal interviews, telephone interviews, drop-off questionnaires or by diary or by simple observation and measurement (Corbin, Swain, and Wilhelm, 1977).

The method used depends basically upon the problem in the study. Simple observational and measurement techniques can be used if one is not interested in gathering specific information, for example per cent of sales, or number of em-

ployees, or frequency of deliveries. Observational techniques are used with licence-plate analysis, or simple counting.

3.2 SURVEY METHODS

3.2.1 Personal Interviews

Personal interviews are probably the best method by which to gather information. Personal interviews consist of face-to-face questioning of respondents by interviews. The interview will usually be structured, in that the questionnaire will proceed in a logical manner. This type of interview is good because if the respondent does not understand a question, the person doing the interview can repeat or explain the question. This type of questionnaire usually gives the highest response rates. The interviewer can personally motivate the respondent to respond in an accurate manner to the question asked. Also, sensitive questions may be asked.

There are also disadvantages using this method of data collection. There is interaction that exists between the interviewer and the respondent which may cause bias in the responses. The important need in this type of interview method, is that, for the interviewer to be effective, he must have been trained carefully to conduct personal interviews. Personal interviews often require cluster sampling at some stage to reduce travel costs and time consumption.

3.2.2 Telephone Interviews

The telephone interview is usually structured. The advantage of telephone interviews is that it may be done from a central location, thus giving better central control. It is also less expensive than the personal interview, up to one-half to two thirds the cost. Response rates are moderately high, and it can reach persons who are otherwise relatively 'unreachable'. The big advantage of the telephone interview is that a wide geographic coverage is possible, and that the interview is not limited to a certain area as in personal interviews.

The only disadvantage about this form of data collection is that the amount of information to be gathered may be limited. This is because the respondent may not want to reveal certain information that he may consider confidential over the phone.

3.2.3 Mail Questionnaires

Mail questionnaires are highly structured and they are relatively inexpensive to administer (one-twentieth to one-tenth the cost of personal interviews). A larger sample can be covered at a moderate increase in costs, for example, reproduction costs of the questionnaire, paper, and stamps. The mail questionnaires have the advantage of being distributed to a wide geographic area. The anonymity of the respondent can be preserved and they can be easily administered.

There are disadvantages to mail questionnaires. The response rate to this form of questionnaire is usually low and the type of information that can be obtained is limited. The time period required for data collection can be long. This is a disadvantage if the data is required quickly. Also control as to who completes the questionnaire is very difficult. For example, if on the questionnaire, there is a question concerning income, or if someone owns a motor vehicle, the questionnaire may be completed by a family member who does not have an income or motor vehicle. In this case, the results of the questionnaire may be misleading.

3.2.4 Drop-off Questionnaires

This method requires that the interviewer drop-off the questionnaire at a household, business, or institution to be completed by the respondent which is usually selected by the interviewer. Then the questionnaire will be picked up at a later date by the interviewer. The problem with this method is that, many respondents will forget about the questionnaire until the interviewer drops by to pick it up. This adds more time to the collection of data.

3.2.5 Diary Questionnaire

There are different types of diaries: purchase diaries and media exposure diaries. These type of diaries must be arranged so that the respondent can easily and accurately

record their behavior over a specified period of time. This type of data collection is useful when a recall method is not feasible. Diary questionnaires are quite costly and difficult to administer. Also there is a long time period required for data collection.

3.3 CHOSEN SURVEY METHOD

After reviewing the various survey methods, the method opted for this study was telephone interviews. This method was chosen because the Regional Municipality of Sudbury is quite large in area, and to do personal interviews would be time consuming and very costly and also the number of interviews would be limited because of travel distance and time. This method would allow the maximum number of wholesale and retail establishments in the Regional Municipality of Sudbury to be reached, therefore receiving a higher response rate as compared to the mail questionnaire. This method is also better than drop-off questionnaires because it saves the trouble of returning to collect them. The telephone interview was inexpensive because there were no long distance calls to make.

3.4 SURVEY OF WHOLESALE AND RETAIL ESTABLISHMENTS

The next step after choosing the survey method, was whether to sample or survey the entire distributive trades in the Regional Municipality of Sudbury for which the study

is being done. The Standard Industrial Classification (1970) was looked at to review the number of distributive trade categories (Appendix A) that existed. Then a search was conducted of the Regional Municipality of Sudbury's planning agencies, Chamber of Commerce, and of the Sudbury Regional Development Corporation to see if there was a list available with all the distributive trades in the Regional Municipality. The result was that there was no such list in existence. The author had to establish a list of wholesalers and retailers by using the telephone directory for the Regional Municipality of Sudbury.

When comparing the list of categories in the Standard Industrial Classification (1970) with the establishments listed in the telephone directory for the Regional Municipality, it was evident that the Regional Municipality of Sudbury was lacking in some categories of the distributive trades; especially wholesaling.

For example, the Regional Municipality of Sudbury lacks wholesalers of coal and coke, drugs and toilet preparations, household furniture and furnishings, farm machinery and equipment, only to mention a few.

Yet the number of establishments was too great to do a practical survey of all wholesale and retail establishments. Because of this, it was decided to do a sample survey of the wholesale and retail establishments using stratified random sampling. This was chosen because the distributive

trades had to be stratified into two sectors: wholesaling and retailing sectors. These two sectors were then stratified further into different wholesale and retail categories that existed in the Regional Municipality of Sudbury. These categories were then randomly sampled, making certain that each category was represented by at least one establishment that existed in that category which is listed in the Regional Municipality of Sudbury telephone directory.

3.5 QUESTIONNAIRE DESIGN

The questions in a questionnaire must be designed to gather the information needed. Therefore one must know what data is required for the study.

The questionnaire for the telephone interview for this study was designed to gather information on how dependent wholesaling and retailing in the Regional Municipality of Sudbury is on external markets and interior markets.

First of all, the questionnaire was designed to be a short one. This is because the author felt that the respondents' attention span on the telephone would be short, and that the managers or store owners time is valuable, therefore the author did not want to consume much of their time, since they did have a business to conduct.

The wholesale questionnaire originally had thirteen questions on it. After doing a pre-test of ten wholesale establishments, the questionnaire had to be reduced by three

questions. The questions that were deleted from the questionnaire dealt with: 1) the size of the expenditure that the retailer bought from the wholesaler; 2) the frequency that the retailer bought from the wholesaler; and 3) the name of the retailer and the type of good that the retailer bought from the wholesaler.

The reason that these question had to be dropped from the questionnaire was that the wholesaler was reluctant to reveal such information on the basis that the wholesaler wanted to keep his buyer anonymous.

A pre-test of ten retailers also revealed that the questionnaire had to be reduced from ten to nine questions. The question dropped from the questionnaire dealt with the name of the supplier that the retailer did business with. The reason as in the wholesale questionnaire was that the retailer did not want to reveal such information to 'protect' the supplier.

As a result, the wholesale questionnaire had ten questions and the retail questionnaire had nine questions (Appendix B).

In the telephone interview questionnaire there was no need to ask for the name of the establishment or the address. This is because the establishments and their addresses were known ahead of time.

The questionnaire for the wholesale and retail establishments are identical except there is an extra question in

the wholesale questionnaire. Question one measures the percent of sales outside and inside the Regional Municipality of Sudbury. Question two asks for the number of employees that work at each establishment. These first two questions are important to the study. With the data collected from these questions, it is possible to calculate the number of employees that work in the basic and non-basic sectors of wholesaling and retailing in relation to sales outside and inside the Regional Municipality of Sudbury. It is believed that the greater the sales for export, the greater basic employment will be. Question three determines where the employees live if they live in the Regional Municipality or in an outlying centre, and which centre they live in. The fourth question ascertains whether the establishments deliver. The fifth question reveals the delivery radius of the firm in miles. Question six asks the frequency which the establishment delivers. The seventh question determines the destination of the deliveries; either in the Regional Municipality or outside the Regional Municipality. In cases of deliveries outside the Regional Municipality, the eighth question reveals the centre that outside deliveries go to. The data collected from this question gives the range of the good delivered and also helps in delineating the market area. Question nine shows where the wholesalers and retailers suppliers are located.

For wholesaling there is an added question. This question reveals where the wholesalers major buyers are located.

3.6 SURVEY RESULTS

The results of the survey of wholesalers and retailers are shown in Tables 3-1 and 3-2 by establishment, number of establishments surveyed and number of establishments responded. A total of 161 wholesale and retail establishments was surveyed, and of the 161 establishments surveyed, there were 123 responses and 38 non responses. The overall response rate was quite high, 76.3 percent.

3.6.1 Wholesale Survey Results

A comparison of wholesale trade in the Standard Industrial Classification (1970, Appendix A) and the actual wholesale trade establishments surveyed from the telephone directory (Table 3-1) reveals that the Regional Municipality of Sudbury is lacking in some wholesale trade establishments and that the Regional Municipality has some categories that are not listed in the Standard Industrial Classification.

There were forty wholesale establishments surveyed; of the forty there were twenty-seven respondents and thirteen non-respondents. In some cases, as in shoe and dry cell battery wholesalers, these were the only wholesale establishments of this type in the Regional Municipality of Sudbury. The response rate for the wholesaling establishments was 67.5 percent.

Table 3-1

WHOLESALE

Categories From The Telephone Directory	Total Number of Establishments Listed	Number of Establishments Surveyed	Number of Establishments Responding
Shoe	1	1	1
Mining Equipment	3	3	1
Dry Cell Batteries	1	1	1
Building Materials	3	3	2
Petroleum	4	3	2
Food	5	4	3
Baked Goods	3	3	2
Farm Products	6	3	2
Hardware	3	3	3
Automotive Supplies	12	6	5
Electrical Equipment and Supplies	7	4	2
Cigar, Cigarettes, and Tobacco	3	3	1
Paper Products	5	3	2
Total	56	40	27
Response Rate 67.5%			

Source: Compiled by the author from the survey.

Table 3-2

RETAIL

Categories From The Telephone Directory	Total Number of Establishments Listed	Number of Establishments Surveyed	Number of Establishments Responding
Batteries	3	3	2
Florists	10	5	5
Radio, T.V., and Electrical Supplies	12	6	6
Tire Dealers	9	6	5
Book Stores	6	5	4
Jewellery Stores	18	6	6
General Merchandise and Department Stores	9	5	3
Food Stores*	5	4	3
Building Materials	8	4	3
Men's Clothing	17	10	8
Stationary Stores	9	5	4
Automobile Dealers	13	9	7
Shoe Stores	8	5	5
Furniture Stores	11	6	5
Women's Clothing	14	8	4
Service Stations**	8	8	5
Shoe Repair	3	3	3
Cigar, Cigarettes, and Tobacco	3	3	1
Beer and Ale***	1	1	1
Pharmacies	18	8	8
Hardware	9	5	5
Electrical Equipment	5	3	1
Wine Stores	3	3	2
Total	202	121	96

Response Rate 79.3%

* Surveyed head offices of major chain stores.

** Surveyed one of each of the major service stations.

*** The author was only able to survey the head warehouse.

Source: Compiled by the author from the survey.

3.6.2 Retail Survey Results

As in wholesaling, the Regional Municipality of Sudbury lacks establishments which are categorized in the Standard Industrial Classification (1970, Appendix A), but also has some that are not categorized in the Standard Industrial Classification. The Regional Municipality of Sudbury telephone directory contains retail categories of building materials, stationery stores, and shoe stores. The Standard Industrial Classification does not contain these retail categories. A comparison of actual numbers of retail categories found in the Regional Municipality of Sudbury telephone directory and the Standard Industrial Classification reveals that there are more retail categories in the Regional Municipality of Sudbury than in the Standard Industrial Classification. This is because some categories were broken down further in the Regional Municipality of Sudbury telephone directory. For example in the Standard Industrial Classification, tire, battery and accessories are classified together, whereas in the Regional Municipality of Sudbury telephone directory tires and battery stores were categorized separately. Tire and battery stores could have been combined for the study, but it was felt that leaving them categorized separately would give a more detailed analysis of the retailing sector in the Regional Municipality of Sudbury.

Of the 121 retail establishments surveyed, there were 96 respondents and 25 non-respondents. This gave a response rate of 79.3 percent.

3.7 TESTING THE RELIABILITY OF THE SAMPLE

Even though there was a high response rate of 76.3 percent for the whole of the establishments in the survey, a standard error of sample test was done to determine if the survey sample was representative of all the wholesale and retail establishments in the Regional Municipality of Sudbury. This was done with respect to the percent of sales drawn from inside and outside the Regional Municipality of Sudbury.

The standard error equation was taken from Yeates (1974) to test the standard error about the mean. The equation is:

$$S = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{N - 1}}$$

where S = standard error

X = variable concerned

$\bar{X}$ = mean of variables concerned

N = number of observational units

For wholesaling the total number of responses was 27 and the mean of sales drawn from outside the the Regional Municipality was 31 percent and the mean of sales drawn from inside the Regional Municipality was 69 percent. Therefore, for drawing power from outside the Regional Municipality:

$$S = \sqrt{(75 - 31)^2 / 27 - 1 + \dots + (3 - 31)^2 / 27 - 1}$$

$$S = 14.88$$

and for sales drawn from inside the Regional Municipality:

$$S = \sqrt{(25 - 69)^2 / 27 - 1 + \dots + (97 - 69)^2 / 27 - 1}$$

$$S = 14.88$$

For retailing the number of observational units is 95 (total responses), and the mean of sales drawn from inside the Regional Municipality of Sudbury is 91.9 percent. The mean of sales drawn from outside the Regional Municipality of Sudbury is 8.1 percent. Therefore the standard error for sales drawn from outside the Regional Municipality of Sudbury is:

$$S = \sqrt{(28 - 8.1)^2 / 96 - 1 + \dots + (0 - 8.1)^2 / 96 - 1}$$

$$S = 2.76$$

The standard error for sales drawn from inside the Regional Municipality of Sudbury is:

$$S = \sqrt{(72 - 91.9)^2 / 96 - 1 + \dots + (100 - 91.9)^2 / 96 - 1}$$

$$S = 2.76$$

This shows that the variance about the mean for wholesaling is large 14.88. This large variance about the mean can perhaps be explained by non-response bias (Filion, 1978). Non-response bias cannot be controlled for in a survey, this is because of the time and privacy of the respondent (Filion, 1974). Another reason for non-response bias is the fact that there is a limited amount of wholesale establishments in the Regional Municipality of Sudbury. It can be

seen that the sample size for wholesaling is small (Table 3-1). In this instance the standard error cannot be regarded as a good measure of variance about the mean. This is because as the sample size decreases, the likelihood of the sample distribution of means being similar to the parent population distribution decreases. Therefore standard error should be used only with large samples (Yeates, 1974).

Also, there was partial non-response bias. In some cases, the respondent did not know the answers to questions in the questionnaire. In other cases, the respondent gave answers to questions, but because the respondent gave incorrect responses due to faulty memory, the response could not be used. In other circumstances, the respondent was not suitable to give responses for the questionnaire. This is because the respondent was an employee of the firm, and not the owner or manager. Therefore, the responses could not be used in the analysis.

For retailing, the variance about the mean is considerably lower than for wholesaling. This is a result of a higher response rate for the retailing sector, and also there are more retail establishments to sample from.

3.8 CHARACTERISTICS OF WHOLESALE AND RETAIL ESTABLISHMENTS

The characteristics discussed in this section will not cover all the data received from the telephone questionnaire. This section will discuss only delivery and frequency

of deliveries of the establishments, location of major buyers, and location of suppliers. Percentage of sales drawn from outside and inside the Regional Municipality of Sudbury, and employment characteristics will be discussed in the chapters dealing with the analysis of market areas and the economic base analysis.

3.8.1 Wholesale Characteristics

Of the twenty-seven establishments that responded, twenty-one deliver to their customers. This is 84.4 percent of the establishments surveyed. The only establishments that do not deliver are mining equipment and electrical equipment. Of the twenty-one establishments that deliver, fourteen deliver daily ranging from two to 100 deliveries per day. Seven establishments deliver weekly, ranging from three to five times per week, and no establishments deliver monthly (Table 3-3).

The location of wholesale establishments, major buyers are found predominantly in the Regional Municipality of Sudbury, although there are many outside the Regional Municipality (Table 3-4). In the case of batteries, food, shoes and mining equipment, their buyers are located in all centres in Northeastern Ontario (see Map 3-1 for centres in Northeastern Ontario).

The wholesaler's suppliers come from a wide area. In the cases of hardware, supplies come as far away as Vancou-

Table 3-3

FREQUENCY OF DELIVERIES: WHOLESALE

Number of Deliveries				Shoe	Mining Equipment	Dry Cell Batteries	Building Materials	Petroleum	Food	Baked Goods	Farm Products	Hardware	Automotive Supplies	Electrical Equipment and Supplies	Cigar, Cigarettes, and Tobacco	Paper Products
	D	W	M													
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
25																
26																
27																
28																
29																
30																
100																

* D - Daily W - Weekly M - Monthly

Source: Compiled by the author from the survey.

Table 3-4

LOCATION OF MAJOR BUYERSWHOLESALE

Shoe - North Bay, Elliot Lake, Timmins, Kapuskasing, Regional Municipality of Sudbury.

Mining Equipment - Wawa, Elliot Lake, Regional Municipality of Sudbury, Mattawa, as far north as James Bay, and Parry Sound.

Dry Cell Batteries - Hearst, Sault Ste. Marie, Elliot Lake, Regional Municipality of Sudbury, North Bay, Parry Sound, most of the centres in northeastern Ontario.

Building Materials - Elliot Lake, North Bay, Regional Municipality of Sudbury, Sault Ste. Marie.

Petroleum - Timmins, Parry Sound, Elliot Lake, Regional Municipality of Sudbury, Spragge, Little Current, North Bay.

Food - Regional Municipality of Sudbury, as far west as Wawa, as far north as Hearst, as far east as Mattawa, and as far south as Parry Sound.

Baked Goods - Regional Municipality of Sudbury, Sault Ste. Marie, Blind River, Elliot Lake, North Bay, Pointe au Baril.

Farm Products - Regional Municipality of Sudbury, Timmins, Blind River, Elliot Lake.

Hardware - Regional Municipality of Sudbury, Kapuskasing, French River, Elliot Lake, North Bay.

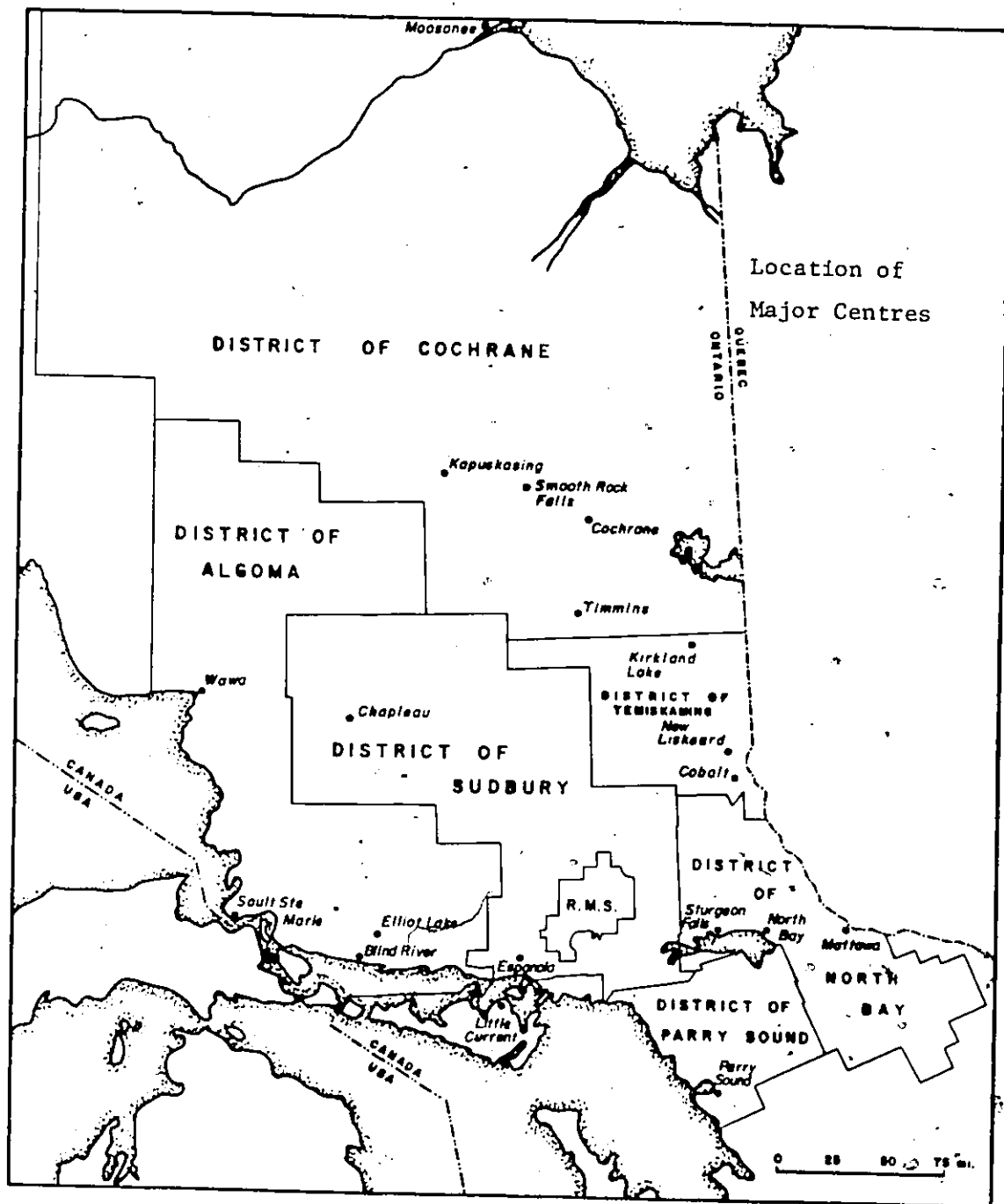
Automotive Supplies - Regional Municipality of Sudbury, Chapleau, Manitoulin Island.

Electrical Equipment and Supplies - Regional Municipality of Sudbury.

Cigar, Cigarettes, and Tobacco - Regional Municipality of Sudbury, Espanola.

Paper Products - Regional Municipality of Sudbury, Elliot Lake, Little Current, Chapleau.

Map 3-1



ver, food from Winnipeg, and mining equipment from Sweden. Predominantly, the suppliers come from southern Ontario centres such as Toronto, Peterborough, Kitchener, London and Sarnia (Table 3-5).

3.8.2 Retail Characteristics

Forty of the 96 retail establishments which responded to the telephone questionnaire deliver. This is 41.6 percent of the retail establishments which responded. Of the forty establishments that deliver, 28 deliver daily, ranging from two to 30 deliveries per day, four deliver weekly, ranging from two to 25 per week, and eight establishments deliver monthly, ranging from two to five deliveries per month (Table 3-6).

The location of the retail establishments' principle buyers are located in the Regional Municipality of Sudbury, with very few buyers located outside the Regional Municipality. The retailer's suppliers location, again as in wholesaling are located basically in southern Ontario (Table 3-7 and 3-5).

3.9 SUMMARY AND CONCLUSIONS

The survey method used in the study was found to be relatively successful in that 76.3 percent of the total wholesale and retail establishments surveyed by telephone interviews responded. For the wholesale sector the standard error

Table 3-5

LOCATION OF WHOLESALE SUPPLIERS

Shoe - Port Colbourne, Hamilton, Toronto, Montreal
 Mining Equipment - Sweden
 Dry Cell Batteries - would not give location
 Building Materials - Sudbury, Vancouver, Long Lac
 Petroleum - Sarnia, Port Credit, Toronto, Nandicote
 Food - Toronto, Kitchener, Winnipeg
 Baked Goods - Toronto, Kitchener
 Farm Products - Bradford, Toronto
 Hardware - Toronto, Peterborough, Vancouver, Montreal
 Automotive Supplies - Toronto, Sudbury, Montreal, London
 Electrical Equipment and Supplies - Peterborough, Toronto
 Cigar, Cigarettes, and Tobacco - Toronto
 Paper Products - Toronto

LOCATION OF RETAIL SUPPLIERS

Batteries - Toronto
 Florists - St. Catherines, Toronto, Grimsby, Windsor, Hamilton,
 Niagara Falls
 Radio, T.V., and Electrical Supplies - Toronto, Brockville, Montreal
 Tire Dealers - Kitchener, Grimsby, Hamilton, Sudbury, Toronto
 Food Stores - Toronto
 Jewellery Stores - Toronto, Montreal
 General Merchandise and Department Stores - Sudbury, Montreal,
 Edmonton, Toronto, Japan
 Food Stores - Sudbury
 Building Materials - Toronto, London, Vancouver, Montreal, Sudbury
 Men's Clothing - Kitchener, Montreal, Winnipeg, Edmonton, St. Catherines,
 Toronto, Hamilton, Preston, Prescott

Retail continued.....

Stationary Stores - Toronto, Montreal

Automobile Dealers - Toronto, Brampton, Ottawa, Flint Michigan, Oakville,
Windsor, Detroit Michigan, Japan for imports

Shoe Stores - Brantford, Montreal, Toronto

Furniture Stores - Toronto, Stratford, Montreal, Kitchener, Napanee,
Whitby

Women's Clothing - Montreal, Toronto, Winnipeg

Service Stations - Sudbury

Shoe Repair - Montreal, Toronto, St. Catherines, Quebec City

Cigar, Cigarettes, and Tobacco - Sudbury

Beer and Ale - would not give location

Pharmacies - Sudbury, Toronto

Hardware - London, Toronto, St. Jacob's

Electrical Equipment - Sudbury

Wine Stores - Niagara Falls, St. Catherines

Table 3-6

FREQUENCY OF DELIVERIES: RETAIL

Store Type	D	V	M	K
Wine Stores				
Electrical Equipment				
Hardware				
Pharmacies				
Beer and Ale				
Cigar, Cigarettes, and Tobacco				
Shoe Repair				
Service Stations				
Women's Clothing				
Furniture Stores				
Shoe Stores				
Automobile Dealers				
Stationery Stores				
Men's Clothing				
Building Materials				
Food Stores				
General Merchandise and Department Stores				
Jewellery Stores				
Book Stores				
Tire Dealers				
Radio, T.V., and Electrical Supplies				
Florists				
Batteries				
Number of Deliveries	1	2	3	4

Table 3-7

LOCATION OF MAJOR BUYERSRETAIL

Batteries - Regional Municipality of Sudbury, Timmins, Elliot Lake, French River, Sturgeon Falls.

Florists - Regional Municipality of Sudbury, Chapleau, Espanola.

Radio, T.V., and Electrical Supplies - Regional Municipality of Sudbury, Elliot Lake, Espanola, Sturgeon Falls, Hearst, Sault Ste. Marie.

Tire Dealers - Regional Municipality of Sudbury, Espanola, Elliot Lake, North Bay, Timmins.

Book Stores - Regional Municipality of Sudbury.

Jewellery Stores - Regional Municipality of Sudbury, Elliot Lake, North Bay, Espanola, Timmins, Blind River, Chapleau.

General Merchandise and Department Stores - Regional Municipality of Sudbury, North Bay, Sturgeon Falls, Elliot Lake, Espanola.

Food Stores - Regional Municipality of Sudbury.

Building Materials - Regional Municipality of Sudbury, Elliot Lake, Timmins, Chapleau, Parry Sound.

Men's Clothing - Regional Municipality of Sudbury, Massey, Timmins, Elliot Lake, North Bay, Sault Ste Marie, Espanola, Little Current.

Stationary Stores - Regional Municipality of Sudbury, Elliot Lake, Manitoulin Island, Sturgeon Falls, French River.

Automotive Dealers - Regional Municipality of Sudbury, Elliot Lake, French River, Espanola.

Shoe Stores - Regional Municipality of Sudbury.

Furniture Stores - Regional Municipality of Sudbury, Elliot Lake, French River, Gogama, Noëlville, North Bay, Sault Ste. Marie.

Women's Clothing - Regional Municipality of Sudbury, Timmins,
Sturgeon Falls, North Bay, Espanola.

Service Stations - Regional Municipality of Sudbury.

Shoe Repair - Regional Municipality of Sudbury, Timmins, Elliot
Lake, Hearst.

Cigar, Cigarettes, and Tobacco - Regional Municipality of Sudbury.

Beer and Ale - Regional Municipality of Sudbury.

Pharmacies - Regional Municipality of Sudbury.

Hardware - Regional Municipality of Sudbury.

Electrical Equipment - Regional Municipality of Sudbury.

Wine Stores - Regional Municipality of Sudbury.

was relatively large, this was attributed to non-response bias which could not be controlled for, and the limited number of wholesale establishments in the Regional Municipality of Sudbury and possibly structural differences in market formation.

It is recommended for future studies, the response rate be increased by surveying mores establishments, but in the case of the Regional Municipality of Sudbury, the limited number of wholesale establishments made it difficult.

This chapter concluded with a description of wholesale and retail characteristics. The fourth chapter will discuss the delineation of the market areas for wholesale and retail establishments in the Regional Municipality of Sudbury.

Chapter IV

DELINEATION AND DISCUSSION OF WHOLESALE AND RETAIL MARKET AREAS

4.1 INTRODUCTION

The geographic extent or influence of cities or centres is usually emphasized in the definitions of market areas found in the literature (Rosenbloom, 1976). A market area is an area of demand. This area of demand includes existing or potential buyers of goods and services (Huff, 1964). These areas may be trading areas and their hinterlands or metropolitan districts; or they may correspond to political areas such as countries, states, counties, and cities (Applebaum and Cohen, 1961).

A centre usually contains stores of different types and sizes (store mix), and each store in the centre or city has its own market or trade area.

It is the purpose of this chapter to delineate the market areas of wholesale and retail establishments by categories found in the telephone directory of the Regional Municipality of Sudbury. The two sectors will then be examined in terms of their dependence on the Regional Municipality of Sudbury.

Also, the centrality of the Regional Municipality of Sudbury will be shown by way of the delineated market areas and spatial demand.

4.2 METHODS AVAILABLE FOR DELINEATING MARKET AREAS

A number of ingenious methods and techniques have been used to delineate market areas. These range from early mathematical models (Reilly, 1929, Converse, 1949, and Huff, 1964), observation and surveys (Gist, 1968) and mapping techniques (Mazze, 1974).

Huff (1964) modifies Reilly's (1929) model of retail gravitation for determining market or trade areas. Huff reveals that Reilly's original model¹ has limitations in its conceptual and operational limits.

First of all, the breaking point formula is incapable of providing graduated estimates above and below the break even position between two competing centres. As a consequence, it is impossible to calculate objectively the total demand for the products or services of a particular distribution centre. Secondly, when the break point formula is used to delineate marketing areas of several shopping areas within a geographical area, the overlapping boundaries that result are inconsistent with the basic objectives of the

¹Reilly's Model of Retail Gravitation

$$(B_a/B_p) = (P_a/P_a) * (D_b/D_a)$$

where B_a = the proportion of the retail business from an intermediate town attracted by city A,

B_p = the proportion of the retail business from an intermediate town attracted by city B,

P_a = Population of city A,

P_b = Population of city B,

D_a = the distance from the intermediate town to city A

D_b = the distance from the intermediate town to city B.

formula's use; to calculate the boundaries between competing shopping areas where the competitive position of each is equal. Finally, the parameter which was originally estimated empirically by Reilly should not be interpreted as a constant for all types of shopping trips. This is because a distributive centre may have different trading areas for different classes of products

Huff's modification focuses on the consumer rather than on the firm.

