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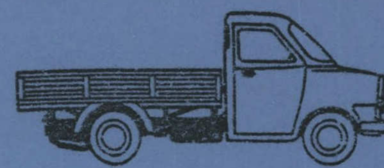
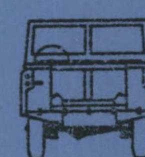
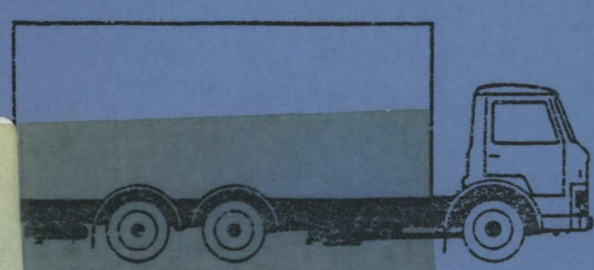


A USERS SURVEY OF MOBILE RADIO SERVICES IN RURAL AREAS OF THE PRAIRIE PROVINCES

Volume One

Project Report





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2 MAN ON THE MOVE',

A USERS SURVEY OF MOBILE RADIO SERVICES IN RURAL AREAS OF THE PRAIRIE PROVINCES

VOLUME ONE

PROJECT REPORT

1. C. ROGER SCHINDELKA

AUGUST, 1977

ACKNOWLEDGEMENTS

The results which are documented in this project report were acheived with the co-operation of many individuals. A special acknowledgement is extended to George Cormack of the Rural Communications Study Group for his thoughtful guidance. The co-operation of Al Bens, Hugh Wood and Bob Plemel of SED Systems Ltd. of Saskatoon merits attention. The helpfulness which was displayed by the staff of the various DOC field offices in the Central Region is very much appreciated. Kieth McMillan and Jay Horton of the Saskatoon field office donated much of their time to provide information and iron out problems.

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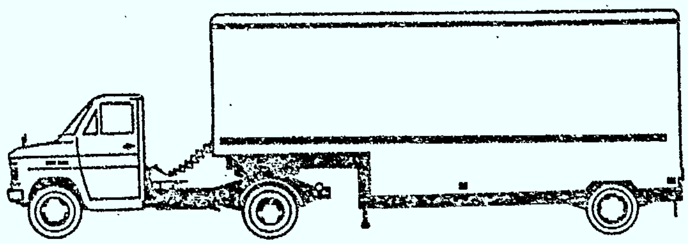
INTRODUCTION



1. NATURE OF THE STUDY

1.1 Background Information

The sponsorship of this research project lies with the Rural Communications Program of the Department of Communications. This program developed out of the disparity in communications services between urban and rural households which is further complicated by the existence of major cost constraints in the further provision of rural services due to the comparatively larger separation between households. It was therefore seen as desirable to investigate the application of technology to overcome this constraint. In view of the fact that there existed various communications technologies as well as diverse rural population distributions, the first step in their task beyond the problem definition stage was to develop an information base in the field of communications services. This project is essentially designed to provide an information base for mobile radio services in rural areas of the Prairie Provinces.

The stated objectives, both general and specific, or the Rural Communications Program are stated below so as to place this project into perspective.

1.1.1 General Objectives

- To provide the engineering/economic framework for the development of the federal policies on rural communications.
- To foster federal/provincial cooperation in improvement of rural services.
- To provide Canadian product design for rural communications.
- To provide the basis for a coherent domestic market for equipment used for improvement of rural services.

1.1.2 Specific Objectives

- To develop an information base in the field of communications services (telephone, broadcasting, CATV and data) in rural areas.
- To identify ways in which the range, quality and economic viability of such services can be improved.
- To determine the most cost effective ways to improve telecommunications services in Canada.
- To identify government opportunities for government stimulation of industrial electronics development.
- To determine to the extent feasible, the types of services which are considered to be necessary and desirable in various time frames and the economic implication of providing such services.

As can be seen by the objectives stated above, the development of an information base is only an interim step. In accordance with the general flow of activities, the information which is gathered and analyzed by this project is to be coordinated with a mobile radio technical survey and systems design project which is being conducted by SED Systems Ltd. of Saskatoon, Saskatchewan.

1.2 Terms of Reference

The terms of reference for this study are to undertake a systematic study of rural mobile radio services in the Central Region,[1] which includes the Prairie Provinces and the adjoining Northwest Territories. The study is to include social, economic and geographical aspects of this mode of communications.

The term mobile radio is meant to refer to the three major groups of users that are designated as 1) public commercial[2], ii) private commercial and, iii) general radio service licence holders. Mobile radio equipment is intended to include: i) radio-telephone systems that involve one or more mobile radio remotes plus a base station that is connected to the common carrier system, ii) radio systems involving one or more mobile remotes plus a base station that is not connected to the common carrier system and iii) licensed "walkie-talkie" or mobile GRS systems. The connection to the telephone system in i) above may be established through a manual access system by the base station operator or may be established by a fully automated system wherein the remote user has direct dial and access to the telephone network via the radio link. Microwave systems and satellite systems are not covered by this study. Government systems (security, highways, etc.) are also not covered; however, paging systems are covered.

In conjunction with the study of the present use of mobile radio techniques, a pilot study will be carried out which will provide a methodological basis for future field work. The accent will be placed upon the determination and employment of appropriate techniques for the assessment of the communication needs of a particular rural setting. The design of this pilot study will be oriented towards an investigation into the communication needs of distinct geographical settings.

1.3 Survey Objectives

Going beyond the terms of reference, a more definitive statement of objectives is needed. These objectives are as follows:

1.3.1 To identify the socio-economic-geographic characteristics of users.

1.3.2 To identify user complaints and preferences.

1.3.3 To analyze communications patterns of users.

1.3.4 To estimate future needs.

Due to the fact that the first objective is so broad in scope, namely that there is a whole gamit of attributes which combine to form the sociological, economic and geographical profiles of mobile radio users and given the fact that there is a wealth of information available in the form of Census data, it was decided to achieve this objective in large part by an indirect method. The method in this case was to look for relationships between the levels of utilization of different radio services in different areas and levels of certain characteristics of the population in these same areas.

The nature of the last three objectives is different from the first in that it is necessary to go directly to the mobile radio user in order to fulfill them. By going directly to the user it is possible to fulfill the first objective in a more complete manner as well.

1.4 Organization of the Report

The report is organized so as to proceed from the general to the specific in a logical fashion. Extensive use is made of the visual presentation of information. The report is actually made up of three separate documents. Volume One contains the project report and some appendices. Volume Two contains the more bulky appendices pertaining to licensing data which was aggregated and some questionnaire analysis. Volume Three consists of computer printouts of basic questionnaire data and the correlation results.

The project report which follows attempts to outline the status of mobile radio techniques by successively considering the phenomena of mobile communications first from a loosely theoretical viewpoint, then in relation to the study area and finally from information gathered from users.

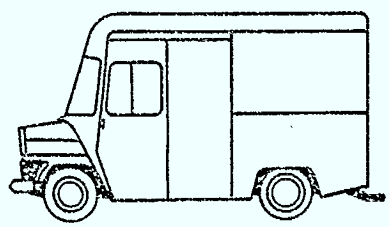
The two most important viewpoints from which mobile communications is considered are location and industrial classification. As the study concentrates upon rural areas, the aspect of location is thought to be crucial. The industrial orientation of mobile communications is thought to be an important element as well.

Footnotes

1. It should be noted that although the title of the report states that the study was carried out within the rural areas of the Prairie Provinces data was collected for the users survey from all users in the Central Region who resided outside of urban places of greater than 5000 population. But because a rural user is differentiated from a remote user, the data was analyzed in the context of the rural areas of the prairies. The quantity of data from outside the prairies is minimal and is not considered to affect the results.

2. From a licensing viewpoint, a 'public commercial' license designates an entity who is providing communications services to the business public. The actual user of this service is licensed as a private commercial user.

Some General Considerations



2. TECHNOLOGICAL CHANGE AND RURAL DEVELOPMENT

Technology is a somewhat abstract concept which has many concrete manifestations. As such it serves to help explain the variable nature of phenomena within a given area viewed either statically or dynamically. The effect of technology, as viewed by Wagner (1960), is to produce an artificial environment, the level of which is in proportion to the prevailing technical level and the degree of economic integration of the society. Two indexes of the level of artificiality are the relative concentration of people in settlements and the relative dependence of individuals upon highly specialized productive roles. In the Canadian context, these manifestations are highly documented facts, especially the rural-urban population shift.

The ability to understand technology and technological change is hampered by the absence of any degree of consistency in describing technical change. Many terms are used interchangeably to describe this process. These terms include: development, economic development, economic growth, technological development, technological growth, advancement, industrialization, and modernization. (Karial, 1972). Nevertheless, the common concern with all these terms is with the changing nature of society whether it is with respect to one particular symptom or a group of symptoms, or with the changes evident in one particular segment of society.

2.1 The Changing Rural Environment

Some of the conclusions reached by Wagner (1960) in his investigations into *The Human Use of the Earth* are seen to be appropriate summations of the general changes brought about by technological change. They are as follows:

- The frequency, variety, and magnitude of the geographic features produced by human activity express the degree of artificiality attained by the group.
- The density of human populations and the spatial scope of societal organization are roughly proportional to the degree of artificiality attained by the given group.
- Differences in human welfare are much more closely correlated with differences in artifical environments than with difference of natural environment.
- The progression that takes place in social relations is one from virtual independence of small groups to vast interdependence among peoples and places (Wagner, 1960, p. 236).

Taken together, the above conclusion illustrate that one way of looking at the urban-rural dichotomy is by employing technology as the method of comparison. But even if rural areas are portrayed as being less dependent on technology as their urban counterparts, the influence of technology may have relatively greater impact. For example, technological factors affecting modern farming demand that the scale of agricultural structures be enlarged for economic viability. With an ever present substitution of capital for labor, the rural areas are being depopulated. These changes in occupance have important implications with respect to future provision of services and the expansion and contraction of settlements.

The fact that rural areas are supporting an ever-decreasing proportion of population as a result of economic reorganization does not mean that these areas should be neglected. In fact, any person, or group of persons, who is faced with the discrepancy between economic costing and social costing in the provision of rural services must heed those broader policies which define the desirability of maintaining rural populations even though the services provided will never be viable. Of course, even with the accent upon social responsibility in the provision of services, the discrepancy between economic and social costs may dictate negative decisions.

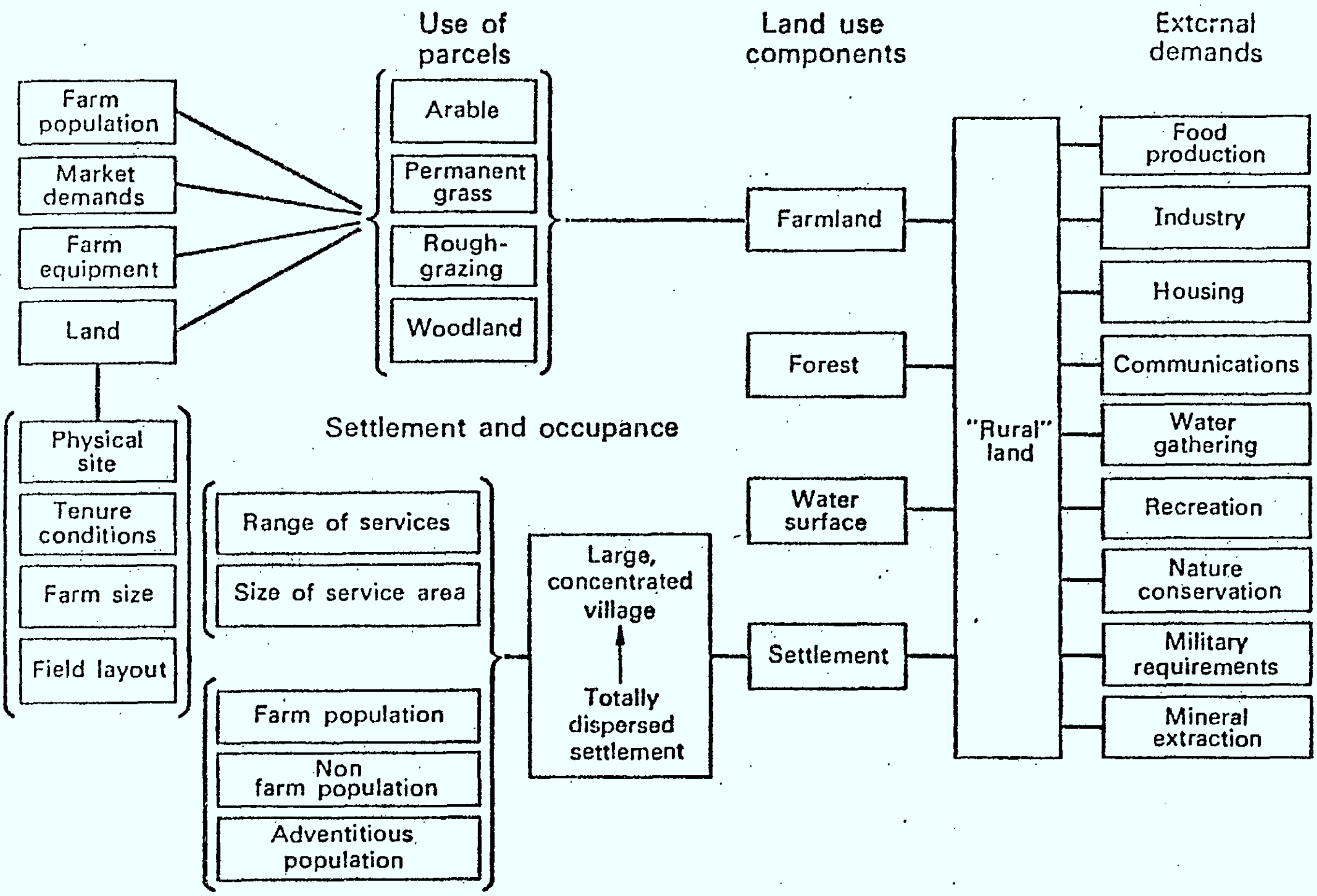
One of the characteristics of present-day rural living is a broader 'mentally urbanized' way of life brought about by increased personal mobility and mass media communication techniques. An expectation of the level of services enjoyed by urban residents, compounded by diseconomies associated with the provision of those services in rural areas has promoted a lateral approach to rural problems. This approach requires the alignment of old problems in new ways to produce more viable alternatives. For example, the more efficient provision of services may require that farm homes become more clustered, as is advocated by *Report of the Rural Development Advisory Group of Saskatchewan (1976)*. Yet, it is possible that for some services, the conventional method of delivery could be changed to make them viable.

2.2 Communications and Development

In considering the problems of the rural landscape, attention must be given to external forces of change as well as internal ones. Figure 1 displays the major components of the countryside. It is noticeable that one of the external demands placed upon rural land is that of communications. From the point of view of development, adequate communications is a precondition for growth. Consider the following passages:

Figure 1

PHYSICAL COMPONENTS OF THE RURAL LANDSCAPE



Adapted from Cooke, R.U. and Johnson, J., *Trends in Geography*, 1969.

> "As previously mentioned, anything that reduces costs is a potential contributor to economic growth and development. One international bank report has this to say: 'Transportation, communications and power have one important element in common. They all provide auxiliary services important to the development of agriculture, industry, mining, and domestic and foreign trade.' Inadequacy of these services constitutes one of the greatest barriers to economic development." (Morris, 1967, p. 414).

> "Poor communications, including telephone, telegraph, post office, radio and TV broadcasting are an impediment to development. Modern industry cannot tolerate the delay of slow communications or the lack of information that results from difficult transmissions." (Morris, 1967, p. 418).

Transportation, communications and a host of other technological developments have combined in the past to reduce the constraints of geographic space. It is generally conceded that the pattern of settlement has been more directly influenced by transportation than communications. The greater accessibility of some places over others is a reflection of the uneven distribution of transport lines and terminals. In more recent times, the telephone has become a virtually ubiquitous service and roadways have been evening out the accessibilities of all places within a given region.

In fact, any forthcoming developments in communications, however novel and significant, will fit directly onto the trend line of the telegraph and the telephone. With the provision of better channels for the transmission of information and meaning, the capacities of social intercourse will be greatly expanded as people transact their business over great distances. The shape of any future communications developments will of necessity mimic the future population which is generally characterized as becoming increasingly mobile, both socially and physically and as possessing an increasing amount of leisure time.

2.3 Participants in Development

The recognition of many physical components in the rural landscape and their interrelationships presents a somewhat shallow picture unless the social fabric is also considered. In fact it is the needs and aspirations of the people themselves which will determine the shape of development. The effectiveness of the development of the physical aspects of the rural environment (i.e., communications networks) through senior government programs is tempered by the outlook of the people involved. The actual delivery of a program is dependent upon mobilizing diverse groups of private organizations, farmers, businesses, civic leaders and government agencies. Actions intended to motivate and inspire people in a free choice society to improve themselves and their conditions cannot bring about lasting change if the people do not want help.

In reality, rural development in the Prairie Provinces is concomitant with the development of agriculture. From the point of view of persons who do not farm yet who earn their living by providing advice, sales or services to the agriculture population, a 'modern' farmer is seen to be a man who seeks, understands, and adopts the benefits which can be obtained from present day science, technology and management procedures. In other words, the modern farmer seeks the highest level of efficiency and profit attainable. (Abell, 1966)

The application of science to agriculture is ultimately a managerial decision. But how widespread is the aspiration of technological advancement among the rural population? Undoubtedly, there is a strong desire to modernize among many farmers but this desire is less evident or even nonexistant among others. Most decision-makers concerned with rural development consciously or unconsciously base their decisions on the assumption that rural people share the aspiration to seek change. Implicit with this assumption is the value judgement that there is something wrong with those people who do not share this aspiration.

Irregardless of the amount of resistance to change, there are many forces which support technological change in rural areas. There are forces from both government and private sources. There is the dissemination of ideas and techniques from other areas and sectors. Vertical integration, corporate structures, contract farming and specialized agricultural units are all seen to be evident of farm modernization. But it must be remembered that all farmers operate within the same marketplace. Those dynamic farmers that adapt to new situations are those that prosper. Those farmers who fail to adapt will become less financially solvent.

2.4 The Transfer of Technology

Technology is seen to diffuse from areas where greater amounts are present to areas with lesser amounts. Diffusion is a process defined as "the (1) acceptance (2) over time (3) of some specific item - an idea or practice, (4) by individuals, groups or other adopting units, linked (5) to specific channels of communication, (6) to a social structure, and (7) to a given system of values or culture" (Levin et al, 1963). If there was no resistance to the acceptance of innovations in an area, a new product or idea would rapidly spread through the area upon its introduction. But there are many resistances to change - customs, habits, economic constraints, poor transportation and communication. Consider, for example, the farmer who is satisfied with the status quo or the farmer who is unable to change his situation due to a complex of limiting factors.

The diffusion of innovations is a highly studied and documented area of investigations. As such, there is an abundance of literature which, when combined, provides a concensus view of the characteristics which distinguish the early adopters of an innovation from the later adopters. Some characteristics have a greater degree of support than others. Table 1 lists the different characteristics accredited to early adopters and shows the percentage of studies which supported each particular characteristic.

When viewed from the viewpoint of technical change or economic development, the early adopter becomes an entrepreneur associated with an economic unit. The entrepreneur functions to "initiate the enterprise, introduce new ideas and innovations for its operations, assume the risks of an enterprise, obtain the necessary capital and other factors required to operate the business, and coordinate their use, especially in new combinations". (Morris, 1967, p. 287). While they are the prime movers of change, entrepreneurs also select the techniques of change and, perhaps, even the direction.

Entrepreneurs can be classified on the basis of their adoption behaviour. The *innovators* are those who see and put an idea into effect. Those who are quick to adopt innovation made by others are *imitators*. *Fabians* exercise great caution and make the change only when it is safe while *drones* refuse to change. The first two groups must predominate for an area to advance. The supply of entrepreneurs is conditioned by such factors as the opportunity given to individuals to make decisions, the change orientation of the population and the status given to the innovator.

Diffusion tends to occur along personal communications channels. Mass media communication tends to make people aware but it is personal influence and example which are important at the level of the actual decision.

Table 1

CHARACTERISTICS OF EARLY ADOPTERS OF AN INNOVATION

Characteristic	Support (%)
No difference in age from later adopters	48
More years of education	74
More likely to be literate	63
Higher social status	68
Have larger size units (farms, and so on)	67
More likely to have a commercial orientation	71
More favourable attitude towards credit (borrowing money)	76
More specialized operations	60
Have greater empathy	64
Are less dogmatic	47
Have a greater ability to deal with abstractions	63
Have greater rationality	79
Have greater intelligence	100
Have a more favourable attitude towards change	75
Have a more favourable attitude towards risk	73
Have a more favourable attitude towards education	81
Have a more favourable attitude toward science	74
Are less fatalistic	82
Have higher levels of achievement motivation	61
Have higher aspirations	74
Have more social participation	73
Are more highly integrated within the social system	100
Are more cosmopolite	76
Have more change agent contact	87
Have greater exposure to mass media communications channels	69
Have greater exposure to interpersonal communications channels	77
Seek information about innovations	86
Have greater knowledge of innovations	76
Have a higher degree of opinion leadership	76
More likely to belong to systems with modern norms	70
Are more likely to belong to well integrated systems	53

Adapted from Roger, E.M. and Shoemaker, F.F., *Communication of Innovations*, 1971, Appendix A, Generalizations about the diffusion of Innovations, pp. 346-385.

2.5 Mobile Communications Possibilities

New communications technologies have the capacity to bring about enormous economic, political, social and cultural changes through increased capacities and capabilities. Basic questions about these changes concern for whom they are to be made, for what kinds of communications, and for what purposes? Will technological developments focus upon the pursuit of private economic gain or toward the achievement of public interest objectives? The present situation for mobile communications technologies is that they are directed towards private economic pursuits. What are the future mobile communications possibilities?

Four factors which are seen to play a role in determining future developments are needs, technical possibilities and barriers, economic constraints and legal or organizational barriers. The driving force behind the present utilization of mobile communications services and the key to the future of this mode is needed. The present categories of need which are being met by mobile services are *safety, efficiency* and *convenience.* Safety is the common factor for many mobile communications needs - medical assistance, police activities, transportation services, etc. Taxi operations are typical of the efficiency need. It is a valid argument that any endeavour which necessitates that individuals be spread out beyond voice range can be significantly improved by the use of mobile communications. In addition there are many needs and uses which can be regarded as matters of convenience. The many circumstances in which individuals would like to communicate, above and beyond the fundamental safety and efficiency needs, are many. The ability to do so would have profound affects upon society.

Future mobile services will arise out of the general technical environment. Two extraordinary developments that will influence all kinds of communication are the development of microcircuits and computer capabilities. Microcircuit development is improving by orders of magnitude the size, cost, power consumption, and reliability of certain types of electronic circuits. Microcircuits will provide some reduction in transmitter size and large reduction in receiver size which will permit current size equipment to contain much more complex functions. The continued development in the programming capabilities of the computer will enable such developments as computer coordinated mobile systems and mobile computer terminals.

Mobile communications are growing. In the past, congestion problems encountered with mobile radio channels have been overcome by technology investments. The development of new services is hampered by the limitation of radio spectrum. It is argued (Cohn, 1973), that better spectrum management policies are needed to overcome this limitation resulting in a substantial contribution to the safety, efficiency, and convenience with which society functions.

3. INSIGHTS INTO MOBILE RADIO COMMUNICATIONS

The existence of mobile communications systems demonstrates that there is a portion of society which possess *mobility* to such a degree that a *communications link* is deemed necessary. This chapter investigates mobility as it relates to communications. The common element is seen to be that of *need for interaction*, which is created by movement and satisfied by communication linkages.

3.1 Movement - The Causal Factor

As society moves from an agricultural to industrial to post industrial economies there is an increasingly finer specialization of labor which reflects a more complex division of labor and a greater diversity of needs. As most individuals become specialists, the satisfaction of their diverse needs generates a great deal of movement. All forms of movement, whether it is people, goods, information or ideas, is a form of spatial interaction. Along with this increase in the level of movement in an evolving economy there is a simultaneous increase in the means by which interaction occurs. (Moryadas, 1975). Thus there is both an increasing level of interaction as well as an increasing number of alternative modes with greater economic specialization.

Two consequences of complex societies based upon specialized occupations are the increasing role of agglomeration economies and the increasing importance of scale economies.