Huff's alternate model is;

$$P_{ij} = (S_j / T_{ij}^x) / (S_j / T_{ij}^x)$$

where, P_{ij} = the probability of a consumer at a given point of origin i travelling to a particular shopping centre j ,

S_j = the size of the shopping centre (measured in terms of the square footage area devoted to the sale of a particular good.

T_{ij} = the travel time involved in getting from a consumers' travel base i to a given shopping centre j , and

x = a parameter which is to be estimated empirically to reflect the effect of travel time on various types of shopping trips.

The expected number of shopping consumers at a given place of origin i at that shop at a particular shopping centre j is equal to the number of consumers at i multiplied by

the probability that a consumer at i will select j for shopping. That is;

$$E_{ij} = P_{ij} * C_i$$

where E_{ij} = the expected number of consumers at i that are likely to travel to shopping centre j ; and

C_i = the number of consumers at i .

His alternative model represents a theoretical abstraction of consumer spatial behavior. The mathematical conclusions can be deduced from the model which in turn, can be interpreted in terms of the consumers spatial behavior.

Gist (1968) reveals that there are various methods for delineating market or trading areas by using observations and surveys. Three that he cites are: licence-plate analysis, analysis of credit records, and survey techniques.

An observational technique which is relatively inexpensive and which when properly employed, results in accurate estimates of trade area limits is the analysis of automobile licence-plates. This procedure involves recording the licence number of automobiles parked on the lot or the centre of the establishment, and a subsequent determination of the residential addresses of the automobile owners. It is important not to collect licence numbers during a time when an atypical representation of consumer traffic is expected. Special sales for example might 'pull' customers from greater than normal distances and thus overstate the actual

trade area. This might ignore local markets, therefore giving bias to outside markets. Then after having developed a representative sample of the clientele of the store, the procedure then involves the construction of a map with all the addresses of the clientele. This technique is best suited to those types of operations in which off-street parking is provided.

Another observational technique which can provide acceptable results involves the examination of store credit records for information regarding the residences of the customer group. This technique can result in bias. This is because the trade area and economic group delineated from the credit customers may vary greatly from the cash customers.

Huff believes that the best way to determine the location of store clientele is by actually surveying the customer. This may be done by telephone interview, interviews in the stores, by mail questionnaires, or right at the home of the respondent. Although the cost of such surveys is normally much higher than observational techniques, the superiority of the information that may be generated is often great. The survey (i.e. questionnaire) technique was used in this thesis to gather information (see Chapter Three).

Mazze (1974) used cognitive maps to show shopper movement patterns. This involved the respondent to draw mental maps of their shopping trips (single or multipurpose) start-

ing from their residence to the stores most frequented. This gave the market area of the stores by showing the location of the residences of the customers.

There are various other methods to delineate or define market areas which can be derived from surveys. Many of the other methods use as major criteria such factors as drawing power, per capita sales, share of market, movement, population and competition.

Drawing power refers to the percent of sales that a store obtains from a specific area in relation to its total sales. Per capita sales refers to sales per unit of population. Share of market refers to per cent of total available sales that a particular store obtains. Movement refers to transportation in terms of travel time or distance. Population refers to the number of people required to support a specific store. Competition refers to the location of competitive facilities and the power exerted by each in securing sales (Applebaum and Cohen, 1961).

There are various difficulties encountered in applying some of these criteria. Per capita sales and share of market criteria vary according to the type, size, and location of stores and with the policies and capabilities of each firm. For example, a general merchandise store company may consider as within its trade area all areas from which it obtains one dollar per capita per year, (or a 0.05 per cent share of the market). In another case, a supermarket

chain may consider as within its trading area all areas from which it obtains five dollars per capita per year, (or a 1.5 per cent of the market). Should the population within the market area increase considerably and should additional competition be established in the process, a decreased per capita sales and/ or share of market might not

change the store's total sales obtained from the market, but the definition would no longer be valid. Actually, a thickly populated market will lower the minimum per capita sales, and a thinly populated market raise them.

Market area criteria based upon movement such as distance or travel time might be useful if it were possible to develop a valid formula that would allow for differences of competition, traffic friction, and frequency of customer shopping.

Population can be a very useful market criterion if the number is weighted for competition. For example, a market area of a full-scale department store would require and include 100,000 persons if all expenditures of these 100,000 persons for department store goods were made at the store. If this were only one store out of five equal competing stores, then an area with a population of 500,000 would be needed to form the market. This is of course assuming a linear demand relationship.

Location of competition as a criterion of store market size is difficult to apply in metropolitan areas where com-

petition exists not only among stores of approximately equal competition, but also stores of much greater and lesser rank.

4.3 METHOD USED FOR WHOLESALE/RETAIL MARKET DELINEATION

From the various methods mentioned to delineate market areas, the technique used for delineating the market areas for the Regional Municipality of Sudbury is drawing power. Earlier, drawing power was defined as the percentage of sales that a store obtains from a specific area in relation to its total sales. The drawing power percentage figures have been taken from questions one of the revised wholesale and retail questionnaires (Appendix B). Question one was designed to determine what percentage of the firms' total sales were for areas outside the Regional Municipality of Sudbury and for the Regional Municipality of Sudbury itself. Because of the two percentage figures, one for sales inside the Regional Municipality of Sudbury and one for outside the Regional Municipality of Sudbury, the trade areas for wholesale and retail establishments were broken into two trade areas; one being the major market area, and the other the secondary market area. The major market area constitutes the area from which the wholesale and retail receive over 50 per cent of their sales. The secondary market constitutes the area from which the remaining sales come.

The outer limits of the market area are determined by the range of the good (Marshall, 1969). For this study, the outer limits of the market area are taken from question eight in both the revised wholesale and retail questionnaires. Question eight in both instances indicates the most distant centres outside the Regional Municipality of Sudbury that the wholesale and retail establishments offer their goods or services to most frequently.

The results of question one from both the wholesale and retail questionnaires can be seen in Tables 4-1 and 4-2. The figures shown in Tables 4-1 and 4-2 are the average per cent of drawing power from outside and inside for the Regional Municipality of Sudbury by rank for each of the establishments. These figures were arrived at by aggregating the per cent of sales outside and sales inside the Regional Municipality of Sudbury for each establishment that responded for each category. The next step was to divide this aggregated figure by the number of establishments in each category. This gave the overall percent of sales from inside and outside the Regional Municipality of Sudbury for each category. For example, there were eight respondents for men's clothing stores. The per cent of sales outside the Regional Municipality of Sudbury were added together for each of the eight stores, and then divided by eight. This gave the overall mean of sales from outside the Regional Municipality of Sudbury for the men's clothing category. The same process was

used for per cent of sales from inside the Regional Municipality of Sudbury. The per cent of sales outside the Regional Municipality of Sudbury is 8.1 per cent, and the per cent of sales inside the Regional Municipality of Sudbury is 91.9 per cent. These figures are shown in Table 4-2. The same procedure was done for all of the categories shown in Tables 4-1 and 4-2.

The results of questions eight for both the revised wholesale and retail questionnaire can be viewed in Table 4-3. Comparing Table 4-3 with Tables 4-1 and 4-2, it can be seen that the categories with the largest per cent of sales outside the Regional Municipality of Sudbury are basically the ones that offer their goods and services to the centres farthest from the Regional Municipality of Sudbury.

For example, wholesalers of mining equipment supply their goods to Wawa, Mattawa, as far north as James Bay, and to Parry Sound; whereas wholesalers of electrical equipment and supplies only supply their goods to consumers in the Regional Municipality of Sudbury. The same is true for retailing.

With the data computed from question one and question eight of the revised wholesale and retail questionnaires, the market areas for wholesale and retail categories were delineated (Appendix C and D). Each map corresponds to the categories revealed in Tables 4-1 and 4-2. Table 4-1 contains thirteen wholesale categories, therefore thirteen maps

Table 4-1

DRAWING POWER BY RANK: WHOLESALING

Categories From Telephone Directory	Drawing Power From Out of RMS. % of Sales	Drawing Power From in RMS. % of Sales
Shoes	75	25
Mining Equipment	60	40
Dry Cell Batteries	50	50
Building Materials	45	55
Petroleum	35	65
Food	31.1	68.9
Baked Goods	29	71
Farm Products	27.5	72.5
Hardware	21.6	78.4
Automotive Supplies	12	88
Electrical Equipment and Supplies	9	91
Cigar, Cigarettes, and Tobacco	5	95
Paper Products	3	97

Source: Compiled by the author from survey.

Table 4-2

DRAWING POWER BY BANK: RETAILING

Categories From Telephone Directory	Drawing Power From Out of RMS. % of Sales	Drawing Power From In RMS. % of Sales
Batteries	28	72
Florists	17	83
Radio, T.V., and Electrical Supplies	14.3	85.7
Tire Dealers	10.2	89.8
Book Stores	10	90
Jewellery Stores	9.6	90.4
General Merchandise and Department Stores	9.3	90.7
Food Stores	9	91
Building Materials	8.3	91.7
Men's Clothing	8.1	91.9
Stationary Stores	7.7	92.3
Automobile Dealers	7.7	92.3
Shoe Stores	7.2	92.8
Furniture Stores	5.6	94.4
Women's Clothing	5.5	94.5
Service Stations	5.4	94.6
Shoe Repair	5	95
Cigar, Cigarette, and Tobacco Stores	5	95
Beer and Ale	5	95
Pharmacies	3.8	96.2
Hardware	3.4	96.6
Electrical Equipment	2	98
Wine Stores	00	100

Source: Compiled by the author from survey.

TABLE 4-3

CENTRES MOST FREQUENTLY DELIVERED TO OUTSIDE THE R.M.S.Wholesale Categories

- Shoes - North Bay, Elliot Lake, Timmins, Kapuskasing.
- Mining Equipment - Wawa, Mattawa, James Bay, Parry Sound, basically in all of northeastern Ontario.
- Dry Cell Batteries - Hearst, Parry Sound, Sault Ste. Marie, North Bay.
- Building Materials - Elliot Lake, North Bay.
- Petroleum - Timmins, Parry Sound, Elliot Lake, Spragge, Little Current, North Bay.
- Food - Wawa, Mattawa, Hearst, Parry Sound, Sault Ste. Marie, basically to all centres in northeastern Ontario.
- Baked Goods - Sault Ste. Marie, Blind River, Elliot Lake, North Bay.
- Farm Products - Timmins, Blind River, Elliot Lake.
- Hardware - Kapuskasing, French River, Elliot Lake.
- Automotive Supplies - Manitoulin Island, Chapleau.
- Electrical Equipment and Supplies - deliver only in Regional Municipality of Sudbury.
- Cigar, Cigarettes, and Tobacco Products - Espanola.
- Paper Products - Elliot Lake, Little Current, Chapleau.

Retail Categories

- Batteries - Timmins, Elliot Lake, French River, Sturgeon Falls.
- Florists - Chapleau, Espanola, Parry Sound.
- Radio, T.V., and Electrical Supplies - Elliot Lake, Espanola, Sturgeon Falls, Hearst, Wawa, Cochrane, Sault Ste. Marie.
- Tire Dealers - Espanola, Elliot Lake, North Bay, Timmins.
- Book Stores - deliver only in the Regional Municipality of Sudbury.

Table 4-3 continued ...

Jewellery Stores - Elliot Lake, North Bay, Espanola, Timmins, Blind River, Chapleau.

General Merchandise and Department Stores - North Bay, Sturgeon Falls, Elliot Lake, Espanola.

Food Stores - deliver only in the Regional Municipality of Sudbury.

Building Materials - Elliot Lake, Timmins, Chapleau, Parry Sound.

Men's Clothing - Timmins, Massey, Elliot Lake, North Bay, Sault Ste. Marie, Espanola, Little Current.

Stationary Stores - Elliot Lake, Manitoulin Island, Sturgeon Falls, French River.

Automobile Dealers - Elliot Lake, French River, Noelville, Espanola, Warren.

Shoe Stores - does not deliver.

Furniture Stores - Elliot Lake, Manitoulin Island, Gogama, Sault Ste. Marie, North Bay.

Women's Clothing - Timmins, Sturgeon Falls, North Bay, Espanola.

Service Stations - deliver only in the Regional Municipality of Sudbury.

Shoe Repair - Timmins, Hearst, Elliot Lake, Sault Ste. Marie.

Cigar, Cigarettes, and Tobacco - does not deliver.

Beer and Ale - does not deliver.

Pharmacies - deliver only in the Regional Municipality of Sudbury.

Hardware - deliver only in the Regional Municipality of Sudbury.

Electrical Equipment - deliver only in the Regional Municipality of Sudbury.

are presented in Appendix C showing the market areas for each category. This also applies to the twenty-three retail categories in Table 4-2.

4.4 WHOLESALE MARKET AREA

4.4.1 Wholesale Category Classification

Earlier, it was mentioned that the nature of the good affects the distance that the good will be offered and the distance consumers will travel for it (Gist, 1968).

The classification of wholesalers mentioned in Chapter Two is important in understanding wholesaling in the Regional Municipality of Sudbury. Agents and brokers manufacturer's sales offices, and manufacturer's branch offices are considered to have higher order functions (Goss, 1976). This is because they are extremely specialized as to the products carried and the variety of customers served. This specialization usually results in the need to serve large trade areas with a high sales volume, particularly in the case of agents and brokers and sales offices which do not physically handle products sold to the consumer and thus have sales as their only function. They are also located in the largest centres of a region.

In the Regional Municipality of Sudbury wholesalers of mining equipment and wholesalers of dry cell batteries fall into the agents and brokers classification. This is because these two wholesale categories have sales as their only

function and do not physically handle the products they sell. They also have large market areas (Appendix C), and a great sales volume for sales outside the Regional Municipality of Sudbury (Table 4-1).

Merchant wholesalers, petroleum wholesalers and farm product assemblers are considered to have lower order functions (Goss, 1976). This is because they handle the products that they sell, often delivering the product to the consumer themselves.

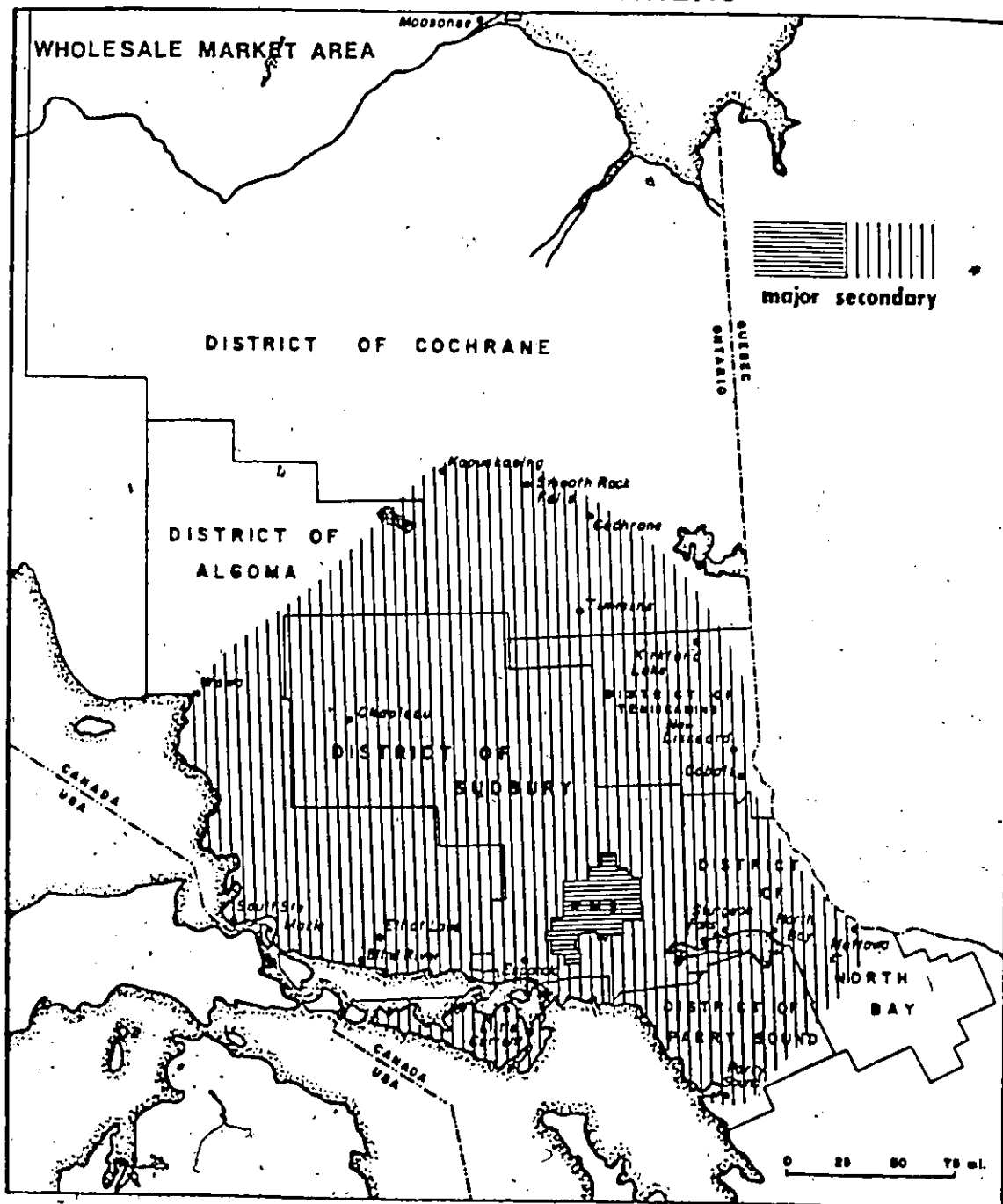
The other wholesale categories in the Regional Municipality of Sudbury fall into the above classifications. These other wholesale categories have smaller sales volume for sales outside the Regional Municipality of Sudbury than wholesalers of mining equipment and dry cell batteries (Table 4-1). The exception is wholesalers of shoes. Even though wholesalers of shoes physically handle the product that they sell, it is a unique and specialized good. This is because it has a large per cent of sales which come from outside the Regional Municipality of Sudbury. The market area is also smaller than wholesalers of mining equipment and dry cell batteries.

4.4.2 Combined Wholesale Market Area

A map was made showing the market area for the combined retail categories listed in Table 4-1 (Map 4-1). The same technique was used for Map 4-1 as was used for the wholesale

Map 4-1

R.M.S. MARKET AREAS



maps found in Appendix C. The major market area is the area from which the mean of the combined wholesale categories receive 50 per cent or more of their sales from either inside or outside the Regional Municipality of Sudbury. The secondary market area is the area from which the mean of the combined wholesale categories receive less than 50 per cent of their sale from either inside or outside the Regional Municipality of Sudbury. The means were computed by adding each column in Table 4-1 and dividing by the number of wholesale categories. The mean for per cent of sales outside the Regional Municipality of Sudbury is 31 per cent and the mean for per cent of sales inside the Regional Municipality of Sudbury is 69 per cent. The limit of the market area for the combined wholesale categories is the range of the wholesale category which offers its goods to the most distant centres. This wholesale category is mining equipment. This was used because in theory, the most extensive boundary of the most powerful store will also serve as the boundary of all other stores (Applebaum and Cohen, 1961).

Map 4-1 reveals that the major market area for the combined wholesale categories is the Regional Municipality of Sudbury. The average percent of sales that come from inside the Regional Municipality of Sudbury is 69 per cent, and 31 per cent and the average per cent of sales that come from outside the Regional Municipality of Sudbury is 31 per cent.

This 31 per cent comes from a large area reaching from Wawa, to Kapuskasing, to Mattawa, and to Parry Sound.

4.4.3 Wholesale Dependency

It is evident that in terms of the mean of the percent of sales from inside and outside the Regional Municipality of Sudbury, the combined wholesale sector is dependent on the Regional Municipality of Sudbury.

The degree of their dependence can be measured by using their drawing power of sales from outside the Regional Municipality of Sudbury. Since the wholesale categories are already ranked accordingly, the lower the drawing power from outside the Regional Municipality of Sudbury, the greater their dependence is on the city.

For example, petroleum wholesalers draw 35 per cent of their sales from outside the Regional Municipality of Sudbury and shoe wholesalers draw 75 per cent of their sales from outside the Regional Municipality of Sudbury. This reveals that shoe wholesalers receive 40 per cent more sales from outside the Regional Municipality of Sudbury than petroleum wholesalers. This indicates that wholesalers of shoes are 40 per cent less dependent on sales from inside the Regional Municipality of Sudbury than petroleum wholesalers.

For another example, farm product wholesalers draw 27.5 per cent of their sales from outside the Regional Municipality of Sudbury and hardware wholesalers receive 21.6 per cent of their sales from outside the Regional Municipality of Sudbury. This indicates that farm product wholesalers re-

ceive 5.9 per cent more sales from outside the Regional Municipality of Sudbury than wholesalers of hardware goods; or in other words, farm product wholesalers are 5.9 per cent less dependent than wholesalers of hardware goods on sales from inside the Regional Municipality of Sudbury.

It is quite evident that wholesalers of shoes and mining equipment are not dependent on the Regional Municipality of Sudbury for their existence, but are dependent on the surrounding area for their existence. Receiving over 50 per cent of sales from outside the Regional Municipality of Sudbury can cause some concern. This is because if a better and closer establishment locates between the Regional Municipality of Sudbury and the surrounding area, the people wanting to purchase this good will go to the centre where the intervening opportunity is. If this happened to wholesalers of shoes and mining equipment, these wholesalers will be in a difficult position. This is because their external sales will decrease because of the intervening opportunity. Their sales drawn from inside the Regional Municipality could not 'carry' them over because the sales from inside are too small to make a worth while profit. An intervening opportunity would not effect establishments that were dependent on the Regional Municipality of Sudbury as much as the establishments who were less dependent on the Regional Municipality of Sudbury. But a hierarchy would suggest that there is no intervening opportunity for high order goods only low order goods.

Alternately, if anything went wrong with the economy of the Regional Municipality of Sudbury, the wholesale categories dependent on the Regional Municipality of Sudbury will be in trouble. The best position to be in, may be to share sales equally between the Regional Municipality of Sudbury and the surrounding area, like wholesalers of dry cell batteries. In this case, you are not dependent on any area for dependence.

Deliveries also play a role in dependency. It is quite apparent from chapter three that the majority of wholesalers deliver (84.4% of the wholesale establishments deliver). This indicates that they offer their goods to more people and centres, therefore, decreasing their dependency on the Regional Municipality of Sudbury.

4.4.4 Population Reached by Wholesale Categories

Table 4-4 reveals the approximate number of people reached by each wholesale category in relation to its per cent of sales from outside and inside the Regional Municipality of Sudbury, (see Map 4-3). The per cent of sales from inside the Regional Municipality of Sudbury always reaches the constant population of the Regional Municipality of Sudbury. Generally, the greater the per cent of sales from outside the Regional Municipality of Sudbury, the greater the population reached. In some cases, as in wholesalers of building materials, the population reached is less

Table 4-4

WHOLESALE SECTOR

Categories From Telephone Directory	Drawing Power From Outside R.M.S. in %	Approximate* Potential Population Reached	Drawing Power From Inside R.M.S. in %	Approximate* Potential Population Reached	Total Approximate Potential Population Reached
Shoe	75.0	(158,867)	25.0	(157,030)	(315,897)
Mining Equipment	60.0	(261,168)	40.0	(157,030)	(418,198)
Dry Cell Batteries	50.0	(247,070)	50.0	(157,030)	(404,100)
Building Materials	45.0	(72,814)	55.0	(157,030)	(229,844)
Petroleum	35.0	(126,190)	65.0	(157,030)	(283,220)
Food	31.1	(255,667)	68.9	(157,030)	(412,697)
Baked Goods	29.0	(157,723)	71.0	(157,030)	(314,753)
Farm Products	27.5	(69,556)	72.5	(157,030)	(226,586)
Hardware	21.6	(165,303)	78.4	(157,030)	(322,333)
Automotive Supplies	12.0	(9,220)	88.0	(157,030)	(166,250)
Electrical Equipment and Supplies	9.0	-1-	91.0	(157,030)	(157,030)
Cigar, Cigarettes, and Tobacco	5.0	(5,926)	95.0	(157,030)	(162,956)
Paper Products	3.0	(18,069)	97.0	(157,030)	(175,099)

* Population based on 1976 census of population.

-1- Establishments did not deliver or they only delivered in the Regional Municipality of Sudbury, therefore did not know where external sales came from.

Source: Compiled by the author from the census and the survey.

than some wholesale categories which receive less per cent of sales from outside the Regional Municipality of Sudbury. This is because wholesalers of building material's sales are concentrated in fewer centres; whereas, the others are diffused among more centres.

4.5 RETAIL MARKET AREA

The retail trade area basically depends upon the different type and number of establishments provided by the centre and the

type of goods they offer. Not all establishments will have the same trade area because some goods have a greater range than others. The range of the good depends upon whether the good is a low order good or a high order good. Low order goods will have a smaller market area and high order goods will have a greater range with a larger market area.

Table 4-2 reveals the variety of retail categories along with the percent of sales from outside and inside the Regional Municipality of Sudbury. The retail categories were ranked by their drawing power of sales from outside the Regional Municipality of Sudbury. Generally, this indicates that the greater the sales from outside the Regional Municipality of Sudbury, the greater the market area, and the more centres the retail sector will offer its goods to (see Appendix D for retail market areas, and Table 4-3 for centres that goods are offered to the most).

4.5.1 Combined Retail Market Area

A map (Map 4-2) was constructed showing the market area for the combined retail categories listed in Table 4-2. The same method was utilized for Map 4-2 for delineating the combined retail market area as was used for the construction of Map 4-1 for the combined wholesale market area (see Combined Wholesale Market Area). The mean for per cent of sales outside the Regional Municipality of Sudbury is 8.1 per cent, and the mean of sales inside the Regional Municipality of Sudbury is 91.9 per cent. The limit of the of the combined retail market area was determined by surveying each retail category in Table 4-3 and seeing which centres the retail categories had in common and offered their goods to most frequently.

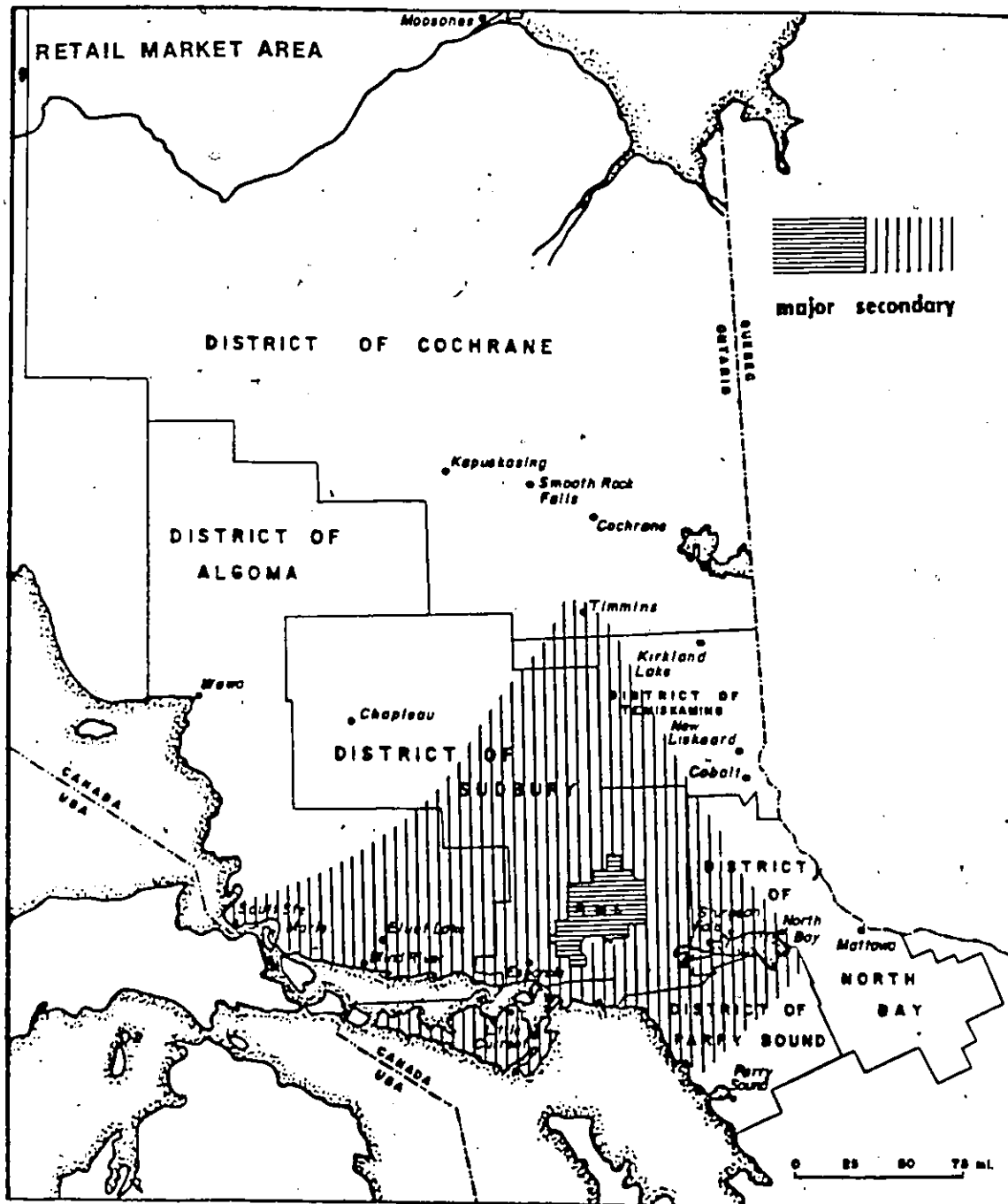
Map 4-2 reveals that the major market area for the combined retail categories is the Regional Municipality of Sudbury. The average per cent of sales from inside the major market area is 91.9 per cent, and the average per cent of sales from the secondary market area is 8.1 per cent.

4.5.2 Retail Dependency

The mean per cent of sales from outside and inside the Regional Municipality of Sudbury for the combined retail categories reveals that the retail sector is dependent on the Regional Municipality of Sudbury. It is also apparent from Table 4-2 that every retail category is dependent on the Regional Municipality of Sudbury because no retail category

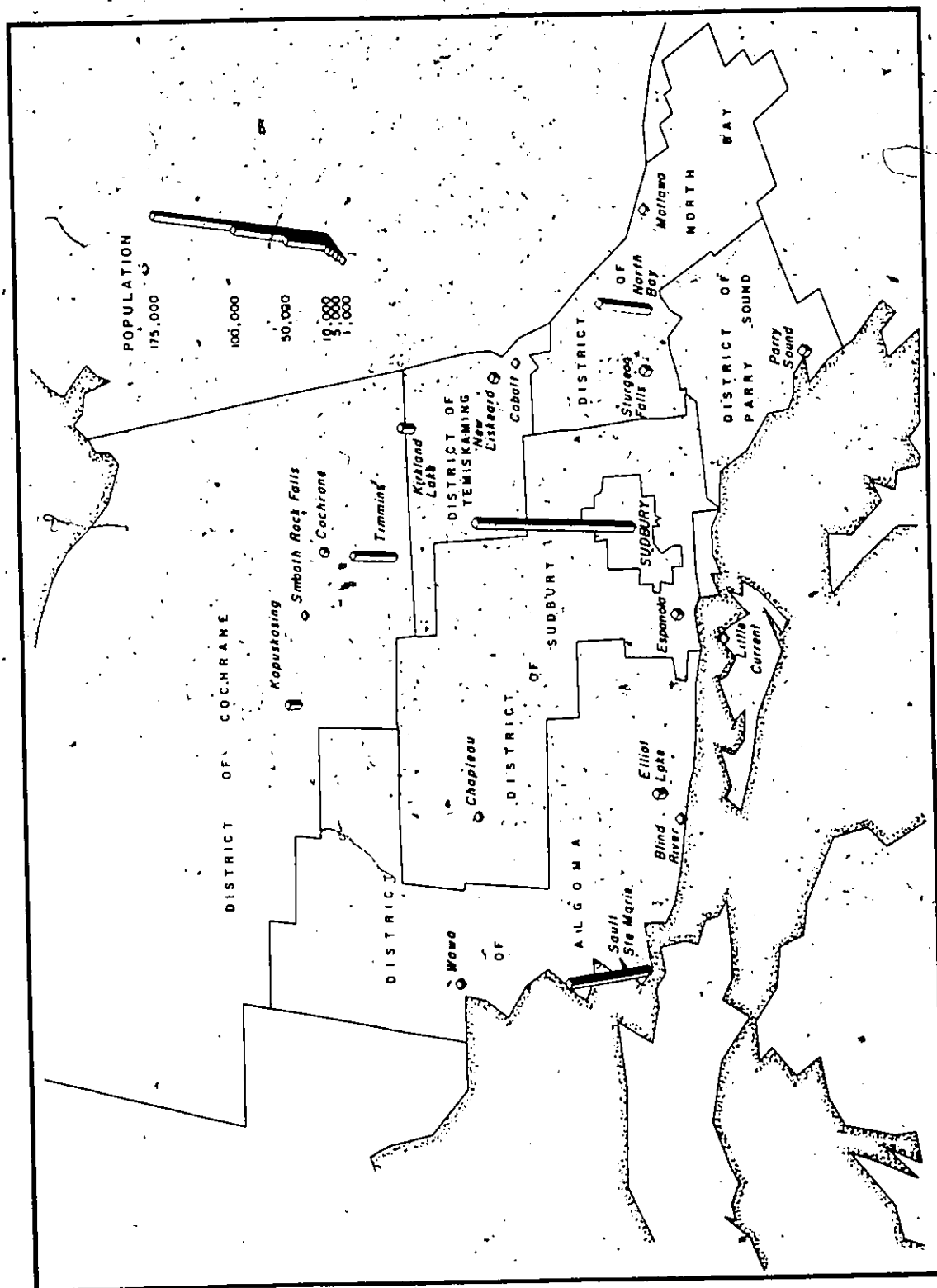
Map 4-2

R.M.S. MARKET AREAS



Map 4-3

Population of Major Centres in Northeastern Ontario



receives more than 50 per cent of its sales from outside the Regional Municipality of Sudbury. Even though all the retail categories are dependent on the Regional Municipality of Sudbury, some are more so than others.

For example, wine retailers do not receive any sales from outside the Regional Municipality of Sudbury, whereas, battery retailers receive 28 per cent of their sales from outside the Regional Municipality of Sudbury (Table 4-2). This reveals that wine store retailers are 28 per cent more dependent on sales from the Regional Municipality of Sudbury than battery retailers.

For another example, jewellery store retailers draw 9.6 per cent of their sales from outside the Regional Municipality of Sudbury and building material retailers receive 8.3 per cent of their sales from outside the Regional Municipality of Sudbury (Table 4-2). This indicates that building material retailers are 1.3 per cent more dependent on the Regional Municipality of Sudbury than jewellery store retailers.

This dependency of retailing on the Regional Municipality of Sudbury can be unbeneficial or beneficial. Unbeneficial because, if anything were to happen to the economy of the Regional Municipality of Sudbury, the retailers are in danger of losing a great amount of sales. Their per cent of sales from the secondary market would be too little to make up the difference in sales lost from inside the Regional Municipality of Sudbury.

Dependency can also be good. Retailers will not be effected as greatly if sales from the secondary market were to drop because their majority of sales come from the major market area which is the Regional Municipality of Sudbury. The sales from inside the Regional Municipality of Sudbury can help alleviate the sales lost from the secondary market.

Chapter three reveals that less than half of the retail establishments deliver (41.6 per cent of the retail establishments deliver). They also deliver less frequently than the wholesale establishments. The retail establishments offer most of their goods only in the Regional Municipality of Sudbury. This indicates a great dependency on the Regional Municipality of Sudbury. The dependency can be weakened if the retail establishments were to deliver more frequently, and if they were to offer their goods and services to more centres outside the Regional Municipality of Sudbury.

4.5.3 Population Reached by Retail Categories

Table 4-5 reveals the approximate number of people reached by each retail category in relation to sales received from inside and outside the Regional Municipality of Sudbury, (see Map 4-3). The per cent of sales from inside the Regional Municipality of Sudbury always reaches the constant population of the Regional Municipality of Sudbury. Generally, the greater the per cent of sales from outside the Regional Municipality of Sudbury, the greater the population reached. This however, is not always the case.

Table 4-5

RETAIL SECTOR

Categories From Telephone Directory	Drawing Power From Outside R.M.S. in %	Approximate* Potential Population Reached	Drawing Power From Inside R.M.S. in %	Approximate* Potential Population Reached	Total Approximate Potential Population Reached
Batteries	28.0	(69,050)	72.0	(157,030)	(226,080)
Florists	17.0	(14,721)	83.0	(157,030)	(171,751)
Radio, T.V., and Electrical Supplies	14.3	(95,248)	85.7	(157,030)	(252,278)
Tire Dealers	10.2	(120,689)	89.8	(157,030)	(277,278)
Book Stores	10.0	-1-	90.0	(157,030)	(157,030)
Jewellery Stores	9.6	(120,841)	90.4	(157,030)	(277,871)
General Merchandise and Department Stores	9.3	(72,814)	90.7	(157,030)	(229,844)
Food Stores	9.0	-1-	91.0	(157,030)	(157,030)
Building Materials	8.3	(81,609)	91.7	(157,030)	(238,639)
Men's Clothing	8.1	(209,362)	91.9	(157,030)	(366,392)
Stationary Stores	7.7	(25,793)	92.3	(157,030)	(182,823)
Automobile Dealers	7.7	(21,175)	92.3	(157,030)	(178,205)
Shoe Stores	7.2	-1-	92.8	(157,030)	(157,030)
Furniture Stores	5.6	(107,560)	94.4	(157,030)	(264,590)
Women's Clothing	5.5	(108,698)	94.5	(157,030)	(265,728)
Service Stations	5.4	-1-	94.6	(157,030)	(157,030)
Shoe Repair	5.0	(14,775)	95.0	(157,030)	(171,805)
Cigar, Cigarettes, and Tobacco	5.0	-1-	95.0	(157,030)	(157,030)
Beer and Ale	5.0	-1-	95.0	(157,030)	(157,030)
Pharmacies	3.8	-1-	96.2	(157,030)	(157,030)
Hardware	3.4	-1-	96.6	(157,030)	(157,030)
Electrical Equipment	2.0	-1-	98.0	(157,030)	(157,030)
Wine Stores	0.0	-1-	100.0	(157,030)	(157,030)

* Population based on 1976 census of population.

-1- Establishments did not deliver or they only delivered in the Regional Municipality of Sudbury, therefore did not know where external sales came from,

Source: Compiled by the author from the census and survey.

For example, battery retailers receive 28 per cent of their sales from outside the Regional Municipality of Sudbury; but the population that they reach is smaller than men's clothing retailers which receive 8.1 per cent of their sales from outside the Regional Municipality of Sudbury (Table 4-5). The reason for this, is that, battery retailers' sales from outside the Regional Municipality of Sudbury are concentrated in fewer centres. Men's clothing retailers' sales are diffused over a greater population.

4.6 WHOLESALE-RETAIL CATEGORY COMPARISON

4.6.1 Market Areas

The most evident comparison that can be made between these two sectors, is that the wholesale sector has wholesale categories which have major market areas outside the Regional Municipality of Sudbury; whereas, retailing does not. These two wholesale categories are shoe wholesalers and mining equipment wholesalers. Also, the entire market area for the wholesaling sector is greater than that of retailing (see Map 4-1 and 4-2, Appendix C and D).

4.6.2 Sales and Dependency

Comparing the sales received from outside the Regional Municipality of Sudbury, it is quite apparent that wholesale categories receive more sales from outside the Regional Municipality of Sudbury than retail categories (Tables 4-1 and

4-2). This makes wholesalers less dependent upon the Regional Municipality of Sudbury than retailers. The 'pros' and 'cons' of dependency were discussed in the sections dealing with wholesale dependency and retail dependency.

The mean of sales received from outside the Regional Municipality of Sudbury for all of the wholesale and retail categories are 31 per cent and 8.1 per cent respectively. Using the same method to show dependency of one category to another, it can be seen that, wholesaling is 22.9 per cent less dependent on sales from inside the Regional Municipality of Sudbury than retailing.

The low per cent of sales received from outside the Regional Municipality of Sudbury for the retail sector seems to indicate that there are more intervening opportunities for the surrounding area; therefore decreasing the dependency for the surrounding area on the Regional Municipality of Sudbury. The opposite seems to be the case for the wholesale sector.

4.7 CENTRALITY

The spatial demand for the goods offered in the Regional Municipality of Sudbury is great. This is evident from the drawing power percentage figures for wholesaling and retailing, but, more so for wholesaling (Table 4-1 and 4-2). Also Table 4-3 reveals the centres most frequently delivered. These centres are located as far west as Wawa,

north to James Bay, east to Mattawa, and south as far as Parry Sound.

The delineated trade areas also reveal the distance for which goods and services are offered by the Regional Municipality of Sudbury (Appendix C and D). Here again, the wholesale market areas are greater than the retail market areas. This reveals that the wholesaling sector offers more goods which are absent in other centres. Nonetheless, Map 4-2, the combined retail market area indicates that the retail goods are offered over a fairly large secondary market. The spatial demand for goods, and their market areas reveal that the Regional Municipality of Sudbury serves its surrounding area because of the number of services and goods which are offered in the Regional Municipality of Sudbury.

4.8 CONCLUSION

The method used to delineate market areas for the wholesale and retail categories served its purpose well (drawing power). By using drawing power to delineate the market areas, it was possible to show which areas were major market areas and secondary market areas, and the per cent of sales for wholesaling and retailing came from each area.

In general, it is quite obvious that the wholesale sector has a much larger trade area than the retail sector (see Appendix C and D, and Maps 4-1 and 4-2). It is also evident that the wholesale sector is less dependent on the Regional Municipality of Sudbury than the retail sector.

The market areas reveal the space-relation which bind the Regional Municipality of Sudbury to other centres in the area. The market areas show the extent that the centres are served by the Regional Municipality of Sudbury. Therefore, the market area concept is the link between the structure of the distributive trades and the economic base of the region.

This chapter dealt with analyzing the wholesale and retail sectors in the Regional Municipality of Sudbury in terms of market areas and their dependence on the Regional Municipality of Sudbury. The following chapter will deal with an economic base analysis of the Regional Municipality of Sudbury. It will show the relationship between sales and employment in the Regional Municipality of Sudbury.

Chapter V

DEPENDENCY AND VULNERABILITY OF THE DISTRIBUTIVE TRADES

5.1 INTRODUCTION

There is always an element of uncertainty in a city, if a city has a great concentration of economic activity in one specific sector. A city may suffer severely because of a decrease in demand for the products or services that the city provides or because of the rise of a competing product or service. This is especially true for single industry towns, or towns that are dependent on exports (Pfouts, 1970). Local industries which have a large market are more responsive to changes in demand than those with output limited to local markets (Luttrell and Gray, 1970).

On the other hand, a city or centre may gain by being dependent upon exports. The demand for a product may increase which would be to the advantage of the city or centre.

The above reveals that there is an ironic relationship between export generated growth and vulnerability. Even though industries with output to local markets are less responsive to demands from non-local markets, they are still vulnerable or dependent and changes in demand on industries who are more responsive to changes in demand from non-local

markets. This is because there is a cause and effect relationship between basic and non-basic industries.

The purpose of this chapter is to analyze the wholesale and retail categories found in the Regional Municipality of Sudbury to determine how dependent they are on exterior and interior markets.

In order to do this, an economic base study will be done for the wholesale and retail categories. The economic base analysis will involve proportioning employment in the wholesale and retail categories into basic and non-basic employment. The proportion of basic and non-basic employment will then be analyzed in terms of dependency and vulnerability on exterior and interior markets.

5.2 THEORY BEHIND THE ECONOMIC BASE

An economic base study identifies the key elements of a community (Tiebout, 1962). Economic base studies distinguish between two broad sectors of the local economy: 1) firms who sell goods and services outside the community (exports); and 2) firms who sell goods and services within the geographical area being studied (local) (Roterus and Calef, 1955, Garnick, 1970, Romanoff, 1974, and Burke, 1977).

Assumed between these two sectors is a cause and effect relationship. The export market is considered to be the prime stimulator of the local economy in that, if employment serving the export market rises or falls, employment in the

local market is believed to do the same and in a certain fixed proportion. This fixed proportion² reveals the multiplier effect between the export market and the local economy. The employment serving the outside market is dependent upon the number of sales to the outside market. As Ullman and Dacey (1971) reveal, the export activities of a city whether they be manufactured goods or retail or other services, support the local (internal) or relatively immobile service activities which are not so easily transportable. If the sales to the outside market decrease, employment serving this market will decrease; and this will have an effect upon employment serving the local market.

For example, when a factory (export) closes, retail merchants (local) feel the impact as laid-off factory workers have less to spend. Because export employment is assumed to be the prime mover, export employment is considered basic, and employment which serves the local market is considered non-basic (Alexander, 1954, Hoyt, 1961, and Burke, 1977). This re-interpretation of economic base theory underlines the multiplier idea.

Luttrell and Gray (1970, p.10) point out, "If an assumption is made that the non-basic sector maintains a con-

²For a detailed derivation of multipliers in the export base model, see: Romanoff, E., "The Economic Base Model: A Very Special Case of Input-Output Analysis", Journal of Regional Science, Volume 14, Number 1, 1974, pp.121-129.

stant relationship over time, then it can be shown that total employment growth is a multiple of basic employment growth".

Industries and firms are not only either basic or non-basic, in that they sell all their products either out of the community or in the community; industries and firms may sell their products in both the export and local markets. Therefore, for each industry and firm in a community, employment can be divided between basic and non-basic.

This raises the problem of allocating basic employment in each industry and firm. This will be discussed further in the chapter when dealing with the measures of the economic base.

Garrison (1972, p.329) indicates " ... the usefulness of the economic base model depends upon the accuracy of the region's economic production into basic and non-basic sectors..."

There are many authors who criticize economic base theory because of its limitations. Two of these authors are Roterus and Calef (1955).

Roterus and Calef believe that the economic base concept is simply a quantitative descriptive tool, which describes certain limited aspects of the economic functions of a city or region. Because it is only a descriptive tool, Roterus and Calef do not believe that there is any purpose to develop elaborate schemes of data collection for propor-

tioning the employed population between basic and non-basic groupings. They also believe that the multiplier effect from the basic-non-basic idea should be used in broad terms, because basic-non-basic relationships are subject to variation from place to place, and over different periods of time.

There are authors who believe even though there are limitations to economic base theory, that it is still a very useful one. One author is Hoyt (1961).

Hoyt (1961, p.51) reveals that many authors are of the opinion " ... that the economic base method is too simple and crude for the purpose of accurately forecasting population of an urban region, chiefly because the ratio between basic and non-basic employment is not constant but variable".

But Hoyt raises the question whether the economic base has a value in determining growth, even if it is not an infallible device for predicting the exact amount of growth and can an urban region grow without any increase in basic activities.

Hoyt cites many examples in his article (e.g. Dallas, Texas and Houston, Texas) of the relationship between basic employment and population growth of urban regions. He also reveals that the economic base principle has world wide applications (e.g. Delhi State in India).

Hoyt shows that large cities with millions of population grow at a slower rate because of a decrease in the ba-

sic sector. He cites the examples of New York, Philadelphia, and Boston which have lost population because of the loss of basic industries, even though they have the greatest consumer services.

Even though there are limitations to the economic base concept, in Hoyt's opinion "The most important contribution of the economic base theory ... is its function in furnishing a sound method of analyzing the economic structure of an urban region".

Also, there is the 'great debate' between Douglas North (1964) and Charles Tiebout (1964) concerning export base.

North believes that development through various stages - primary, secondary, and tertiary - is not an adequate explanation of growth. As a substitute, North maintains that a region's growth is closely tied to the success of its exports and may take place either as a result of the improved position of existing exports relative to competing areas or as a result of the development of new exports. He further points out that it is necessary to look into location theory to explain changes in the export base. The point that North makes is that, the concept of export base is the major variable in determining regional growth.

Tiebout on the other hand, believes that there is no reason to assume that exports are the sole or even most important variable in determining regional growth. Tiebout indicates that other items such as business investment, go-

vernment expenditures, and the volume of residential construction may be just as important with respect to regional growth as exports. Tiebout believes that the concept of export base and the fuller concept of regional growth determination which includes other variables is a short-run concept, where North believes it to be a long-run concept.

This brings us to the different ways of measuring the economic base.

5.3 MEASURES OF THE ECONOMIC BASE

5.3.1 Indirect Measures

Almost all indirect measures of the economic base are concerned with only the division between basic and non-basic activities. Tiebout (1962) indicates that there are three most commonly used indirect measures: 1) the assumption approach; 2) the location quotients approach; and 3) the minimum requirements approach.

A short explanation of each of the three measures will be given along with their major criticisms.

5.3.2 The Assumption Approach

Of all the measures of the economic base, the assumption approach is the simplest. The usual assumption is that all manufacturing and agriculture is export and the remaining industries are local. This assumption is not true because much of the manufacturing industries' products are lo-

cally orientated and many services are non-locally orientated. Also, the larger a region is, the more likely that a large portion of the manufacturing industries will serve local markets.

5.3.3 Location Quotients Approach

Location quotients are widely used to measure the export industry. They are sometimes called localization coefficients (Ullman and Dacey, 1971). The same technique is used to measure export magnitudes. Location quotients may be determined by the formula;

$$L.Q. = (E_{IaCa} / TE_{Ca}) / (E_{IaN} / T_{EN})$$

where, L.Q. = Location Quotient

E_{IaCa} = Employment in Industry a in City a,

TE_{Ca} = Total Employment in City a,

E_{IaN} = Employment in Industry a in the Nation, and

T_{EN} = Total Employment in the Nation.

If a community is self-sufficient in product y and does not export or import, and the community assumes to have the same demands as the nation, then local employment is assumed to be the same in proportion as the nation as a whole in industry x. In the case where a community has three times the proportion of total employment locally than it has nationally, the assumption is that the community is specialized in industry x and exports two-thirds of its production. The community exports two-thirds because one-third is assumed necessary to satisfy local demands. Where industry

x in a community shows less employment as the nation, it is assumed that products y are imported into the community.

Three criticisms can be discussed in the use of location quotients. The first criticism argues against the assumption of uniform demand throughout the region. This is because some communities may have different demands than those of other communities.

The second criticism comes from the question: What if the community is more productive than the national average in terms of output per employee? If this is the case, even with the proportional share of employees in an industry the output is higher. In this case, some of the employment should be in the export sector.

The final criticism is more difficult to deal with. The results one gets using location quotients depend upon the level of the Standard Industrial Classification (S.I.C.) level used in the analysis. All industries are classified in various digit levels, the more digits, the finer the detail. For example, a community may specialize in building boats. This is part of the transportation equipment industry S.I.C. 37. If the location quotients are used at the two digit level, no exports of boats may appear. This is because also in the S.I.C. 37 are the automobile, aircraft, bicycles, trains and other transportation equipment industries. Therefore the exports are hidden.

No exports may appear until the data gets down to S.I.C. 3732 - the boat building and repair industry. This final criticism has been given the name of "problem of product mix" (Tiebout, 1962, p.48).

5.3.4 Minimum Requirements Technique

This technique is a variation on the location quotients method. Ullman and Dacey (1971, p.121-122) state that "This method yields a quantitative statement which closely approximates the per centage of a labour force required in various sectors of the economy to maintain the viability of an urban area".

The first step involved in this technique is to group a number of communities similar to the one being studied in this thesis. Then, calculate the per cent of total employment in each industry for each community. The percent of a given industry is then ranked in order of decreasing size. The community which has the smallest percent is assumed to be the minimum required by any community to satisfy local needs.

The problem with this technique is to decide where to put the cut off point for the percentages. This is because the higher the cut off point, the less each community will have as exports.

5.3.5 Direct Measures of the Economic Base

As mentioned earlier, indirect measures of the economic base are mainly concerned with only the division between exports and non-exports. They are not very useful if one wants to determine the number or percentage of sales of an individual firm to the basic sector and to the non-basic sector.

The most direct method for gathering data is to use a firm by firm approach. This approach consists of doing a sample survey of local firms located in the study area. The firm by firm approach provides more accurate data than the indirect methods (see Chapter Three).

5.4 ASSOCIATION BETWEEN MARKET AREAS AND ECONOMIC BASE

In the Regional Municipality of Sudbury, the largest employer in the region is the mining industry. It would be natural then to do an economic base analysis of the mining industry in the Regional Municipality of Sudbury to see the effects that it would have upon local industries if the demand for nickel increased or decreased. The results would probably show that the local industries are dependent upon whatever happened in the mining industry.

This thesis however is not concerned with the mining industry, but with the distributional trades of wholesaling and retailing in the Regional Municipality of Sudbury. Therefore, this chapter will deal with an economic base analysis of the distributive trades to determine their vulnera-

bility and dependence upon the Regional Municipality of Sudbury.

The previous chapter dealing with the market areas revealed the space-relation link between the wholesaling and retailing categories in the Regional Municipality of Sudbury and ~~other~~ centres in northeastern Ontario. The economic base analysis in this chapter will reveal the economic link between the wholesaling and retailing categories and their market areas in the Regional Municipality of Sudbury. This economic link will indicate the dependency and vulnerability of the wholesale and retail categories. This will be done in terms of how dependent and vulnerable employment is upon interior and exterior markets.

5.5 ANALYSIS PROCEDURE

The data used for this chapter is taken from questions one and two of the revised wholesale and retail questionnaire (Appendix B). Question one in both questionnaires determined the per cent of sales received from outside and inside the Regional Municipality of Sudbury. The per cent of sales inside and outside the Regional Municipality of Sudbury was explained in Chapter Four.

Question three in both the wholesale and retail questionnaires collected data on the number of employees in each establishment that responded. The total employment for each wholesale and retail category was then computed by adding

the total employment in each establishment for each category (Table 5-1 and 5-2).

The per cent of sales outside (basic sales) and the per cent of sales inside (non-basic sales) and the total employment in each wholesale and retail category were used to divide the total employment in each category into basic employment and non-basic employment. This was done by proportioning the total employment in each category in relation to basic and non-basic sales. For example, wholesalers of shoes have 75 per cent of their sales as basic and 25 per cent of their sales as non-basic. The total employment is four in this category. Therefore, 75 per cent of the total employment is considered to be working in the basic sector (three employees) and 25 per cent of the employees work in the non-basic sector (one employee) for this category. By using this method for all the categories in the wholesale and retail categories, the total employment in each category was divided into basic and non-basic employment (Table 5-1 and 5-2).

The multiplier concept was used as a measure of dependency for each of the wholesale and retail categories. It must be stressed that the multiplier concept is not being used in the truest sense of the word. It is not measuring a cause and effect relationship between basic employment and non-basic employment. The multiplier was modified by the author to be used as a ratio of dependence to show how dependent the wholesale and retail categories are on the Re-

gional Municipality of Sudbury. The multiplier or ratio of dependence is taken from Tiebout (1962):

$$R.D. = 1 / [1 - (N.B.E. / T.E.)]$$

where;

R.D. = Ratio of Dependence

N.B.E. = Non-Basic Employment

T.E. = Total Employment

The ratio of dependence is then transformed into a coefficient to give a coefficient of vulnerability:

$$C.V. = [1 - (1 / R.D.)]$$

where;

C.V. = Coefficient of Vulnerability

R.D. = Ratio of Dependence

This is done so as to give a scale between zero and one to measure vulnerability. The closer the coefficient is to zero, the less vulnerable the wholesale and retail category is on the Regional Municipality of Sudbury, and the more vulnerable on the exterior markets and vice versa.

For example, wholesalers of hardware products have 17.1 employees in the basic sector and 63.9 employees in the non-basic sector, and have a total employment force of 81 employees. Therefore:

$$R.D. = 1 / [1 - (N.B.E. / T.E.)]$$

$$= 1 / [1 - (63.9 / 81)]$$

$$= 4.7$$

and the coefficient of vulnerability is:

$$C.V. = [1 - (1 / R.D.)]$$

$$= [1 - (1 / 4.7)]$$

$$= .79$$

Therefore, hardware wholesalers are more dependent on the Regional Municipality of Sudbury than the wholesale categories which have a smaller ratio of dependence and less dependent than the wholesale categories which have a greater coefficient of vulnerability (Table 5-1).

The same is true for the coefficient of vulnerability (Table 5-1). The closer the coefficient approaches one (1) on the vulnerability scale, the more vulnerable the category is on changes in the economy of the Regional Municipality of Sudbury.

5.6 WHOLESALE CATEGORIES

In the wholesale sector (Table 5-1) there are two categories (wholesalers of shoes and mining equipment) which have the greatest proportion of employees working in the basic sector than in the non-basic sector. This is because the wholesalers of shoes and mining equipment have more than 50 per cent of their sales in the basic sector. There is one wholesale category (wholesalers of dry cell batteries) whose employment is shared equally between the basic and non-basic sector. This is because wholesalers of dry cell batteries share their sales equally between the Regional Municipality of Sudbury and the surrounding area. For the remaining wholesale categories, the opposite is true. There are more employees working in the non-basic sector and less working

Table 5-1

WHOLESALE

Categories From Telephone Directory	Basic Sales in %	Non-Basic Sales in %	Ratio of Dependence	Coefficient of Vulnerability	Total Employment	Percent of Total Employment	Basic Employment	Non-Basic Employment
Shoes	75	25	1:1.3	.24	4	0.58	3.0	1.0
Mining Equipment	60	40	1:1.6	.38	16	2.35	9.6	6.4
Dry Cell Batteries	50	50	1:2	.5	3	0.44	1.5	1.5
Building Materials	45	55	1:2.2	.55	17	2.5	7.65	9.35
Petroleum	35	65	1:2.8	.65	56	8.23	19.6	36.4
Food	31.1	68.9	1:3.2	.69	162	23.8	50.3	111.7
Baked Goods	29	71	1:3.44	.71	146	21.4	42.3	103.7
Farm Products	27.5	72.5	1:3.66	.73	29	4.2	7.9	21.1
Hardware	21.6	78.4	1:4.7	.79	81	11.9	17.1	63.9
Automotive Supplies	12	88	1:8.3	.88	100	14.7	12.0	88.0
Electrical Equipment and Supplies	9	91	1:11.1	.91	26	3.8	2.34	23.6
Cigar, Cigarettes, and Tobacco	5	95	1:20	.95	18	2.6	0.9	17.1
Paper Products	3	97	1:31.25	.96	22	3.2	0.7	21.3
Total					680 (100%)		174.89 (25.72%)	505.11 (74.32%)
Mean	31Z	69Z						

Ratio of Dependence for Wholesale - 1:3.87

Coefficient of Vulnerability for Wholesale - .74

Source: Compiled by the author from the survey.

in the basic sector. The reason for this is that, the remaining wholesale categories have more than 50 per cent of their sales in the non-basic sector.

The above implies that there is a relationship between sales and employment. The greater the basic sales, the greater the basic employment, and the greater the non-basic sales, the greater the non-basic employment (Table 5-1).

There is also a relationship between sales, employment, and the ratio of dependence. The greater the basic sales and basic employment, the lower the ratio of dependence (Table 5-1). This reveals that, the more sales in the basic sector, the less dependent and vulnerable the wholesale categories are upon the Regional Municipality of Sudbury, especially for wholesalers of shoes and mining equipment.

The coefficient of vulnerability shows that wholesalers of shoes and mining equipment are less vulnerable on changes in the economy of the Regional Municipality of Sudbury than are the other wholesale categories; but are more vulnerable on changes in the surrounding area. This is because the major market area for wholesalers of shoes and mining equipment is the surrounding area.

5.6.1 Combined Wholesale Categories

The ratio of dependence for the combined wholesale categories was computed by taking the combined totals of total employment, basic employment, and non-basic employment (Ta-

ble 5-1). Therefore the ratio of dependence for the combined wholesale categories is:

$$\begin{aligned} R.D. &= 1 / [1 - (505.11 / 680)] \\ &= 3.87. \end{aligned}$$

Then, the coefficient of vulnerability was calculated for the combined wholesale categories as being:

$$\begin{aligned} C.V. &= [1 - (1 / 3.87)] \\ &= .74 \end{aligned}$$

It is evident from the above that the combined wholesale category is dependent on the Regional Municipality of Sudbury.

5.7 RETAIL CATEGORIES

In the retail sector (Table 5-2) there are no categories which have more employees in the basic sector than in the non-basic sector. This is because there are no categories whose sales are over 50 per cent in the basic sector. The retail category with the greatest proportion of employees in the basic sector is retailers of batteries (Table 5-2). The proportion of employees in the the basic sector for the other retail categories continually decrease. This is because the per cent of basic sales are less.

Again, as in the wholesale sector there is a relationship between sales and employment. The greater the basic sales, the greater the basic employment, and the greater the non-basic sales, the greater the non-basic employment.

The coefficient of vulnerability indicates that the retail categories are vulnerable to changes in the economy of the Regional Municipality of Sudbury. The retail category which is the least vulnerable is retailers of batteries. The retail categories then become more vulnerable as the per cent of basic sales decrease.

5.7.1 Combined Retail Categories

The ratio of dependence for the combined retail categories was computed by taking the combined totals of employment, basic employment, and non-basic employment (Table 5-2). Therefore the ratio of dependence for the combined retail categories is:

$$\begin{aligned} R.D. &= 1 / [1 - (1634.89 / 1792)] \\ &= 11.36 \end{aligned}$$

Then, the coefficient of vulnerability was calculated for the combined retail sector as being:

$$\begin{aligned} C.V. &= [1 - (1 / 11.36)] \\ &= .91 \end{aligned}$$

It is apparent that the combined retail category is dependent and vulnerable to changes in the economy of the Regional Municipality of Sudbury. It is vulnerable because the coefficient of vulnerability is very near to one (1) on the scale of zero (0) to one (1).