3.1.1 Agglomeration economies

Any activity, from its initial establishment through to its continued existence, is based upon the existence of a threshold, whether it is people or production. The spatial consequences are such that service activities with low thresholds require small trade areas and are located close together, while higher threshold activities will be more dispersed. For example, in a given rural area, virtually all settlements will have a grocery store, while the incidence of veterinary services will be more selective. Given a variety of activities with certain threshold requirements and a certain population distribution, the geographic arrangement of activities will determine the number of single-purpose trips which are necessary. The tendency is towards agglomerations of activities at a small number of locations which promotes the realization of "agglomeration economies" through shared costs (police protection, trash removal, etc.) and lower distribution costs. *Thus, for an activity with a given threshold level, the tendency will be to locate at a location which possesses activities of comparable threshold levels, thereby increasing the amount of movement to and from that agglomeration.*

3.1.2 Scale economies

Economies of scale also play a critical role in a specialized economy. The scale economies refer to lower unit costs due to larger volumes of output and are realized through the evolution of larger establishments. Through this process, the smaller establishments either disappear from the landscape or are merged with other establishments. *The implications of the operation of this factor is the reduction of the overall number of establishments in a given area assuming a stable market demand. With respect to any one activity, the effect is to create larger separation between establishments and therefore create longer trips.*

3.1.3 The Causes of Movement

Up to this point movement has been treated as a ever increasing characteristic of an evolving economy. This economy has been characterized as having tendencies toward agglomerations of activities as well as larger scales of activities. Going beyond the identification of this greater need for interaction, there are some abstract concepts which together help to explain the causes of movement between two places.

The ability of a commodity or a service to satisfy a human need is termed *utility*. When goods and services are made available where they are needed, the result is *place utility*. When they are made available when they are needed, the result is *time utility*. (Wilson, 1954) Thus the fundamental causes of movement are the creation of place utility which is further enhanced by time utility. This applies equally to the movement of goods, people, information, etc.

There are other factors which account for the occurrence of movement between two places. The fact that one location has a good or service available and another location does not will not automatically generate movement. There must be a demand for the good or service in the location and the other location must have the capability of supplying it. This is known as *specific complementarity*. For example, a rural resident requiring some on-site repair work requires a serviceman who can transport both himself and the necessary equipment to the site. Of course, complementarity will in itself not generate movement between two places if there exists a more accessible alternative source of supply. These *intervening opportunities* serve to promote the most accessible alternative, although it may not be the most optimal. Also necessary to movement is the *transferability* of the good or service which is dependent upon the existance of a transportation facility. (Ullman, 1956)

3.1.4 The Distance Factor

Movement between two places as a result of a need for interaction requires that distance be overcome. With a diverse range of goods and services being moved, there is a trade-off between the mode of movement or a combination of modes for any one good or service. But before this decision can be reached the distance factor must be evaluated. The *physical distance* must be evaluated, whether it be road distance or point-to-point distance. This distance is fixed and may exclude certain modes of movement. Also a relevance is the *time measure* of distance which is a function of such factors as the mode of movement, the density of traffic, the physical environment, the regulation of movement, and the state of the art of movement technology. The cost of movement or the *economic distance* incorporates a budget measure with movement. Movement costs generally vary with physical distance as well as between modes.

The rather abstract portrayal of movement up to this point has outlined the general factors which influence both the level of movement and the nature of movement. The concern in this study is, of course with a very specific type of movement, namely, the movement of information via mobile radios. But before this area of interest is approached, the basic facets of the elements involved in movement will be considered.

3.2 Nodes and Routes - The Elements

Any form of interaction has a locational origin and/or destination which can be defined as a node. (Moryadas, 1975) There must be both people and places for interaction to occur. There are many different types of nodes with their own peculiar type of interaction which necessitates some classification scheme.

3.2.1 Classification of Nodes

The basic foundation of classification is the *individual* because groups of individuals make up *establishments* and groups of establishments comprise *settlements*. The individual is a node when he is receiving or transmitting something. *The mobile radio user is a specific subset of this aggregate group of individuals.* Two or more individuals who are engaged in the supply or demand of any good or service at a particular location comprise an establishment. A settlement is a spatially juxtaposed collection of establishments.

Two methods of distinguishing between types of nodes are in terms of their functional specialization and the time discreteness of their functioning. If one looks at human society from an economic perspective an occupational pyramid with unskilled individuals at the bottom and the highly trained professionals at the top is apparent. *In society as a whole there is a rough correlation between the functional role which an individual has in society and the amount of movement upon which that role is dependent.* An ordinary laborer travels a much smaller distance in the course of making a living as compared to a journeyman electrician or plumber.

Establishments can also be viewed as a pyramid with numerous low-order business types at the bottom and the highly specialized ones at the top. The ubiquitous grocery store attracts relatively local individuals as opposed to a centralized government function. Settlements can also be functionally arranged on the basis of their specialized products and services.

The common characteristic which differentiates these nodes is their "action space" within which most of the interactions occur. The size of this space varies with the level of specialization. *Of course, the concern here is not with the action space itself, but with the mobility of the individuals within that action space and the subsequent need to communicate.*

Interaction between nodes is also *time-discrete.* Most individuals carry out their functions during the daylight hours but some function at night. Most establishments have a specific period of operation but some operate around the clock, including hospitals, police stations and telephone companies. Not only are there short-term variations but there are also long-term growth or decline trends. Any individual has the greatest interaction requirements and the largest action space during the working years. Establishments generate and receive more movement as they grow. Settlements are in constant competition and those increasing their functional importance expand their action field at the expense of other settlements.

3.2.2 Function of Nodes

The major function of *all* nodes is the origination and destination of movement. *The amount of movement which any particular node generates or receives is related to its size and its hierarchical position.* In cases where the complexity of the movement system or the distance factor is crucial there is the need for a specialized node called a *relay node.* This node serves to receive flows in order to transmit them to another node with minimum delay or cost. As society becomes more complex and expands the number of origins, destination, routes and modes, the role of relay nodes become more crucial. Transportation companies and telephone companies are prime examples here.

3.2.3 Locational Characteristics of Nodes

One method in which to understand nodes is in terms of their relative location with respect to other nodes. It is necessary that there be two nodes in order for interaction to take place and these nodes may constitute a system although in some cases they may not. Each individual node can interact on a purely individual basis or under an establishment. When separate individuals interact on a purely individual basis they do not constitute a system but when they interact as part of an establishment they constitute a system, for our purposes. Relay nodes can also enter into the system. Further differentiation can be based upon the settlement characteristics, or lack thereof, of individuals and establishments.

Another way to view nodes is at a more macro scale by examining their distribution in an area. The distribution could be characterized as concentrated or dispersed, clustered or random, etc. Even a more precise measurement could be employed such as the number of nodes per square mile.

3.2.4 Routes - Capacity and Location

The channels along which interaction between two nodes take place are termed routes. The capacity of a route refers to the maximum traffic in a given time period with given levels of service. Congestion arises when the actual traffic exceeds the design capacity. Elimination of congestion is possible through systematic adjustments, both planned and unplanned, such increasing capacity, changing regulations, changes in behaviour patterns, and changes in the state of the art of technology.

Routes can be classified as being fixed or flexible in location. Motor vehicles follow fixed routes whereas airplanes follow flexible routes. In general, as an area becomes more developed there is an increase both in the number of routes as well as the available modes between two nodes.

3.2.5 The Functions of Routes

The most important functions performed by routes are to structure flows for movement efficiency, the accommodation of multipurpose movement, and the identification of the portions of space to be used for movement. There is also functional specialization in route design. Consider, for example, the freeway as opposed to the ordinary city street or the widely shared GRS channels as opposed to private radio channels. The general impact of routes is to provide accessibility to places and people.

3.3 The Satisfaction of Needs with Mobile Communications

While it is apparent that all individuals are engaged in movement and therefore spatial interaction, all individuals do not recognize that their mobility can be augmented by communications linkages. A cursory examination of those individuals who use mobile radio services reveals that they are engaged in the production and distribution of goods and services, in a large part, as opposed to the consumption of goods and services. Of course, every individual or establishment is a consumer as well as a producer, but it is the latter role that requires mobile communications.

Given that there is a tendency toward fewer and larger establishments in most activities in the space-economy, it is evident that many activities must evaluate their production or distribution patterns. By considering the role of place and time utility as well as evaluating the distance factor, a decision can be reached as to improving their efficiency. As the costs of movement become more prohibitive, the coordination of activities through the use of a mobile communications system becomes more attractive.

It was mentioned earlier than mobile communications generally satisfy safety, efficiency and convenience needs. Irregardless of the type or need which is satisfied, the use of mobile radio services, from the viewpoint of rationality, is predicated on the fact that the benefits, be they social, economic or psychological, justify the costs. This justification is most easily measured when economic benefits and costs are compared. In general, experience demonstrates that three radio-equipped vehicles can do the work of four vehicles without radios. Translated into a benefit/cost ratio the benefits which can be realized are in the neighbourhood of 8 to 1 (Cohn, 1973). This ratio applies to those establishment who can realize maximum savings.

Some types of goods and services, through timely and economical provision of their product, reap greater benefits via fast and efficient radio communications. These establishments, whether they are engaged in the delivery of fuel or ready-mix concrete, or maintenance and repair services, can eliminate a substantial amount of the intrinsic high cost associated with their service. This timely and economical delivery is of direct benefit to the public.

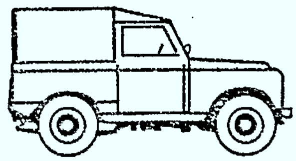
Benefits can not always be measured in dollar terms. Consider the social benefits which accrue from prompt medical assistance. Consider the psychological benefits of knowing you are able to call for assistance and the social benefits of being able to communicate while in the isolation of your vehicle. There are no doubt many instances where economic benefits did not entirely determine the decision to acquire a mobile radio but the decision was swayed by non-economic factors.

It is possible to separate the needs of those mobile radio users who are engaged in wholesale or retail services from those engaged in primary production. The direction and control of personnel and equipment by primary producers (forestry, mining, agriculture, etc.) involves a large amount of movement generated by the separation of work areas, as well as the separation of work areas from the management function. The need for interaction in many instances can be solved by the flow of information rather than human movement. Conventional communications (telephone) can not meet this need in that many operations are site selective and/or seasonal. Thus in any one time period the pattern of interaction may be from point A to point B, but is from C to point B as the work area shifts in the next time period. On the other hand, the supply of services to producers and consumers is in response to an established demand. When mobile communications are employed to satisfy this demand, the intention is to coordinate mobility.

It was stated previously that in the classic mobile communications situation, three vehicles can take the place of four. Consider the typical farming organization which is characterized by special-purpose vehicles (combines, swathers, tractors) and special-purpose implements (seed drills, cultivators, balers, etc.). In a typical growing season, complete with the uncertainties of the weather, there is a sequence of activities which combines various vehicles and implements. Seeding in the spring and fall harvest are the critical work periods requiring maximum effort in minimum time. Maximum effort is based upon machinery in good repair being utilized intensively when the conditions are right. A mobile communications system operating in this environment serves to coordinate a fixed number of workers (often a farmer, his wife and seasonal help) efficiently and to minimize breakdown delays. Every farmer has a story about the thousands of dollars lost when seeding or harvesting is delayed by bad weather.

It is a foregone conclusion that certain activities are better suited to utilizing mobile radios. But considering that the movement component is becoming increasingly important to more and more activities and given the fact that there are more alternative mobile communications systems available, mobile radio possibilities are magnified. The days of mobile radios for taxi drivers and truckers only is gone. While the benefits of this communications mode are becoming more visible to greater numbers of people, the number who adopt a system will be influenced by economic and social requirements. As the barriers become less stringent, the benefits are more accessible.

The Study Area



4. INTRODUCTION TO THE PEOPLE AND RESOURCES OF THE CENTRAL REGION

Such a detailed topical study as is a study of rural mobile radio communications must outline the social, economic and geographic context within which it will be placed. Such an outline follows and will attempt to portray the geographical area under consideration with respect to differences from the total Canadian environment as well as internal variations in the parameters.

4.1 Inhabited and Uninhabited Areas

The term "ecumene" refers to land upon which man has made his permanent home and to all occupied work areas which are utilized for agricultural or any other economic purpose (Gajda, 1960). The most elementary dichotomy of the occupation of Canada's enormous area is to partition it into inhabited and uninhabited areas. The inhabited area or ecumene represents a relatively small strip along the U.S. border while the northern areas are sparsely inhabited or uninhabited. Even this very generalized view is an improvement over a concept of average population density which includes large empty areas in the calculation. Canada's area of 3,549,960 square miles contained an estimated population of 22,446,000 in 1974, according to Canada 1976, the Statistics Canada handbook. This gives a density of 6.3 persons per square mile which increases to 10.7 persons per square mile when the sparsely populated areas of the Yukon and Northwest Territories are excluded. But the real population density is much greater for large empty areas are still included.

Table 1 provides a more detailed picture with respect to the provinces and the territories. The ecumene, for the most part, is composed of a southern strip land which coincides with the agricultural areas and the dense populous zones. The northern ecumene has a different characteristic as no appreciable

TABLE 2

AREA OF ECUMENE AND REAL POPULATION DENSITY

Province	Land Area in sq. miles	Ecumene* in sq. miles	%	Pop.** '000	Density of Population: p. sq. m. of total area	Density of Population: p. sq. m. of ecumene
Newfoundland	143,045	9,360	6.5	543	3.7	58.0
P.E.I.	2,184	2,184	100.0	117	53.6	53.6
Nova Scotia	20,743	10,320	49.7	813	39.2	78.7
New Brunswick	27,473	16,835	61.3	662	24.1	39.3
Quebec	523,860	60,900	11.6	6134	11.7	100.7
Ontario	333,835	65,507	19.6	8094	24.2	123.5
Manitoba	211,755	36,739	17.3	1011	4.7	27.5
Saskatchewan	220,182	104,610	47.5	907	4.1	8.6
Alberta	248,800	74,722	30.0	1914	7.7	25.6
British Columbia	359,279	31,600	14.4	2395	6.6	75.7
Canada, Excl of Territories	2,091,176	432,777	20.7	22,389	10.7	51.7
Yukon Territory	205,346	1,979	0.9	57	.03	9.3
Northwest Territory	1,253,438	4,144	0.3			
Canada	3,549,960	438,900	12.4	22,446	6.3	51.1

* Source: Gajda, R.T. (1960) "The Canadian Ecumeme - Inhabited and Uninhabited Areas, GEOGRAPHICAL BULLITION, No. 15.

** Canada: 1976
Statistics Canada

amount of land use is connected with agriculture. Generally speaking, the the sparsely settled north begins where continuous agriculture and settlement cease.

With respect to the Prairie Provinces, Table 1 shows indirectly that while they combine to form 19.1% of the total land area of Canada, they represent 49.2% of the total ecumene. This is illustrated more graphically by figure 2. Within this continuously settled area, both the pattern of settlement and of the economy are firmly established. The northern limits of continuous settlement are constrained physiographically by the Canadian Shield in Manitoba, while in Alberta and Saskatchewan, climate is the limiting factor as indicated by immature soils and drainage problems.

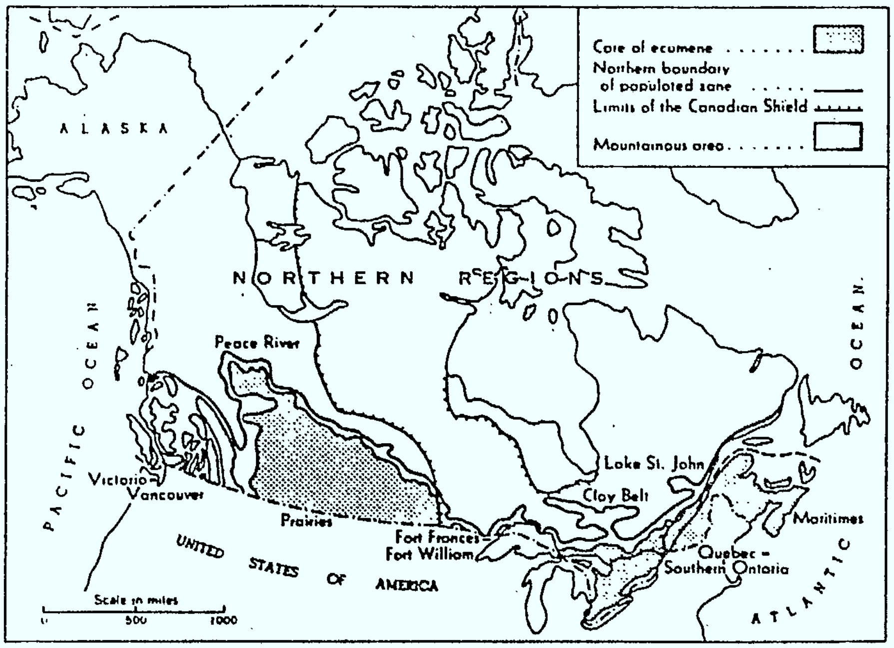
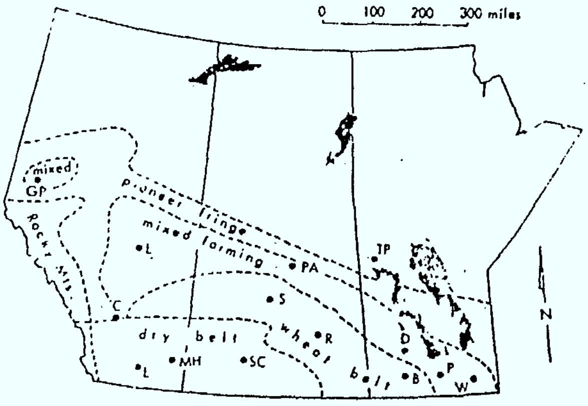


Figure 2. General map of Canada showing the core of the ecumene, and the boundary delineating the populated zone of the country.

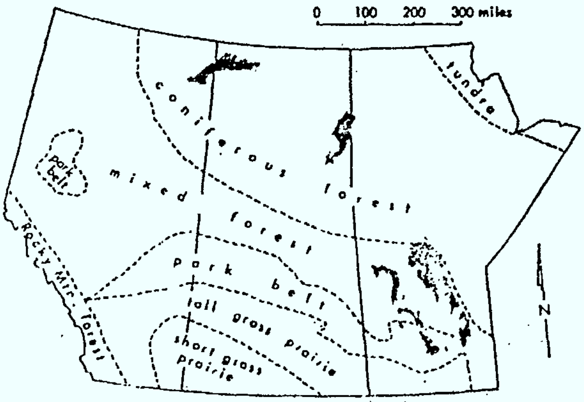
Source: adapted from Gajda, R.T. (1960). "The Canadian Ecumene - Inhabited and Uninhabited Areas", Geographical Bulletin, No. 15 and Canada 1976, Statistics Canada.

Figure 3



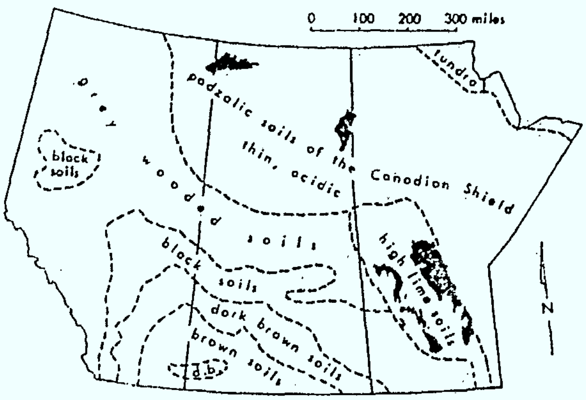
Agricultural regions of the Prairies.

Figure 3a.



Vegetation belts of the Prairie Provinces

Figure 3b.



Soil zones of the Prairie Provinces

Figure 3c.

Source: Tomkins, George S. and Hills, Theo L., (1966) Canada: A Regional Geography.

On the basis of population distribution, settlement types and resource complexes it is possible to delineate different zones of ecumene. Figure 4 shows the boundaries of the three zones which are evident in the Central Region. Zone I is the densely populated southern part and is land utilized for agriculture. Most of the good agricultural land within this zone has already been taken up and any changes will occur slowly in response to economic conditions.

Zone II is semi-populated with the settlement pattern either following transportation routes or is found in small patches. Agriculture in this zone is either neglible or non-existent. The two most important areas in this zone are the mining fields in Northern Manitoba and the oil and gas fields in Northern Alberta. Of interest is the penetration of the railway into the port of Churchill and of the Mackenzie Highway to Hay River. Zone III is the sparsely populated area which has two sub-zones - the more settled and better developed western area and the central and eastern area mostly inhabited by Eskimos.

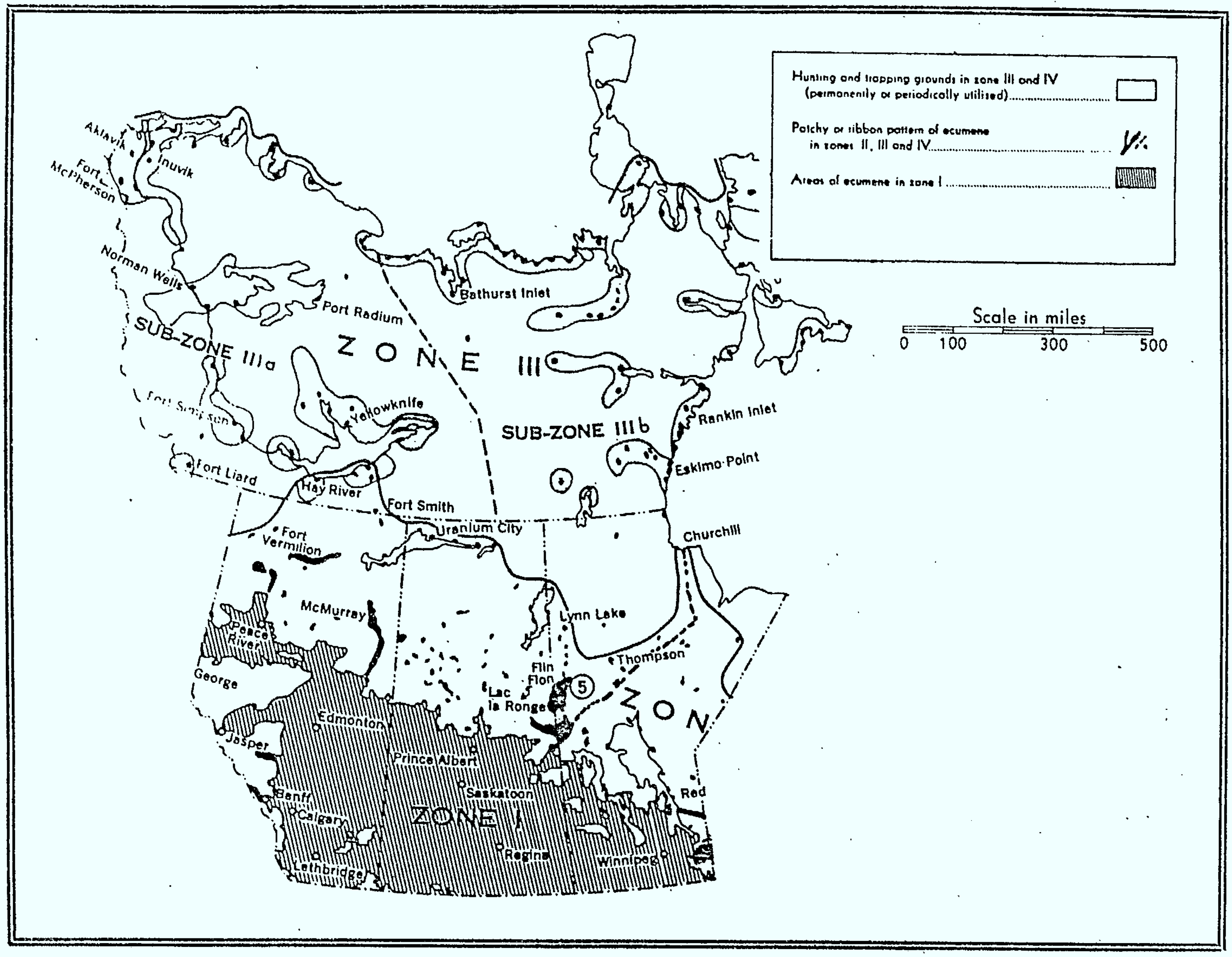


Figure 4. Major Zones of Ecumene Within the Central Region

Source: Adapted from Gajda, R.T. (1960). "The Canadian Ecumene - Inhabited and Uninhabited Areas", Geographical Bulletin No. 15 and Canada 1976, Statistics Canada.

The patches of land which are utilized are occupied by groups of people whose livelihood depends upon mining, lumbering, hunting, trapping, fishing, scientific research and defence. The approximately 200 settlements reflect these activities.

4.2 Population Distribution

The conventional method to study the distribution of population within an area is to dichotomize the population into rural and urban segments. The rural portion is further reduced by classifying it as agricultural or non-agricultural (farm and non-farm). Accurate operationalization of rural and urban concepts is made extremely difficult by their complexity. (Tremblay, 1966) The index that is most universally employed to distinguish between the rural and the urban is that of population density. Of course a measure such as this cannot account for the social, psychological and cultural attributes of each type. The case that is made in favour of this index is based upon the proposition that the differential orientation of individuals, and the institutional patterns which reflect that difference, can be operationally guided by population densities.

> Where the population of a locality is relatively sparse, there exists a greater likelihood that individuals will be oriented primarily to natural conditions and their activities will be governed to a large extent by the influence of these conditions. The scarcity of other individuals and groups precludes their extensive influence on social behavior. Conversely, this impact has a much greater probability of being felt where the population density is higher. In this latter instance, the relative impact of natural forces will be less than in situations comprising fewer people. (Tremblay, 1966, p. 7)

The adequacy of the population density index can be seriously questioned, but it serves as an indirect indicator of rural and urban life. The rural classification is further enhanced by its division into farm and non-farm components. Yet, the actual operation of classifying urban and rural, rural non-farm and rural farm, has its downfalls. The following excerpt from the 1971 Canada Census illustrates some of these downfalls.