Table 5-2
RETAIL

Categories From Telephone Directory	Basic Sales in %	Non-Basic Sales in %	Ratio of Dependence	Coefficient of Vulnerability	Total Employment	Percent of Total Employment	Basic Employment	Non-Basic Employment
Batteries	28	72	1:3.57	.72	17	0.94	4.76	12.24
Florists	17	83	1:5.8	.83	50	2.7	8.5	41.4
Radio, T.V., and Electrical Supplies	14.3	85.7	1:6.9	.86	76	4.2	10.8	65.2
Tire Dealers	10.2	89.8	1:9.09	.89	32	1.7	3.26	28.74
Book Dealers	10.0	90.0	1:10	.9	7	0.39	0.7	6.3
Jewellery Stores	9.6	90.4	1:10.52	.905	79	4.4	7.5	71.5
General Merchandise and Department Stores	9.3	90.7	1:10.7	.907	694	38.7	64.5	629.5
Food Stores	9.0	91.0	1:11.1	.91	97	5.4	8.73	88.27
Building Materials	8.3	91.7	1:12.04	.917	104	5.9	8.6	95.4
Men's Clothing	8.1	91.9	1:12.5	.92	29	1.6	2.3	26.7
Stationary Stores	7.7	92.3	1:12.98	.923	42	2.3	3.2	38.8
Automobile Dealers	7.7	92.3	1:12.98	.923	282	15.7	21.7	260.3
Shoe Stores	7.2	92.8	1:13.8	.928	25	1.3	1.8	23.2
Furniture Stores	5.6	94.4	1:18.1	.945	24	1.33	1.3	22.7
Women's Clothing	5.5	94.5	1:18.1	.945	19	1.0	1.04	17.96
Service Stations	5.4	94.6	1:19.2	.948	37	2.0	1.9	35.1
Shoe Repair	5.0	95.0	1:20	.95	6	0.33	0.3	5.7
Cigar, Cigarettes, and Tobacco	5.0	95.0	1:20	.95	1	0.05	0.05	0.95
Beer and Ale	5.0	95.0	1:20	.95	45	2.5	2.25	42.75
Pharmacies	3.8	96.2	1:26.3	.962	58	3.2	2.2	55.8
Hardware	3.4	96.6	1:29.4	.966	33	1.8	1.12	31.88
Electrical Equipment	2.0	98.0	1:50	.98	30	1.6	0.6	29.4
Wine Stores	0.0	100.0	(N.A.)	(N.A.)	5	0.27	0.0	5.0
Total					1792 (100%)		157.11 (8.76%)	1634.89 (91.24%)
Mean	8.1%	91.9%						

Ratio of Dependence for Retail - 1:11.36

Coefficient of Vulnerability for Retail - .91

(N.A.) - Not Applicable

Source: Compiled by the author from the survey.

5.8 WHOLESALE-RETAIL CATEGORY COMPARISON

The most apparent comparison that can be made between the wholesale and retail categories is that the retail category is more dependent and vulnerable on changes in the Regional Municipality of Sudbury (Tables 5-1 and 5-2).

This is because the ratio of dependence for the combined wholesale category is 1:3.87 and the ratio of dependence for the combined retail category is 1:11.36. The coefficient of vulnerability for the combined wholesale sector is .74 and the coefficient of vulnerability for the combined retail sector is .91. On the scale from zero (0) to one (1), it can be seen that the combined wholesale sector is less vulnerable on changes in the Regional Municipality of Sudbury than the combined retail sector (Table 5-3 and 5-4). This is due to the fact that the wholesale categories have a greater proportion of basic sales and larger market areas than the retail categories. There is a greater demand for wholesale goods from outside the Regional Municipality of Sudbury than for retail goods from outside the Regional Municipality of Sudbury. This is because centres outside the Regional Municipality of Sudbury are lacking in wholesale establishments.

Even though total employment in the retail category is greater than that of the wholesale category by more than double, the wholesale category has more people working in basic employment.

Table 5-3

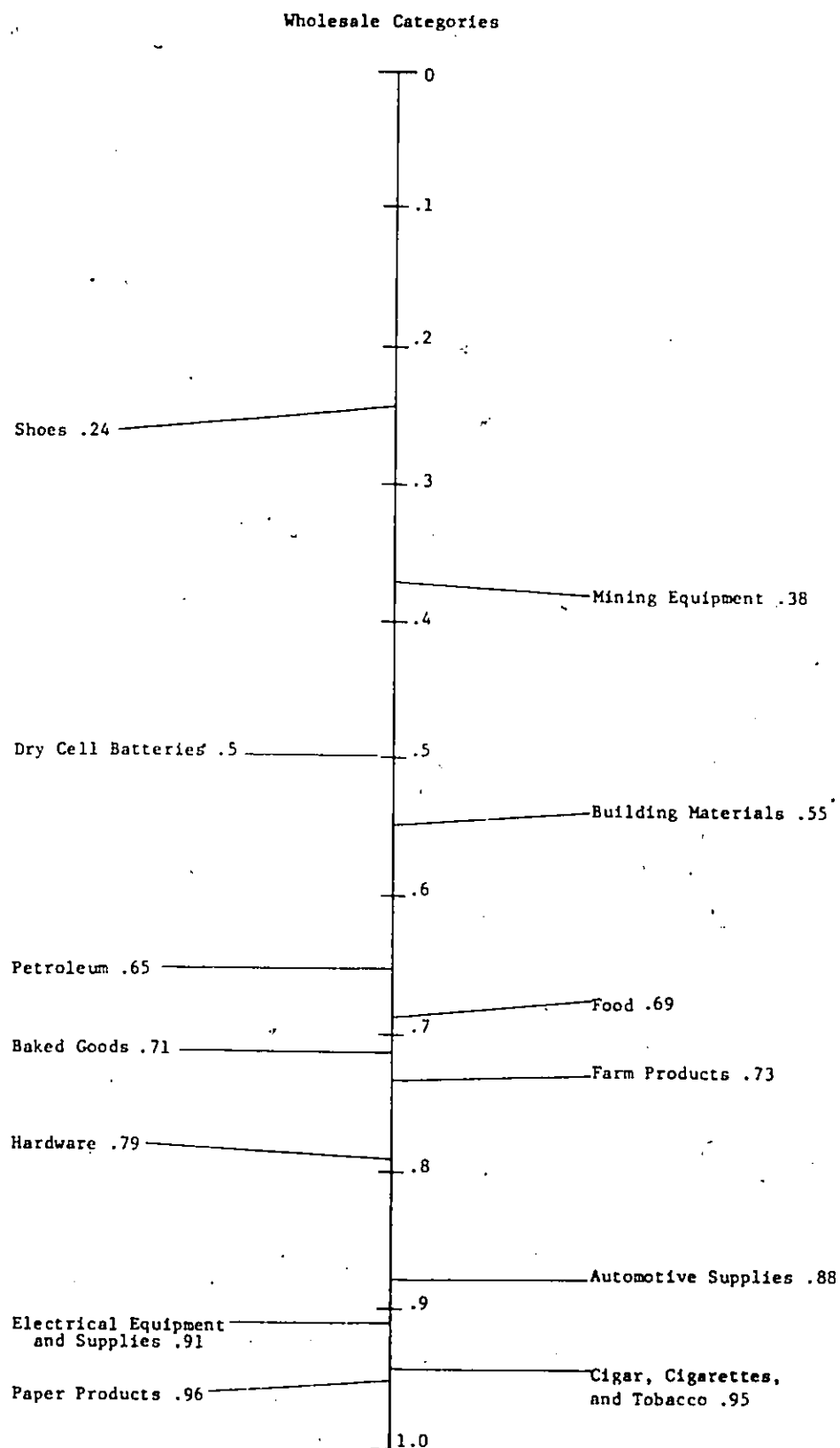
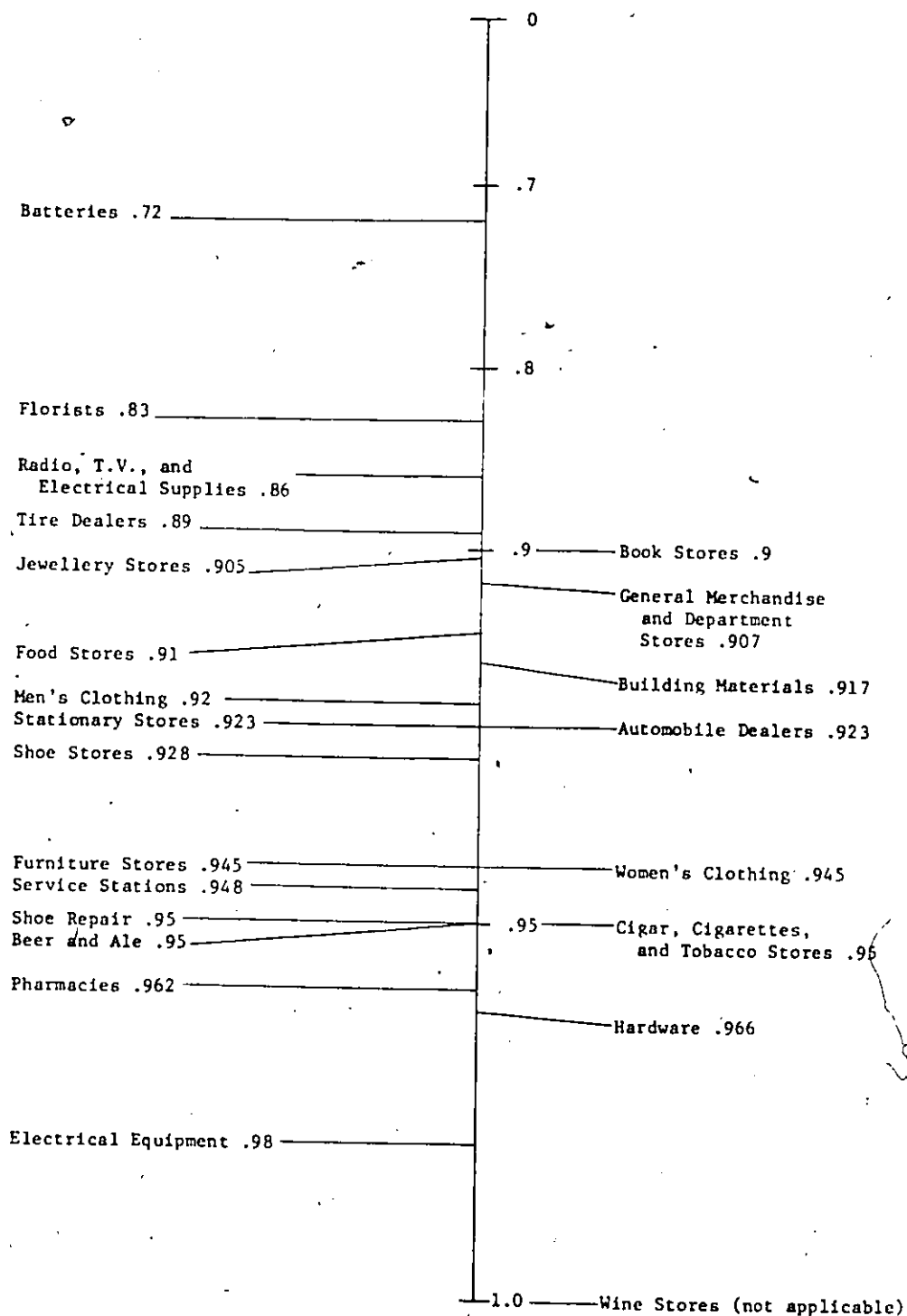
SCALE FOR COEFFICIENT OF VULNERABILITY

Table 5-4

SCALE FOR COEFFICIENT OF VULNERABILITY

Retail Categories



5.9 COMBINED DISTRIBUTIVE TRADES

Table 5-5 shows the results of the combined distributive trades. The per cent of basic sales were calculated by adding the mean per cent of basic sales from the wholesale sector and the retail sector and dividing the total by two. The same was done for computing the per cent of non-basic sales. The ratio of dependence and the coefficient of vulnerability were determined by the same method that was used for the wholesale and retail categories.

Table 5-3 reveals that the total basic employment is 13.4 per cent of the total employment and that the total non-basic employment is 86.6 per cent of total employment. This table implies that the combined distributive trades are dependent and vulnerable on changes in the economy of the Regional Municipality of Sudbury; but there is a variation in the vulnerability and dependence for each of the wholesale and retail categories. This is because not every category is effected equally.

5.10 CONCLUSION

The method employed to show dependency and vulnerability in the wholesale and retail categories served its purpose well, in that, it showed the degree of dependency and vulnerability on the Regional Municipality of Sudbury for each of the categories in wholesale and retail.

TABLE 5-5

COMBINED DISTRIBUTIVE TRADES

Total Employment

Retail + Wholesale = 2472 (100%)

Basic Employment

Retail + Wholesale = 332 (13.4%)

Non-Basic Employment

Retail + Wholesale = 2140 (86.6%)

Basic Sales = 15.9%

Non-Basic Sales = 84.1%

Ratio of Dependence = 1:7.14

Coefficient of Vulnerability = .86

It is quite obvious that both the wholesale and retail sectors are dependent on the Regional Municipality of Sudbury (Table 5-3). The wholesale sector though, is less effected by the 'goings on' in the Regional Municipality of Sudbury than the retail sector. This is due to the fact that the wholesale sector has a greater per cent of sales outside the Regional Municipality of Sudbury than retail. Also, the wholesale sector in some categories have a greater share of the market. This is evident by the larger market areas that the wholesale sector has.

The analysis of the wholesale and retail categories in this chapter points to the fact that, by increasing basic sales, the dependency and vulnerability on the Regional Municipality of Sudbury would decrease.

By using the concept of the ratio of dependence and coefficient of vulnerability, it would be possible to do a combined study for a series of towns or centres in order to access their relative sensitivity in comparison to each other. The following chapter is the conclusion. The concluding chapter will summarize the findings in this thesis.

Chapter VI

SUMMARY

6.1 INTRODUCTION

The purpose of this chapter will be to restate the objectives of this thesis, to show the utility of the frameworks used, and to summarize the major findings of the research.

6.2 OBJECTIVES OF THE THESIS

The objective of the thesis is to analyse the distributive trades of the Regional Municipality of Sudbury in order to show their dependence and vulnerability upon exterior and interior markets in terms of sales and employment.

First of all, this thesis was not a short run analysis of the distributive trades. The distributive trades were not analysed with respect to the short term difficulty which was recently experienced between September 1978 and May 1979, in the mining industry in the Regional Municipality of Sudbury. The analysis was a long term one, in that it does not take into effect the short term difficulties which will always be experienced in the mining industry.

6.3 FRAMEWORK FOR ANALYSIS

In order to fulfill the objective of the thesis, various frameworks were used. These frameworks were; 1) central place theory; 2) market area analysis and ; 3) economic base theory.

These frameworks were linked together to analyse the distributive trades.

Central place theory was used as a framework because it shows the spatial relation of the Regional Municipality of Sudbury with other locations in the surrounding area. The concepts of threshold and range explain the idea of spatial distribution and spatial demand for goods and services. The idea of centrality in central place theory revealed that the distributive trades were central place functions and that the Regional Municipality of Sudbury acted as a central place for supplying goods and services to the surrounding area.

The market area analysis was chosen because it 'operationalized' the concepts found in central place theory. The market area analysis visually revealed spatial demand and spatial distribution of the goods and services which were offered by the distributive trades in the Regional Municipality of Sudbury. This analysis divided the market areas of the distributive trades into major and secondary market areas in terms of per cent of sales drawn from inside and outside the Regional Municipality of Sudbury. It also showed the space-relation link between the distributive

trades in the Regional Municipality of Sudbury and the other centres in northeastern Ontario.

Economic base theory is utilized in this thesis because it reveals the economic link between the distributive trades and their market areas. The economic base theory is used to proportion employment in the distributive trades into basic and non-basic employment according to per cent of sales outside and inside the Regional Municipality of Sudbury.

6.4 EMPIRICAL ANALYSIS

The data used for the empirical analysis was gathered by telephone interviews of the wholesale and retail establishments in the Regional Municipality of Sudbury. Data was collected to reveal the per cent of sales inside and outside the Regional Municipality of Sudbury of each firm and the number of employees in each firm.

The per cent of sales inside and outside the Regional Municipality of Sudbury was used to delineate the market areas for each distributive trade category in terms of drawing power of sales. Drawing power refers to the per cent of sales that a store obtains from one specific area in relation to its total sales.

The employment data was used in the economic base analysis. Employment in the economic base analysis was divided into basic and non-basic employment in proportion to sales outside (basic) and inside (non-basic) the Regional Municipality.

pality of Sudbury. A ratio of dependence was calculated using the multiplier concept found in the economic base theory. This ratio of dependence revealed the degree to which employment in each distributive trade category was dependent upon the Regional Municipality of Sudbury. The ratio of dependence was then converted into a coefficient of vulnerability. The coefficient of vulnerability was used to scale the distributive trade categories in terms of their employment vulnerability or reliance on the Regional Municipality of Sudbury.

6.5 FINDINGS OF THE THESIS

The major findings of the thesis revealed that;

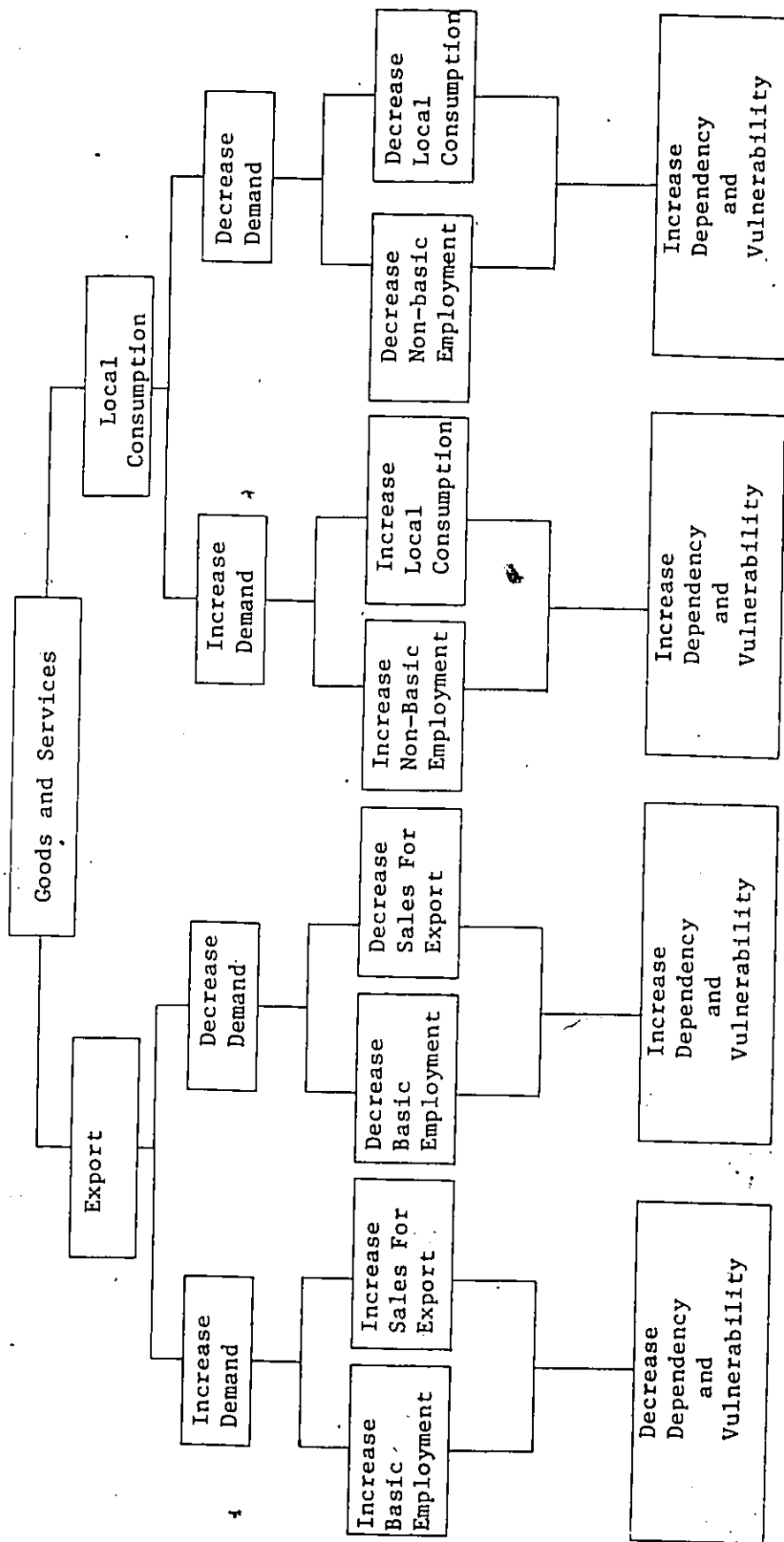
- 1) in general, the wholesale categories have a greater market area than the retail categories;
- 2) in terms of sales, both the wholesale and retail categories are dependent upon the Regional Municipality of Sudbury, but the wholesale sector is less dependent;
- 3) employment in the wholesale and retail categories are dependent upon the Regional Municipality of Sudbury, but, employment in the wholesale categories are less dependent upon the Regional Municipality of Sudbury and;
- 4) even though employment in the wholesale and retail categories rely upon the Regional Municipality of Sudbury, any 'slump' in the economy of the Region will effect employment in each distributive trade differently.

These findings reveal that the goods in the wholesale sector are much more in demand in the surrounding area than the retail sector. The reason for this is possibly that the wholesale sector in the Regional Municipality of Sudbury acts as a distribution centre for other centres in the surrounding area. Also, wholesale goods are of a higher order than the retail goods, therefore, increasing demand which results in a larger market area.

Employment in each category will be effected differently depending upon the per cent of sales outside the Regional Municipality of Sudbury. The greater the per cent of sales outside the Region, the less employment will be effected by a 'slump' in the economy of the Regional Municipality of Sudbury.

From the findings of this thesis a model of dependency and vulnerability (Figure 6-1) was developed. This model contends that to decrease the reliance and vulnerability of the wholesale and retail categories on the Regional Municipality of Sudbury, there must be an increase in demand for exportable goods and services. This then, would result in basic sales and basic employment increasing. This increase in basic sales and employment may increase non-basic sales and employment, but this is not necessarily true. The model reveals that all other combinations for local consumption results in an increased reliance upon the Regional Municipality of Sudbury.

Figure 6-1

MODEL OF DEPENDENCY AND VULNERABILITY

Therefore, the model contends that for the distributive trades to become less reliant upon the Regional Municipality of Sudbury, they must increase sales to the export market.

6.6 CONCLUSION

This study is not unique in that, the methods used in this thesis have been used and proven successful in other works. Even though economic base theory has been considered too simple and descriptive by some authors, the economic base theory has merit. It classifies economic functions on the basis of space-relations, it reveals one group of economic ties which bind a city to others, it permits a classification of and comparative analysis of settlements and provides an additional method of classifying individual economic activities within a city.

Despite any negative criticisms which may be made of the empirical research, this thesis is basically the first to analyse the distributive trades in terms of their dependence upon the Regional Municipality of Sudbury and to the surrounding areas. It is particularly appropriate at this time because this study reveals the long term effects of the distributive trades; not the short term effects which may affect the distributive trades in terms of the largest employer in the Regional Municipality of Sudbury, the mining industry.

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Appendix A

Standard Industrial Classification

WHOLESALE TRADE

1. wholesalers of farm products
2. " " coal and coke
3. " " petroleum products
4. " " paper and paper products
5. " " general products
6. " " food
7. " " tobacco products
8. " " drugs and toilet preparations
9. " " apparel and drug goods
10. " " household furniture and furnishings
11. " " motor vehicles and accessories
12. " " electrical machinery, equipment and supplies
13. " " farm machinery and equipment
14. " " machinery and equipment n.e.s.
15. " " hardware, plumbing and heating equipment
16. " " metal and metal products, n.e.s.
17. " " lumber and building materials
18. " " scrape and waste
19. wholesalers n.e.s.

RETAIL TRADE

1. food stores
2. general merchandise stores
3. tire, battery, and accessories stores
4. gasoline service stations
5. motor vehicle dealers
6. motor vehicle repair shops
7. shoe repair
8. men's clothing

9. women's clothing
10. clothing and dry goods stores n.e.s.
11. hardware stores
12. household furniture and appliance stores
13. radio, television, and electric appliance stores
14. drug stores
15. book and stationery stores
16. florists' shops
17. jewellery stores
18. watch and jewellery repair shops
19. liquor, wine and beer stores
20. tobacconists
21. retail stores n.e.s.

Appendix B

Revised Wholesale and Retail
Questionnaire

WHOLESALE QUESTIONNAIRE

1. What percentage of your total sales go to:
 - a) centres outside the R.M.S. _____
 - b) to the R.M.S. itself _____
2. How many people does your firm employ? _____
3. How many people in your firm live:
 - a) in the R.M.S. _____
 - b) outside the R.M.S. _____
4. Does your firm deliver?
 - a) yes
 - b) no
5. If your firm does deliver, what is the delivery radius approximately in miles? _____
6. If your firm does deliver, what is the frequency of deliveries? _____
7. Do the majority of deliveries go to:
 - a) the R.M.S. _____
 - b) outside the R.M.S. _____
8. In the case of outside deliveries, what centre is delivered to most frequently?

9. Where are your major suppliers or producers located?

10. Where are your major buyers located?

a) in the R.M.S. _____

b) outside the R.M.S. _____

RETAIL QUESTIONNAIRE

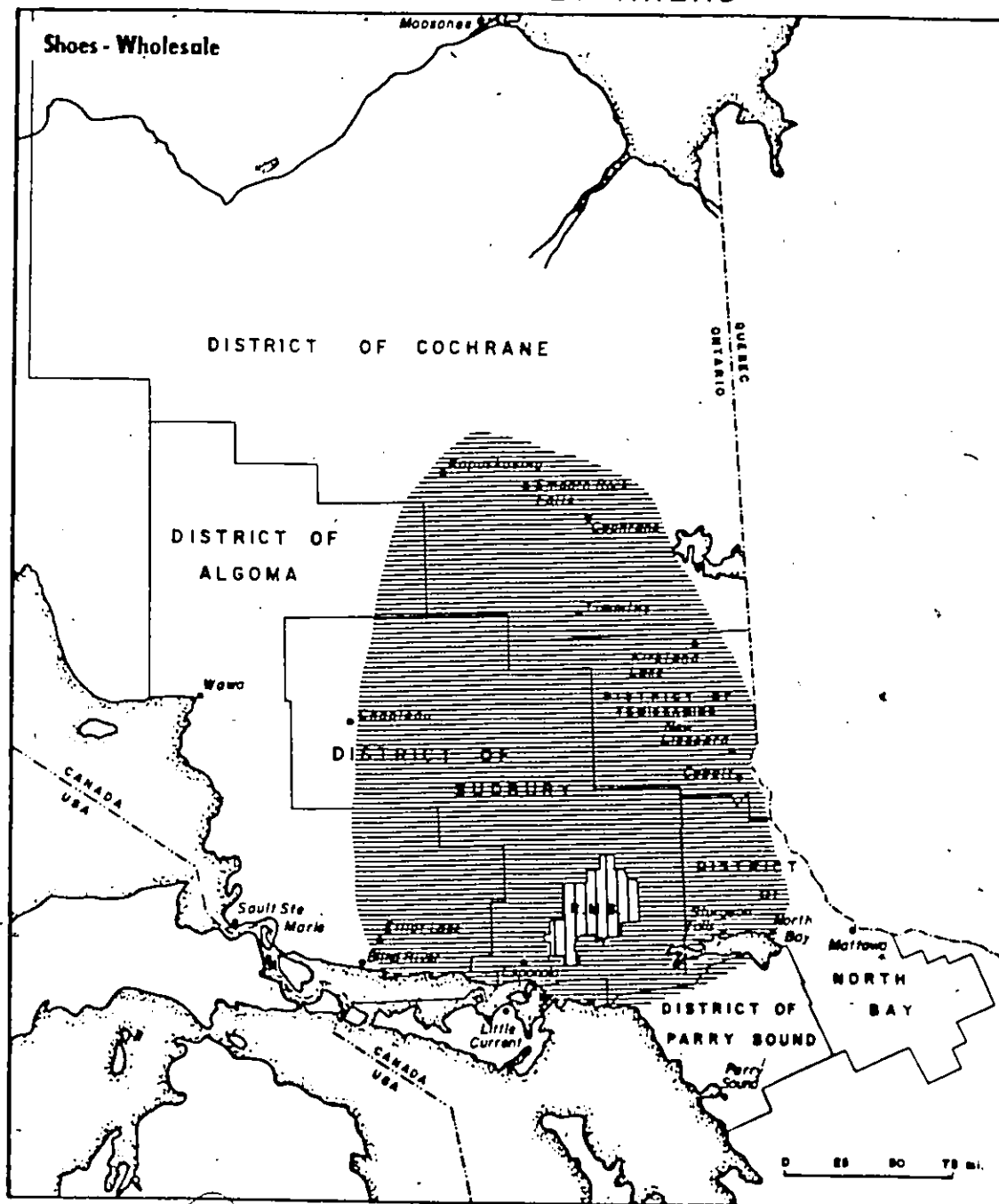
1. What percentage of your total sales go to:
 - a) centres outside the R.M.S. _____
 - b) to the R.M.S. itself _____
2. How many people do you employ? _____
3. How many people in your firm live:
 - a) in the R.M.S. _____
 - b) outside the R.M.S. _____
4. Does your firm deliver?
 - a) yes
 - b) no
5. If your firm does deliver, what is the delivery radius approximately in miles? _____
6. If your firm does deliver, what is the frequency of deliveries? _____
7. Do the majority of deliveries go to:
 - a) the R.M.S. _____
 - b) outside the R.M.S. _____
8. In the case of outside deliveries, what centre is delivered to most frequently?