The following are definitions of urban and rural:

Urban: includes the population living in: (1) incorporated cities, towns and villages with a population of 1000 or over; (2) unincorporated places of 1000 or over having a population density of at least 1000/sq mile; (3) the built-up fringes of (1) and (2) having a minimum population of 1000 and a density of at least 1000/sq mile.

Rural: includes all the remaining population.

Urban size groups: municipalities classed as urban under (1) and (2) above are classified by size group according to their population. However, all municipalities (or parts) lying within the urbanized core of census metropolitan areas or other census agglomerations are allocated to the size group of the whole urbanized core.

Rural farm population: includes the population living in dwellings situated on farms in rural areas. A farm, for the census purposes, is an agricultural holding of one or more acres with sales of agricultural products of $50 or more in the previous year. All persons living on such holdings in rural areas are classed as "rural farm" regardless of their occupation. Thus, the population living on "census-farms" would include some persons not connected with farming operations and who derive their income from non-agricultural pursuits. Conversely, it would exclude those farm operators and their families who do not live on their farm holdings (eg. in a neighbouring town or village).

Thus, we are left with a classification based upon an arbitrary population threshold of 1000 persons for urban places with everything else being rural. What ends up as rural is a variety of farmers, full-time and part-time, resident and non-resident, plus retired folks, commuters and an assortment of businessmen providing needed services to them. Throughout this study, the dichotomization of the population into urban and rural will not be closely followed and more attention will be given to defining the parameters of the population under study on the basis of such criteria as settlement size and employment structure.

Figure 5 illustrates the urban, non-farm and rural farm populations for Canada and the provinces, as of 1971. As can be seen, the rural element is above the Canadian average in all three Prairie Provinces due, in large part, to the high levels of rural farm population.

These same elements, when portrayed on the basis of census division for these same provinces, as in Figure 6, show that the urban-rural mix within the area is highly influenced by the concentration of the urban population in a few major centres. The continuation of present growth trends, as is expected to be the case, will result in even higher concentrations of people in the large urban centres of the country. The levels of population outside of these large urban centres will not experience such a dramatic change. Figure 7a is an isodemographic representation of the population of Canada in 1971. The unit of measurement for the map is *people* rather than space or distance. This type of map attempts to portray population reality within recognizable geographical units. Figure 7b displays the Canadian population as it is expected to be in 2001. Because the same unit of 100,000 persons per square is used on both maps, the growth of the total population and urban Canada especially is very noticable.

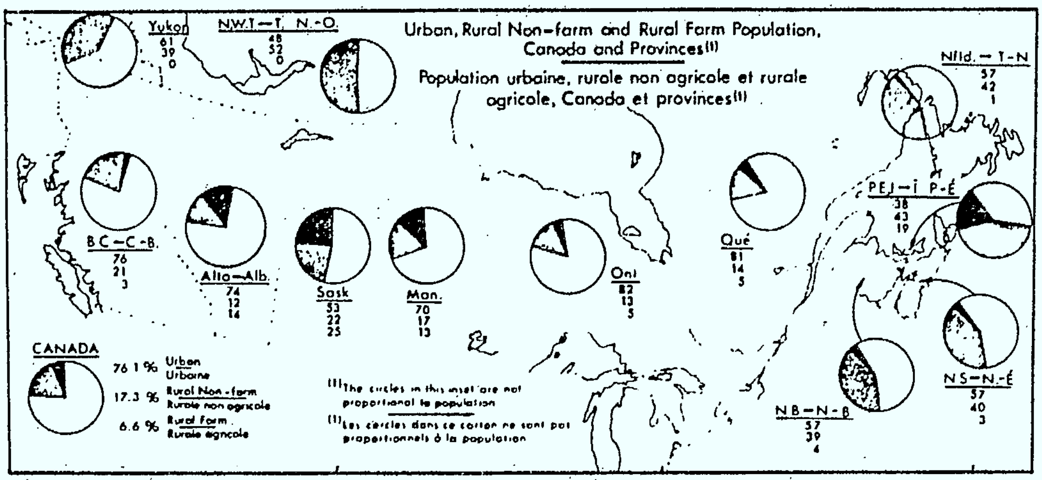


Figure 5 Source: 1971 Canada Census

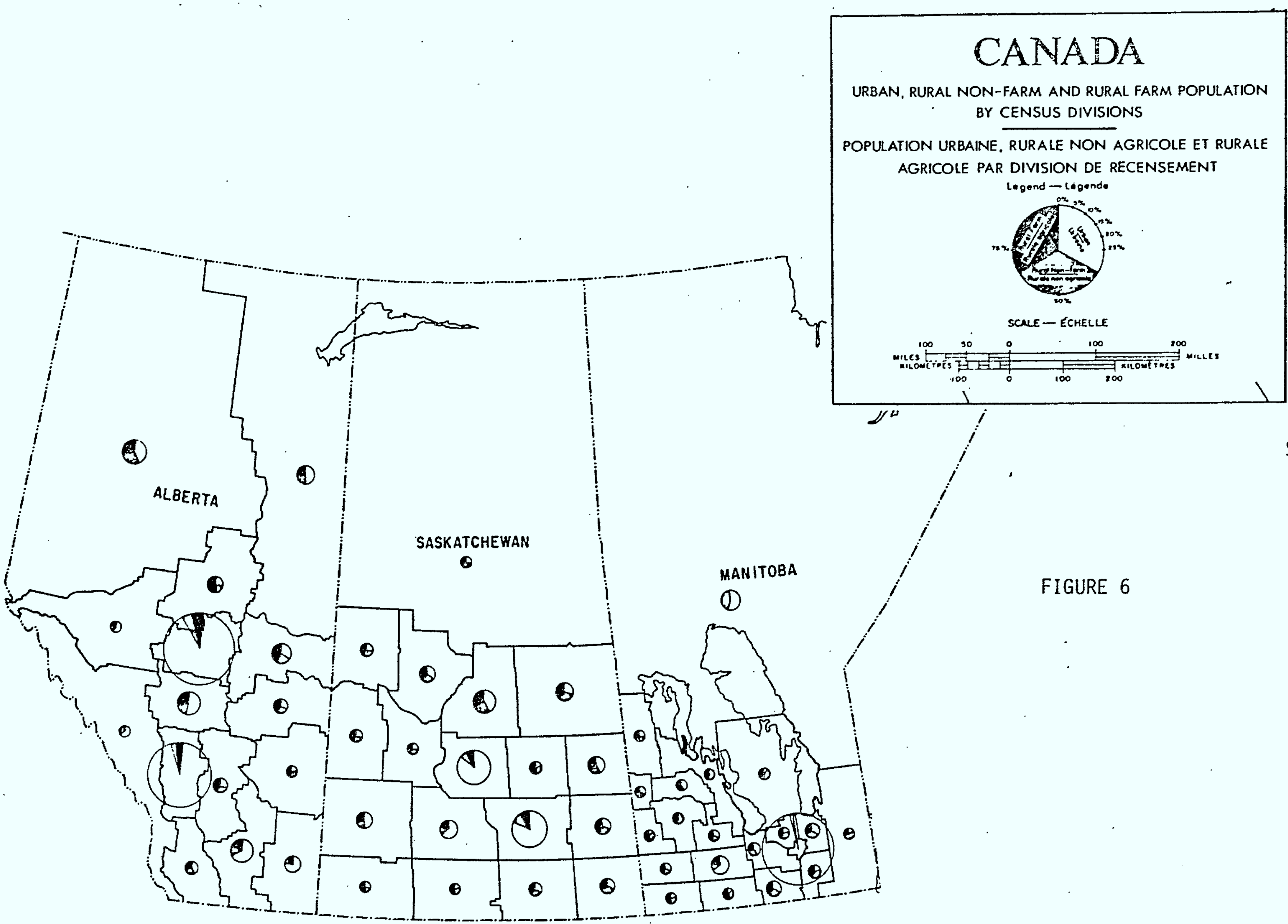


FIGURE 6

Source: 1971 Canada Census

Figure 7

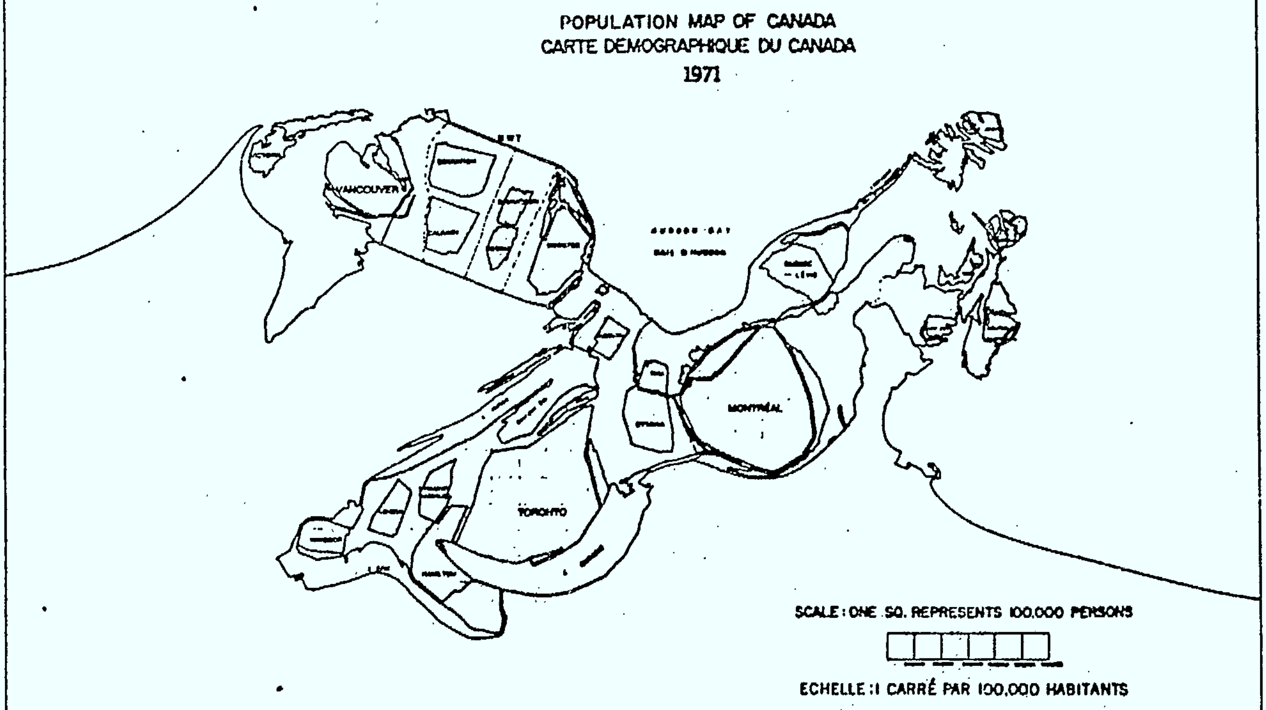


Figure 7a. Isodemographic Population Map of Canadian Population, 1971

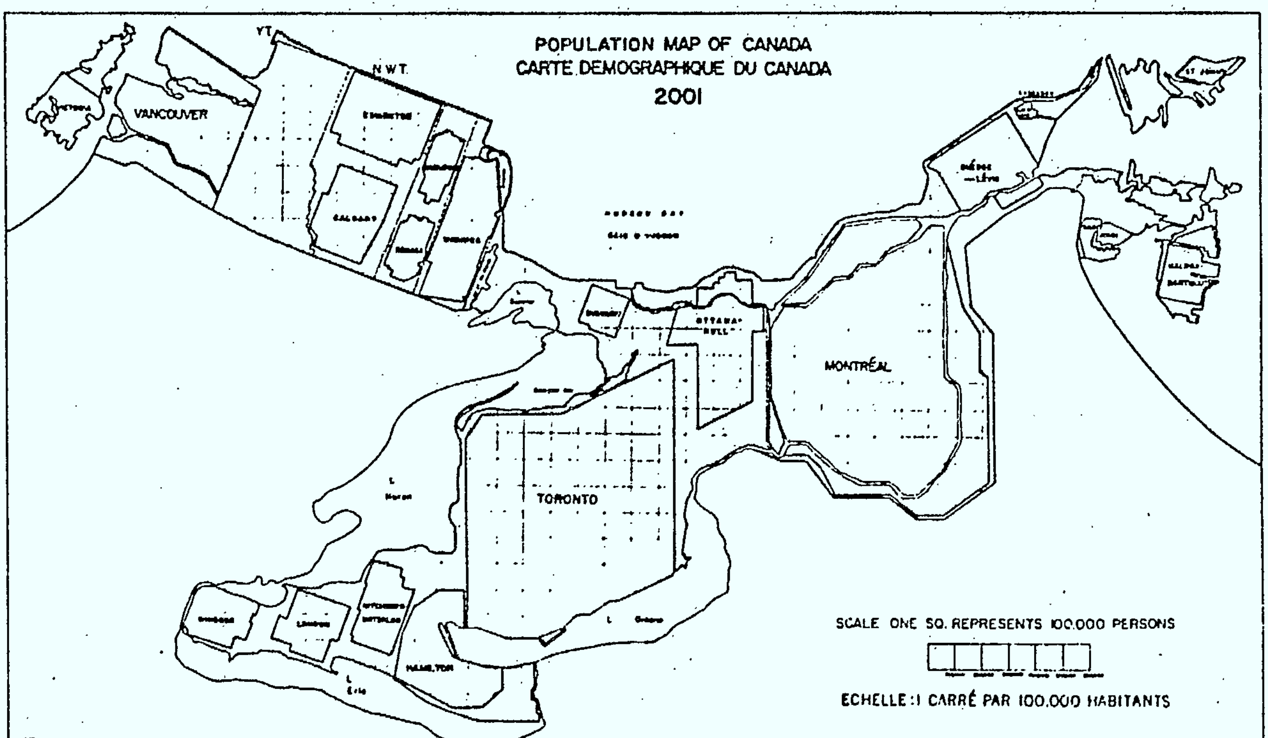


Figure 7b. Isodemographic Population Map of Canadian Population, 2001

Source: Canadian Council on Rural Development (1973)
<u>Committment to Rural Canada</u>

While the rural areas of the country are not expected to experience population changes in the order of magnitude that is expected in urban Canada, they will experience change nevertheless. To continue the comparison, while urban Canada is coping with growth problems, rural Canada will be faced with socio-economic adjustments largely shaped by external forces - technology, transportation, external market demands, to name a few.

4.3 Open Country Population Densities

The real population densities of Alberta, Saskatchewan and Manitoba have been previously represented to be 7.7, 4.1 and 4.7 persons per square mile respectively. The density of the population which occupies and utilizes the land is somewhat less, however. Figures 8 to 10 show the density of the population which resides outside of the incorporated places of the prairies. As the densities are mapped on the basis of census subdivisions, a more microscopic view is obtained.

The variability of densities within the Prairie Provinces finds its explanation largely from the variability in the natural environment. Figure 3 previously demonstrated the rough correlation between soils, vegetation and the type of agricultural land use. The most densely populated area correlates with the black soil zone which supports a more diversified agricultural unit than does the brown soils areas. In these latter areas, which are the prairie proper, a more extensive use of the land is employed resulting in larger agricultural units and therefore a less dense population.

DENSITY OF POPULATION RESIDING OUTSIDE OF INCORPORATED PLACES, 1971, BY CENSUS SUBDIVISIONS

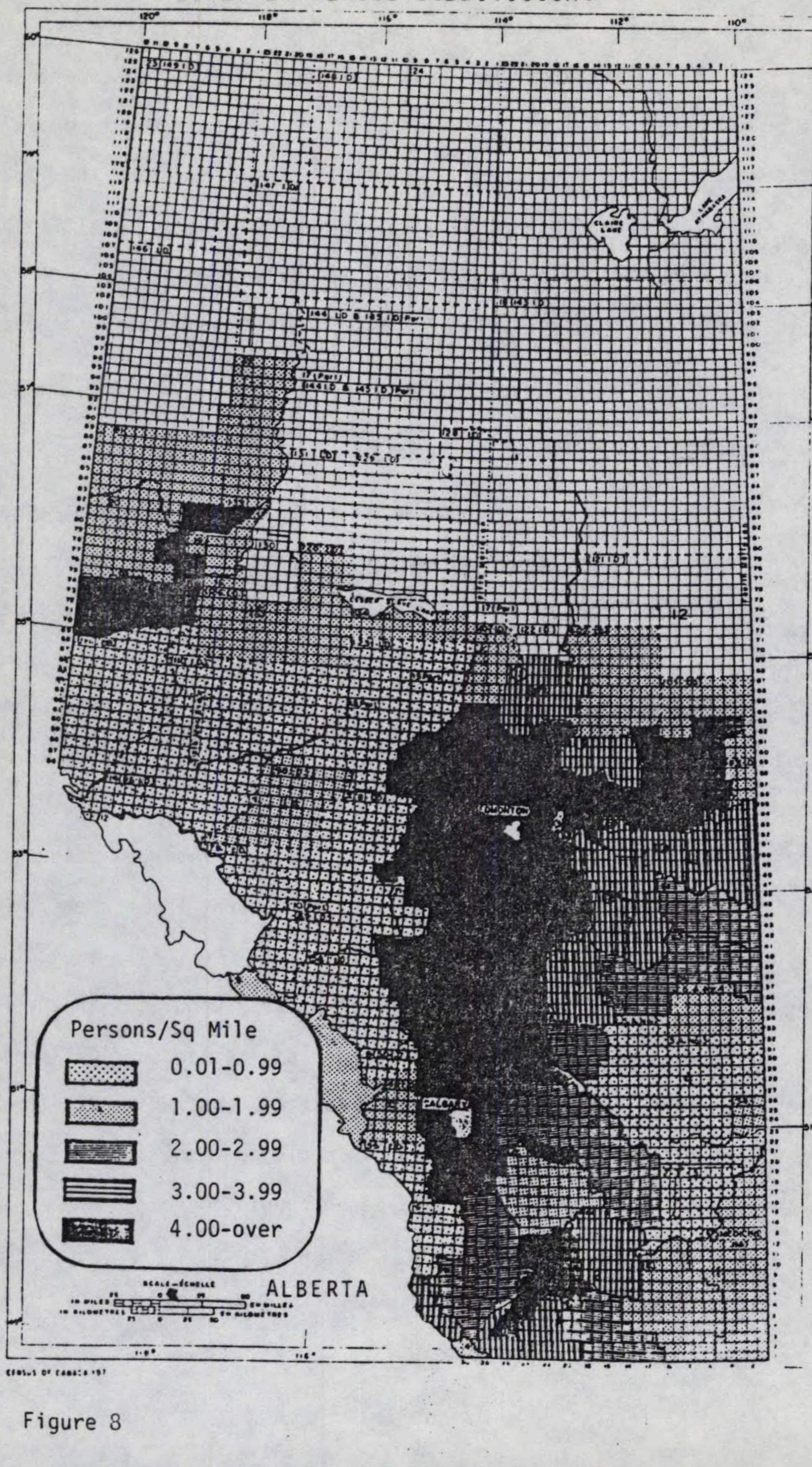


Figure 8

DENSITY OF POPULATION RESIDING OUTSIDE OF INCORPORATED PLACES, 1971, BY CENSUS SUBDIVISIONS

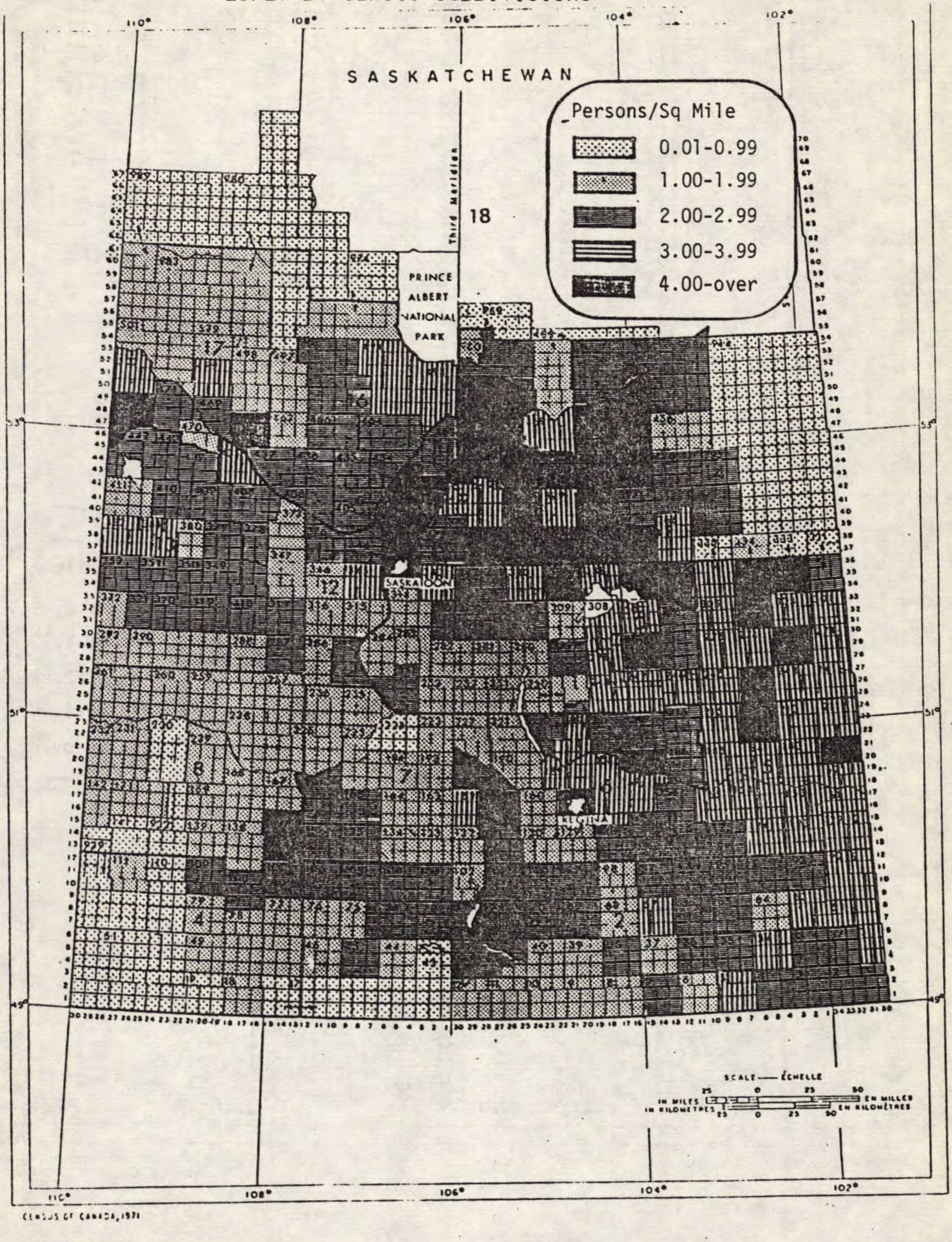


Figure 9

DENSITY OF POPULATION RESIDING OUTSIDE OF INCORPORATED PLACES, 1971, BY CENSUS SUBDIVISIONS

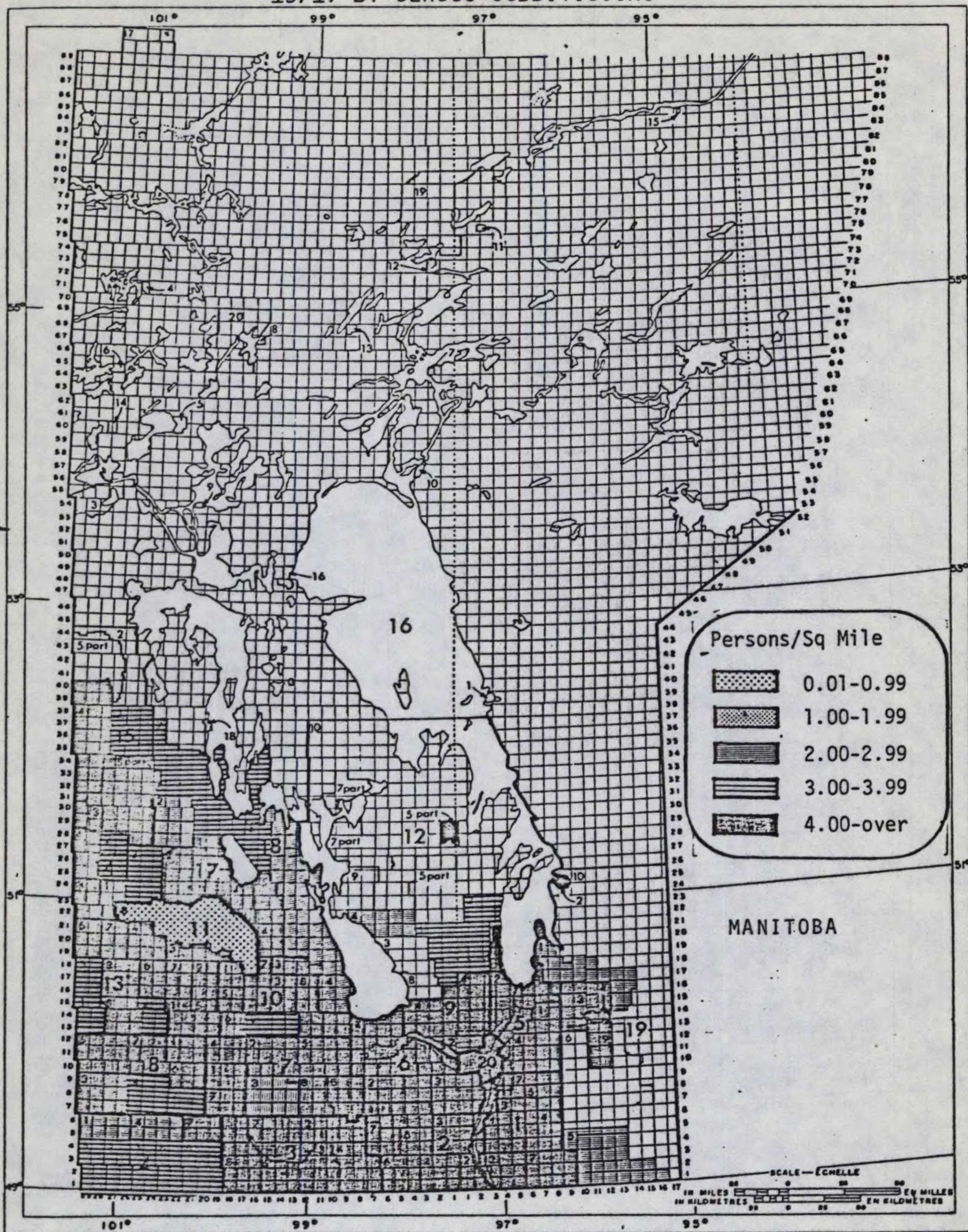


Figure 10

Of course, other factors also enter into the picture. The densities in Manitoba are somewhat overstated because of a larger number of unincorporated places. There is also a tendency for densities to be higher on the periphery of the large urban centres.

4.4 The Prairie Community System

While most of the settled areas of the Prairie Provinces are in the possession of the agricultural population, the many communities which dot the landscape are an integral part of the rural environment. The relationship between the agricultural population and the communities is one of mutual interdependence. A survey of Canadian towns and villages in agricultural areas (Laskin, 1966) asked the communities how they would be affected if the agricultural area around them ceased to exist. Out of the 140 communities in the Prairie Provinces which responded to the survey, seven said they would not be affected and six said they would be partly affected. Of the 127 who said they would be affected, three would be moderately affected, 72 would be seriously affected and 52 would cease to exist.

The present system of communities in the prairies has been shaped over the years by many forces. The settlement period saw a constant succession of centres built along the railroad lines. These units were the focus of virtually all the face-to-face contacts and day-to-day experiences of the farm and village people (Zimmerman and Moneo, 1970). After the depression of the thirties, the dominance of the railroad was lessened with the building of good all-weather roads and the utilization of automobile and truck transport. The building of the road network in conjunction with the existing rail system served to promote the growth of widely spaced centres. These division of labour type communities, as opposed to the settlement type, have become the farm cities of today.

These farm cities are to be distinguished from the prairie cities (Winnipeg, Brandon, Regina, Moose Jaw, Saskatoon, Prince Albert, Medicine Hat, Lethbridge, Calgary, Red Deer and Edmonton) which possess wholesaling, manufacturing and government administration functions to varying degrees. The farm cities are economically dependent of all but the prairie cities. They carry on an economic consumer type relationship with the surrounding area.

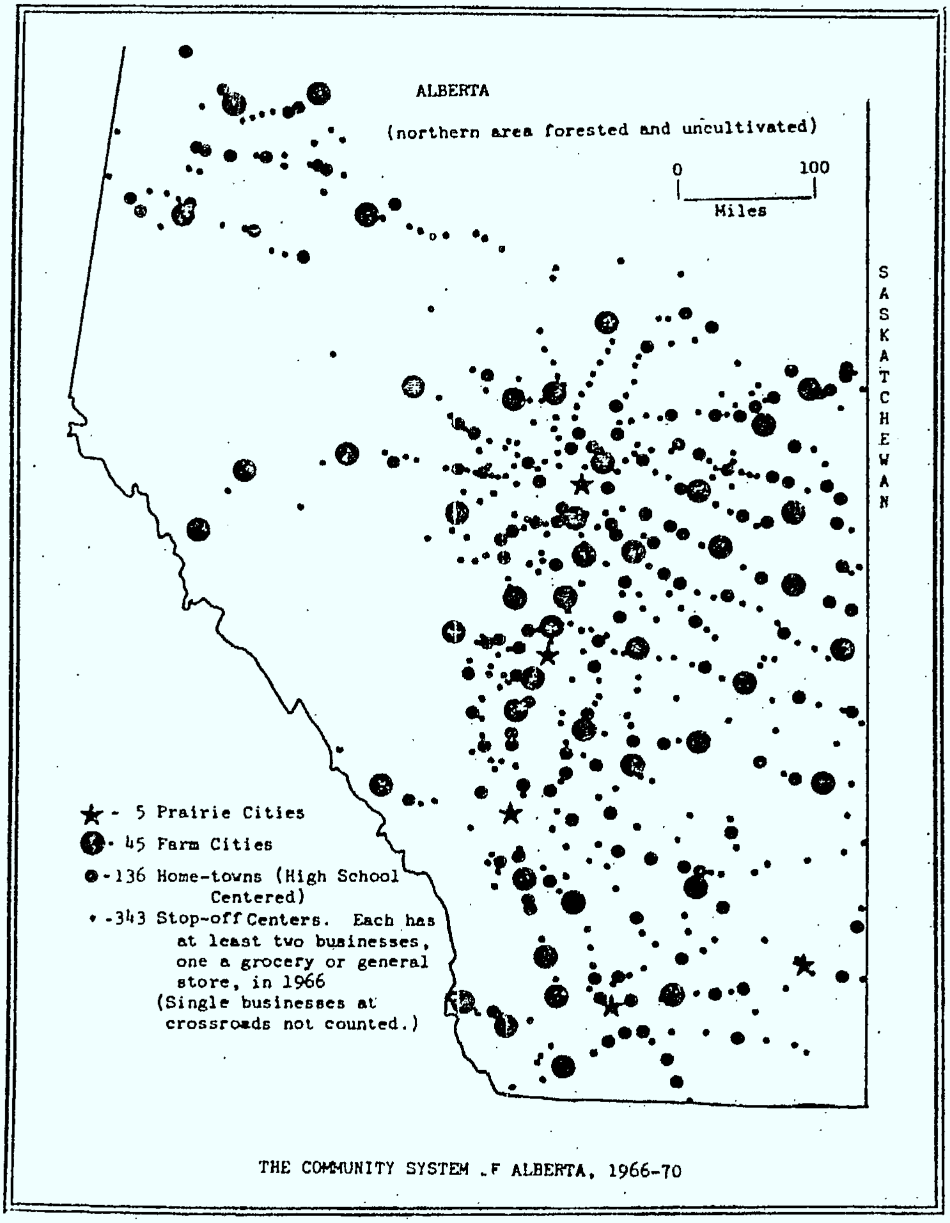
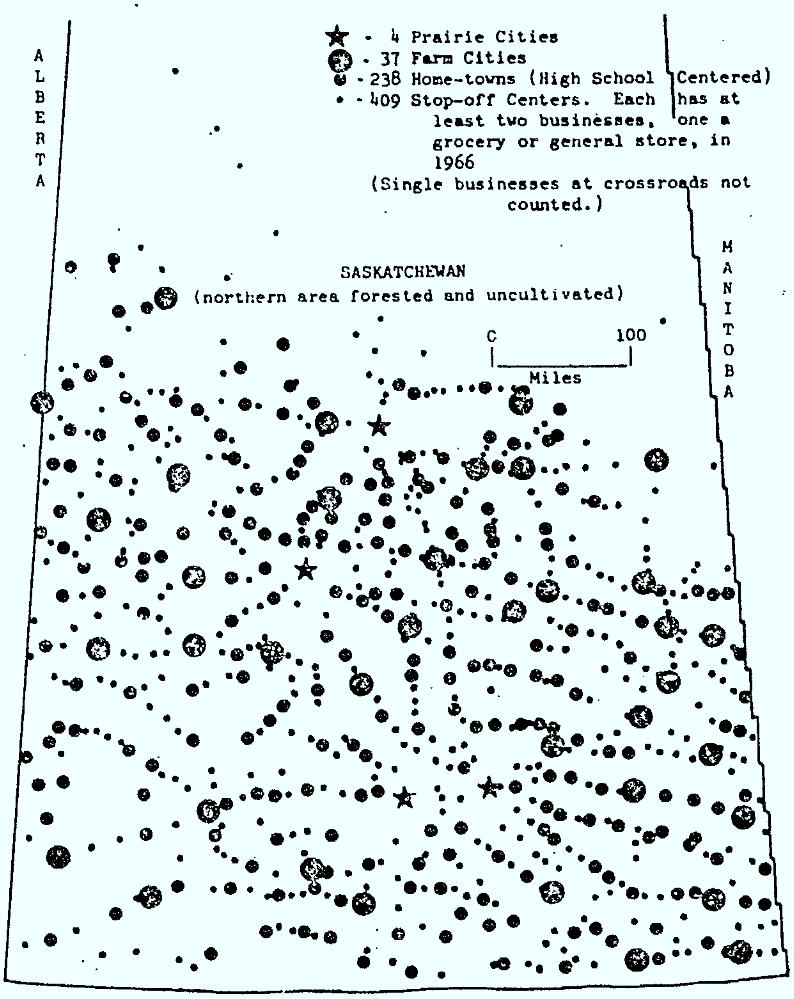


Figure 11

Adapted from Zimmerman C., and Moneo, G., (1970), <u>The Prairie Community System</u>.

The smaller settlement type communities have, over the years, become "home towns" and "stop-off" centres. The average home town has between 400 to 600 residents with about 20 businesses owned mostly by small operators. The high school system is an integral part of the home town. Stop-off centres have fewer residents and about a half dozen basic business establishments. The basic difference between the farm cities as opposed to the home towns and stop-off centres is that the first represents *commerce*,

Figure 12



THE COMMUNITY SYSTEM OF SASKATCHEWAN, 1966-70

Adapted from Zimmerman C., and Moneo, G., (1970),, The Prairie Community System.

while the latter represent *living*. Of the two, commerce is much more fragile.

Early theorists predicted the eventual disappearance of the small rural localistic trade centres to be replaced by the almost total concentration of the people and their social interests around a few larger towns. The persistence of the small centres show that they perform a necessary role. They represent the focus of most of the social and recreational life of the people.

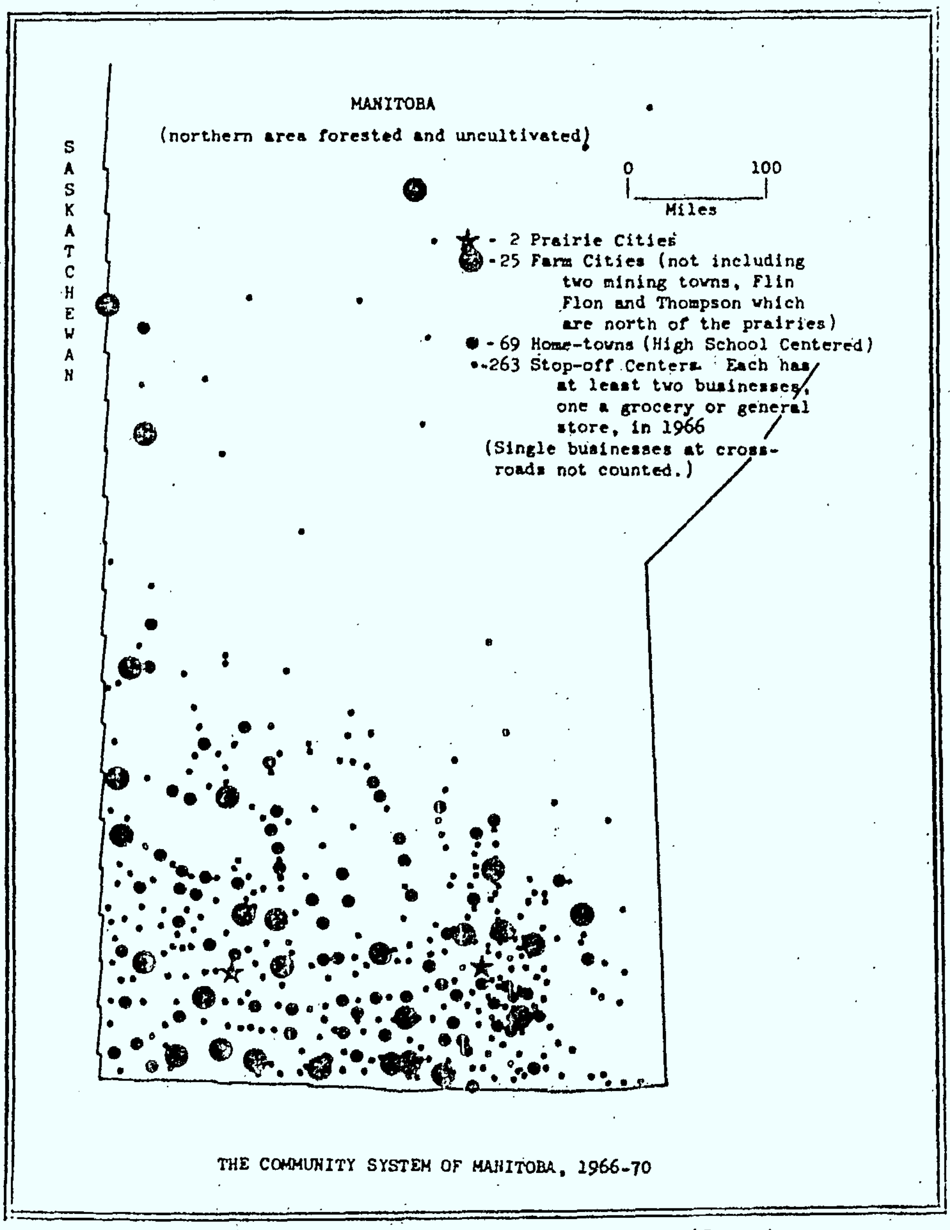


Figure 13

Adapted from Zimmerman, C., and Moneo, G., (1970), The Prairie Community System.

The distribution of the different types of communities in the Prairie Provinces (Figures 11, 12, and 13) illustrates a pyramidal form of organization with 11 prairie cities, 107 farm cities, 443 home towns and 1015 stop-off centres. From a spatial viewpoint, the organization is the same everywhere with minor variations due to historical and natural factors. It has been hypothesized by Zimmerman and Moneo (1970) that there exists a series of farm-city dominated community systems in the prairies. Within the community system there exists symbiotic relationships between different

Figure 14

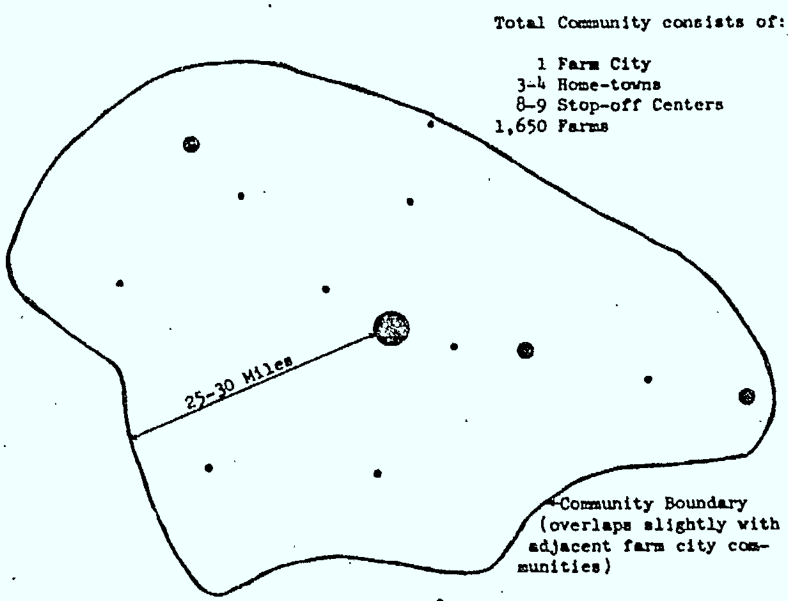


FIGURE 8

REPRESENTATION OF THE TOTAL FARM CITY DOMINATED COMMUNITY SYSTEM, 1970

Average number of persons per community system	15,300
Average number of persons residing in farm city	3,300
Average number of persons residing in the home-towns per community	2,150
Average number of persons residing in the stop-off centers per community	3,700
Average number of persons residing in the open country per community	6,200
Average number of businesses per community system	228
Average number of businesses per farm city	92
Average number of business units in all the home-towns per community	81
Average number of business units in all the stop-off centers per community	55
Area, in square miles, of the total community system (including park lands, Indian Reservations and farms)	2,000-2,800

Adapted from Zimmerman, C., and Moneo, G., (1970), The Prairie Community System.

segments of the population. Figure 14 is their representation of the average community system.

The total community system consists of a farm city, which is at its heart, surrounded by a fiefdom. The relationship between the farm city and the fiefdom is mainly a consumer trading relationship and the town resident knows very little about the fiefdom which he seldom sees. Each system has a radius of 25 to 30 miles with its area being usually irregular. Farm cities tend to arrange themselves along roads of communication and while they may not be far apart, their outlying areas extend laterally from the communications routes for much longer distances.

The major portion of the social, recreational and convenience shopping is carried on in the three or four home towns and the eight or nine stop-off centres within the community system. The home towns are distinguished from the stop-off centres in that they possess some higher order services such as banks and high schools. From the viewpoint of an individual farm, a farmer and his family may do their convenience shopping and some recreational activities in the nearby stop-off centre, but may travel to the home town to take advantage of bank, high school and repair facilities. For their major consumer items - furniture, farm equipment, etc. - they travel to the farm city on occasion. As the range of their activities increase, the social aspect is diminished and the commercial is accentuated.

It is argued that this community system exists as a unit and cannot carry on otherwise. It makes no sense when dismembered. As a system, it reflects the needs and purposes of the society. The future form of this system will likely have a similar structure, but will probably change in its organizational, psychological and social aspects.

4.5 Economic Activities and Employment

The urbanization of Canada and of the Prairie Provinces is a much-documentated trend. In as much as the growth in the prairies is focussed upon its cities, any changes in employment are likely to occur in these urban places as well. Within the system of prairie cities, the domination of Winnipeg has declined with the petroleum-based growth of Edmonton and Calgary. It is expected that economic activities will continue to be polarized around these metropolitan areas.

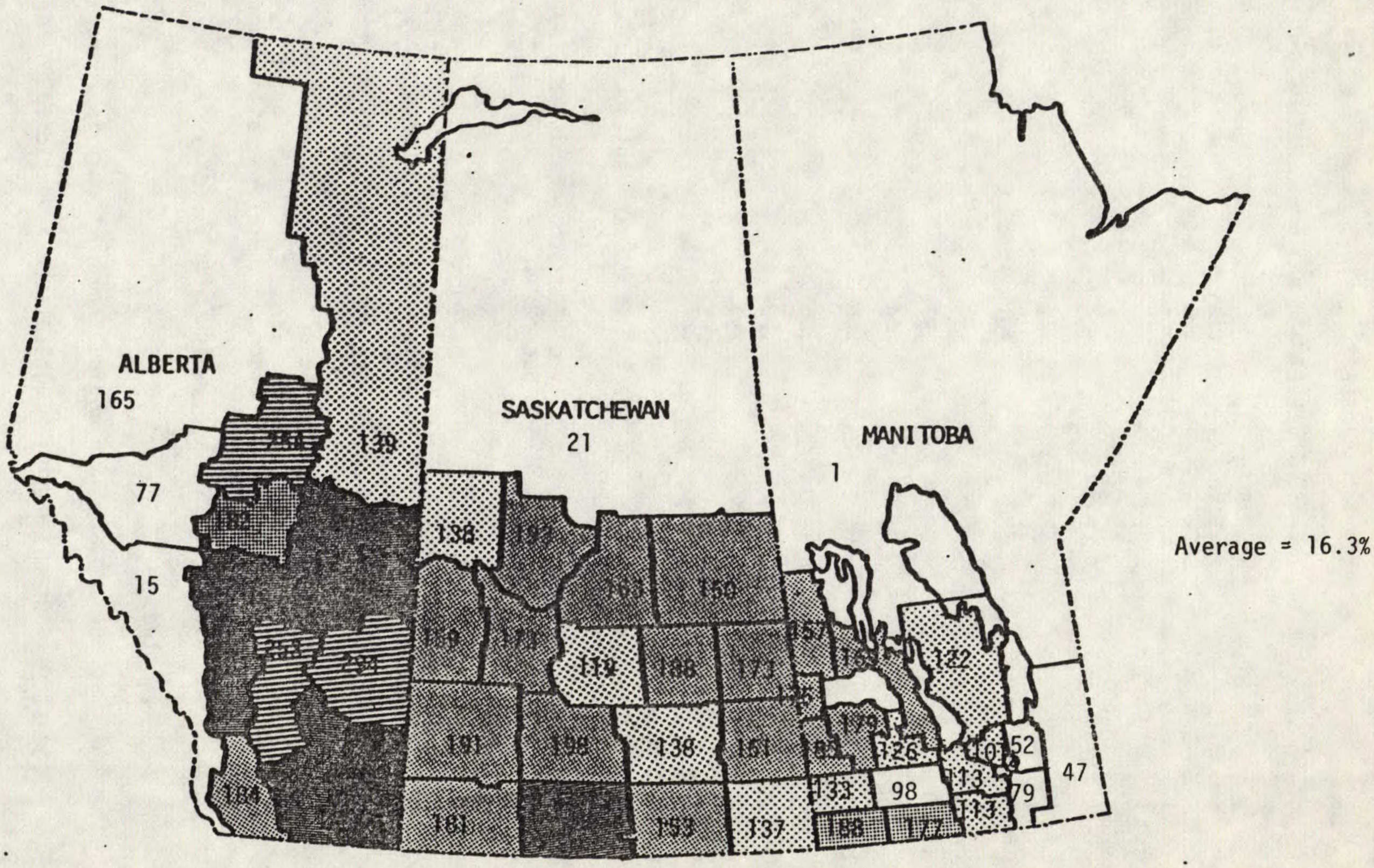
Changes in employment structure which have been experienced up to now are usually accredited to the technological improvements in agriculture which, by reducing the need for agricultural labour, have led to heavy population movements from rural to urban areas. Forecasts of future employment trends point out that the tertiary or service industries will be the major source of growth. But these services are related in large measure to population, and therefore this growth will be predominantly urban based.

It is reasonable to assume that whatever the direction of change in the prairie economy as a whole, the major employers of the rural labour force will continue to be the primary industries. In an effort to display the orientation of the predominantly rural areas of the Prairie Provinces, locational indexes have been computed for selected occupation groups in each census division. A locational index is a ratio of ratios whereby the percentage of the labour force in an area which is employed in a certain occupation is compared to the percentage employed in the larger base area. In this case, the percentage in each census division is compared to the percentage for the three Prairie Provinces. Figures 15 through 26 illustrate the locational indices for 12 major occupation groups. While an index number is displayed for each census division, only those areas with an index exceeding 100 have been shaded. It should be noted that in all cases, the employment breakdown for the census divisions excludes urban places with over 10,000 population in 1971, but that the base percentages include these urban places.

The first in the series of maps depicts the situation in farming, horticulture and animal husbandry. It is immediately apparent that all the areas in the continuously settled area of the region can be characterized as specializing in agriculture as compared to the total employment picture. This is to be expected. In fact, as one continues to examine tne map series, the lack of specialization of most of these study units in other activities is very conspicuous. Of course, the very nature of this analysis dictates that a very high specialization in one dominant activity will necessarily lower the proporation of the work force in other activities. An additional factor which should be remembered when studying the maps is that while the base employment structure includes the prairie cities, the census division employment structure has excluded these same cities. Therefore, in census divisions containing a city, it is not the actual employment structure which is presented, but the non-metropolitan structure. Table 3 provides the average index values for the major occupation groups for the total census divisions, for the 17 cities and for the census divisions excluding the cities.