9. Where are your major wholesalers or suppliers located?

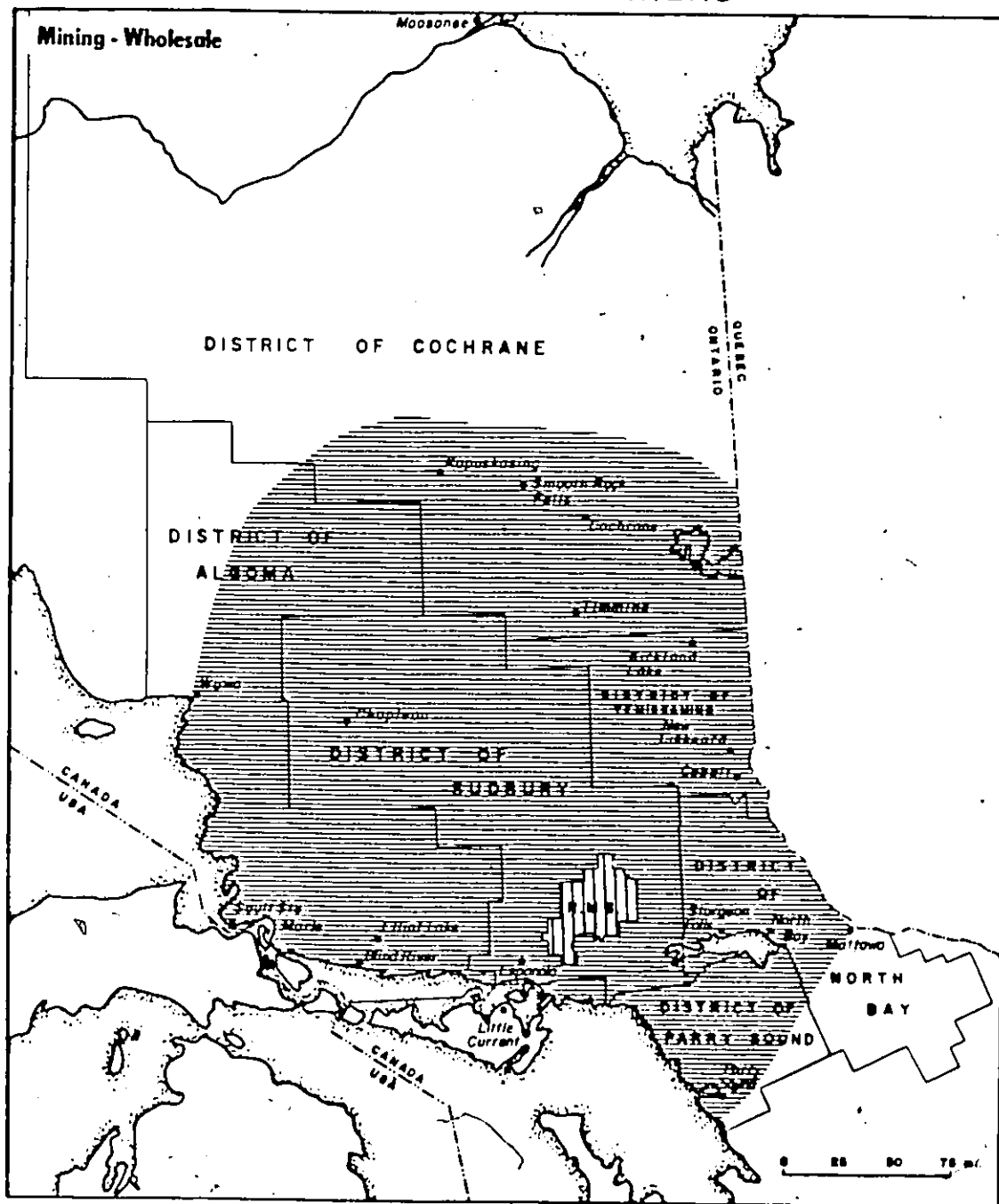
Appendix C

Wholesale Market Areas

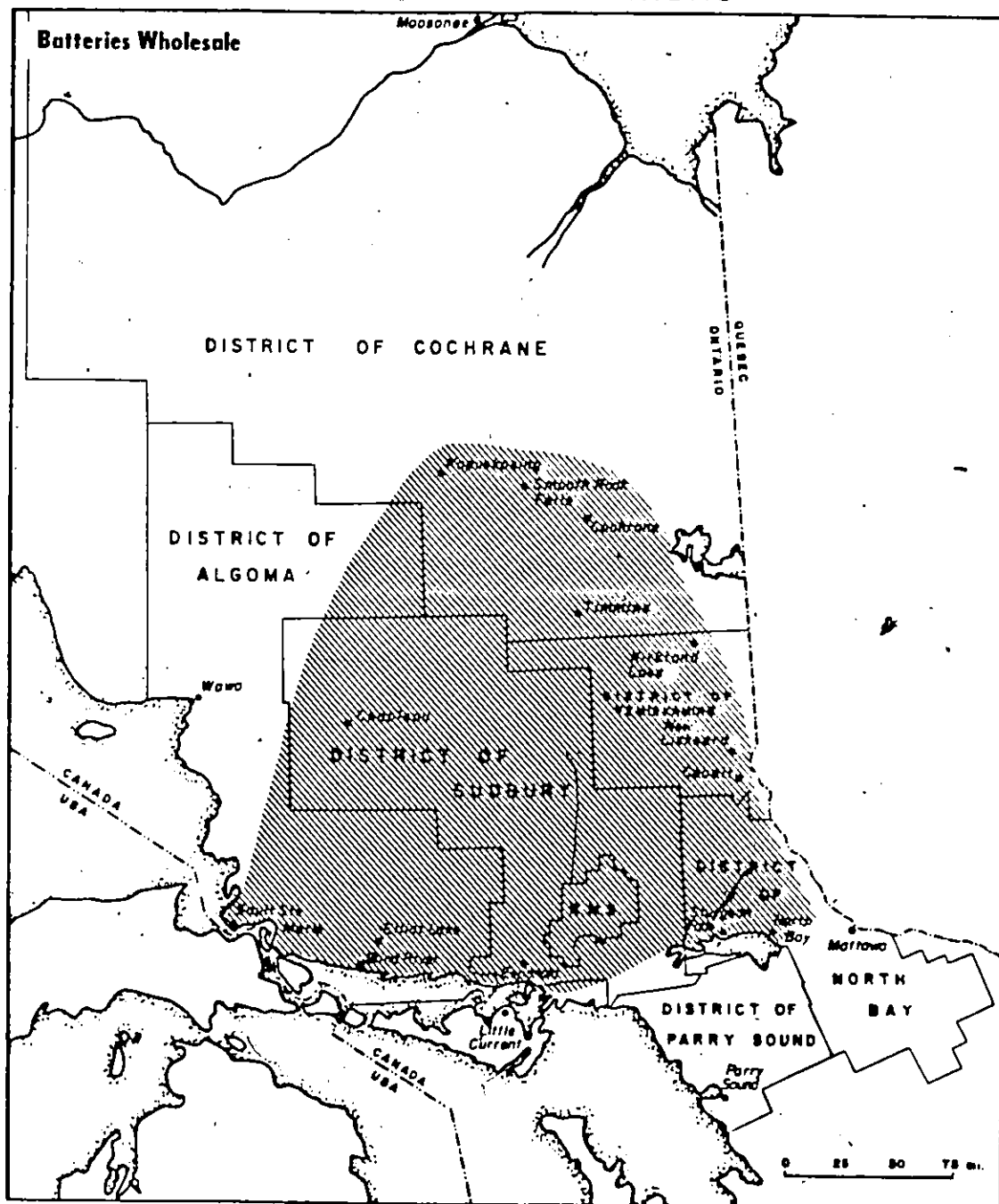
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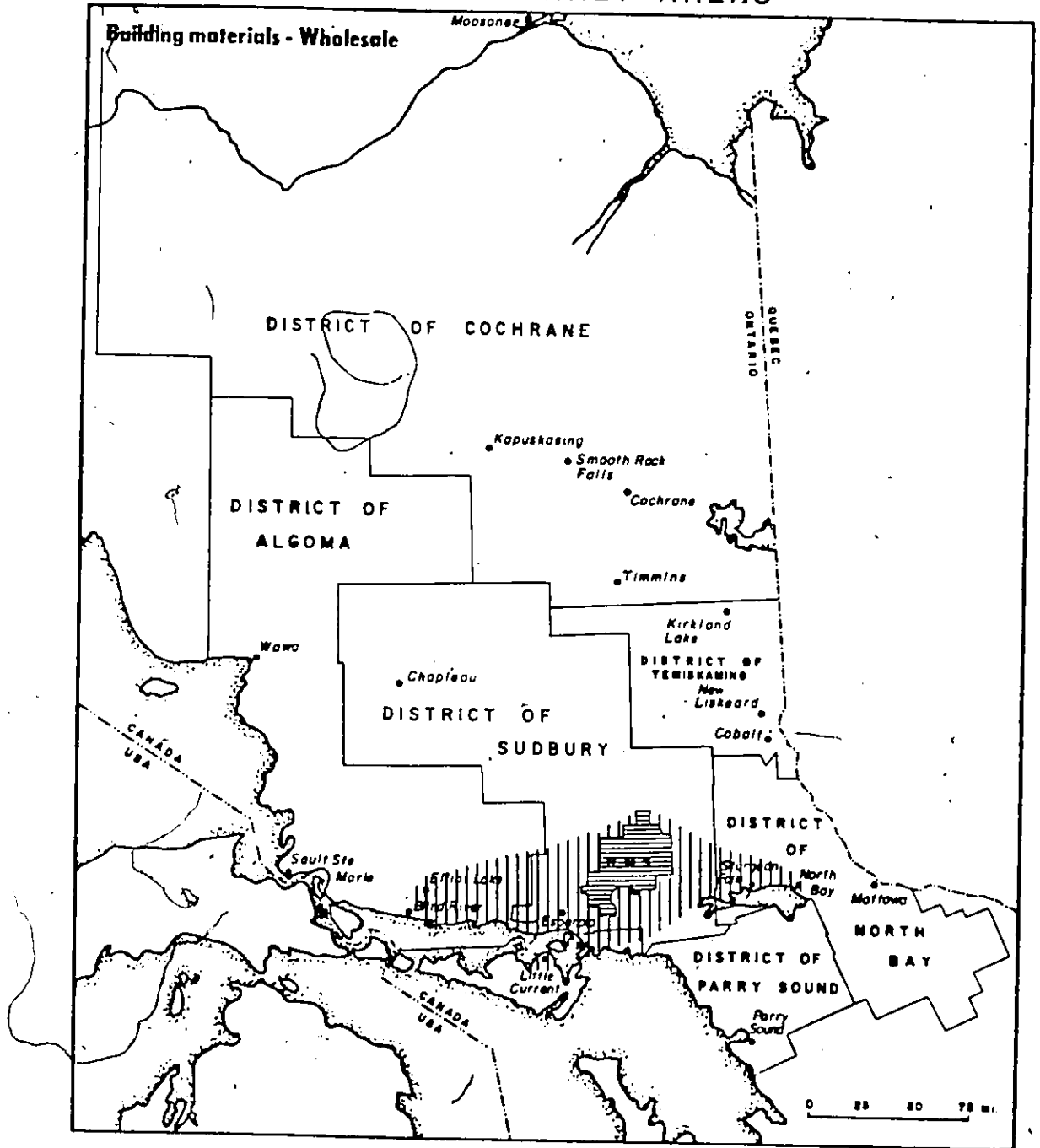
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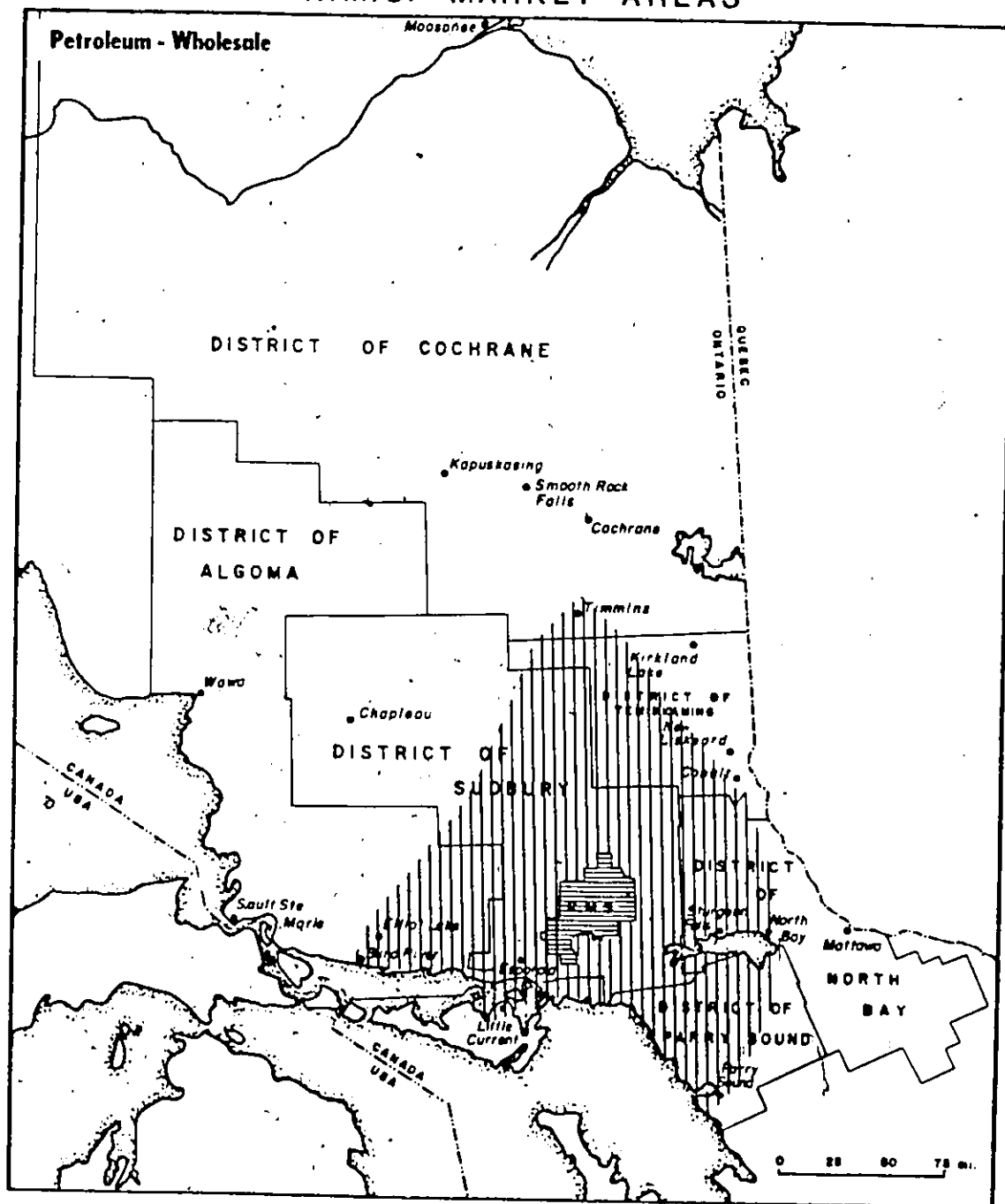
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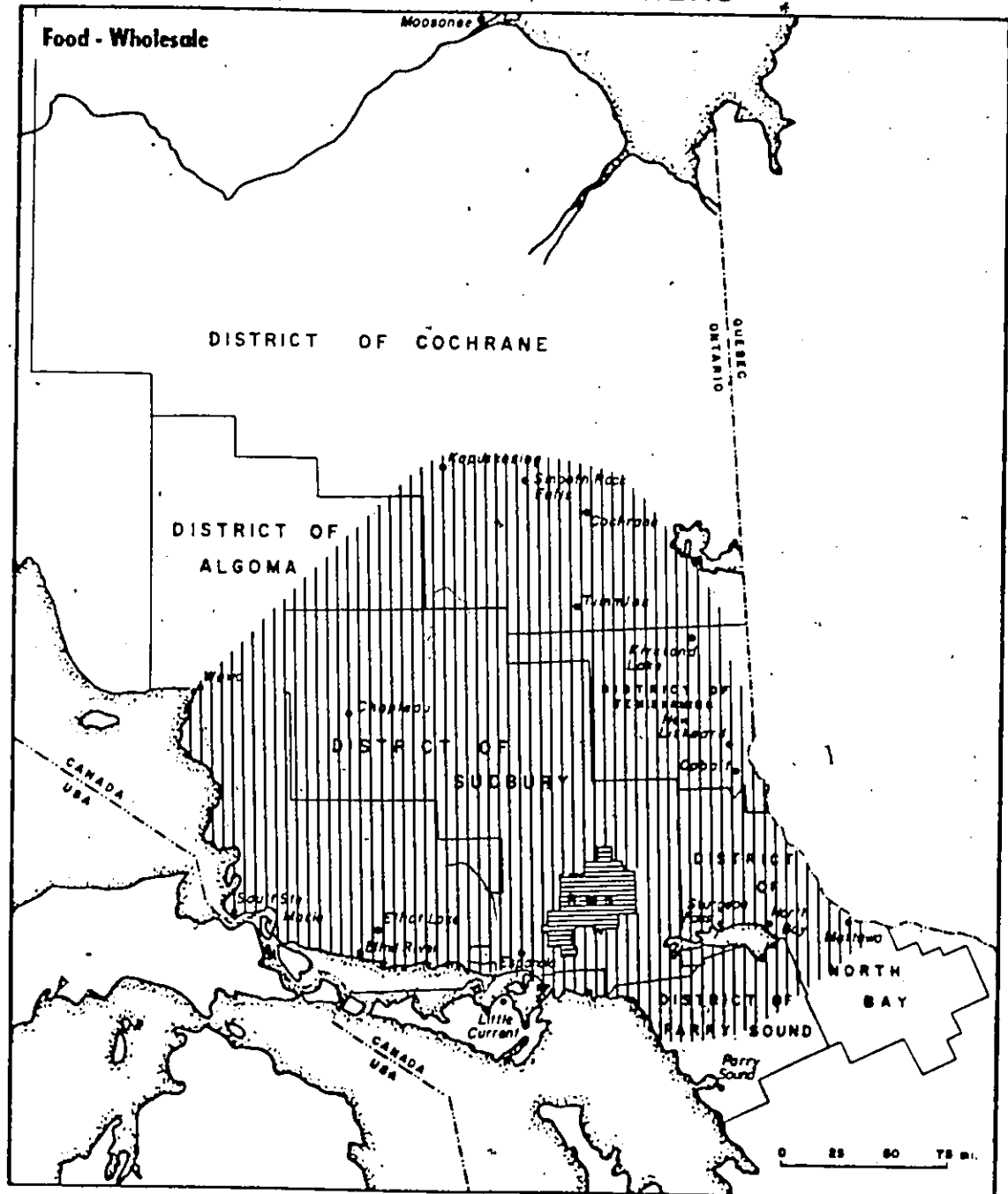
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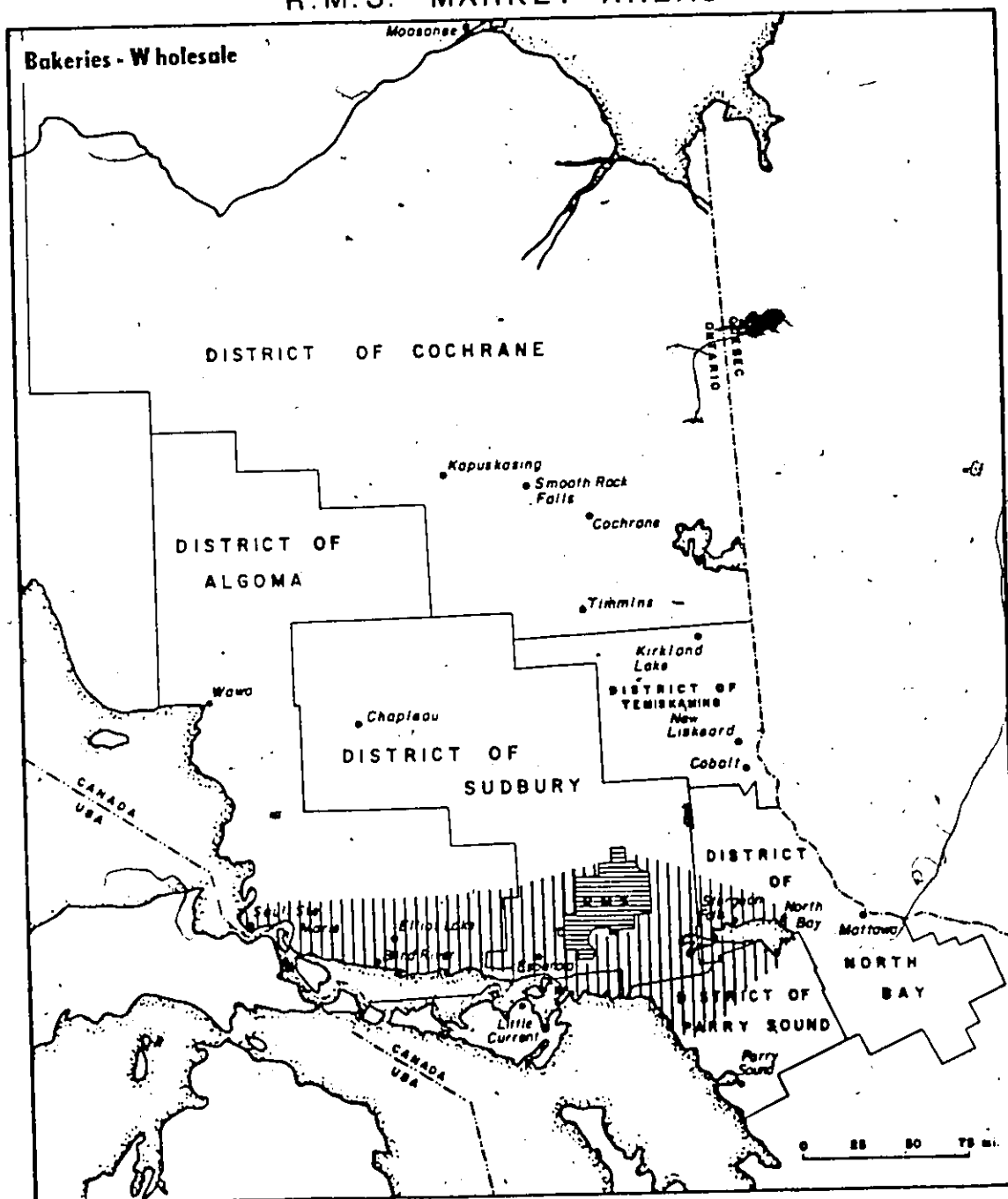
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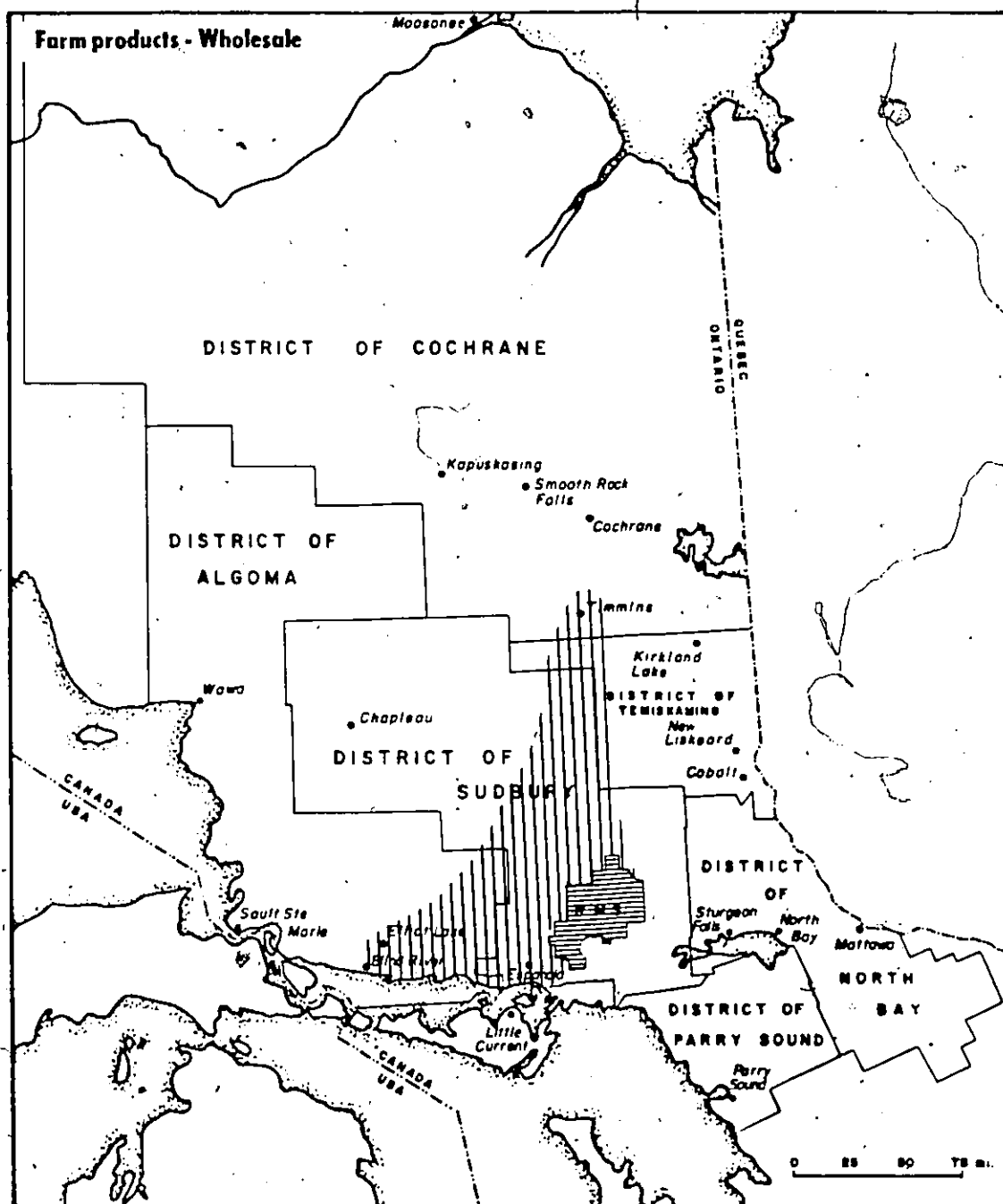
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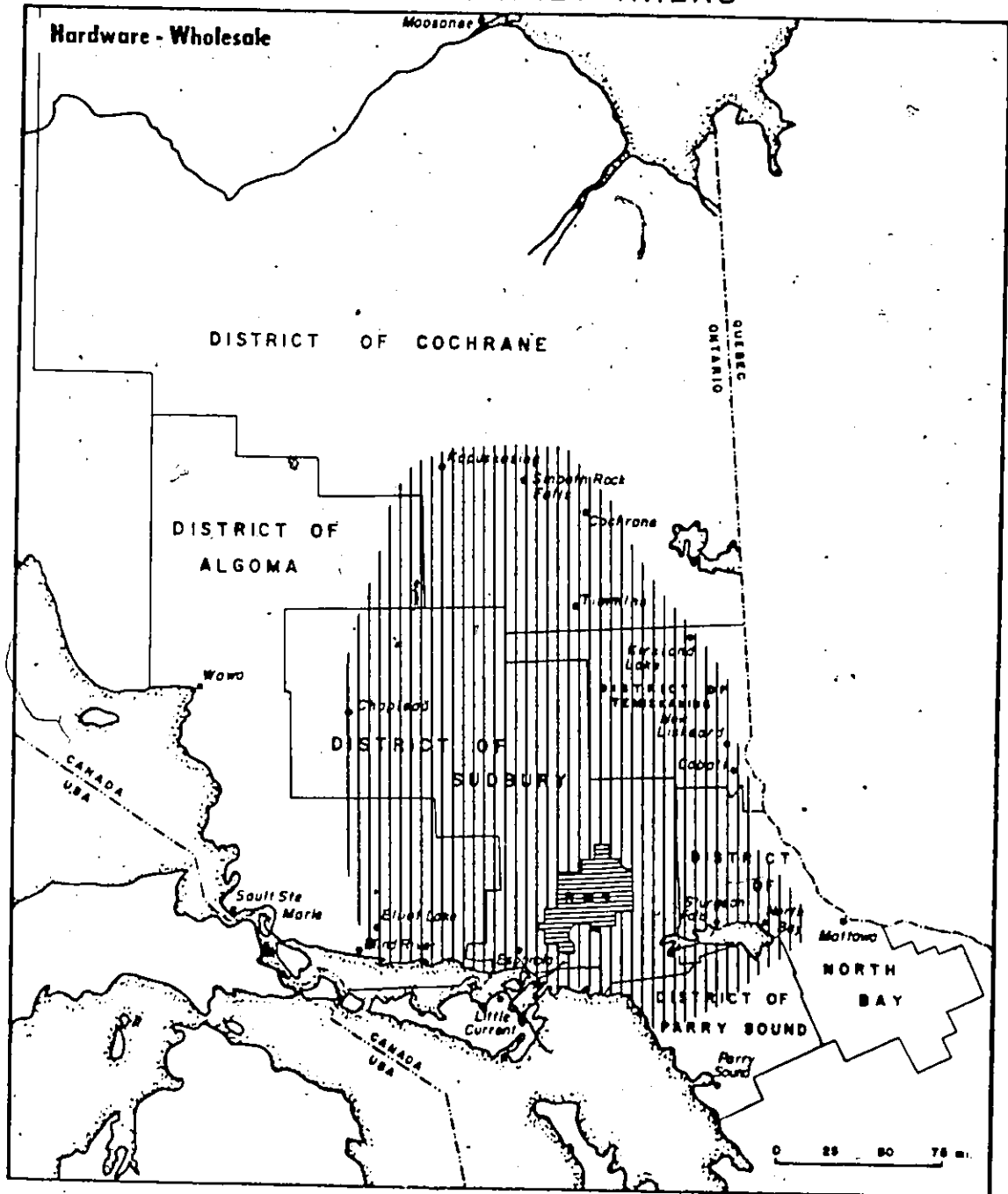
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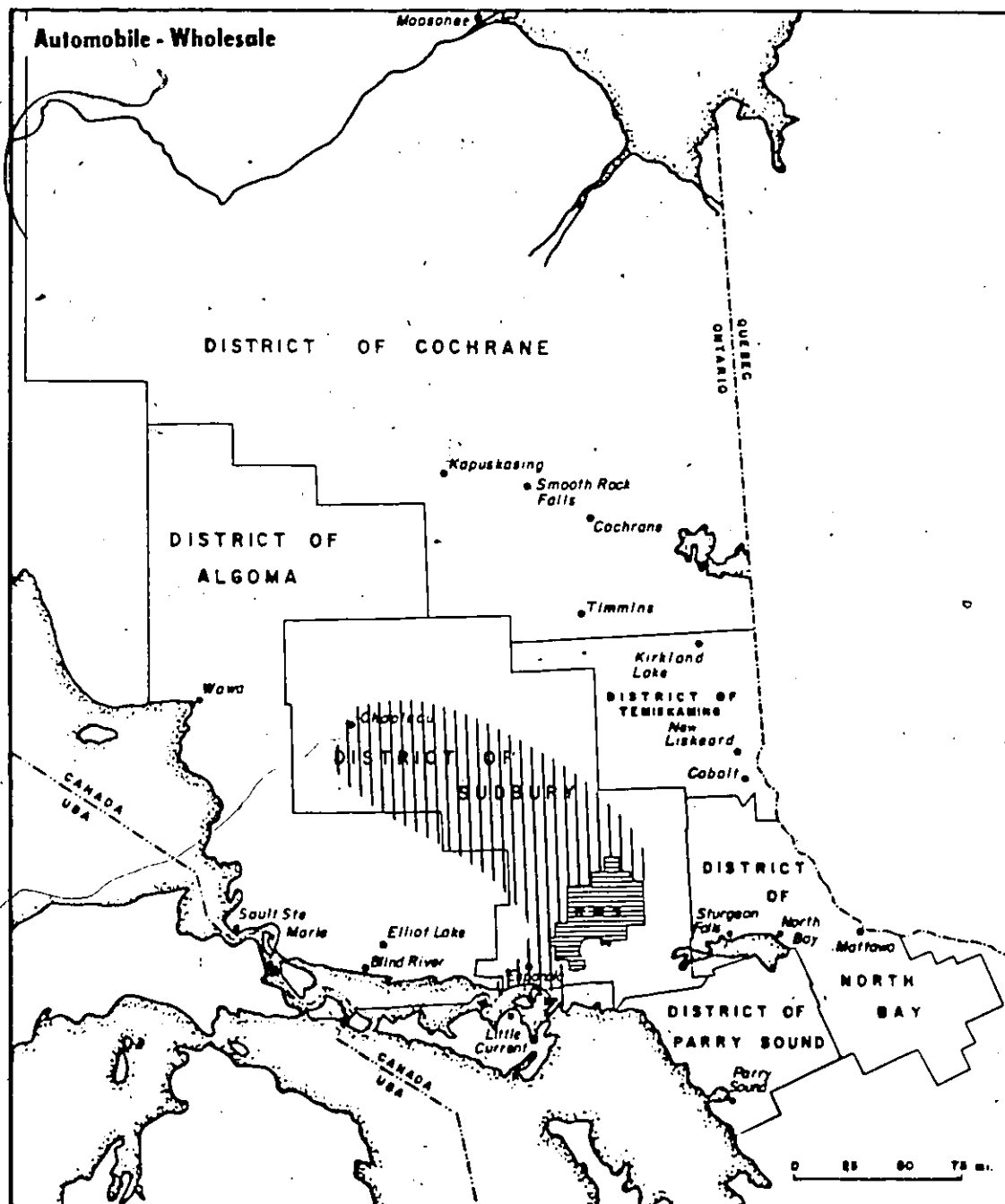
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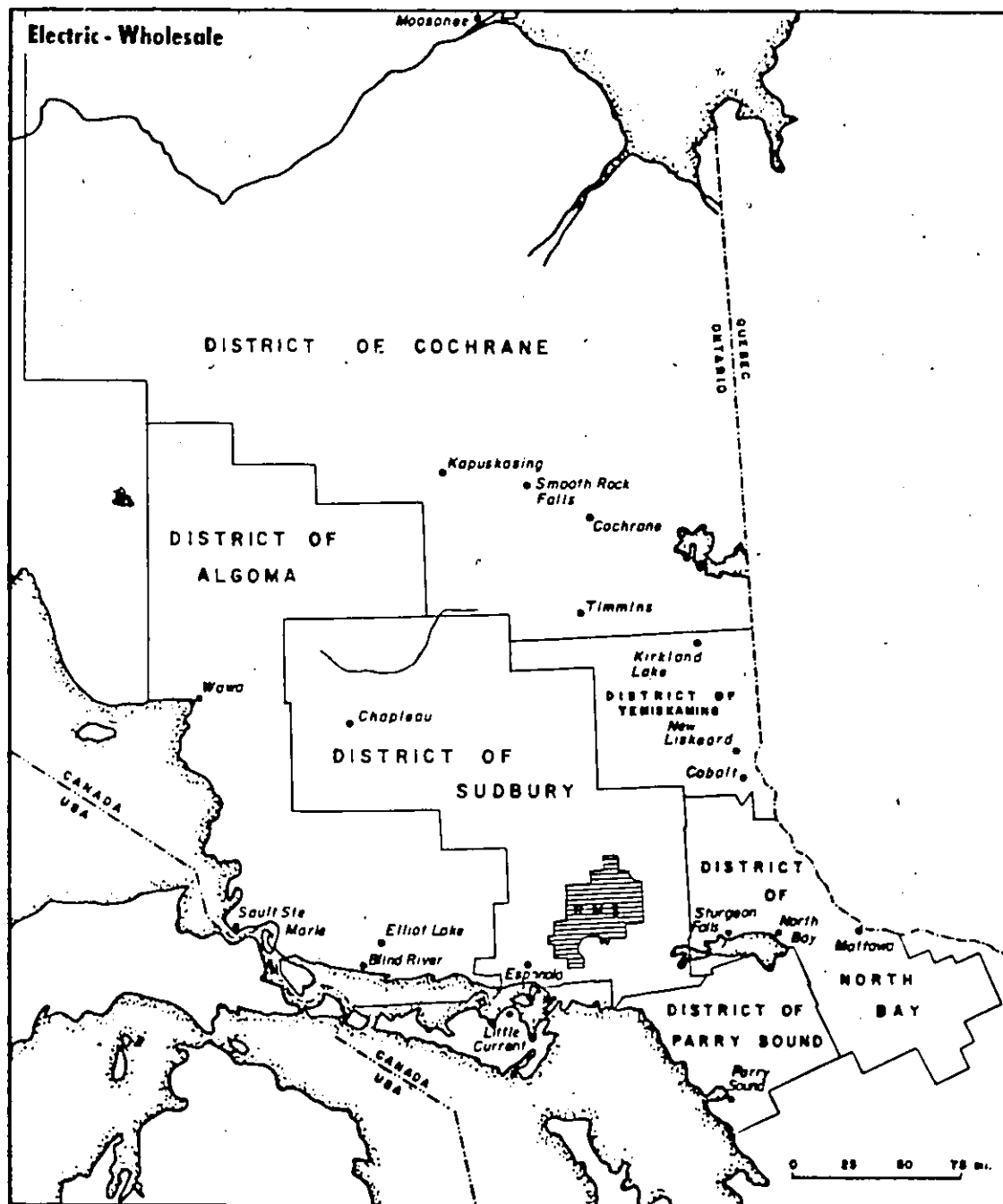
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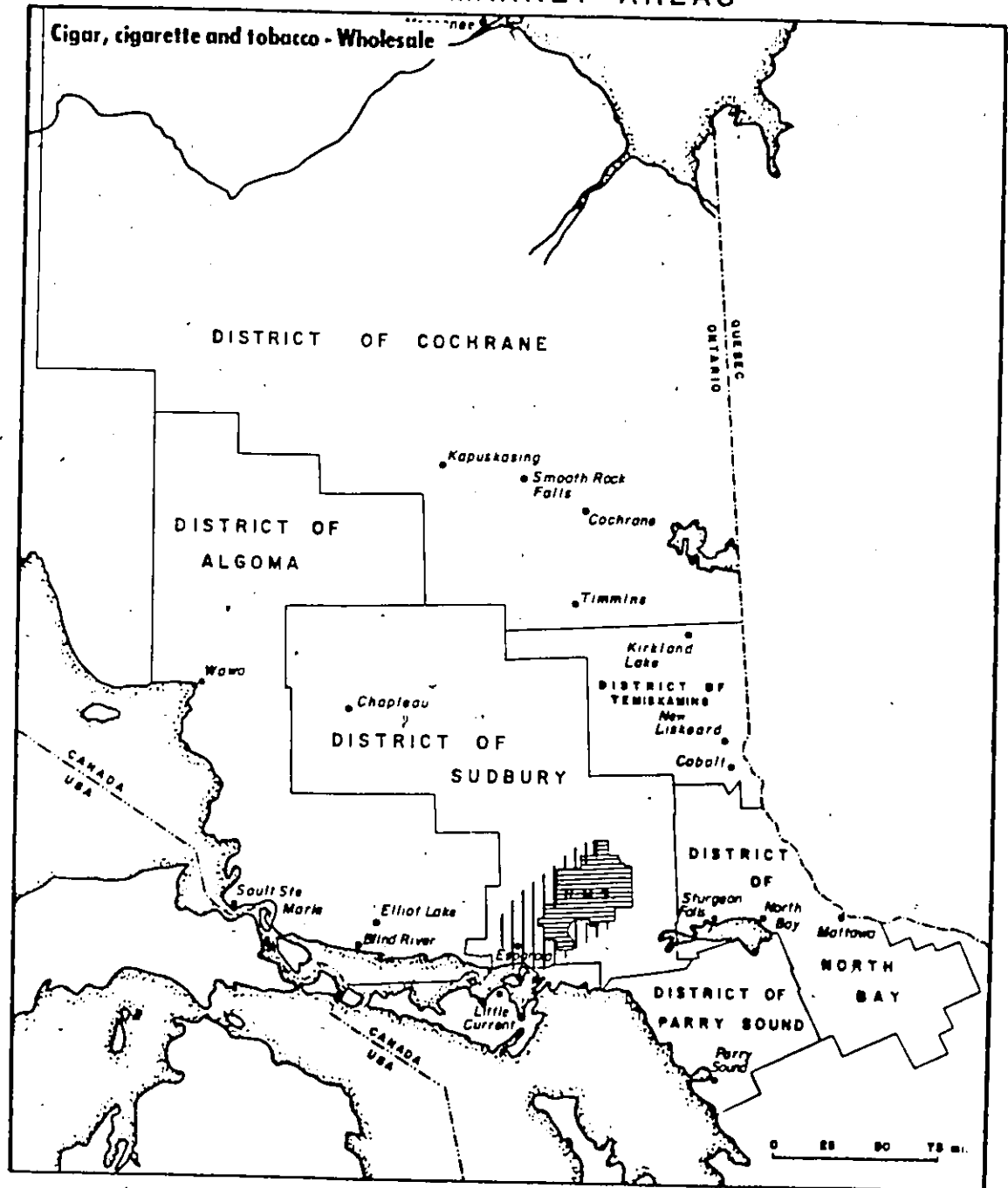
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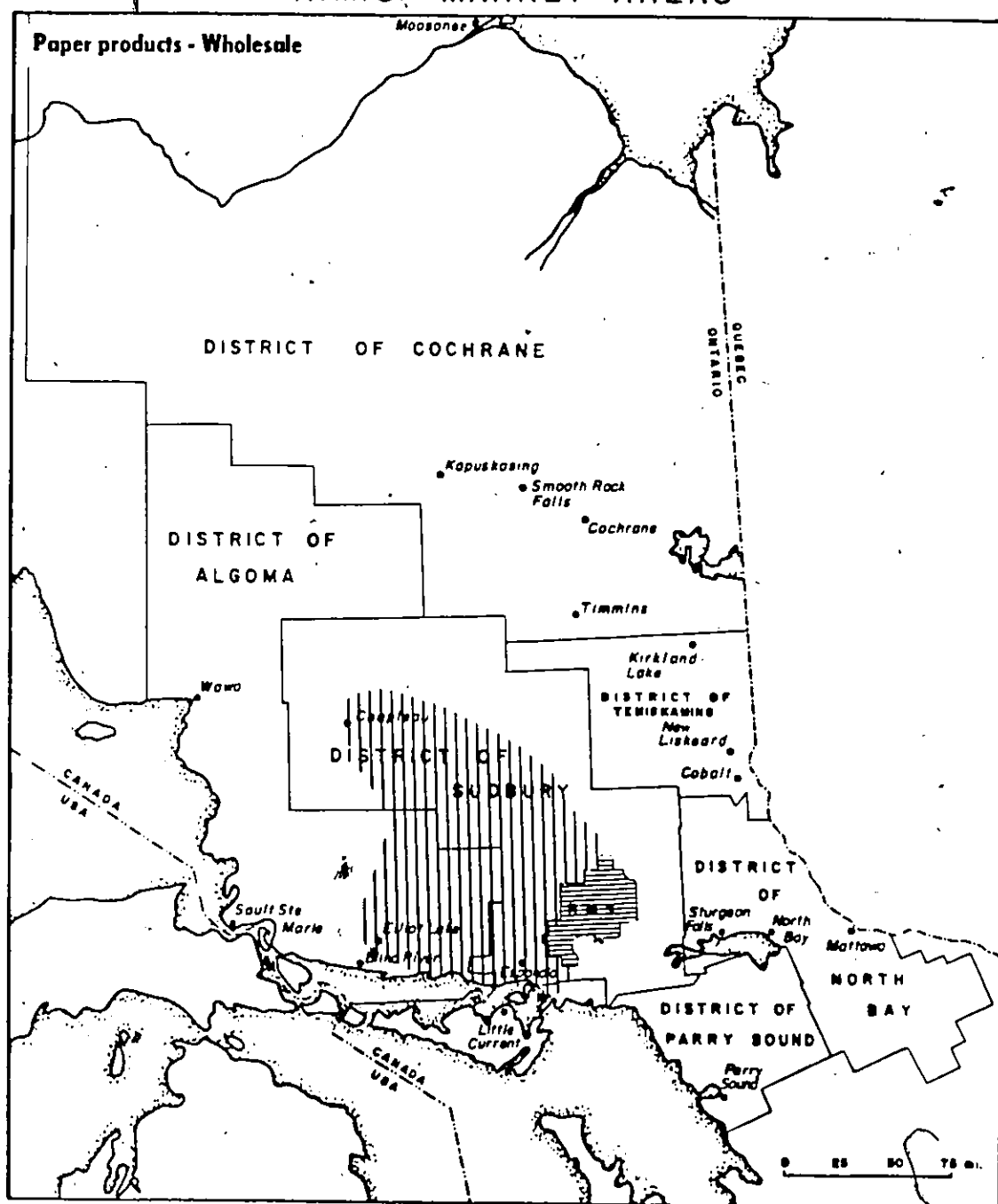
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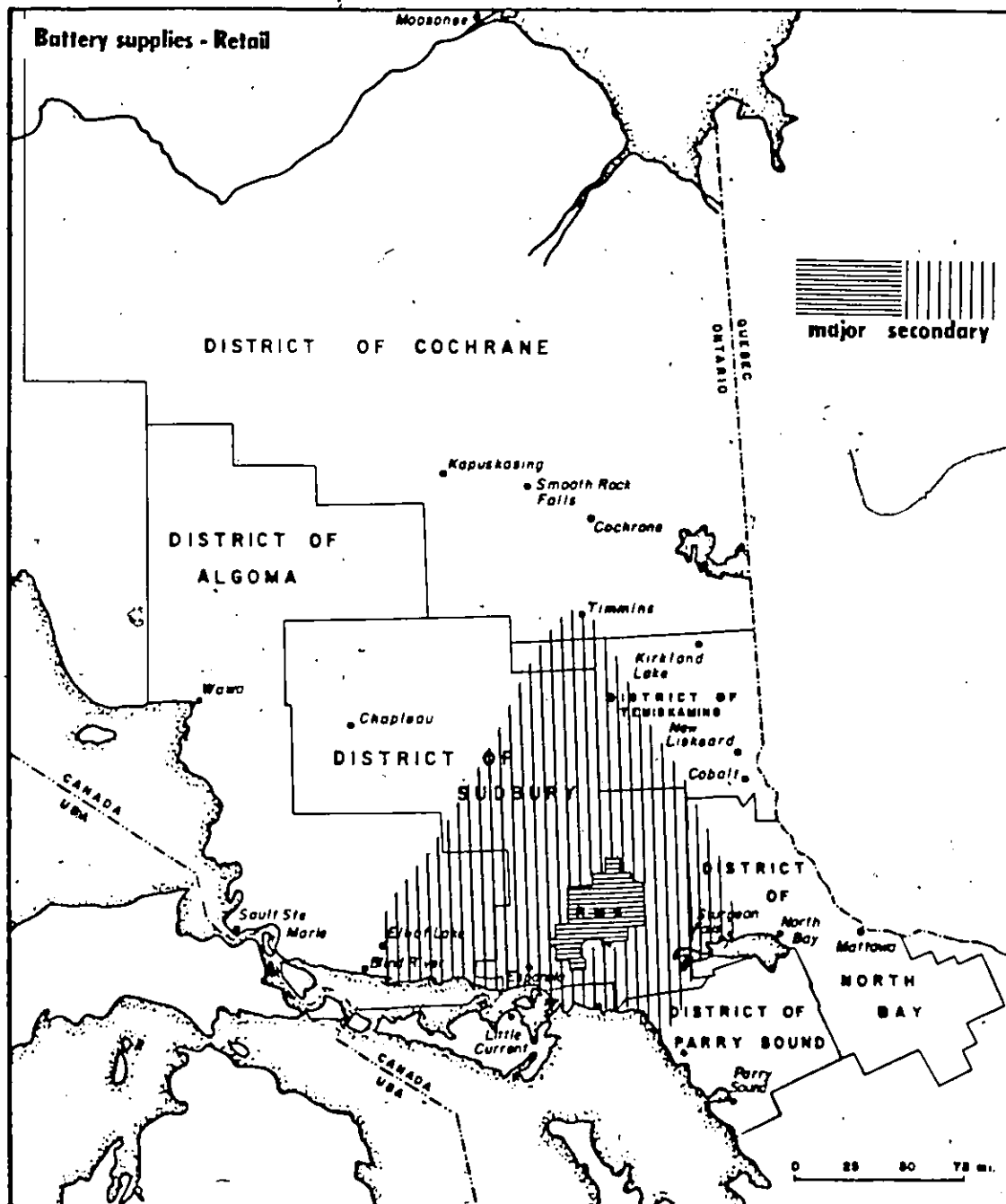
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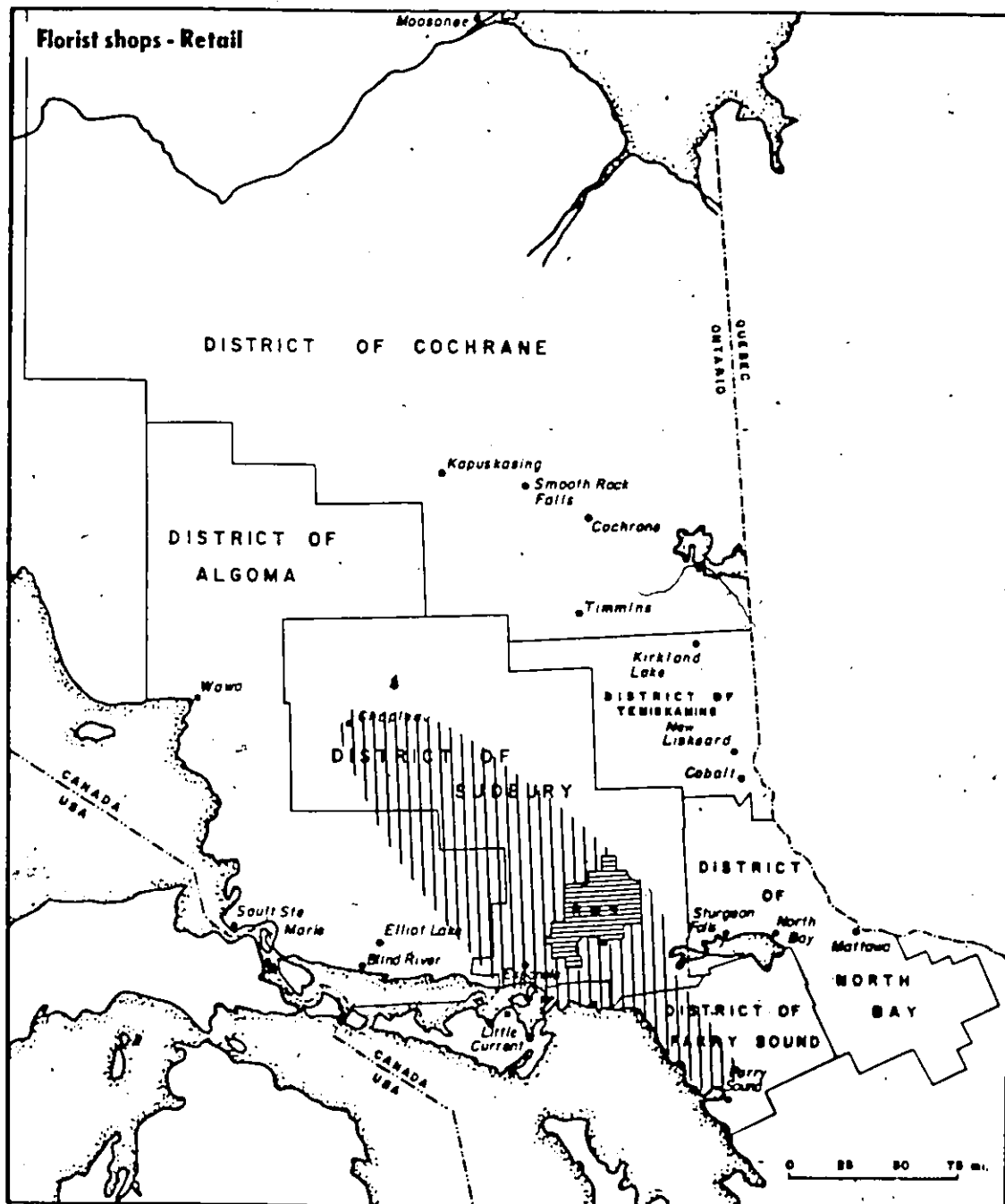
Appendix D