From the viewpoint of the major urban places, there is a very noticeable lack of specialization in the primary activities of farming, mining and forestry, a moderate specialization in processing, fabricating and

FIGURE 15 LOCATIONAL INDEX OF EMPLOYMENT BY CENSUS DIVISION



FARMING, HORTICULTURE AND ANIMAL HUSBANDRY

TABLE 3

AVERAGE VALUE OF LOCATIONAL INDEX FOR MAJOR OCCUPATION GROUPS

Occupation Group	Census Division Totals	Cities * Only	Census Divisions Excl. Cities
Farming	129	17	155
Mining	141	165 **	144
Forestry	204	49	216
Processing	89	131	78
Fabricating	76	108	66
Machining	64	97	55
Construction	93	105	88
Transport	94	110	88
Material Handling	91	108	88
Management	67	109	55
Sales	79	128	66
Service	88	127	77

* The index values for each of the 17 cities are contained in the Appendices. (Appendix A)

** When the index value for the City of Thompson, Manitoba (2039) is exluded, the average for mining becomes 48.

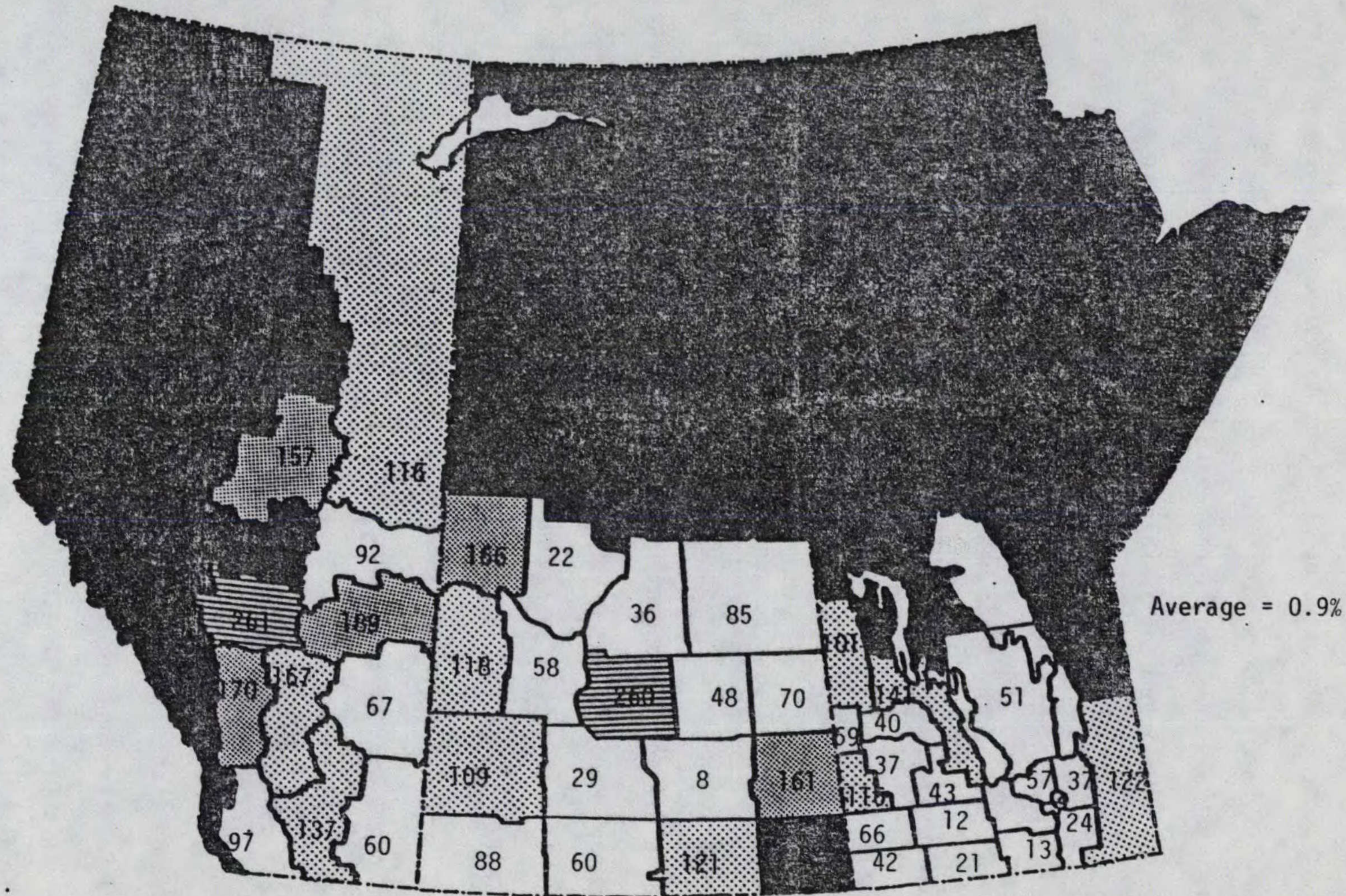
machining, a weak specialization in construction, transportation and materials handling, as well as a moderate specialization in management, sales and service occupations. As these are average values, the nature of the distribution of the values is hidden. Therefore, as each occupation group is discussed, urban places which significantly deviate from the average will be noted.

Returning to the situation in agriculture, not only is there a consistent lack of specialization in agriculture as depicted in Figure 15, there is a consistent lack of it in urban places, although there is a tendency for the index value to be higher for urban places with smaller populations. Mining and quarrying, including oil and gas field operations represents a significantly higher source of employment in the northern reaches of Manitoba and Saskatchewan, as well as western and northern Alberta. As the figures reflect the situation in 1971, the value for northeastern Alberta is very likely understated, considering recent developments in the Athabaska Tar Sands. There are also areas in the southern portions which have above average employment in this primary activity. The high values in southeastern Saskatchewan reflect oil and gas operations, as well as coal and potash mining. The value in central Saskatchewan reflects potash mining around Saskatoon. The western part of Saskatchewan and the shaded portions of Alberta reflect the orientation towards oil and gas operations. Of the urban places, the resource town of Thompson, Manitoba has a very high mining specialization, while Swift Current in southeast Saskatchewan and Red Deer in central Alberta have moderate to high values.

The significance of the petroleum industry as a source of employment should not be underestimated. Barr (1972) quotes an estimate of the effect of this activity. Of the 3,381,000 residents of the Prairie Provinces in 1966, 1,676,000 of them were produced, directly and indirectly, by the petroleum and mining industries. Of this, the petroleum industry accounted for more than a million.

Forestry and logging also show a northern concentration as this activity coincides with the forested areas of the region. The northerly cities of Prince Albert and Grande Prairie show a high specialization in these operations.

FIGURE 16 LOCATIONAL INDEX OF EMPLOYMENT BY CENSUS DIVISIONS



MINING AND QUARRYING,
INCLUDING OIL AND GAS FIELD OPERATIONS

Of the secondary activities of processing, fabricating and machining, processing exhibits the greatest variability for the urban places. The common element in this case seems to be the processing of primary commodities as witnessed by mineral processing in Thompson and pulp and paper in Prince Albert. The areas which show the lowest level of employment in these activities are also the areas which have a lower urban component.

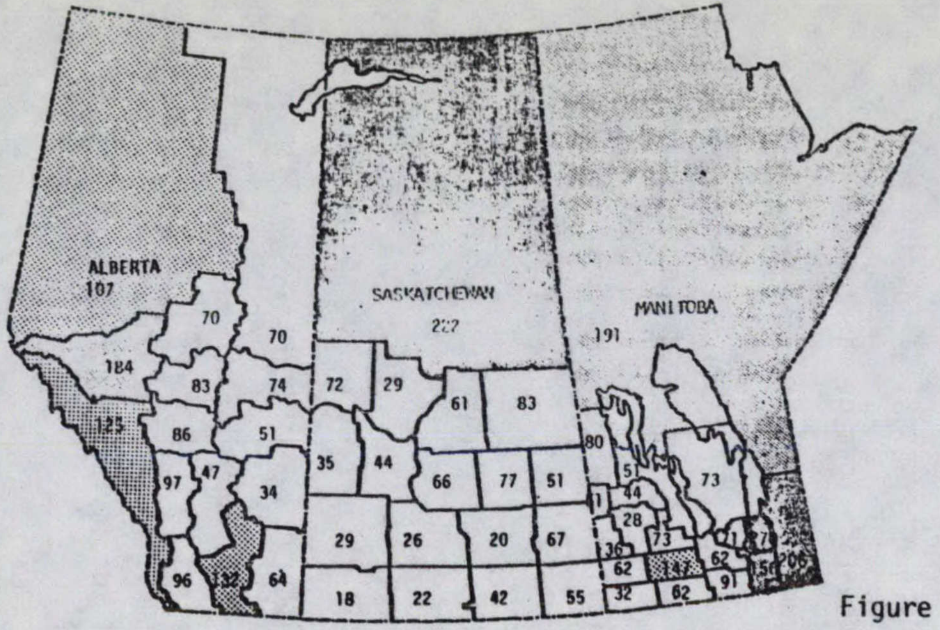
The construction industry shows very little dispersion from the base figure with the range for the index for urban places being from 87 to 131. The areal pattern again indicates a tendency for the index to be lower for areas with a smaller urban population relative to the rural portion. Transportation and materials handling do not exhibit a great deal of variability, although there is some similarity between these activities and the incidence of forestry and mining operations.

The tertiary activities, as portrayed by management, sales, and service occupations, generally demonstrate an orientation towards the large urban places. Urban centres showing a somewhat higher specialization are the governmental administrative centres of Winnipeg and Regina, as well as the city of Calgary, which houses most of the petroleum-based institutions. All urban centres show a positive specialization in sales and service activities with the exception of Thompson. The lack of specialization within the areal units is very conspicuous. Again, the rough correlation with the urbanization is apparent.

The purpose of this section has been to illustrate the preoccupation of areas outside the major urban places with respect to primary activities. The predominance of agriculture within the continuously settled area and the specialization of non-agricultural areas in forestry and mining operations has been demonstrated. The lack of specialization of the agricultural

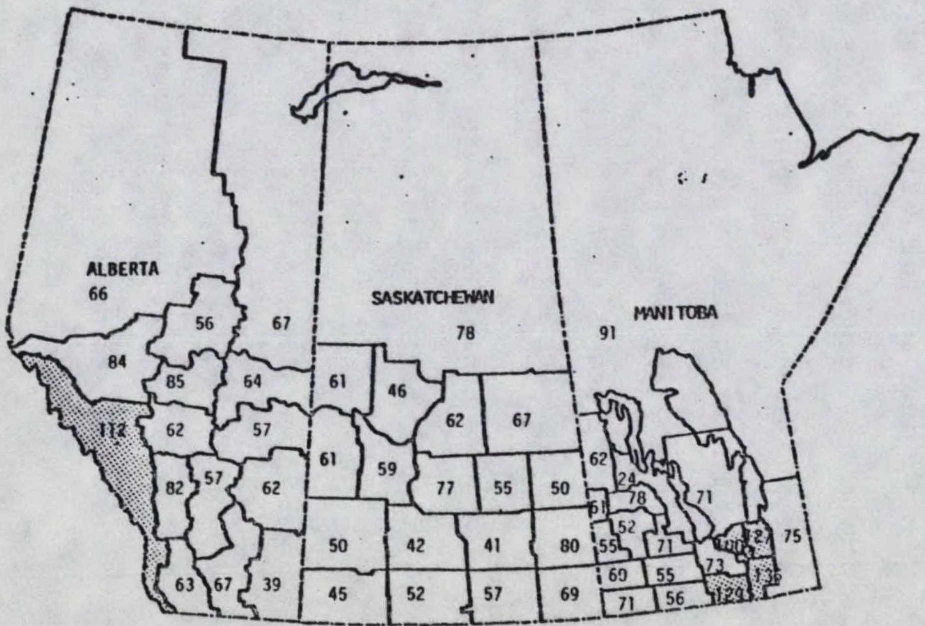
LOCATIONAL INDICES OF EMPLOYMENT
BY CENSUS DIVISIONS

Average	Values
Processing	2.1%
Fabricating	4.9%
Machining	1.6%



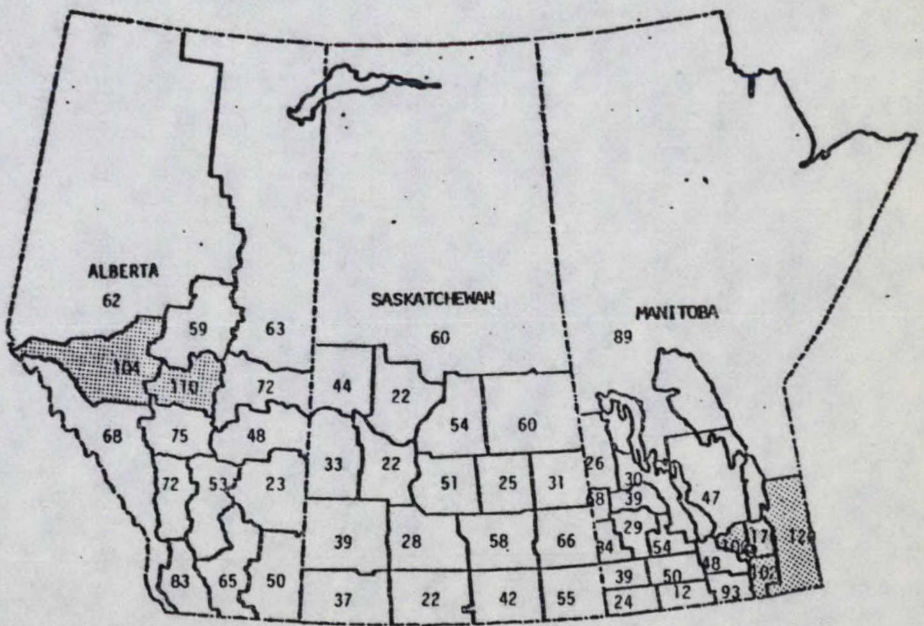
PROCESSING

Figure 18



PRODUCT FABRICATING, ASSEMBLING AND REPAIRING

Figure 19



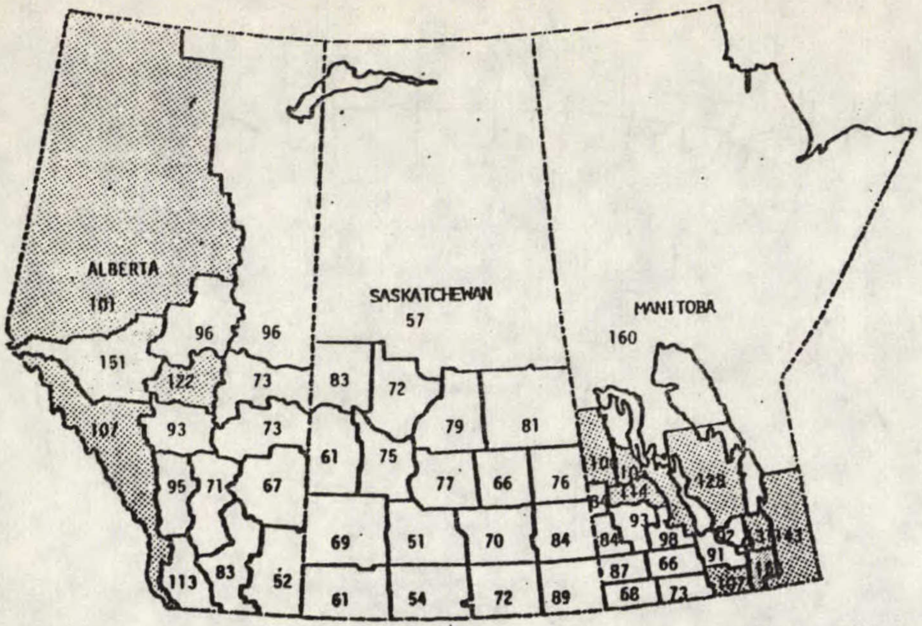
MACHINING

Figure 20

LOCATIONAL INDICES OF EMPLOYMENT BY CENSUS DIVISIONS

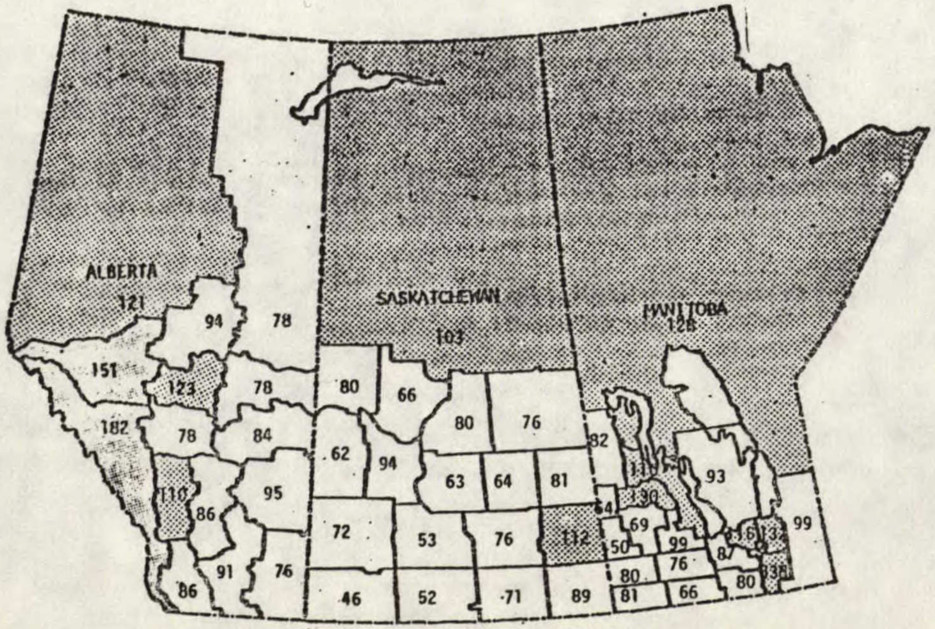
Average Values

Construction	6.7%
Transport	3.7%
Handling	2.1%



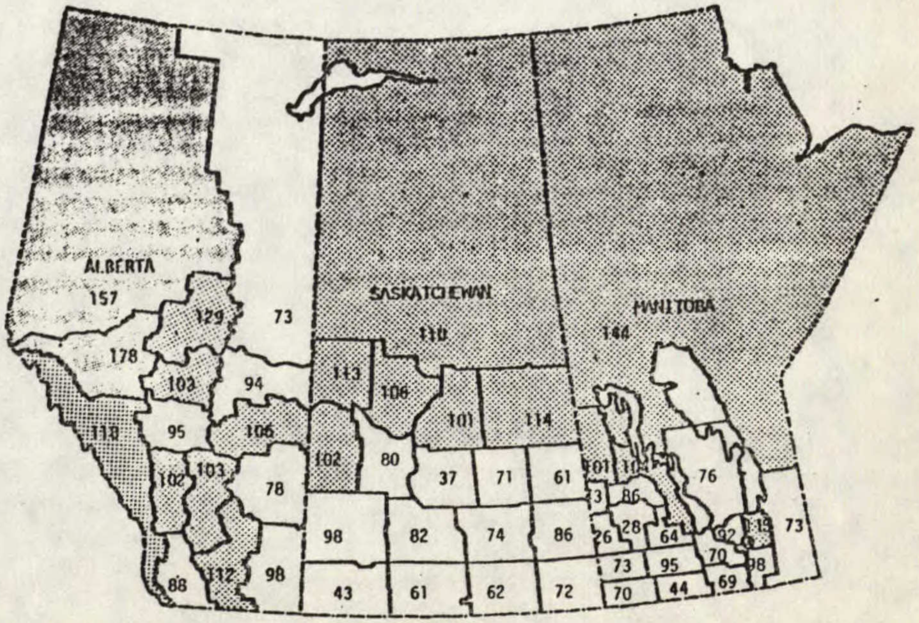
CONSTRUCTION TRADES

Figure 21



TRANSPORT EQUIPMENT OPERATING

Figure 22



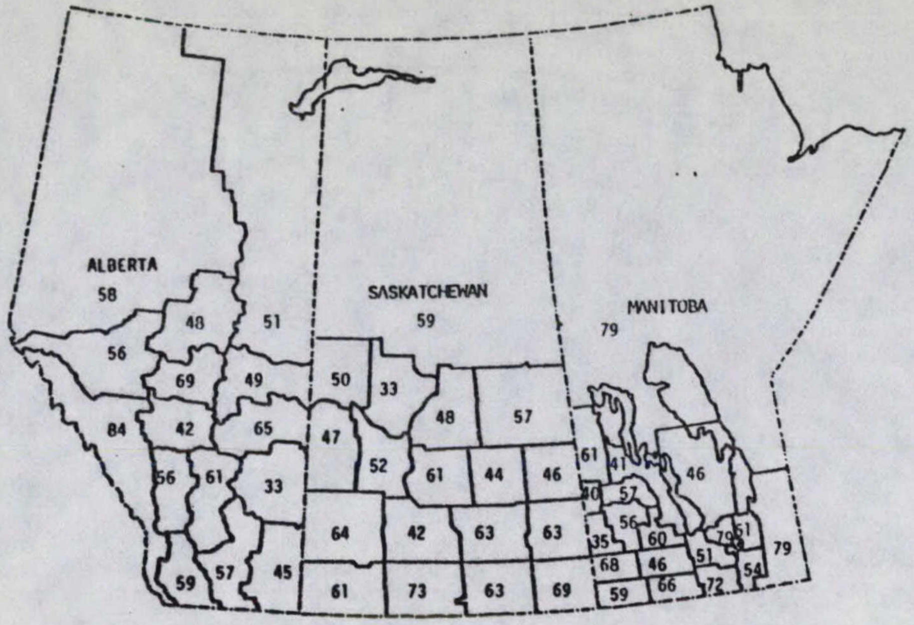
MATERIALS HANDLING

Figure 23

LOCATIONAL INDICES OF EMPLOYMENT
BY CENSUS DIVISION

Average Values

Management	3.8%
Sales	9.2%
Service	11.5%



MANAGEMENT AND ADMINISTRATION

Figure 24

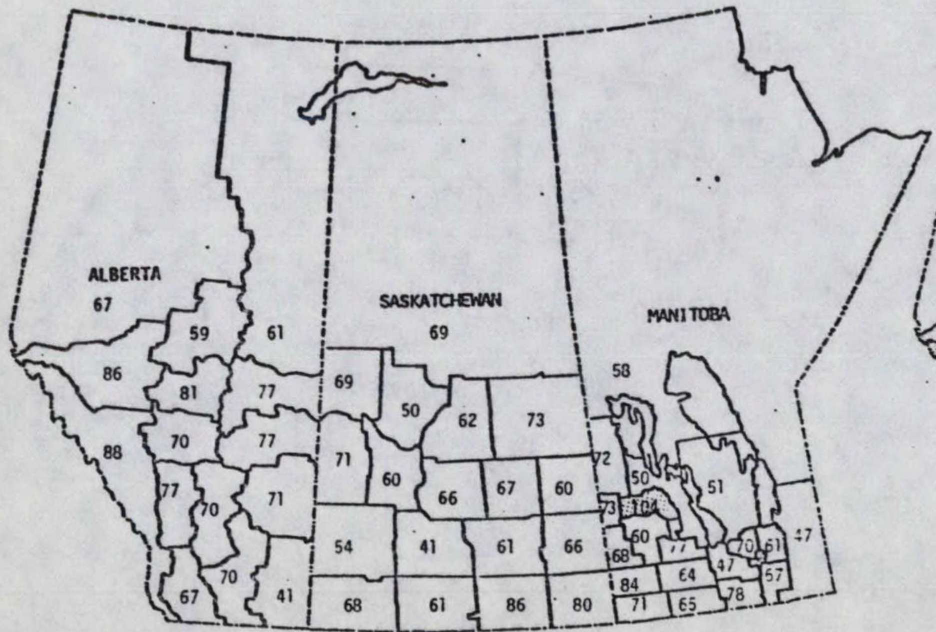
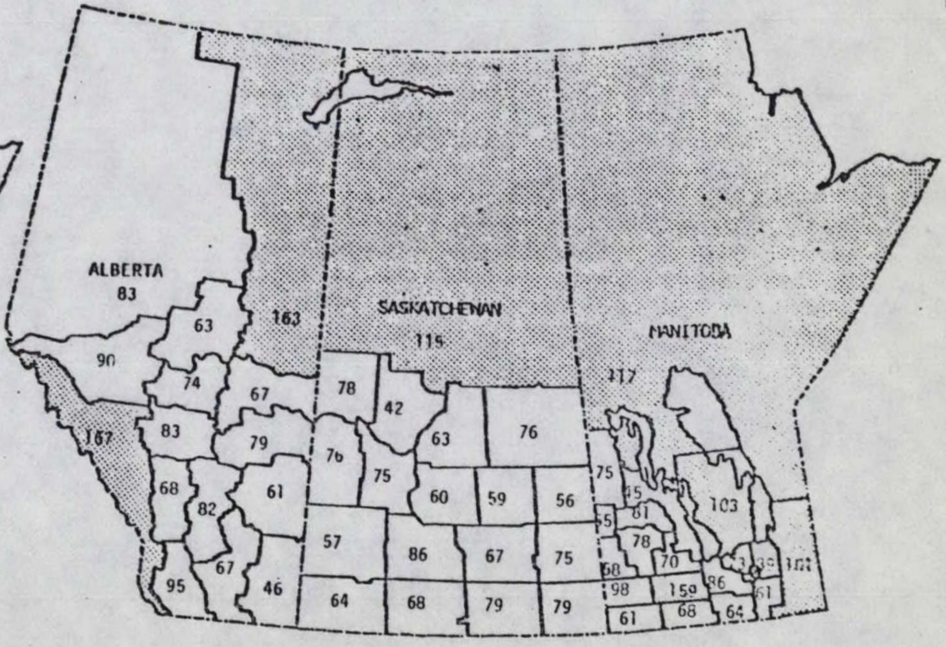


Figure 25

SALES



SERVICE

Figure 26

areas in secondary and tertiary activities is not surprising in view of the dominance of agriculture. The northern areas displayed some specialization, but this can be partially accounted for by considering the lack of an agricultural population of any significance.

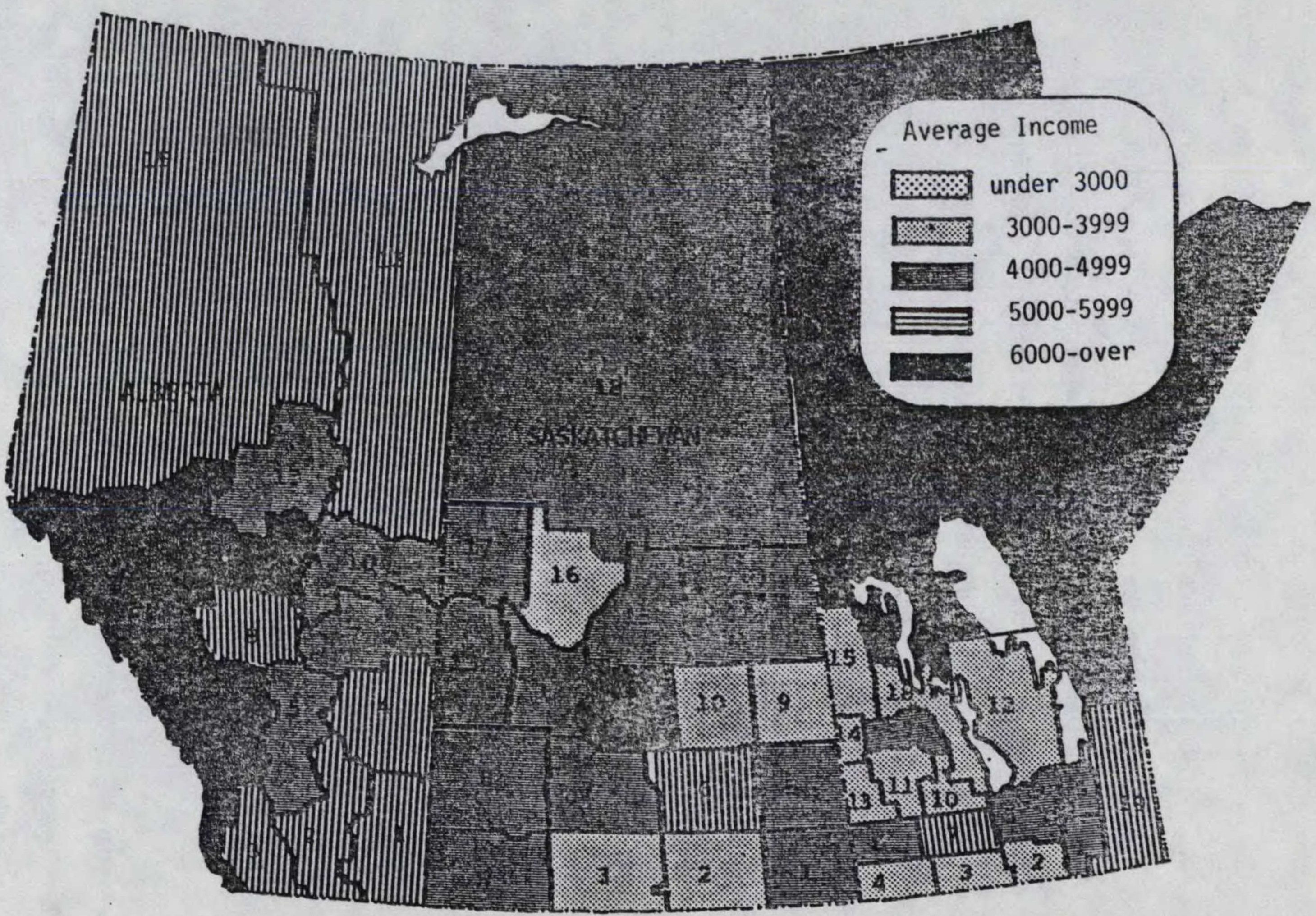
The accent has been placed upon employment structure and not with the level of employment or the nature of employment. It is a common fact that rural areas tend to exhibit structural underemployment. It should also be recognized that primary activities are land-based, while secondary industries are materials-oriented and tertiary activities are people-oriented.

4.6 Income Distributions

It is a well-known fact that there are income disparities within the Canadian population. These disparities are evident, not only at the regional level, but within segments of the population. Figures 27 through 31 depict the levels of average employment income for males, by census divisions, for the total population within the Prairie Provinces, as well as the urban, rural, rural non-farm and rural farm components.

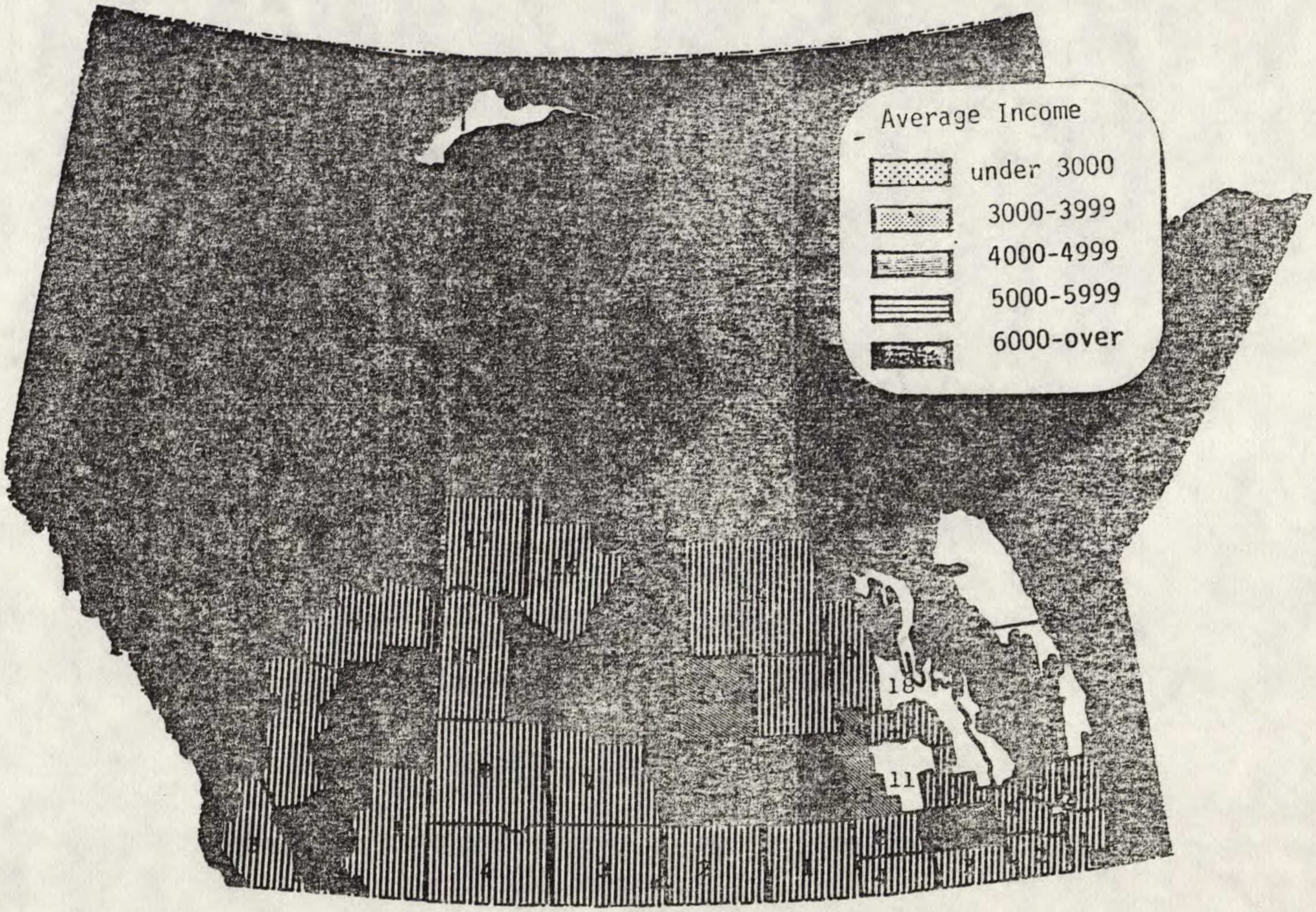
The average employment income for the total population shows quite a large amount of variation within the region. But when this average figure is broken down by the type of residence, the nature of the variation is readily discernible. The urban component has a high average income with very little disparity. On the other hand, the rural population not only has a lower level of income than the urban portion, but demonstrates a greater amount of variation. There is a marked tendency for incomes to be higher in Alberta. As well, the portions of Manitoba surrounding Winnipeg and the non-agricultural eastern and northern fringes display higher incomes.

FIGURE 27 AVERAGE EMPLOYMENT INCOMES FOR MALES BY CENSUS DIVISION



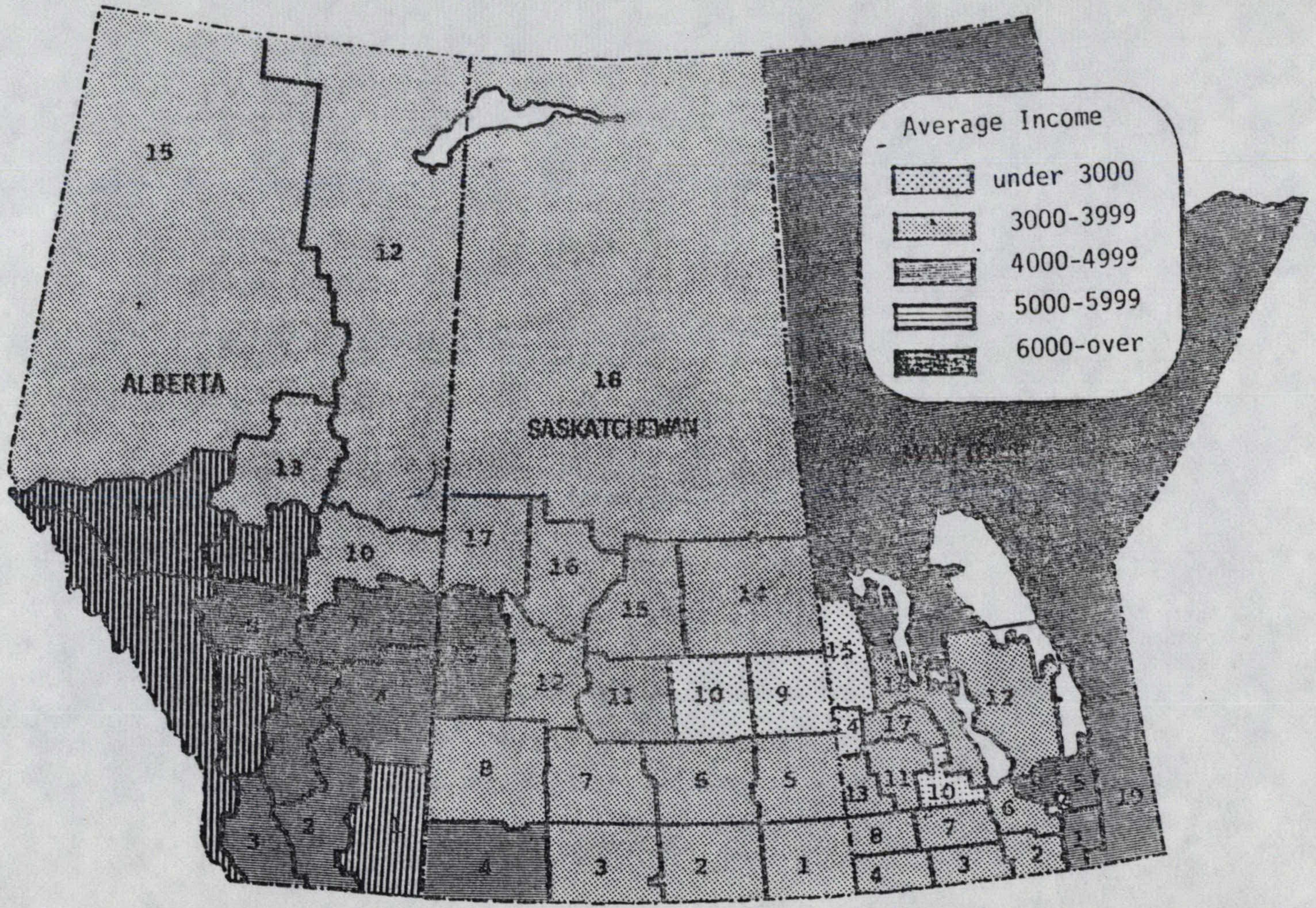
TOTAL POPULATION

FIGURE 28 AVERAGE EMPLOYMENT INCOMES FOR MALES BY CENSUS DIVISION



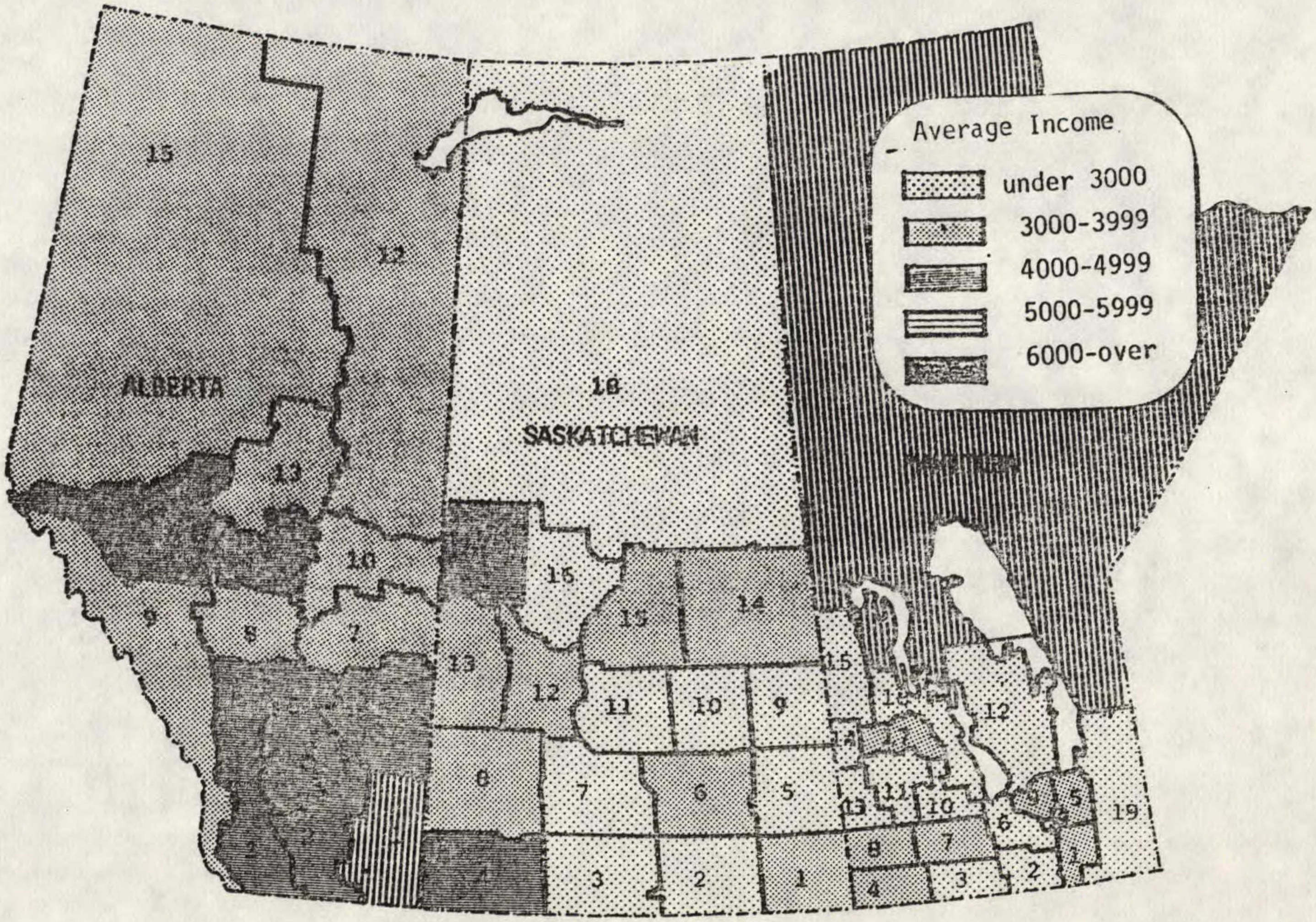
URBAN POPULATION

FIGURE 29 AVERAGE EMPLOYMENT INCOMES FOR MALES BY CENSUS DIVISION



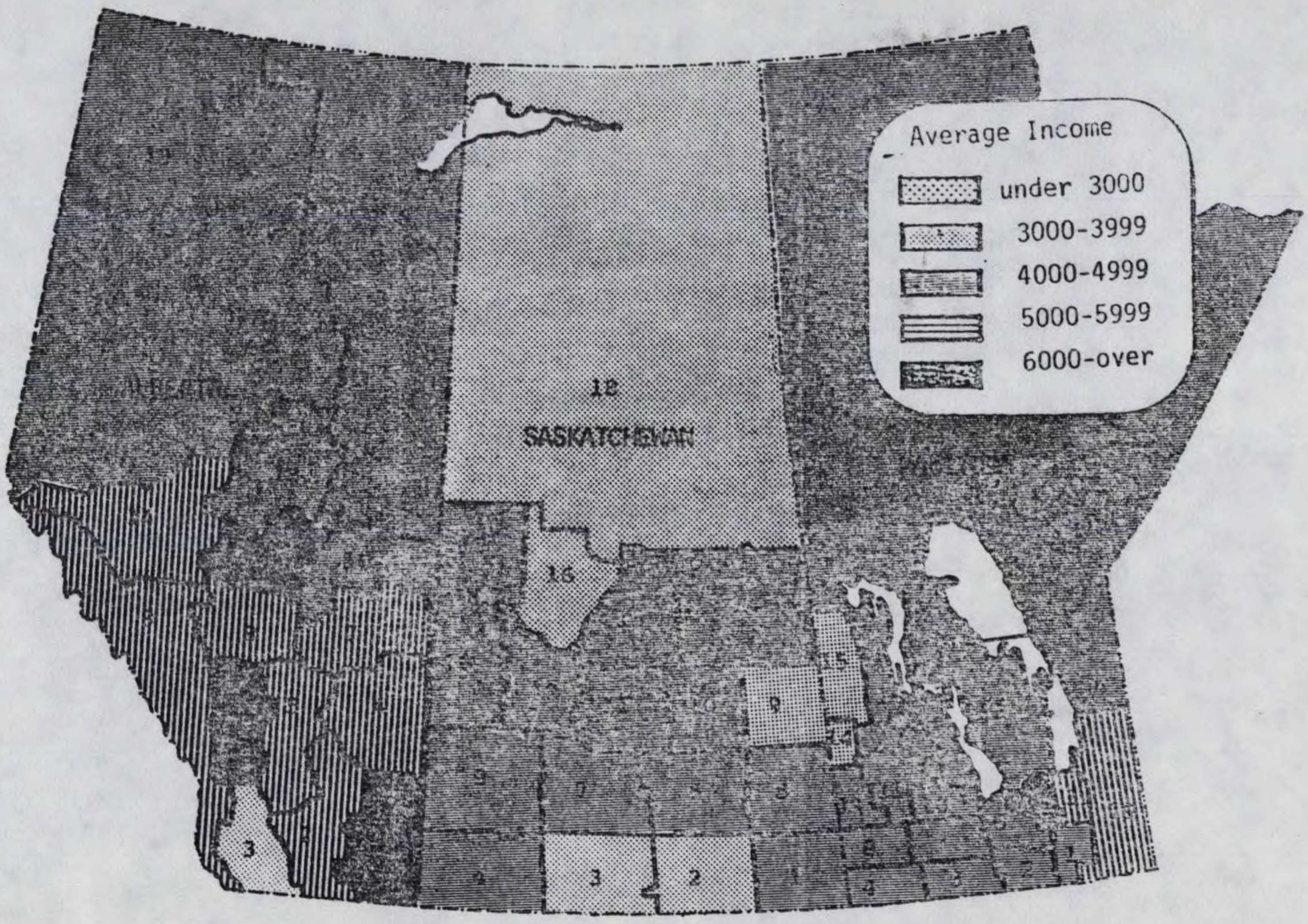
RURAL POPULATION

FIGURE 30 AVERAGE EMPLOYMENT INCOMES FOR MALES BY CENSUS DIVISION



RURAL FARM POPULATION

FIGURE 31 AVERAGE EMPLOYMENT INCOMES FOR MALES BY CENSUS DIVISION



RURAL NON-FARM POPULATION

Within the rural population, there is also a disparity between the non-farm and farm populations. The rural non-farm population has consistently higher incomes. Again, the province of Alberta shows higher incomes for both non-farm and farm populations than the provinces of Saskatchewan and Manitoba.

Of course, the direct comparison of money incomes between urban and rural areas may not be entirely appropriate because of different cost structures, as well as different styles of living. However, it is argued that with the convergence of tastes and consumption habits, the comparison is increasingly valid. Nevertheless, the disparity between urban and rural incomes is very large and does not seem to be narrowing.

The cause of these disparities have been discussed in a previous chapter. The decline and stagnation of agricultural and small-town populations and the rapid growth of the larger urban centres are the symptoms. The essential cause (Schramm, 1970) is technological change which is promoting larger and fewer production units. With a given and limited resource base this leads to local un- or underemployment, which will worsen unless it is balanced by outmigration of the surplus labour force or the inmigration of new economic activities which are not dependent on the limited resource base.

4.7 The Agricultural Sector

The mainstay of the rural population is the agriculture sector, but it is also the sector which has experienced dramatic change in the past. The manifestations of this change are forecasted to continue into the future. The Agricultural Task Force has identified the trends and projected them to 1990. Their model description of agriculture in 1990 (Thair, 1970) is as follows:

1. There will be a substantial reduction in the number of commercial farms.
2. There will be much more use of highly sophisticated management, data processing, research and planning techniques.
3. There will be a drastic reduction in the farm population accompanied by much less government involvement in agriculture, with fewer farm subsidies.
4. Rationalization of the relationship of production and sales.
5. A clear-cut separation of welfare and commercial farm policy programs.
6. Increasing integration in the industry.
7. Much greater rationalization of supply-demand relationships.
8. Emergence of farm employee unions in the bargaining process.

The task force divided the industry into viable and non-viable groups where the viable group would be able to cope with the future by solving financial, management and marketing problems, while the non-viable group was considered to be part of the overall problem of technological displacement characteristic of all sectors. The task force has been criticized by Thair (1970) to be guilty of economic determinism in that they first determined where agriculture was going and then set this as the objective.

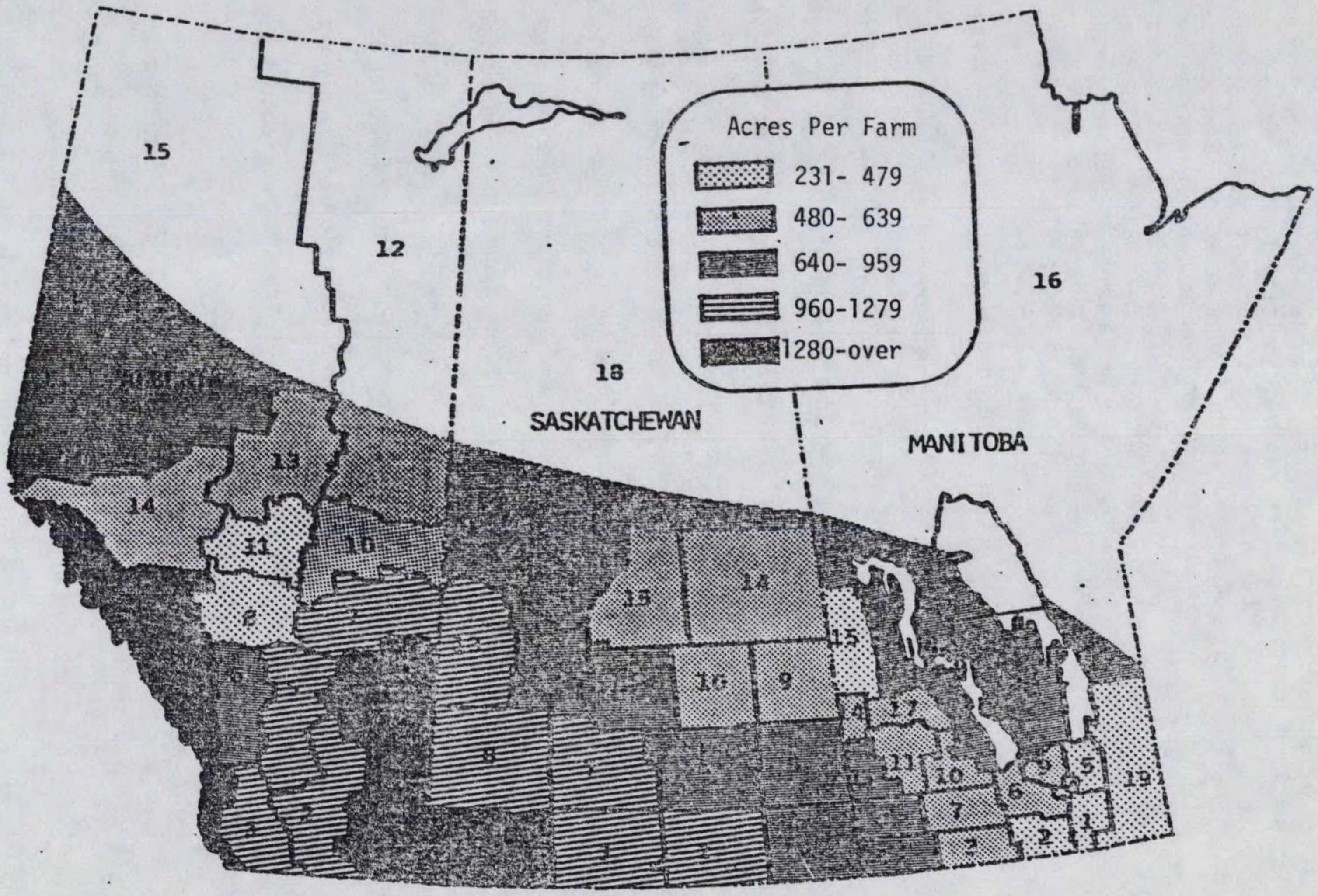
With this "model" in mind, a look at the past and present state of agriculture is warranted, Szabo (1965, 1966) performed an extensive analysis of the change in the agriculture sector from 1951 to 1961. He was concerned with the depopulation of farms and the characteristics of non-resident farm operators. One of the most important patterns which he outlined was the pattern by which the farm population achieved the degree of balance it displayed at that time.