Retail Market Areas

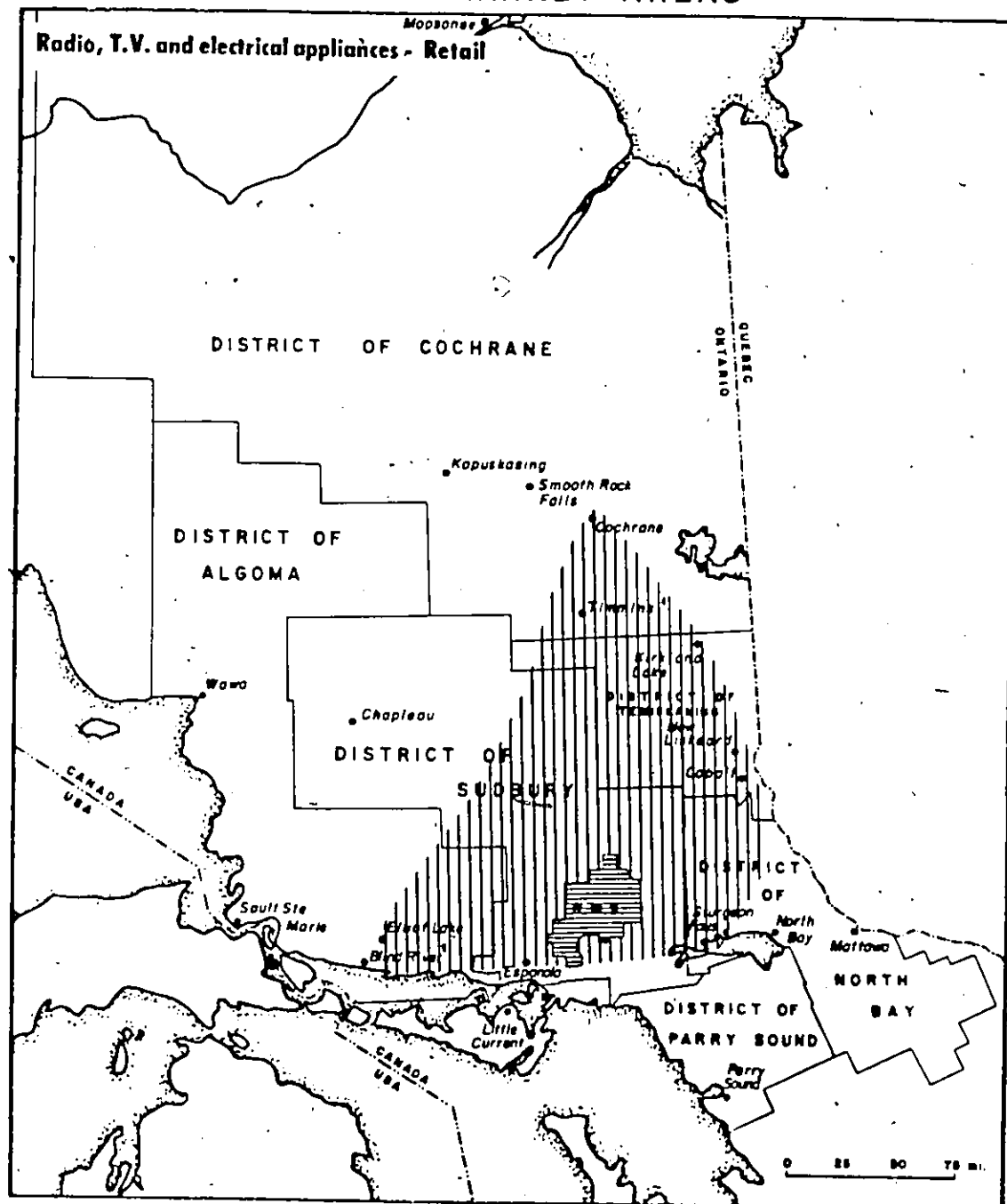
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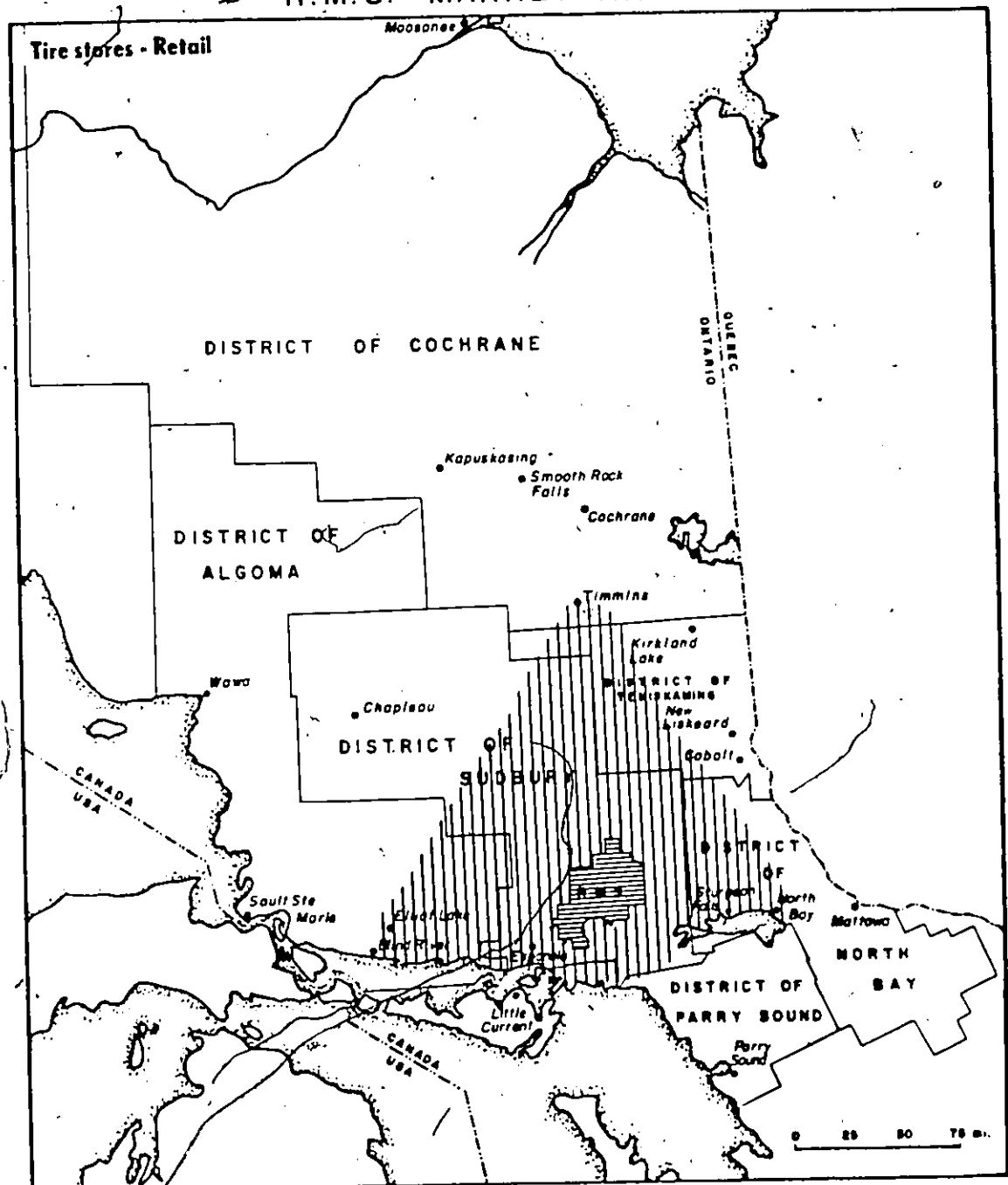
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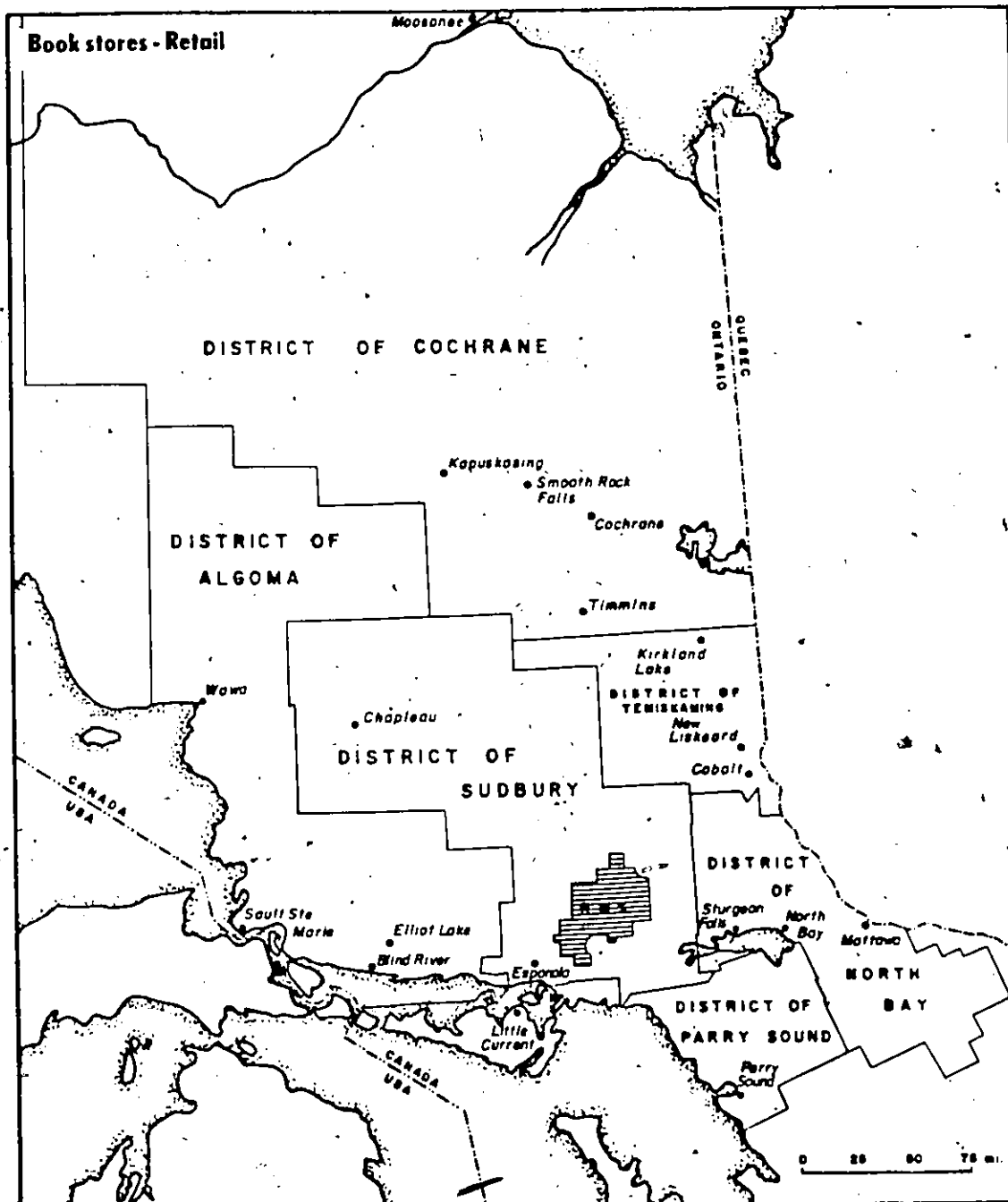
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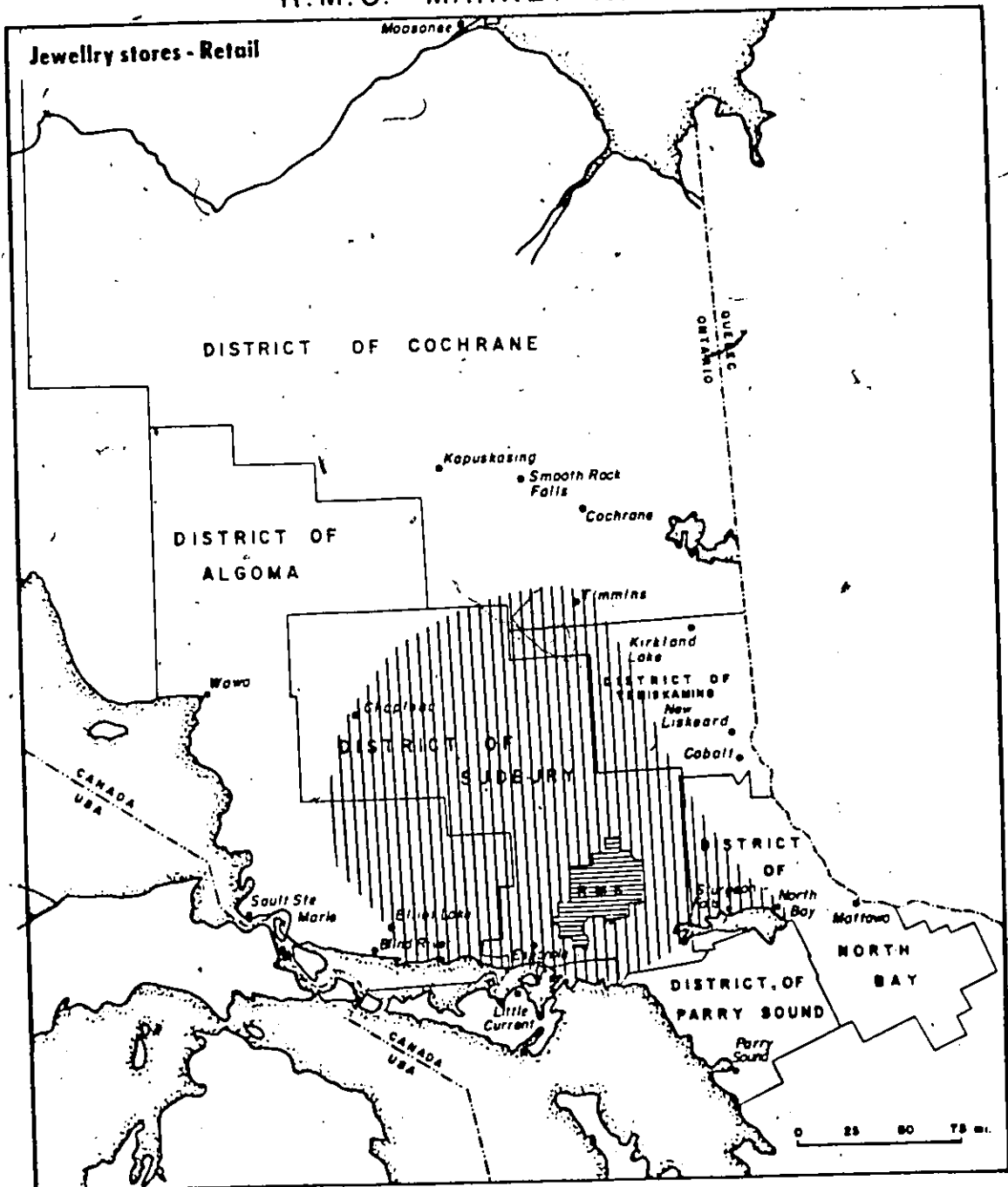
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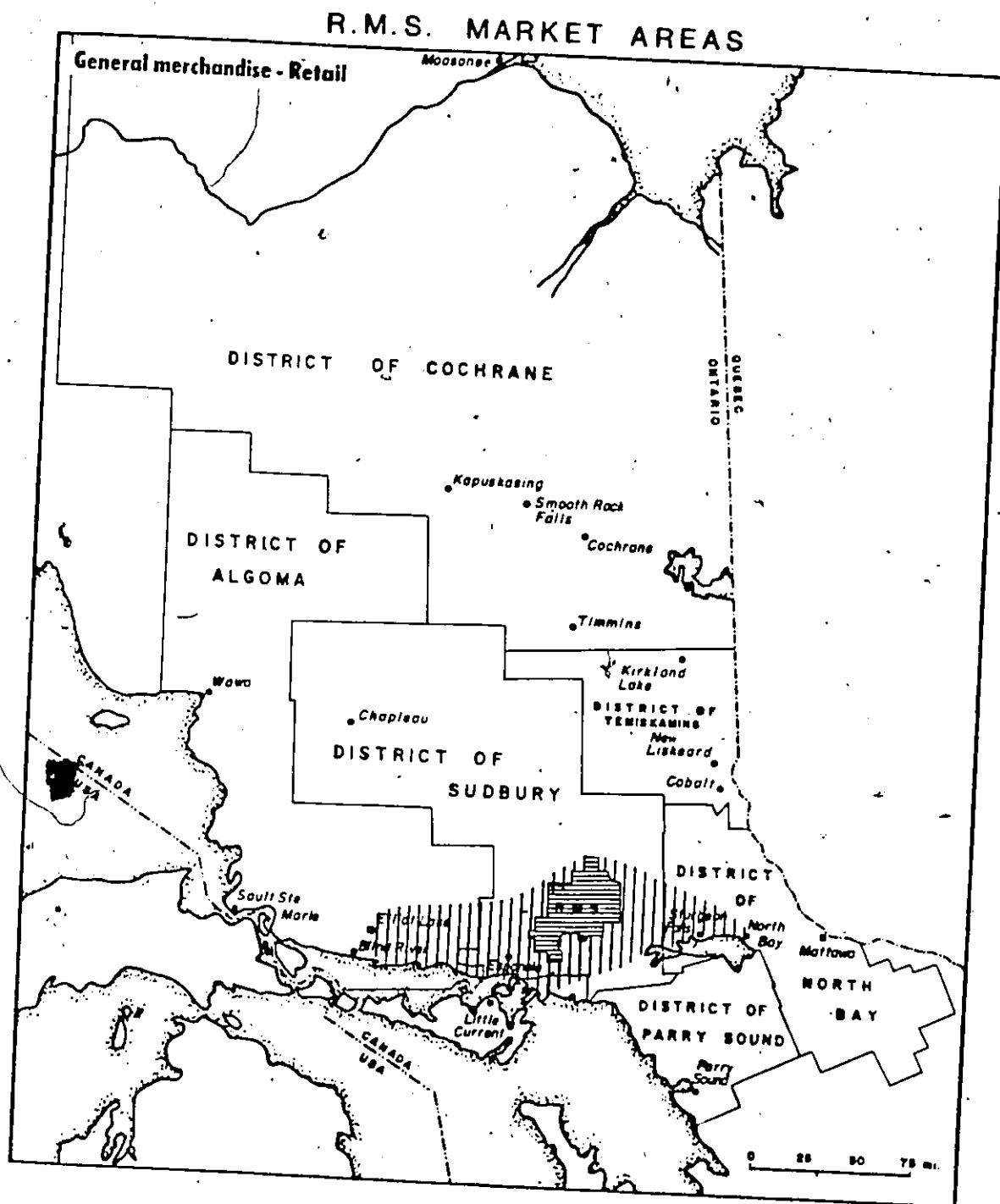