> "Where outmigration of farms began historically earlier, such as southern Manitoba, or where relative overpopulation resulted in an untenable situation in earlier periods, such as in the semiarid areas of Saskatchewan and Alberta, a better balance was achieved before 1951 and outmigration was only relatively moderate after that . . . on the other hand, in areas that were settled historically later, such as some of the northern fringe areas of Saskatchewan and Alberta, or where survival conditions on farms during times of economic stress were easier (for example, parkland areas of Saskatchewan and Manitoba) outmigration was slower before 1951, or even some earlier migrants returned; all these areas necessarily experienced a heavier outmigration during the study period."
>
> (Szabo, 1965, p. 196)

The significance of the pattern outlined above is that the present state of agriculture seems to reflect this same pattern. Figure 32 illustrates the average number of improved acres per census farm by census division. Notice the large farm sizes in the arid parts of Saskatchewan and Alberta and the relatively small farms in the parklands of Manitoba and Saskatchewan. No doubt, factors such as natural conditions, a more diversified agricultural unit and off-farm employment could be utilized to explain this variation. But it also could be argued that there is a historical process of change which had an earlier start in some areas. Figures 33, 34 and 35 seem to support the latter argument. The period from 1966 to 1971 saw a greater decrease in the number of farms in the fringe areas which were settled in a later period. The proportion of viable farms seems to be higher in areas where agents of change have been operating longest. The average number of motor trucks and tractors per farm coincides with the percentage of higher income farms.

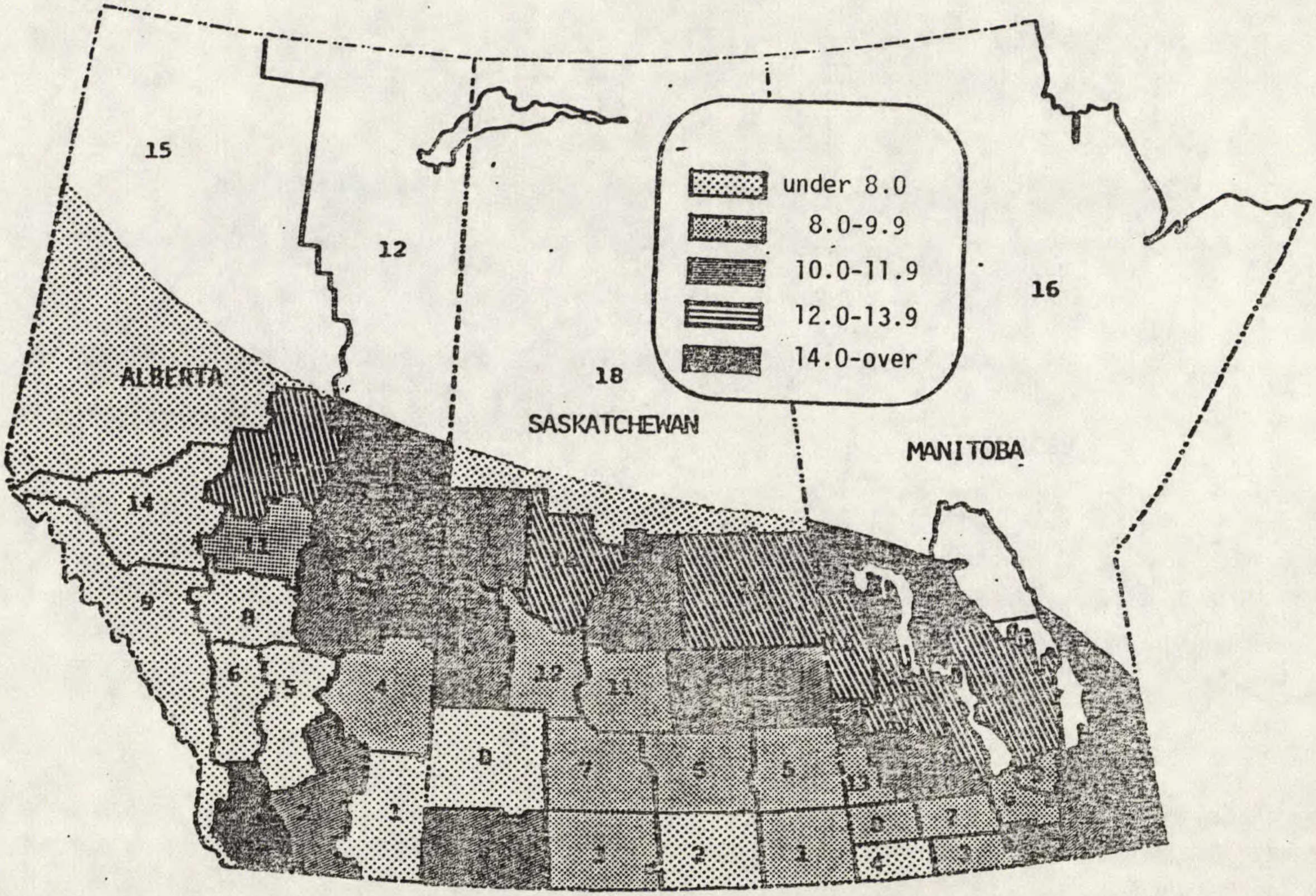
It is apparent that there are economic forces which are promoting the reorganization of the agricultural sector into more efficient production units. These forces appear to be acceptable to government policy makers. But there is also some basis which points out that certain areas

FIGURE 32



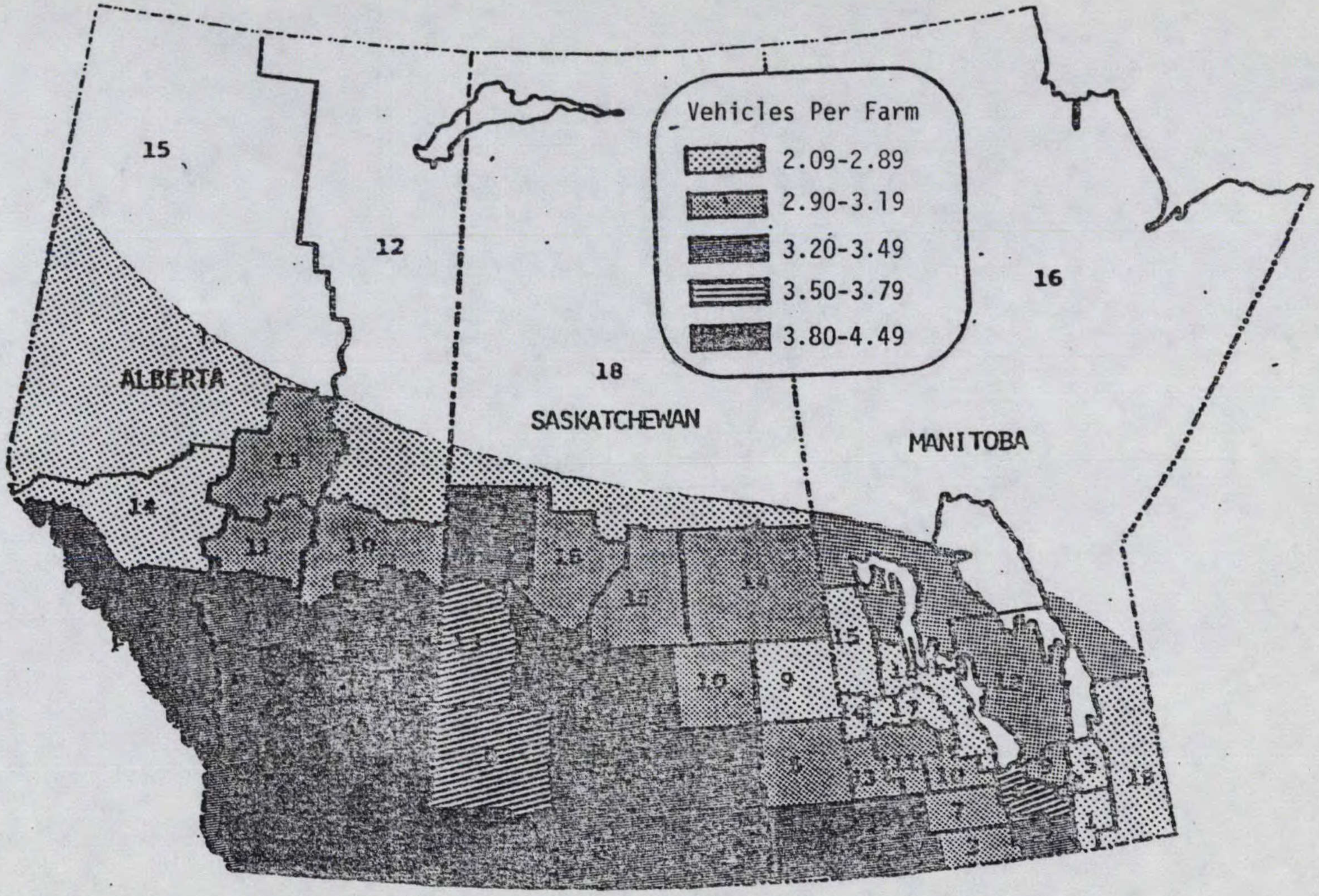
AVERAGE IMPROVED ACRES PER CENSUS FARM, 1971,
BY CENSUS DIVISIONS

FIGURE 33



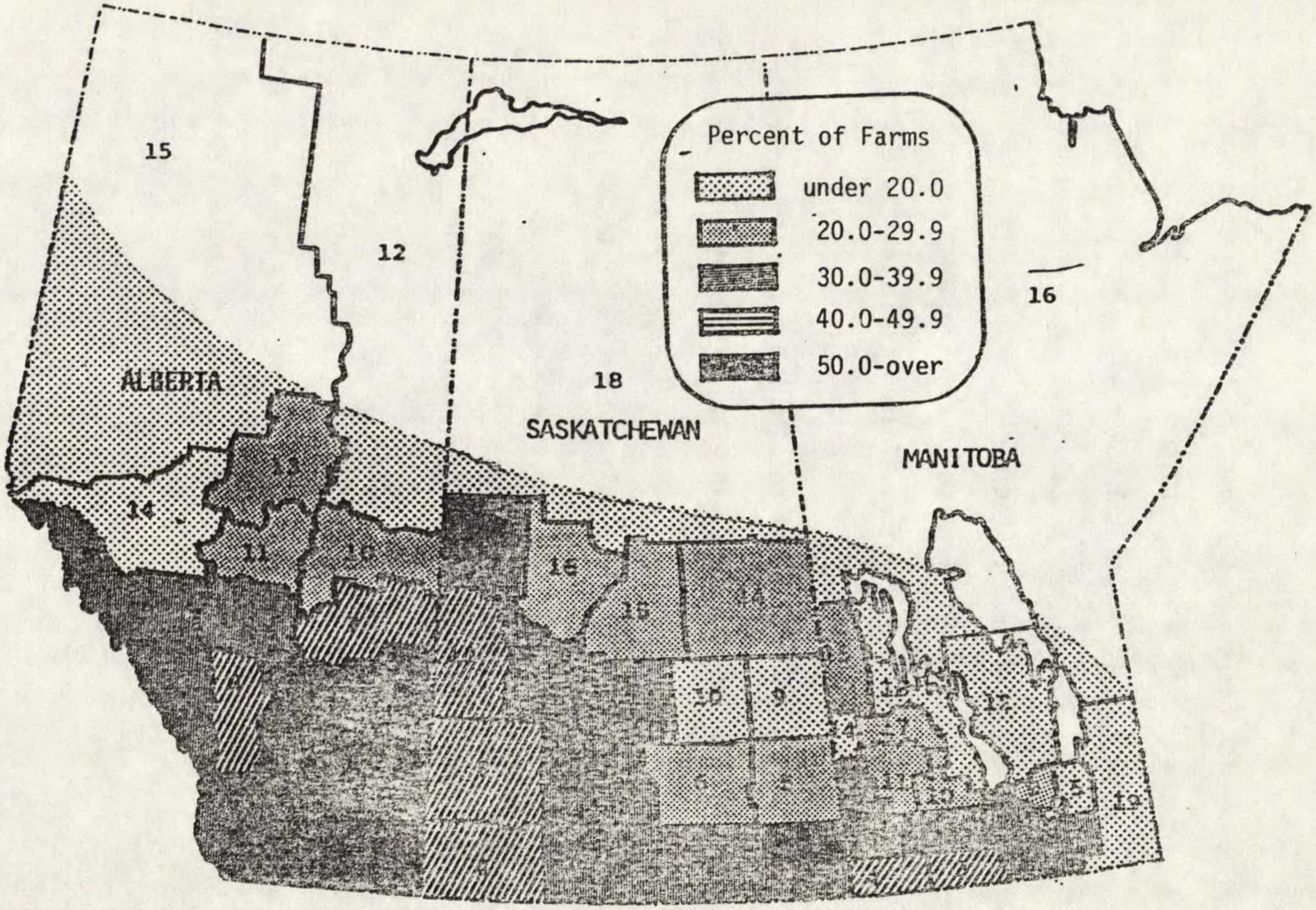
Percentage Decrease in Number of Census Farms, 1966 to 1971, by Census Divisions

FIGURE 34



AVERAGE NUMBER OF MOTOR TRUCKS AND TRACTORS
PER CENSUS FARM, 1971,
BY CENSUS DIVISION

FIGURE 35



PERCENTAGE OF CENSUS FARMS
WITH SALES EXCEEDING $10,000, 1971,
BY CENSUS DIVISIONS

have progressed in this direction to a greater degree than other areas.

4.8 Implications

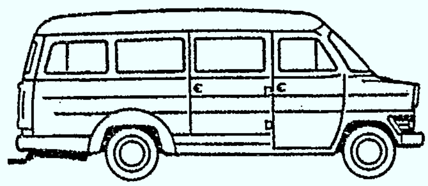
While this section has attempted to present the characteristics of the region in the most comprehensive fashion, it also attempted to present the region in a degree of detail which would provide a greater feel for internal variations. The topics which have been discussed lead to many questions relating to mobile radio services. While this study is an information-gathering task, it is also oriented towards explanation of the present and prediction of the future. These latter tasks are quite difficult.

In any case, the elements in this section which are seen to have implications for mobile radio services in rural areas and which will be brought out later are as follows:

1. The lack of any appreciable population growth in predominantly rural areas.
2. The variation in open country population densities.
3. The existence of farm city dominated community systems.
4. The continued orientation towards primary activities in predominantly rural areas.
5. The relatively low incomes of rural areas.
6. The tendency towards more sophisticated agricultural units.

Interwoven with all these factors are the apparent existence of a historical process which has reached various stages throughout the region.

DATA COLLECTION AND ANALYSIS



5. DATA COLLECTION AND ANALYSIS

As in any research project, the majority of time in this project was spent collecting and analyzing the data. A complete explanation of the methodology employed in collecting, tabulating and analyzing is contained in Appendices. This section serves to provide a more capsule view of the procedures which were followed in carrying out the study.

5.1 Definition of User Categories

The terms of reference for this study includes five different types of mobile radio services. As the reader will encounter these services by name or abbreviation throughout the remainder of the report, it is desirable to define them before proceeding any further.

Definitions of the Categories of Mobile Radio Service

GRS: General Radio Service. GRS is the Canadian version of the American CB or Citizen's Band category. The user owns and operates his system on one or more of the channels allotted to this service.

Private: A private system is one in which the equipment is owned by a business enterprise and operated by its employees. It is licensed for operation on a specific channel(s) in the mobile radio band.

GLMRS: General Land Mobile Radio Service. This is a service offered by the telephone companies as an extension of their normal telephone service. It consists of a radio-telephone installed in a vehicle which can operate on one or more channels in a specific area. The terms General Mobile, Public Mobile, Radio-telephone and Mobile Telephone are all used to describe this type of service.

RCCMRS: Radio Common Carrier Mobile Radio Service. This service is distinguished by the rental of a repeater station operating on two frequencies - one sending and one receiving - to many users. The users may either own or lease their mobile equipment.

Paging: Paging is considered a "one-way" system and involves the transmitting of tone or tone and voice messages to pocket receivers. A paging system can accommodate many users.

5.2 Data Collection

The procedures which were used to collect the data from the different service categories were based upon the nature and accessability of licensing information. As the study was user-oriented and was directed to rural users only, it was necessary to (1) obtain access to a listing of licensees, (2) eliminate the urban users from the total population, and (3) survey the rural population or an acceptable sample thereof. From the viewpoint of DOC licensing regulations, all mobile radio users in the Private, GLMRS, RCCMRS and Paging service categories are covered by the same license and therefore could be surveyed at the same time.

It was decided that the definition of urban and rural as employed by the Statistics Canada was too stringent for our purposes. By expanding the rural portion of the population to include centres up to 5000 population, it was thought that a more accurate survey could be carried out. Because the basis for discriminating between urban and rural was the address of the licensee, it was felt that many rural users with urban addresses would be otherwise ignored. There was also the question of the rural orientation of the urban user to be considered.

The total license population for the four service categories previously mentioned was provided by the Department of Communications in Ottawa with the exception of licensees classified as government. However, it was found to be necessary to go directly to the DOC field offices in the study area to identify and sample the GRS population.

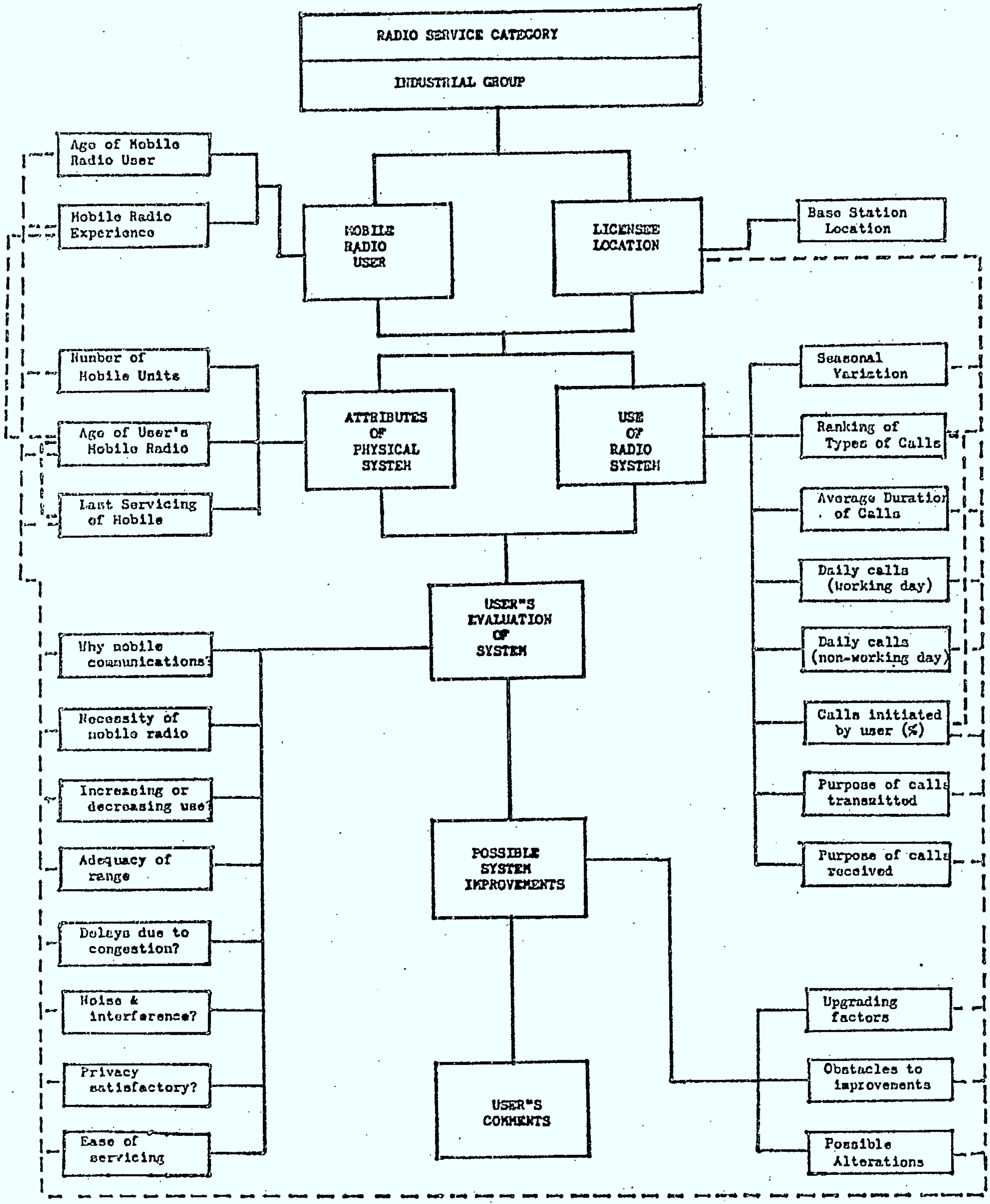
Data was collected in the form of mail-back questionnaires. Two separate mailings were made, the first covered Private, RCCMRS, Paging and GRS users and the second solicited responses from GLMRS users which were inadvertently missed entirely in the first mailing. The first mailing saw 1381 questionnaires sent to Private, RCCMRS and Paging users with 1201 questionnaires being sent to GRS users. This represented 100% of the first three categories which were considered rural by our definition. The questionnaires sent to GRS users represented a 2% sample of the rural users except in the areas covered by the Grande Prairie field office, which was a 5% sample, and the Yellowknife, Fort Smith and Thompson field offices which represented 15% of their GRS populations.

Approximately two weeks after the questionnaires were mailed, a reminder notice was sent to those users who had not replied. This sequence was repeated for the second mailing which saw 1051 questionnaires being sent after the 97 licensees in this classification who were included in the first mailing were eliminated. This mailing represented a 100% sampling except for the Province of Alberta which was sampled at 50% because of the overwhelming dominance of GLMRS users in Alberta.

Of the two, the first mailing was more successful, with 43% of the questionnaires sent being returned. The users covered by the second mailing returned 27% of the questionnaires.

As the questionnaires were returned, they were coded onto optical sensing sheets which were ultimately read and punched on cards. The questionnaire itself asked the user to supply information about himself and the radio system, about how the radio system was used and asked him to evaluate certain characteristics of his mobile communications. Figure 3 illustrates the information which was contained from the questionnaires.

FIGURE 36 DIAGRAM OF QUESTIONNAIRE INFORMATION



5.3 Aggregation of Data

While the questionnaire solicited data which was unavailable from other sources, the license information from which the users were identified contained information which was both accurate and useful to the study. This information consisted of a master list of each mobile unit in the Private, GLMRS, RCCMRS and Paging categories arranged according to the company code of the license holder. As well, each mobile had a Standard Industrial Classification (SIC), which designated the business for which the mobile was being used.

This information was aggregated to determine the industrial mix and average system size. The nature of the information enabled information concerning two groups of users to be compiled. These were Private and GLMRS users. The Private category also contains the RCCMRS and Paging users. In addition, each category was subdivided into the "rural" users and the urban users. While the urban users were not covered by this study, it was decided to aggregate this group as well as to be able to compare the two groups and so as not to lose this source of information.

The process of aggregation necessitated that the mobiles for each license holder be counted and his business be tagged with an industrial classification. In the case where a business was engaged in more than one activity, the purpose for which the majority of mobiles were used was deemed to be the business of the license holder. Where two industrial classifications had the same number of mobiles, the classification which was licensed first was deemed to be the licensee's major activity for our purposes. From this stage, the individual information bits were aggregated into the major classes for each industrial division. For instance, all licensees in the construction industry were aggregated into either general contractors or special-trade contractors and then the division totals were computed. This aggregation was done for both categories by the major urban centres excluded from the study and for the rural licensees by the field office in which the license was held. These compilations are contained in the Appendices.