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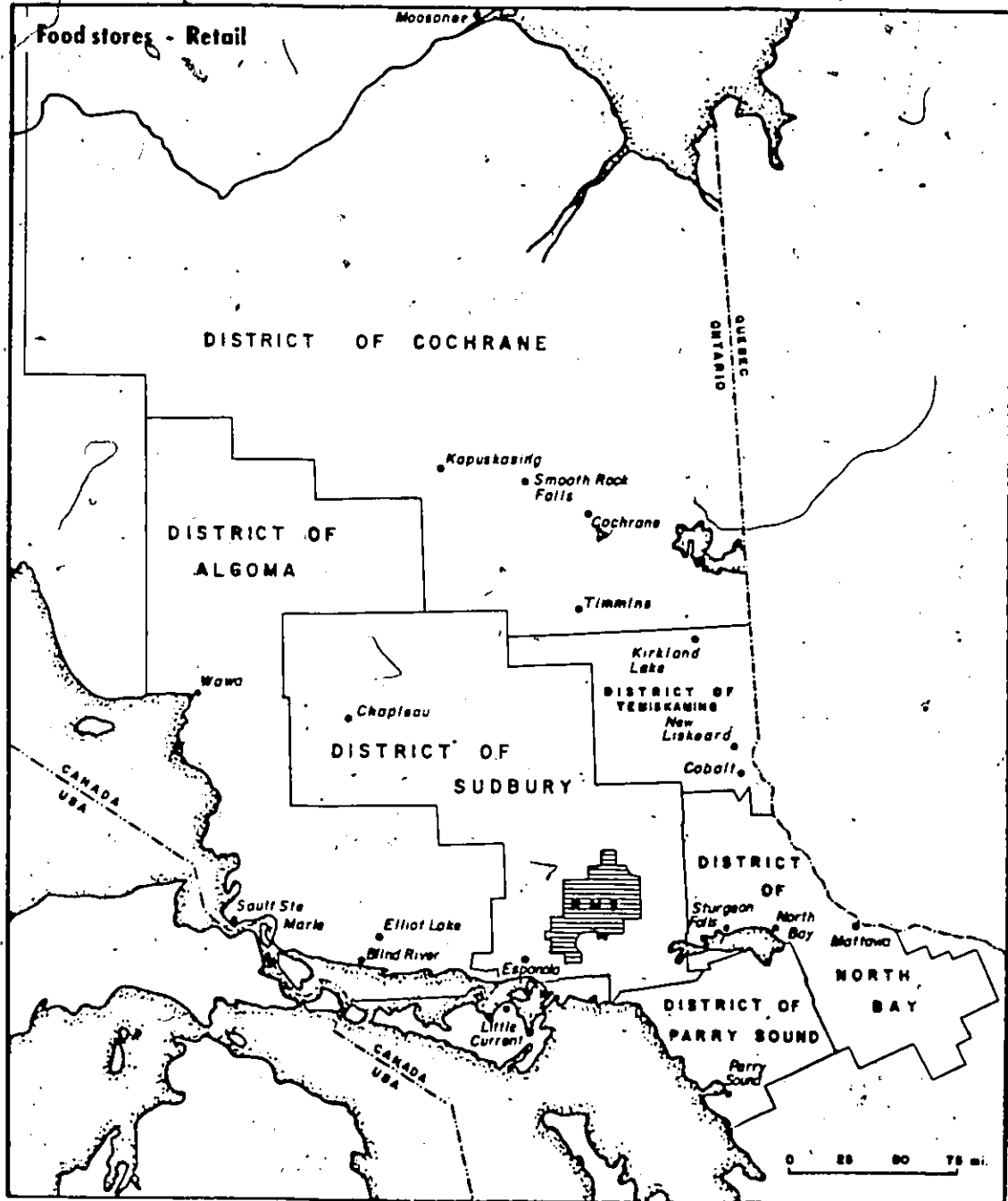


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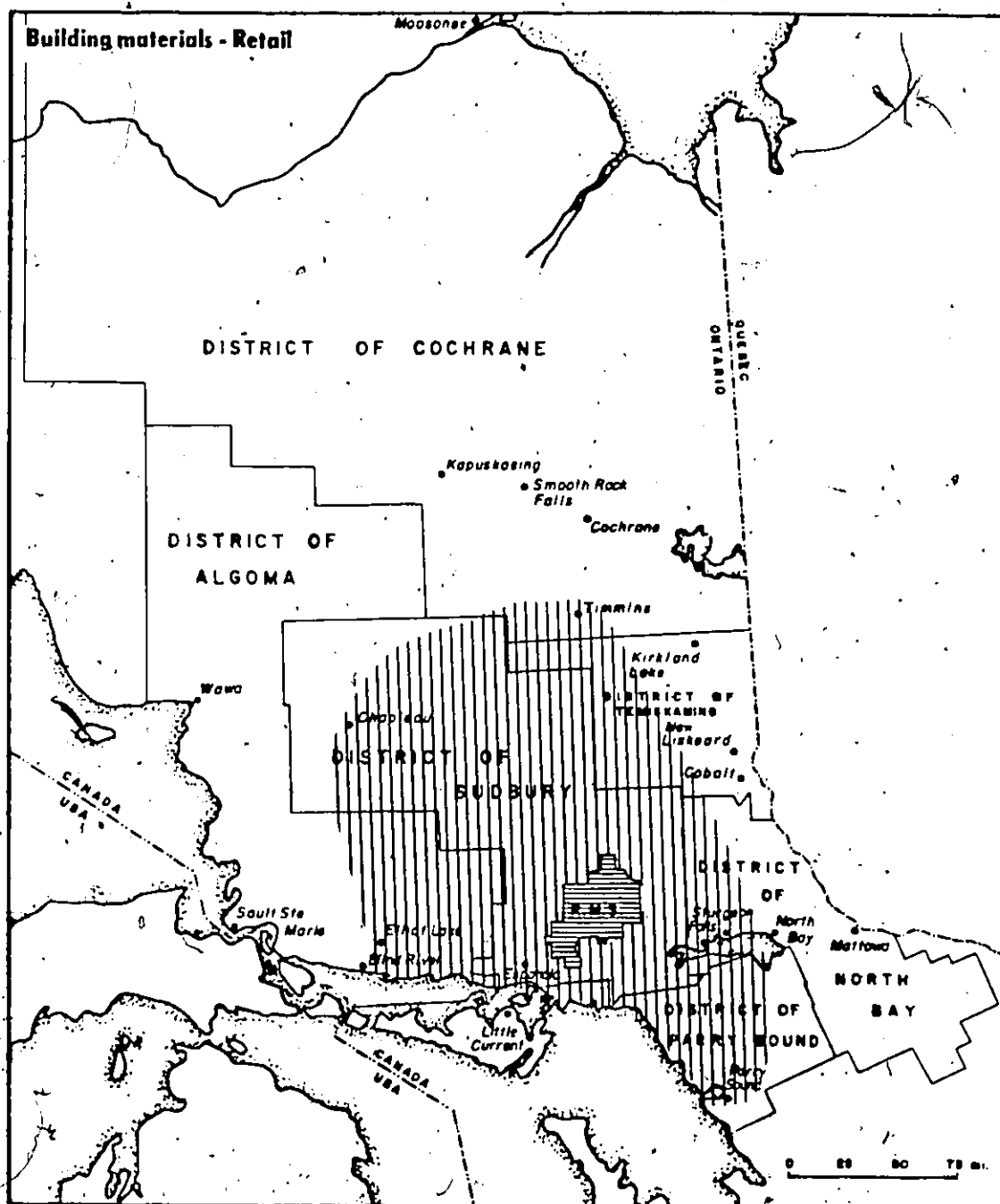




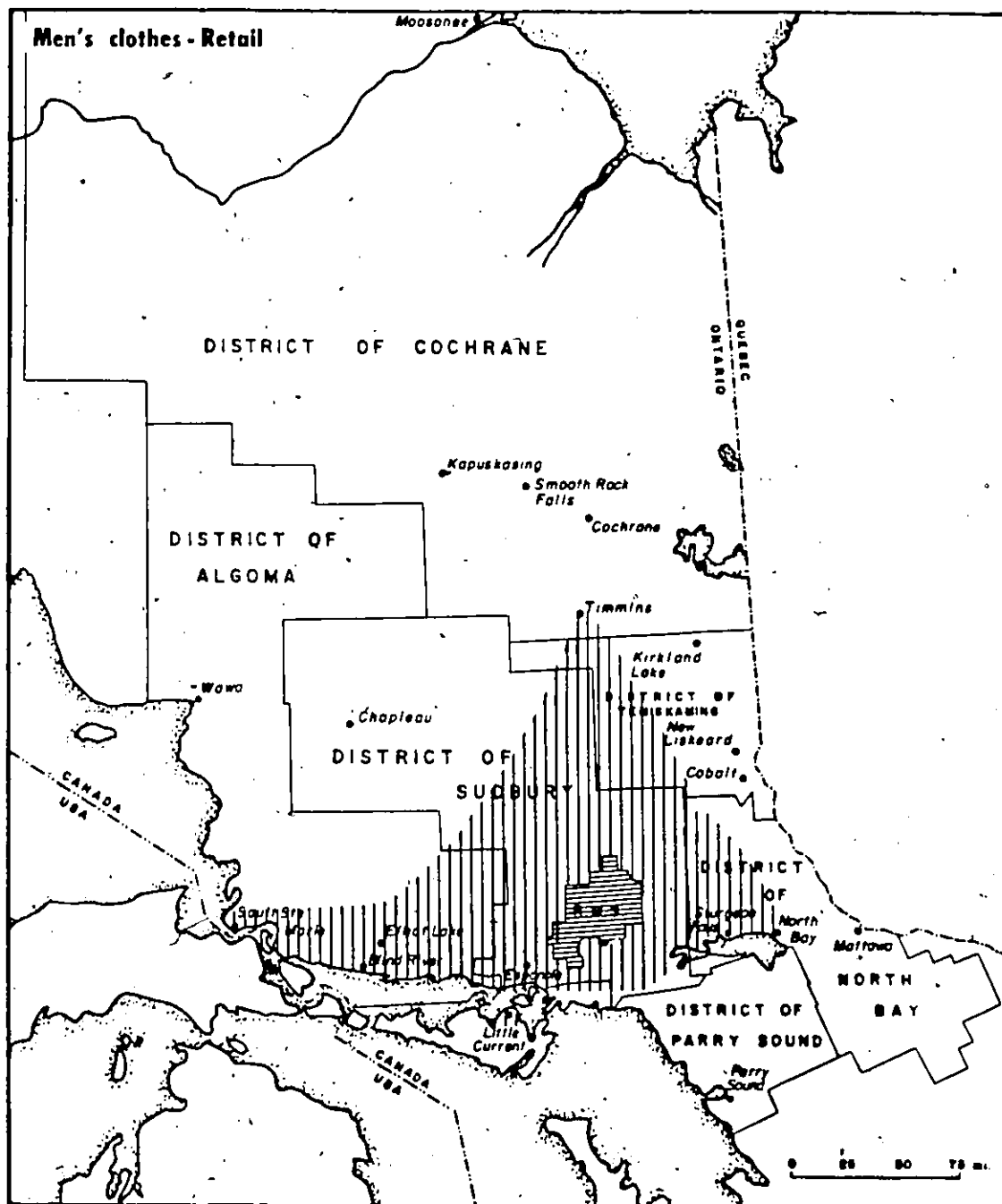
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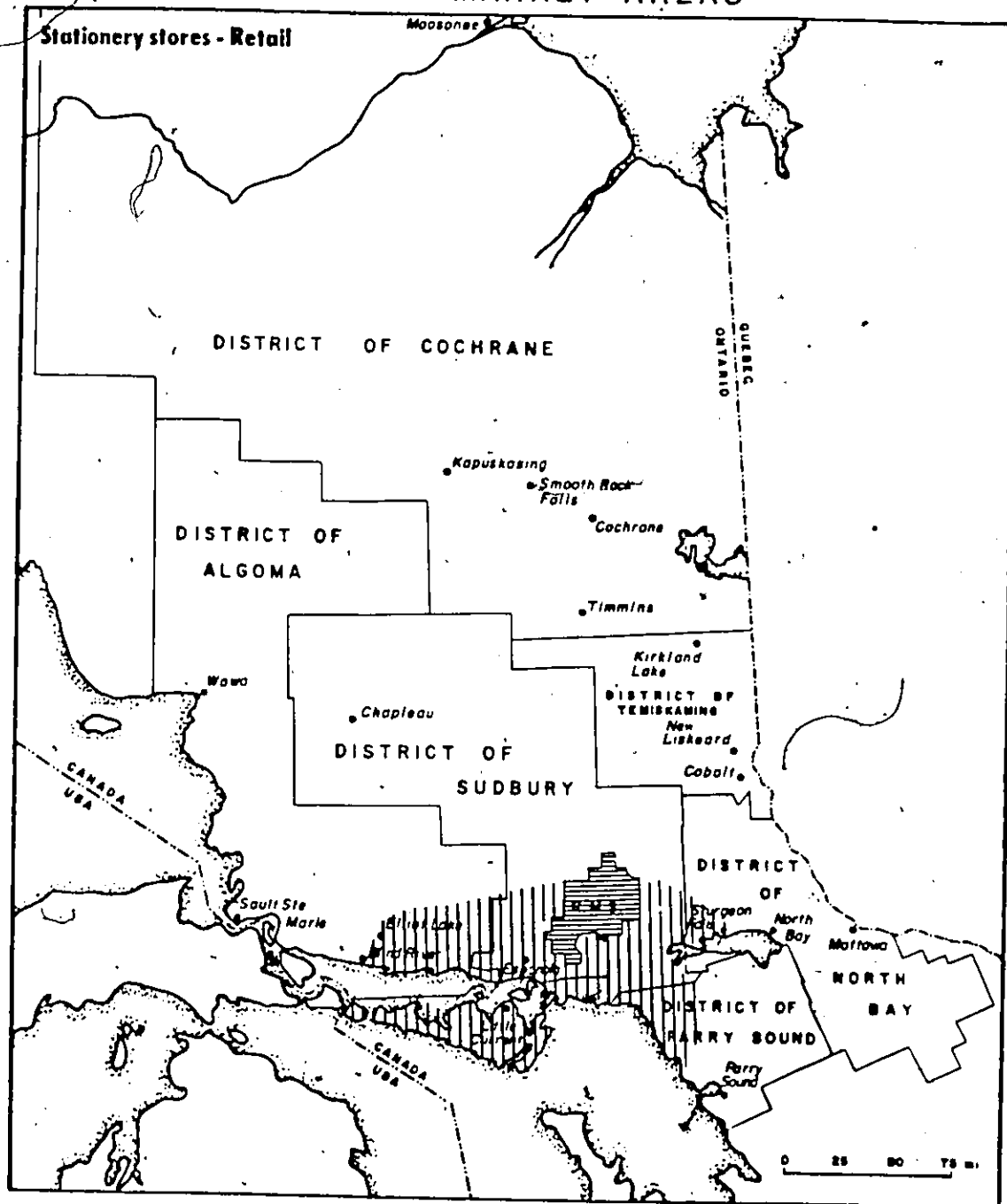
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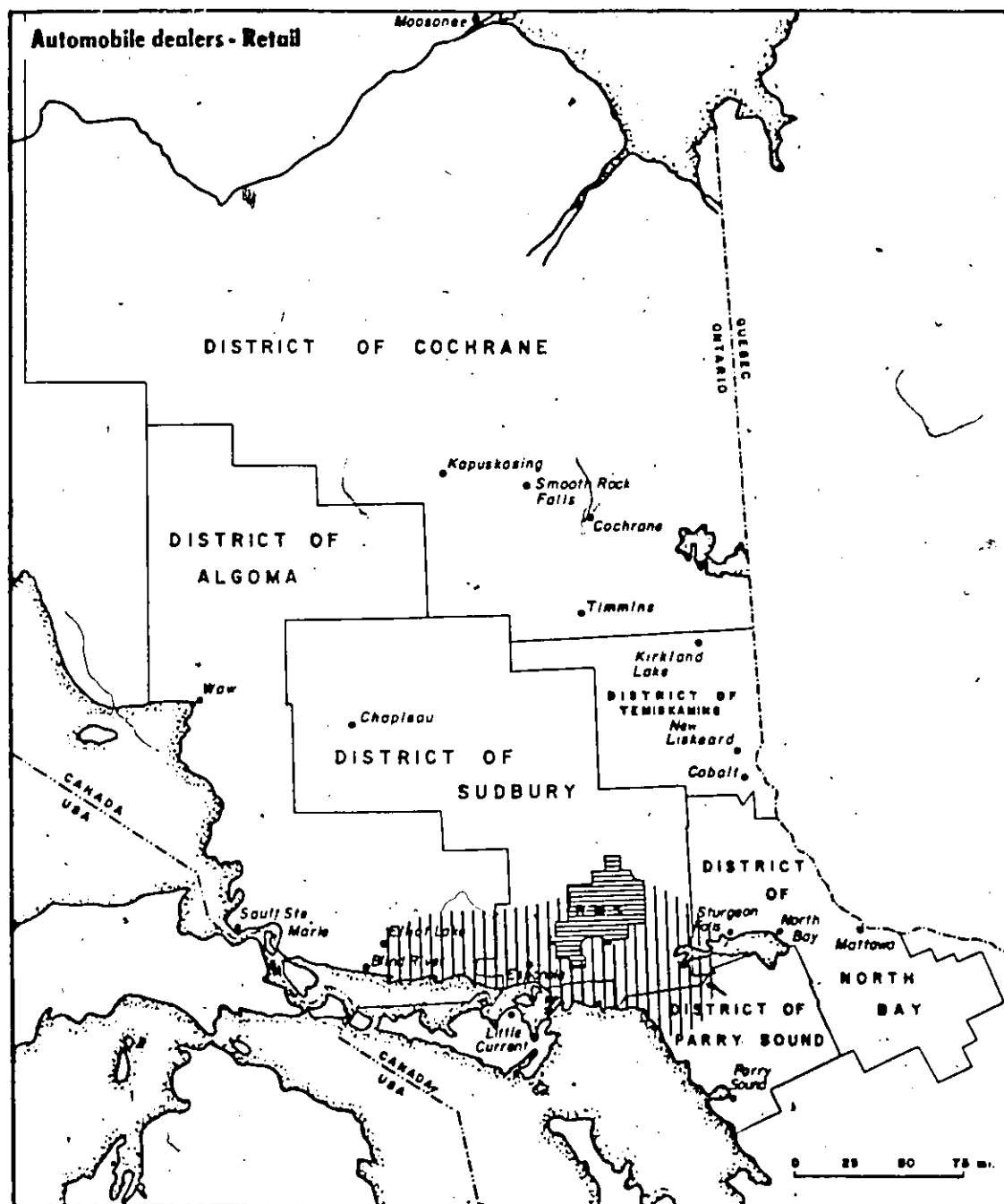
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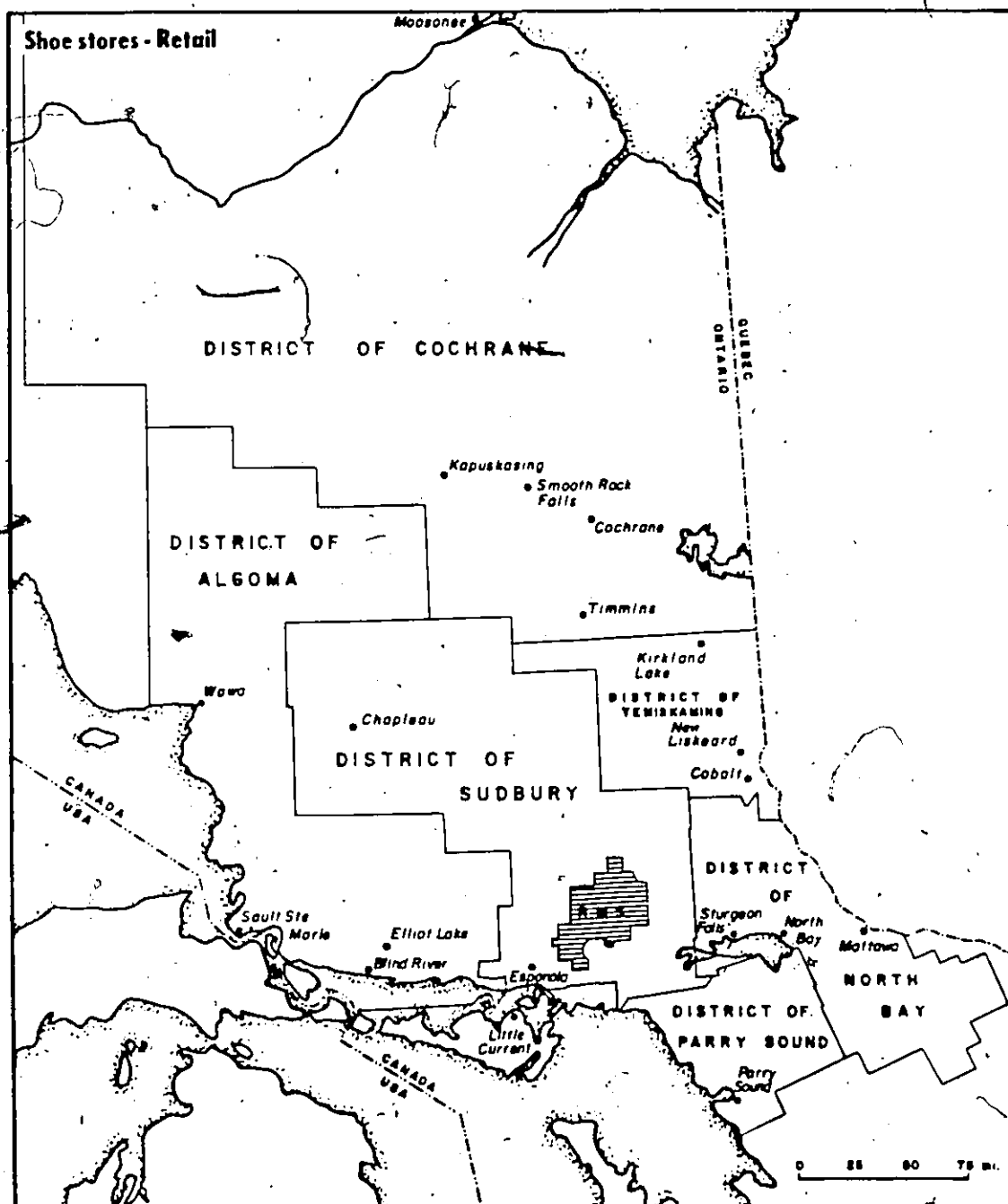
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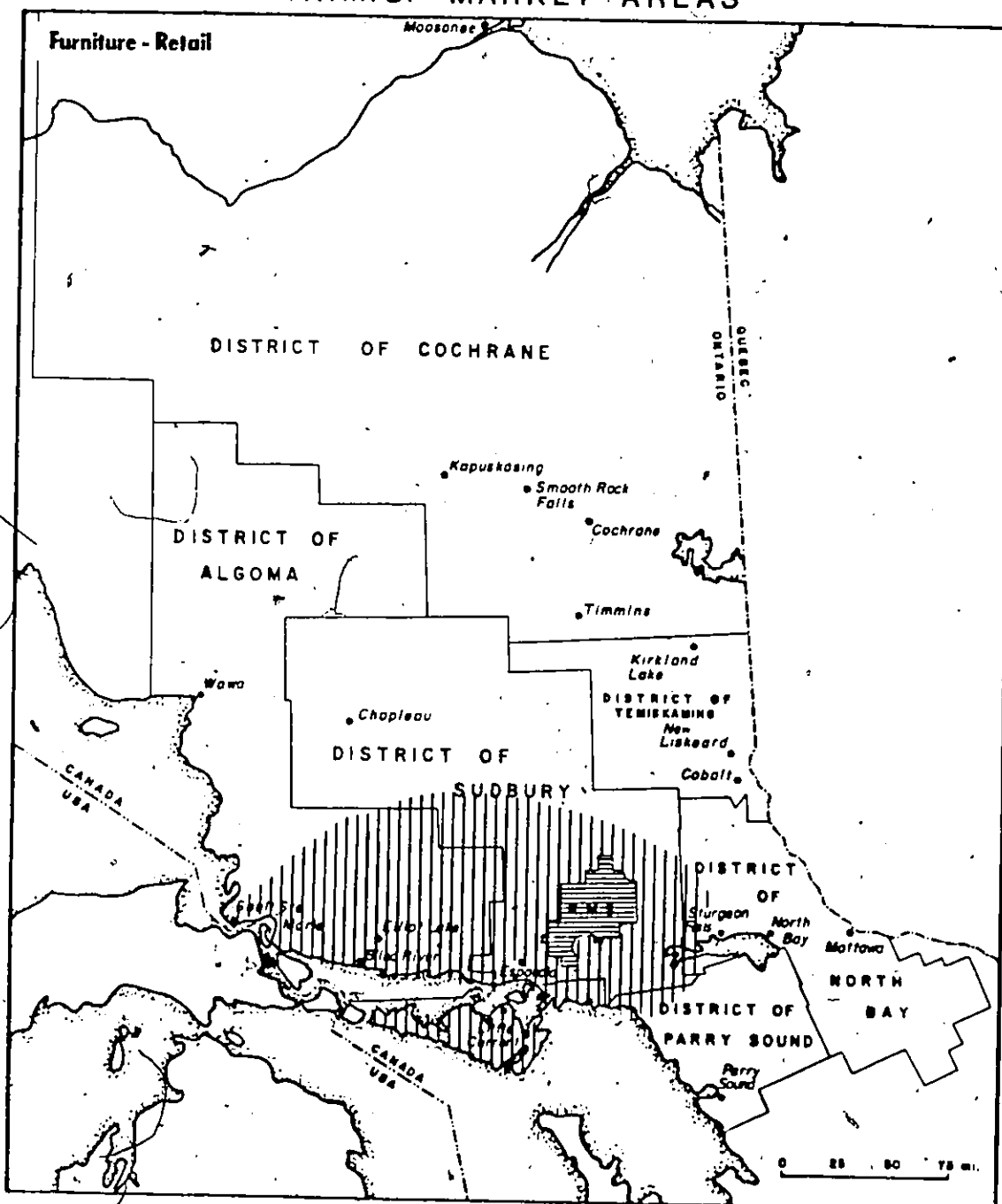
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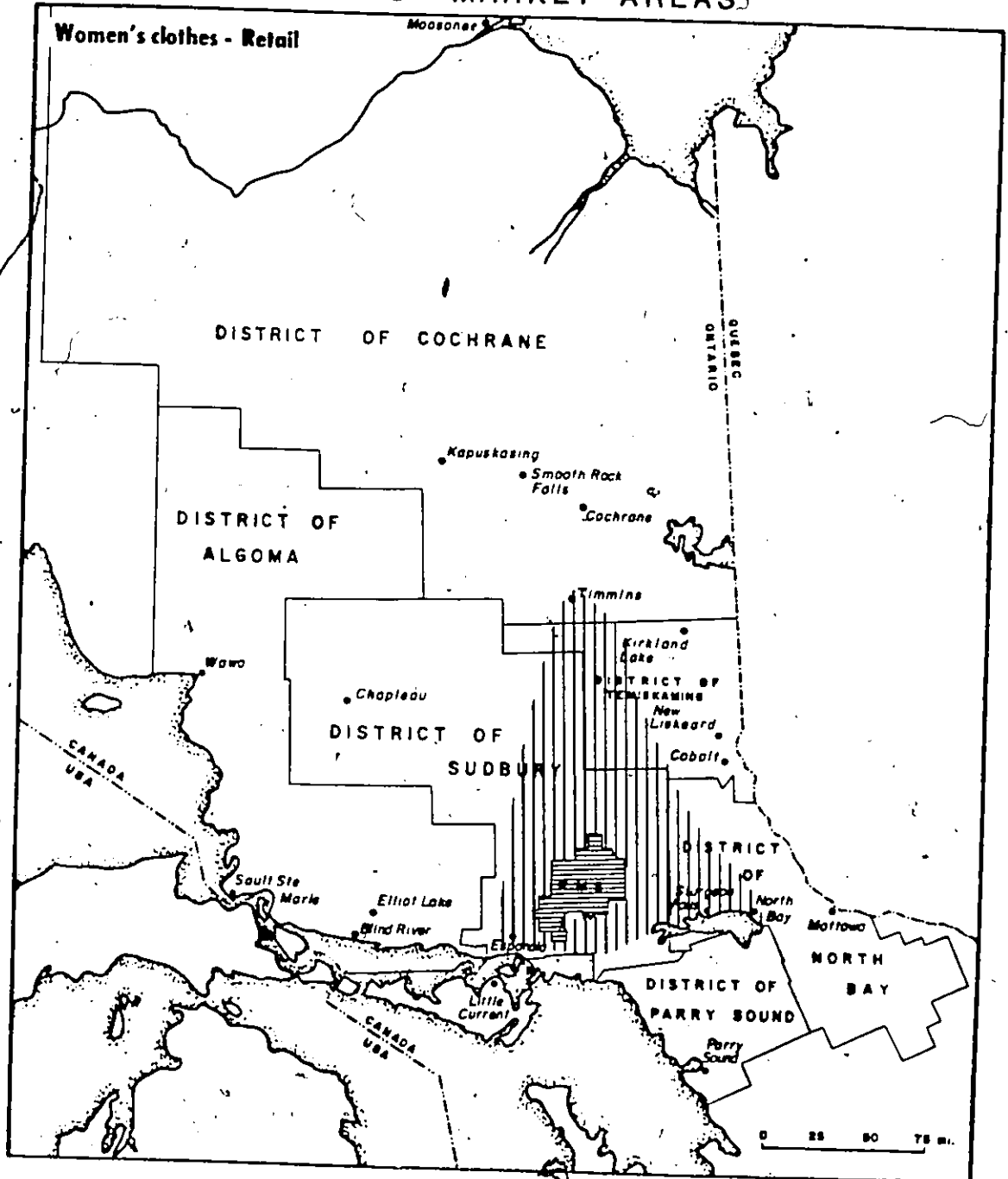
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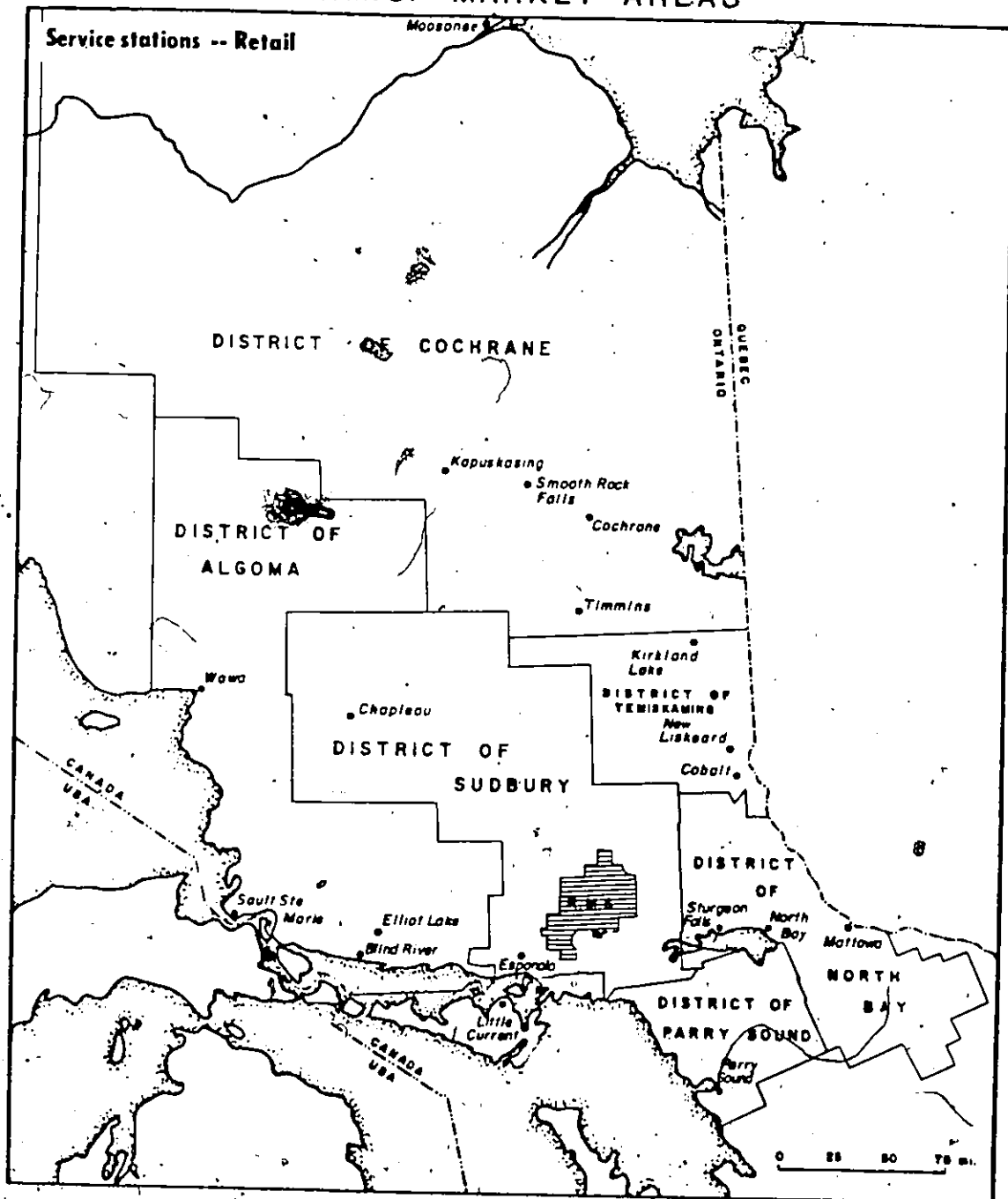
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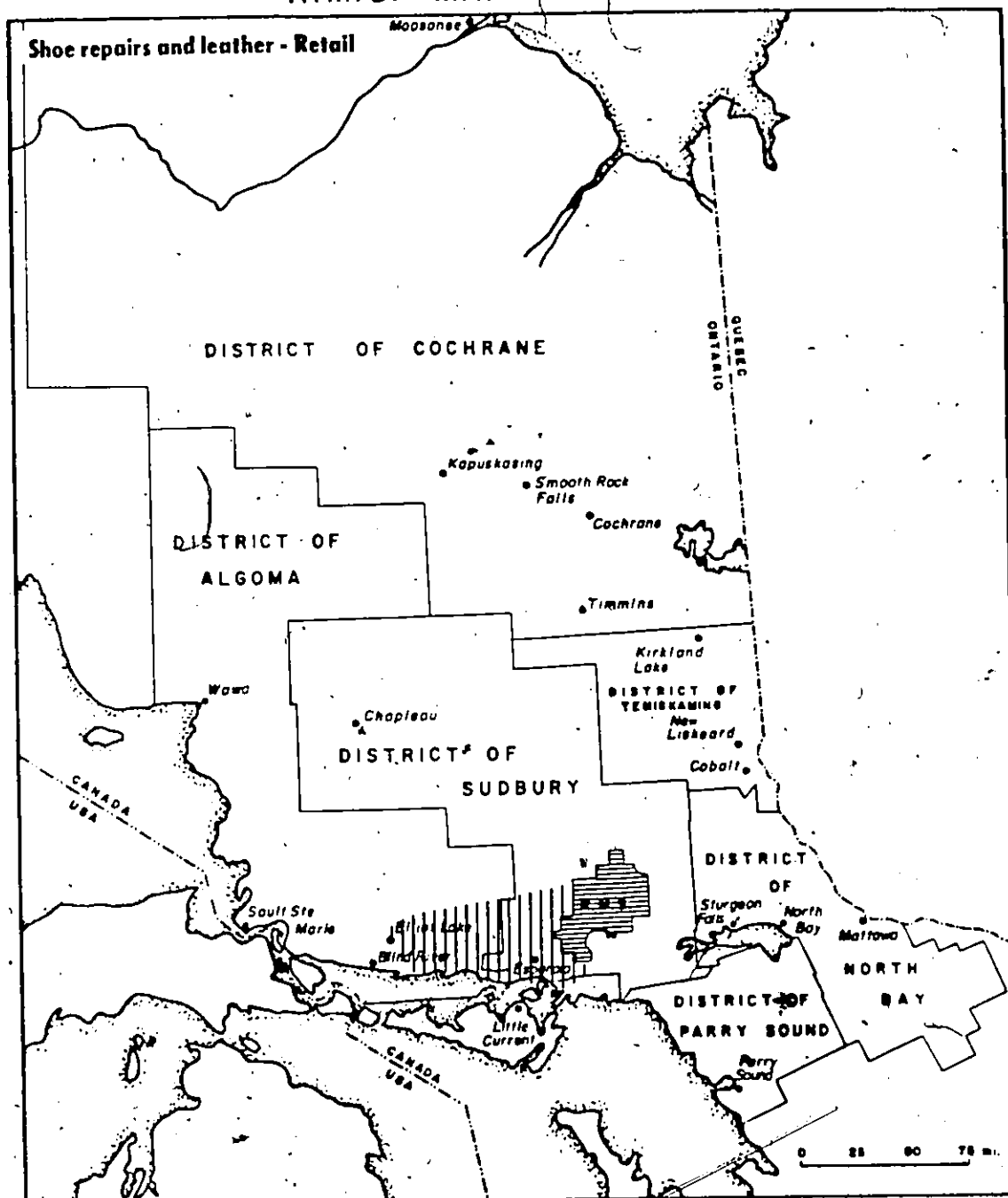
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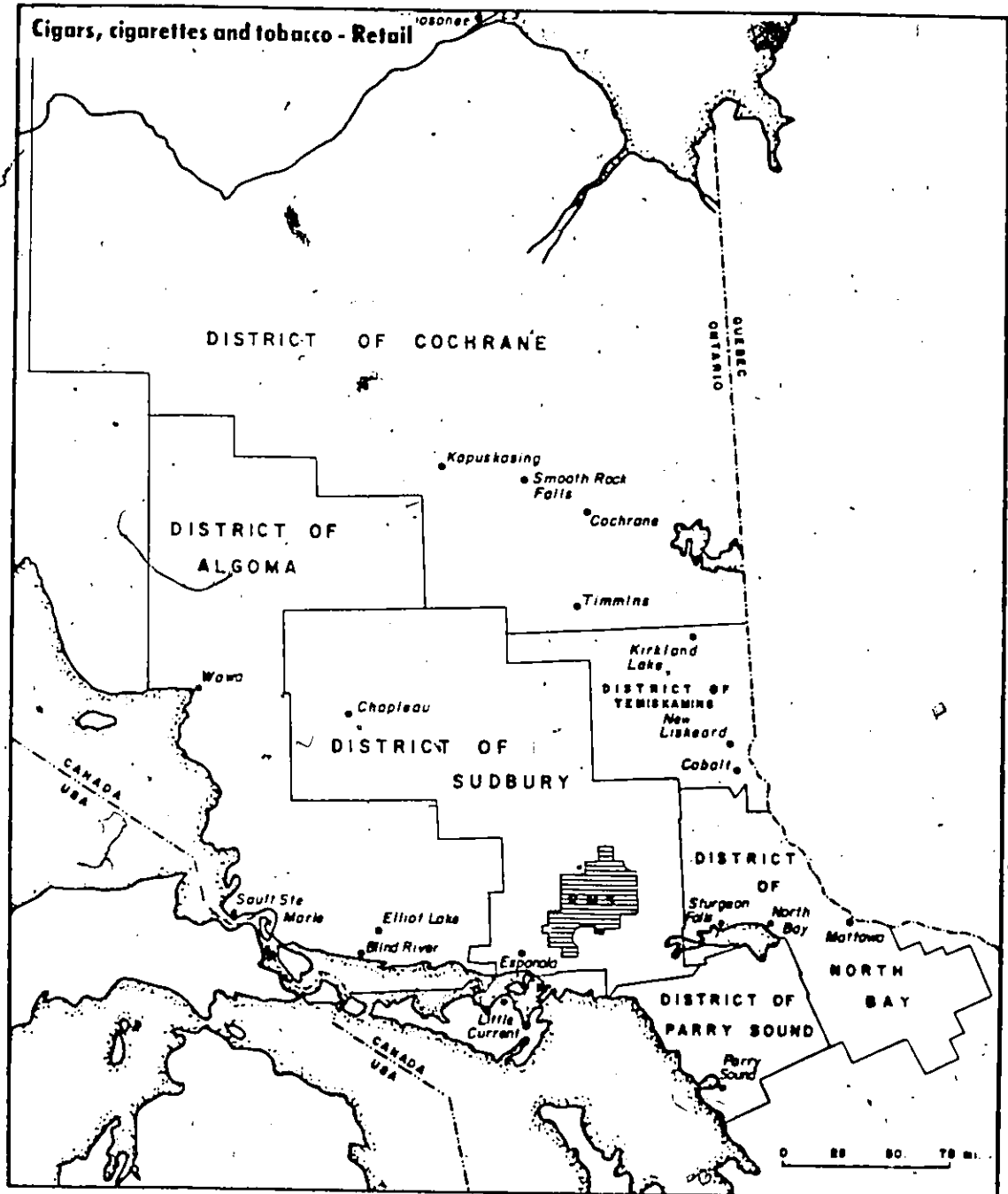
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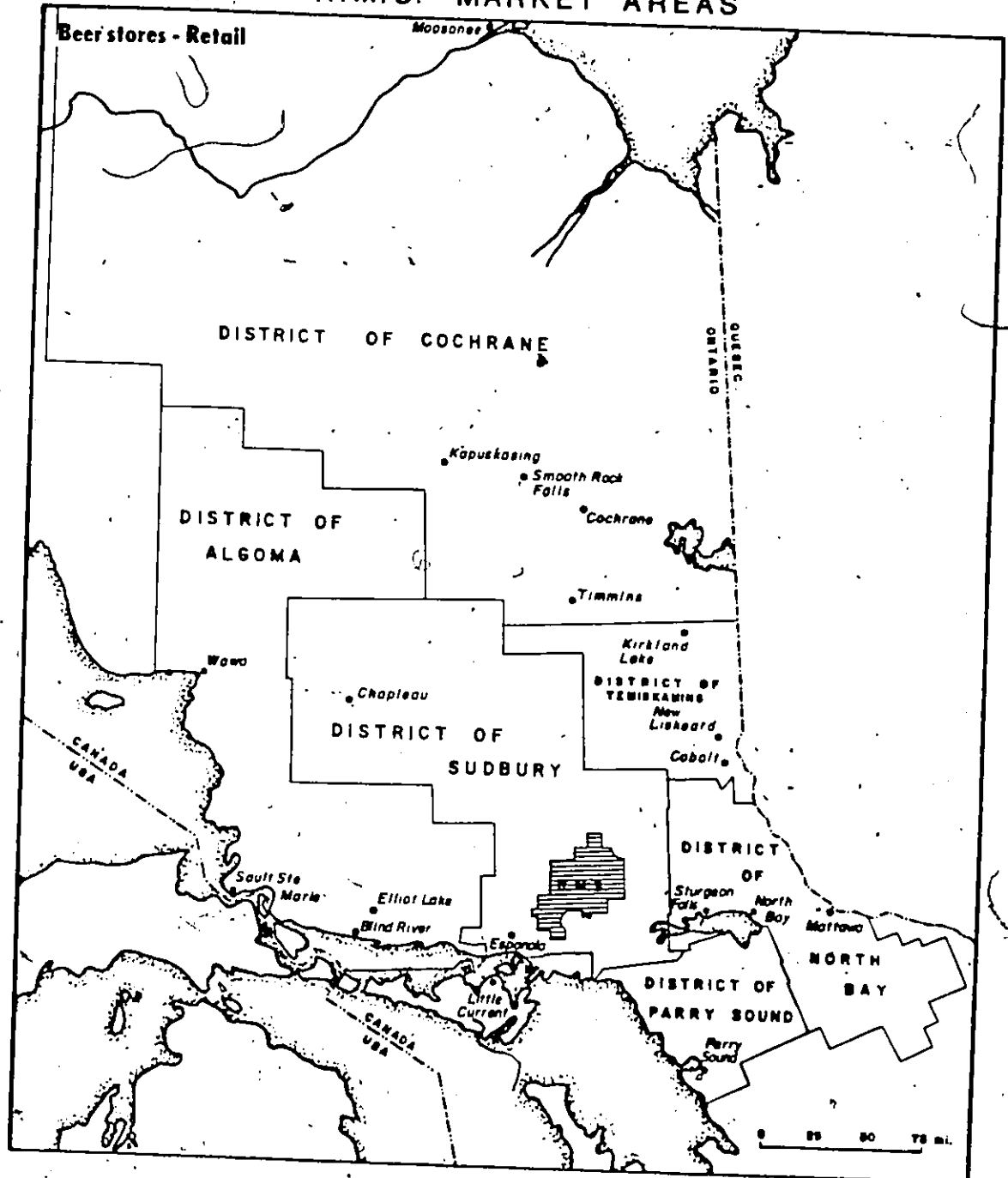
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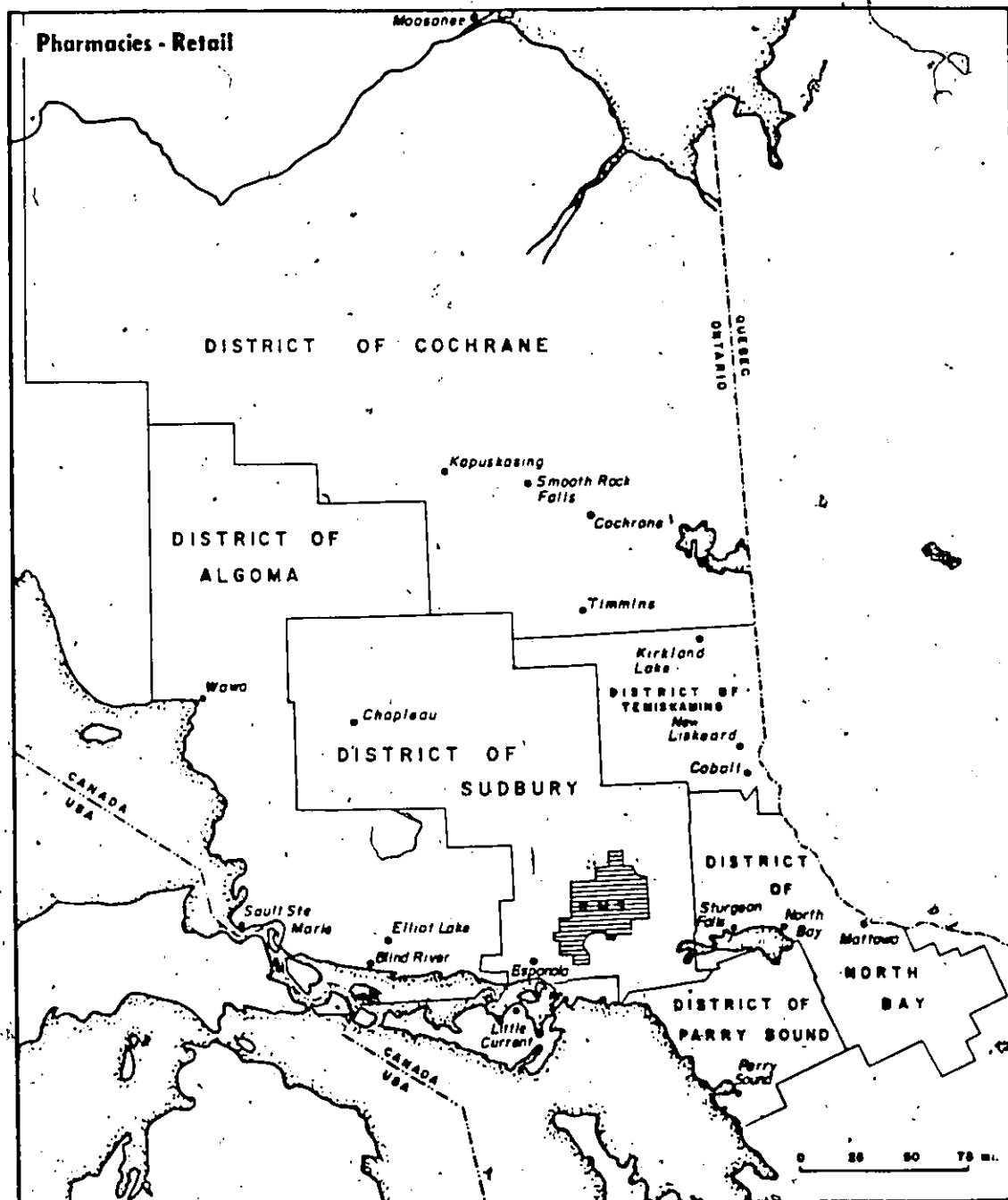
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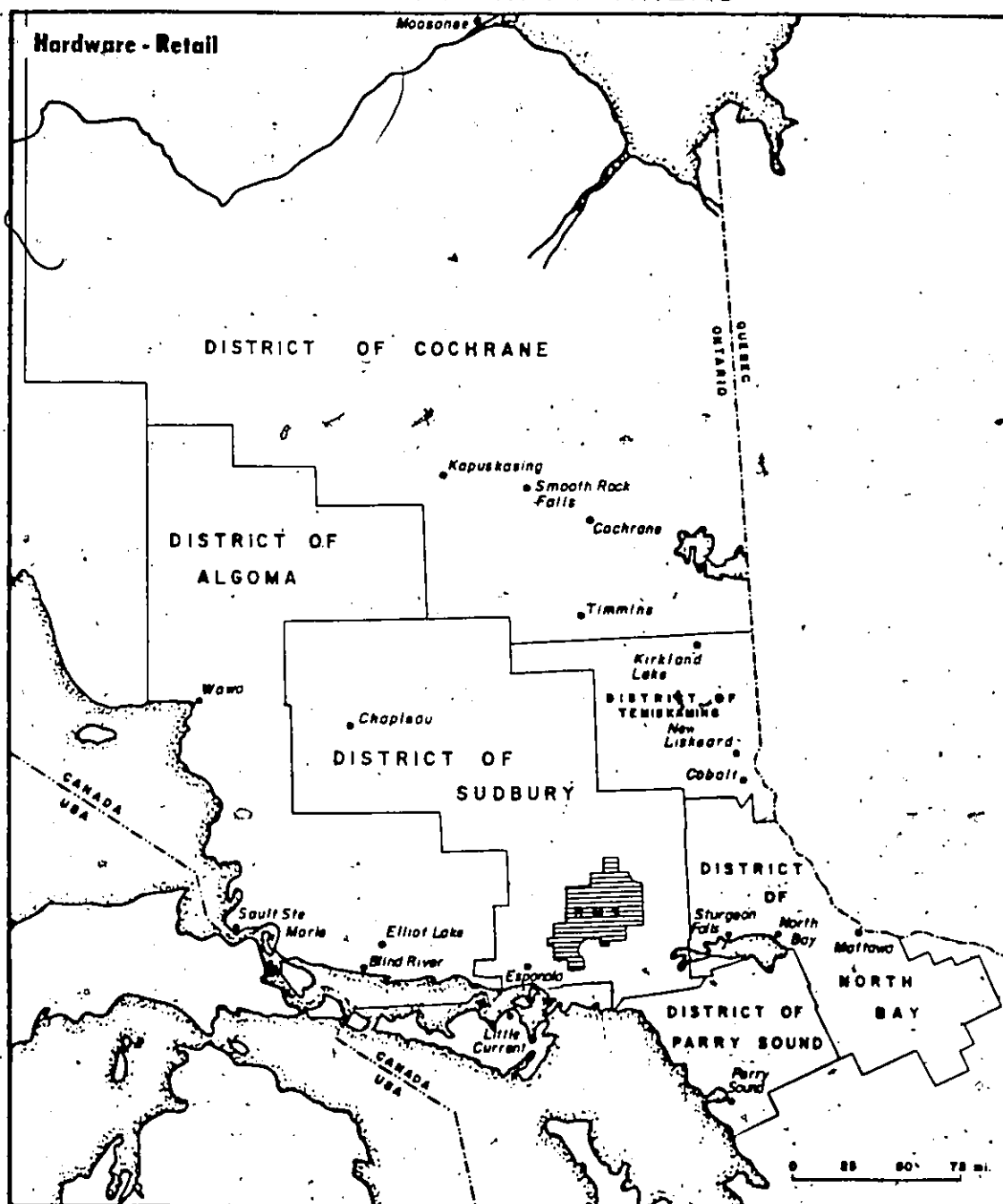
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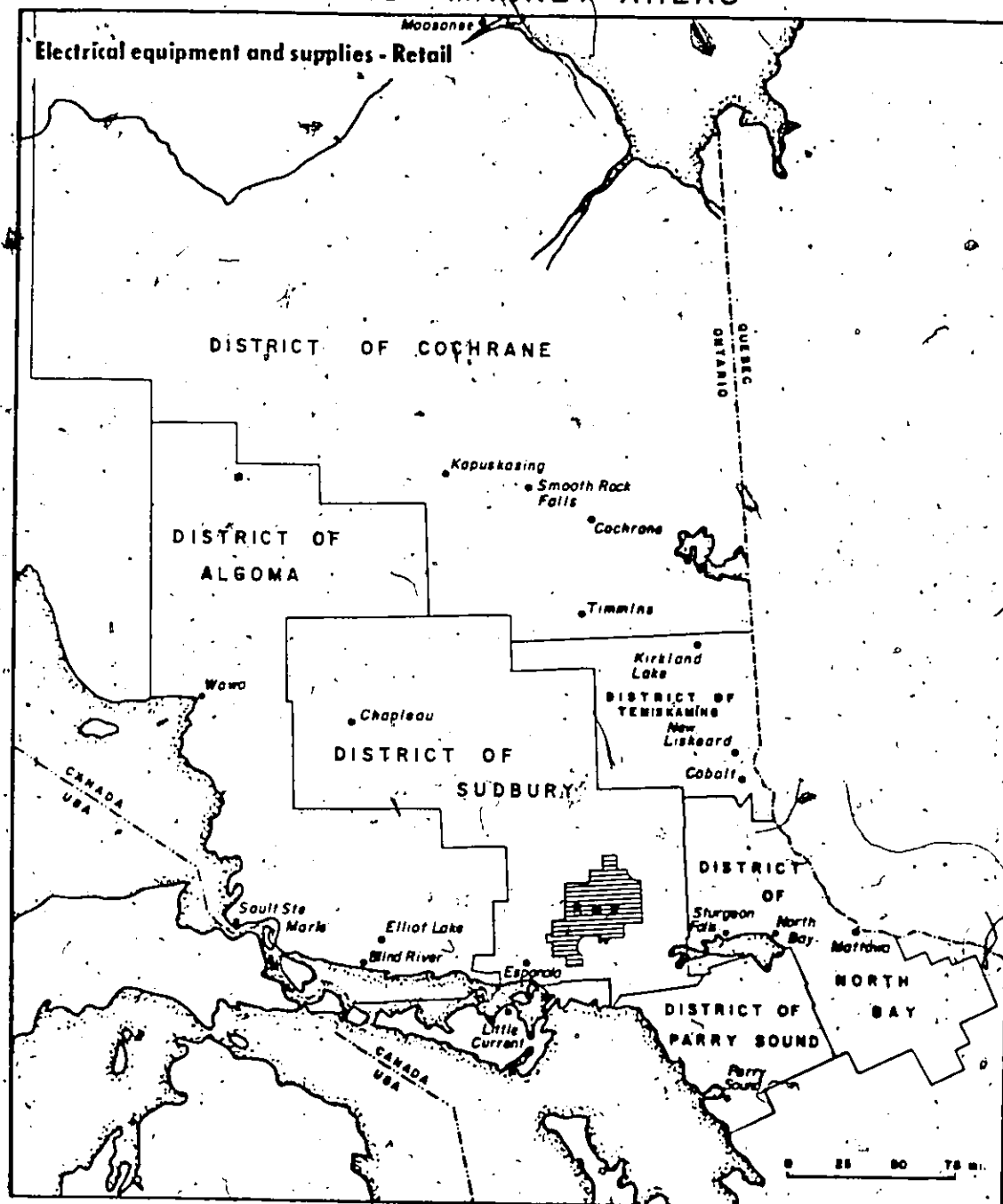
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