In addition to the previous method of aggregation, each license holder, along with the associated system size and industrial classification, was put into a census division classification based upon the location of his headquarters as determined by the mailing address. The purpose of this aggregation was to enable some correlations to be computed against some socio-economic characteristics of the same census divisions, so as to gain some insight into the varying levels of utilization in the region.

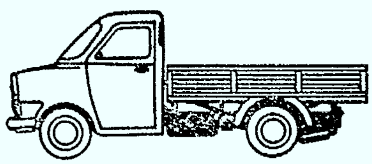
5.4 Questionnaire Analysis

The analysis of the information contained in the questionnaires which were returned was of necessity designed to maximize the benefits given a budget constraint. The first course of action was to generate the distribution of the responses to the various questions for each service category. On the basis of this information, certain decisions were made as to the orientation of further analysis. First, because of the relatively few number of users in both the RCCMRS and Paging categories, it was decided not to carry out any further analysis for these categories and to concentrate on the others. Secondly, it was very apparent that six industrial classifications accounted for over 90% of the users in the three major categories. Therefore, it was decided to group the other categories into a residual industrial classification for any further analysis. As can be seen from the diagram of the questionnaire information, the service category and the industrial classification were the two major distinctions which were made between users in the subsequent analysis.

All the output which was generated by the different types of analysis is not included in the Appendices to this report. Only the basic distributions and the most significant subsequent analysis is provided. Generally, the subsequent analysis involved a flow of activities as follows:

- The breakdown of numerical (cardinal) responses by service category, industrial classification and locational characteristics.
- The cross-tabulation of questionnaire variables.
- The correlation and regression of selected questionnaire variables.
- The comparison of the characteristics of high and low satisfaction users for the three major service categories.
- The breakdown of users into groups based upon the response to the questions pertaining to future system improvements.

APPLICATION OF AVAILABLE DATA



6. DISTRIBUTION OF MOBILE RADIO USERS

The orientation of this study towards the utilization of mobile radio services in the rural segments of the prairie environment makes it necessary to illustrate the differences between the employment of these mobile services in these environments compared to the urban environments which have been excluded from the study. A proper assessment of the characteristics of the mobile radio systems, as well as the people who use them, cannot be made without this comparison. The penetration of these different mobile radio services can be expected to vary within both the social and economic frameworks of the environment. It is indeed fortunate that an information base, as was contained in the licensing information, is available. From this information, it was possible to derive basic facts about all of the mobile radio systems in the Private, RCCMRS, GLMRS and Paging categories. The chaotic situation in the rapidly expanding GRS category required that the basic characteristics of the use of this system be estimated.

Before proceeding to outline these characteristics, some points should be brought forward. It should be remembered that this study does not cover government systems which constitute a very significant amount of the mobile radio population. In addition, the basic method of classifying the licensees was according to their mailing address. This does not necessarily mean that the licensee uses his radio system in that locality only. For example, a large company may have its headquarters in Calgary, yet their mobile radio system may be used only minimally in the Calgary area. There is a limit to which this example applies because all mobile licenses employed in the area served by the respective DOC field offices are held in these same offices. Therefore, one company or individual can have licenses in more than one field office. If this is the case, only those licenses which are held in the field office in which the headquarters are located will be counted, as all those licensees with addresses outside of the area served by a particular field office are not counted for that office. As well, all mobiles licensed by an individual or organization from outside of the region are excluded. For example, all mobile radios licensed to Canadian National Railways and Canadian Pacific Railways, who have a very large number of mobile radios, are not included because their head offices are in Toronto and Montreal respectively. Therefore, the mobile radio population which will be presented can be thought of as representing the indigenous population.

The terms which will be used to describe various aspects of mobile radio systems are quite self-explanatory. A mobile unit is a radio that can be installed in a conveyance, carried by a person, or temporarily installed at a fixed location. A base station is a radio station at a fixed location, but it is used primarily for communicating with other fixed stations. A repeater station is a radio station at a fixed location or installed on a conveyance and is used for relaying signals from one station to another. A mobile radio system consists of at least one fixed base station and at least one mobile radio unit capable of communicating with each other. Radios on different systems do not communicate with each other.

It is readily apparent that the above definition of a mobile radio system must be qualified. The most valid application of the definition is to private radio systems operating on a designated channel. With those radio services which share base stations (GLMRS, RCCMRS, Paging) each separate licensee is deemed to operate a radio system. The ability of GLMRS users to communicate outside of the radio communications mode should be noted. As well, the open channels associated with GRS usage further hamper its application. But because it is impossible to determine which licensees actually conform to the definition, it is applied to all licensees, but should be taken with the appropriate qualification for each service category.

6.1 Private Radio Systems

From a licensing viewpoint, all individuals or organizations who license a mobile radio unit for business purposes, regardless of the category of radio service is given an '08' license. This section presents data concerning private radio systems, but it does not break the data down into the Private, RCCMRS and Paging categories which are represented. The nature of this breakdown outside of the large urban centres was learned via the questionnaire, but the distribution within the large urban centres is not known. The survey results show that RCCMRS and Paging users account for a minor portion of the total users with concentrations in the RCCMRS category mainly in Alberta. These categories are expected to be more dominant in the urban categories.

Some characteristics of these different services should be noted at this point. The typical cost of a mobile for a private radio system is in the neighbourhood of $1000. Thus, the basic cost of the most elementary system consisting of one base and one mobile unit will exceed $2000. While it is typically thought that most private systems are owned by the enterprise using them, there is some evidence that the leasing of these systems

TABLE 4

CLASSIFICATION OF PRIVATE RADIO SYSTEMS AND LABOUR FORCE PENETRATION BY POPULATION CLASSIFICATIONS

	No. of Systems	No. of Mobiles	Average System Size	No. in Work Force 1971	Mobiles/1000 Work Force
Province of Alberta	2,306	17,763	7.7	756.665	23.6
Centres over 100,000	1,250	12,165	9.7	416,585	29.2
Centres 10,000-99,999	334	2,090	6.3	57,155	36.6
Centres 5,000- 9,999	89	435	4.9	20,870	20.8
Centres under 5,000	433	2,560	5.9	72,865	35.1
Rural	200	413	2.1	189,195	2.2
Province of Saskatchewan	826	3,001	3.6	410,070	7.3
Centres over 100,000	378	1,440	3.8	125.190	11.5
Centres 10,000- 99,999	110	378	3.4	46,680	8.1
Centres 5,000- 9,999	37	243	6.6	12,200	19.9
Centres under 5,000	114	377	3.3	37,500	10.1
Rural	187	563	3.0	188,490	3.0
Province of Manitoba	1,009	5,424	5.4	458,920	11.8
Centres over 100,000	452	3,188	7.1	263,035	12.1
Centres 10,000- 99,999	97	442	4.6	33,715	13.1
Centres 5,000- 9,999	41	181	4.5	12,865	14.1
Centres under 5,000	178	751	4.2	24,615	30.5
Rural	241	834	3.5	124,685	6.7
	4,141	26,188	6.3	1,625,655	16.2

from the largest urban places to the smallest with systems in the rural areas being the smallest of all. In an attempt to illustrate the penetration of mobile communication into the different types of environments, the number of mobiles per 1000 people in labour force in these same classifications was computed.

The larger system size in the larger urban places is to be expected considering the larger scale of operations in these places. But the penetration of mobile radios shows some surprising patterns. Alberta has by far the greatest number of mobile radios operating within the work force. However, there is a very conspicuous dichotomy with all urban places having at least 20 mobiles per 1000 population, while the rural population has only 2.2. Among the urban places, the variation in penetration is not conspicuous from this viewpoint. Saskatchewan has a penetration of approximately one third of Alberta, with Manitoba showing a somewhat higher penetration. However, there are some differences. In Saskatchewan, the urban groups of under 5000 and 5000-9999, which approximate the farm cities mentioned previously, seem to have a higher penetration than the prairie cities in the province. In Manitoba, the trend is for the penetration to increase as one goes down the scale with the penetration for urban centres under 5000 being over twice as much as any other group. With respect to the rural populations, Manitoba has over twice the penetration of Saskatchewan and three times that of Alberta.

By taking a more microscopic view of the penetration of private radio systems into different population segments and coupling this with the industrial orientation of the systems, the status of this radio service with the study area can be better defined. Figures 37 and 38

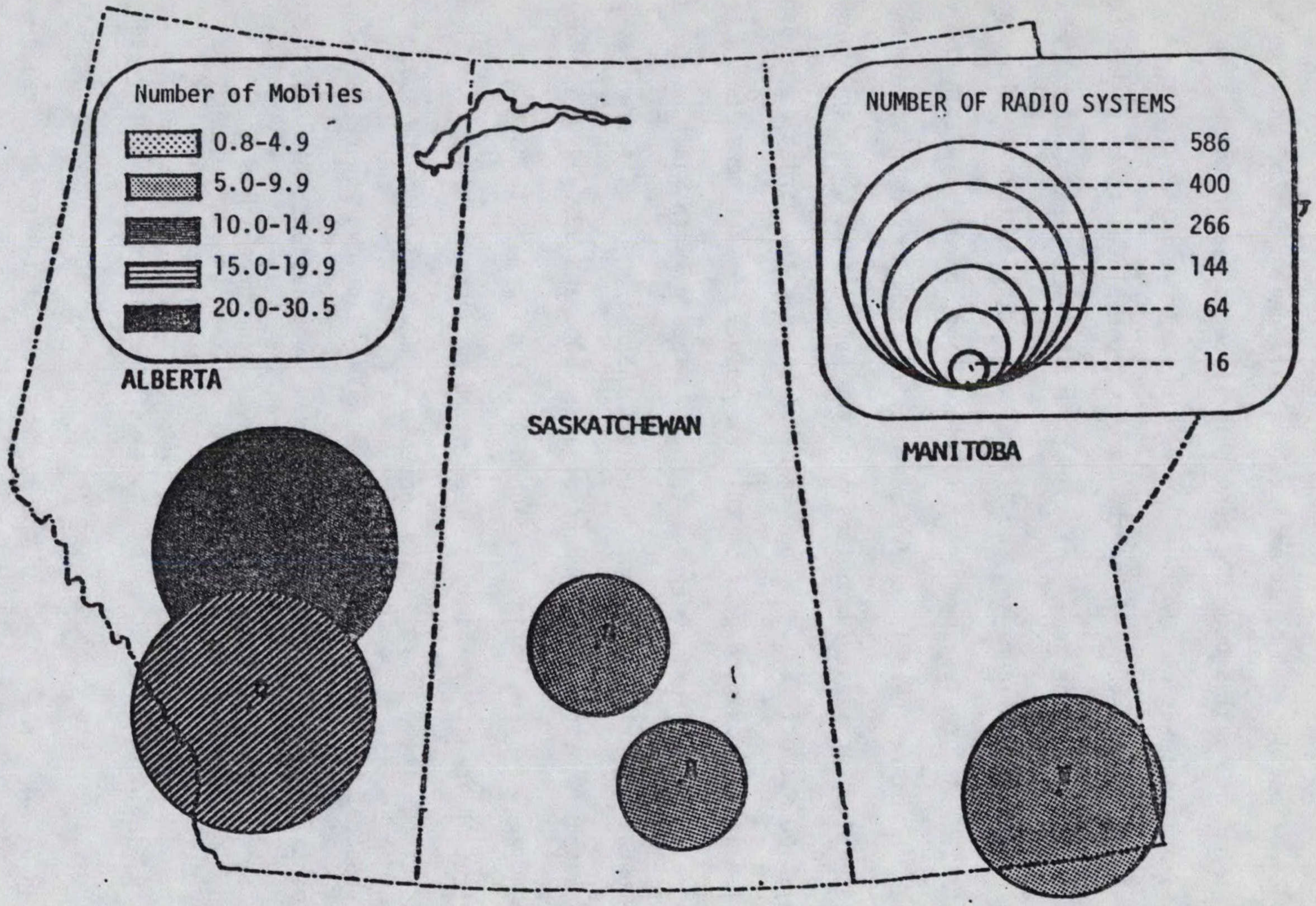


FIGURE 37 NUMBER OF PRIVATE RADIO SYSTEMS IN INDIVIDUAL URBAN CENTERS OVER 100,000 POPULATION, SHOWING NUMBER OF MOBILES PER 1000 POPULATION

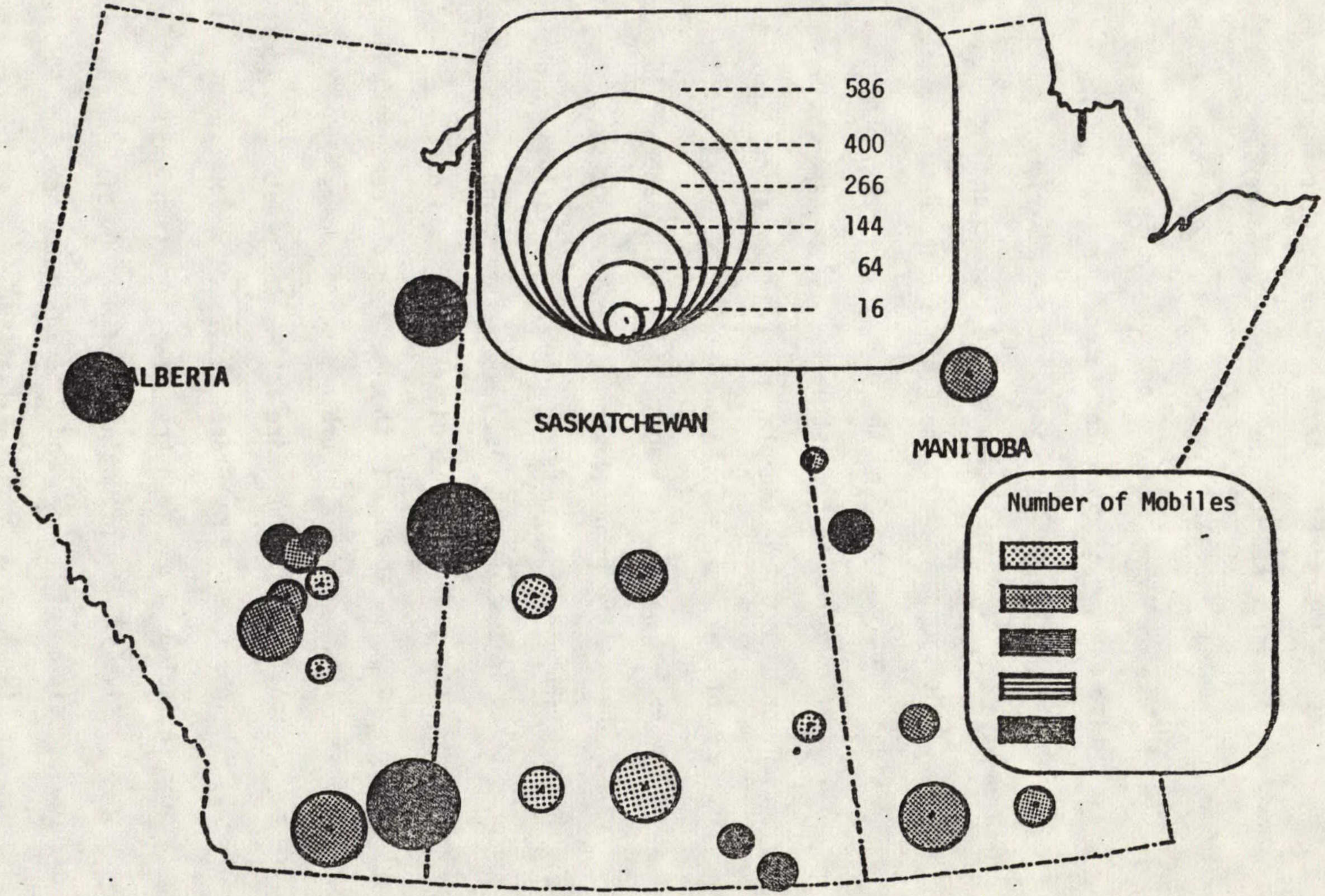


FIGURE 38 NUMBER OF PRIVATE RADIO SYSTEMS IN INDIVIDUAL URBAN CENTERS FROM 5000 TO 100,000 POPULATION SHOWING NUMBER OF MOBILES PER 1000 POPULATION

present the number of systems in the individual urban places excluded from the survey, as well as the associated penetration rates. These penetration rates are expressed in terms of the total population as opposed to the work force because the latter figures were not available for the level of detail needed. Associated with these maps are the industrial breakdown of both the systems and the mobile units for each urban place, which are contained in the Appendices.

As can be seen in Figure 36 of the dominant prairie cities, Calgary and Edmonton have both the largest number of systems and the greatest penetration. Indications are that these higher penetrations are due to both a different industrial mix and the greater utilization of private systems by industries other than construction and transportation which are the convention users. For example, the transportation industry accounts for 22% of the systems in Edmonton and 25% in Calgary. The comparable figures for Saskatoon, Regina and Winnipeg are 50, 46 and 44%, respectively. The construction industry has a 20 to 30% share in all the cities. In addition, Edmonton and Calgary have a relatively higher percentage of systems in the oil and gas, manufacturing and service industries. The larger system sizes in these two cities also stand out.

The pattern of penetration into the lesser urban centres follows somewhat the same lines. Where the urban place performs a function beyond the conventional trade and service roles, the penetration tends to be higher. The highest levels in Grande Prairie, Fort MacMurray and Lloydminister reflect dominant forestry, transportation and petroleum functions, respectively. The predominance of mining, oil and gas is again reflected in the cities of Weyburn and Estevan in southeastern Saskatchewan, while forestry again surfaces in the northern Manitoba town of The Pas.

TABLE 5

NUMBER OF SYSTEMS, NUMBER OF MOBILES AND AVERAGE SYSTEM SIZE, FOR PRIVATE MOBILE RADIO SYSTEMS IN CENTRAL REGION BY INDUSTRIAL DIVISIONS

	# of Systems Centers > 5000	# Mobiles Centers > 5000	Average System Size	# of Systems Centers < 5000	# Mobiles Centers < 5000	Average System Size	Total All Centers # Lic	Total All Centers # Mob
Agriculture	108	353	3.3	473	1344	2.8	581	1324
Forestry	7	244	34.8	19	109	5.7	26	317
Fishing, Trapping	-	-	-	2	5	2.5	2	5
Mines & Oils	130	1379	10.6	82	644	7.8	212	1987
Manufacturing	158	2123	13.4	54	358	6.6	208	2403
Construction	742	4890	6.6	202	770	3.8	944	5480
Transportation	927	7048	7.6	221	1107	4.4	1148	7933
Trade	292	1570	5.4	169	576	5.0	461	1988
Finance, Insurance	46	243	5.3	6	9	1.5	52	249
Personal Business Services	390	2805	7.2	126	595	4.7	516	2931
Other	3	27	9.0	7	7	1.0	10	34
Total	2803	20689	7.4	1361	5524	4.1	4164	26212

While the nature of mobile systems in the large urban centres is of passing interest, the nature of those systems under study are more important. Table 5 shows the industrial breakdown of the systems which were excluded as well as those which were included in the mail survey. For the large urban places, the transportation, construction, service and trade industries are the dominant users. For the surveyed group, agriculture shows a clear dominance with the above-mentioned industries following in the same order. In fact, except for agriculture, the mix is somewhat similar. However, in terms of system size, the systems associated with centres under 5000 are consistently smaller. In fact, while they constitute about one third of the systems, they account for one fifth of the mobile units.

Closer examination of the industrial orientation of the survey population reveals some differences within the region. While agriculture is the dominant industry, it is especially dominant in southern Manitoba. This is also the only area where trade surpasses both transportation and construction as an employer of private systems. From the viewpoint of system size, the variations follow no fixed pattern. Systems for mines and oils show a decreasing size from Alberta in the west, to Manitoba in the east. Agricultural systems are larger in northern Alberta and southern Manitoba and smallest in southern Alberta. Large systems in forestry appear in north-central Saskatchewan and northern Alberta. The larger manufacturing firms with mobile systems are located in the Edmonton area. Systems used in the construction industry have a tendency to be somewhat larger in central and northern Alberta. Smaller system sizes for transportation activities are noticeable in Saskatchewan. The larger size of systems used for trade is conspicuous in the area centred by

TABLE 6

CLASSIFICATION OF PRIVATE MOBILE RADIO SYSTEMS
BY FIELD OFFICE LOCATION AND INDUSTRIAL DIVISIONS

(Licensees from Urban Centers over 5000 are excluded)

	Agriculture	Forestry	Fishing, Trapping	Mines, Quarries, Oil Wells	Manufacturing	Construction	Transportation	Trade	Finance, Insurance, Real Estate	Community, Business, Personal Service	Other	TOTALS
Edmonton	56	14	1	37	11	63	80	43	1	39	1	346
Calgary	86	1	1	8	12	30	31	31		23	1	224
Grande Prairie	7	1		4	3	2	15	5		7		63
Regina	68			9	3	15	15	10		14		134
Saskatoon	65	2		19	5	24	21	16		10		162
Winnipeg	191	1		3	18	43	35	62	5	29	3	390
Thompson				1	1	4	16	1			2	25
Fort Smith					1	1	2	1		2		7
Yellowknife				1		1	6			2		10
TOTALS	473	19	2	82	54	202	221	169	6	126	7	1361

TABLE 7

CLASSIFICATION OF INDIVIDUAL PRIVATE MOBILE RADIOS SYSTEMS
BY FIELD OFFICE LOCATION AND INDUSTRIAL DIVISIONS

(Licensees from Urban Centers over 5000 are excluded)

	Agriculture	Forestry	Fishing, Trapping	Mines, Quarries, Oil Wells	Manufacturing	Construction	Transportation	Trade	Finance, Insurance, Real Estate	Community, Business, Personal Service	Other	TOTALS
Edmonton	144	26	2	394	148	275	442	121	1	273	1	1827
Calgary	166	2	3	71	61	90	186	95		111	1	786
Grande Prairie	31	37		33	8	113	92	31		15		360
Regina	183			37	13	43	44	24		43		387
Saskatoon	173	43		94	24	83	62	53		30		562
Winnipeg	647	1		10	102	158	180	248	8	111	3	1468
Thompson				1	1	4	20	1			2	29
Fort Smith					1	1	24	3		7		36
Yellowknife				4		3	57			5		69
TOTALS	1344	109	5	644	358	770	1107	576	9	595	7	5524

TABLE 8

CLASSIFICATION OF SIZE OF PRIVATE MOBILE RADIO SYSTEMS
BY FIELD OFFICE LOCATION AND INDUSTRIAL DIVISIONS

(Licensees from Urban Centers over 5000 are excluded)

	Agriculture	Forestry	Fishing, Trapping	Mines, Quarries, Oil Wells	Manufacturing	Construction	Transportation	Trade	Finance, Insurance, Real Estate	Community, Business, Personal Service	Other	TOTALS
Edmonton	2.6	1.9	2.0	10.6	13.5	4.4	5.5	2.8	1.0	7.0	1.0	5.3
Calgary	1.9	2.0	3.0	8.9	5.1	3.0	6.0	3.1		4.8	1.0	3.5
Grande Prairie	4.4	37.0		8.3	2.7	5.4	6.1	6.2		2.1		5.7
Regina	2.7			4.1	4.3	2.9	2.0	2.4		3.1		2.9
Saskatoon	2.7	21.5		4.9	4.8	3.5	2.9	3.3		3.0		3.5
Winnipeg	4.3	1.0		3.3	5.7	3.7	5.1	4.0	1.6	3.8	1.0	3.8
Thompson				1.0	1.0	1.0	1.3	1.0			1.0	1.2
Fort Smith					1.0	1.0	12.0	3.0		3.5		5.1
Yellowknife				4.0		3.0	9.5			2.5		6.9
TOTALS	2.1	3.8	2.5	7.4	5.2	2.9	4.0	2.5	1.0	4.0	1.0	3.2

Grande Prairie. Mobile systems employed in community, business and personal service activities seem to be larger in central Alberta and lowest in the northern section of Alberta.

As was mentioned earlier, within the survey population there exists an urban-rural dichotomy. The urban portion consists of centres in the 1000 to 5000 population category, while the rural portion includes both non-farm and farm populations as defined previously. Because these two groups can be perceived as having more differences than similarities, it is useful to separate them where possible. Figures 39 and 40 represent the number of private mobile radios per 1000 population for each of these population categories computed for each census division possessing both radios and people classified as belonging to these groups. When interpreting the maps, it is important to notice the much larger values for the urban population class.

The pattern of penetration into the small urban places shows medium to very high penetration in southern Manitoba. Saskatchewan shows a consistently light to moderate penetration. Within Alberta, the largely unpopulated areas show a high to very high penetration. A very high penetration is also apparent in the Edmonton area. There is a medium penetration in the Calgary and Medicine Hat areas and light to moderate penetration elsewhere. From Table 4 presented previously, it will be remembered that while Alberta has over twice as many systems and six times as many mobiles in the urban centres compared to the rural population, both Saskatchewan and Manitoba have a greater number of systems and mobiles in rural locations. This rural-urban mix is reflected in the penetration pattern in rural areas. Southern Manitoba shows a very high number of mobiles compared to the rest of the region. Saskatchewan displays a greater amount of variability with

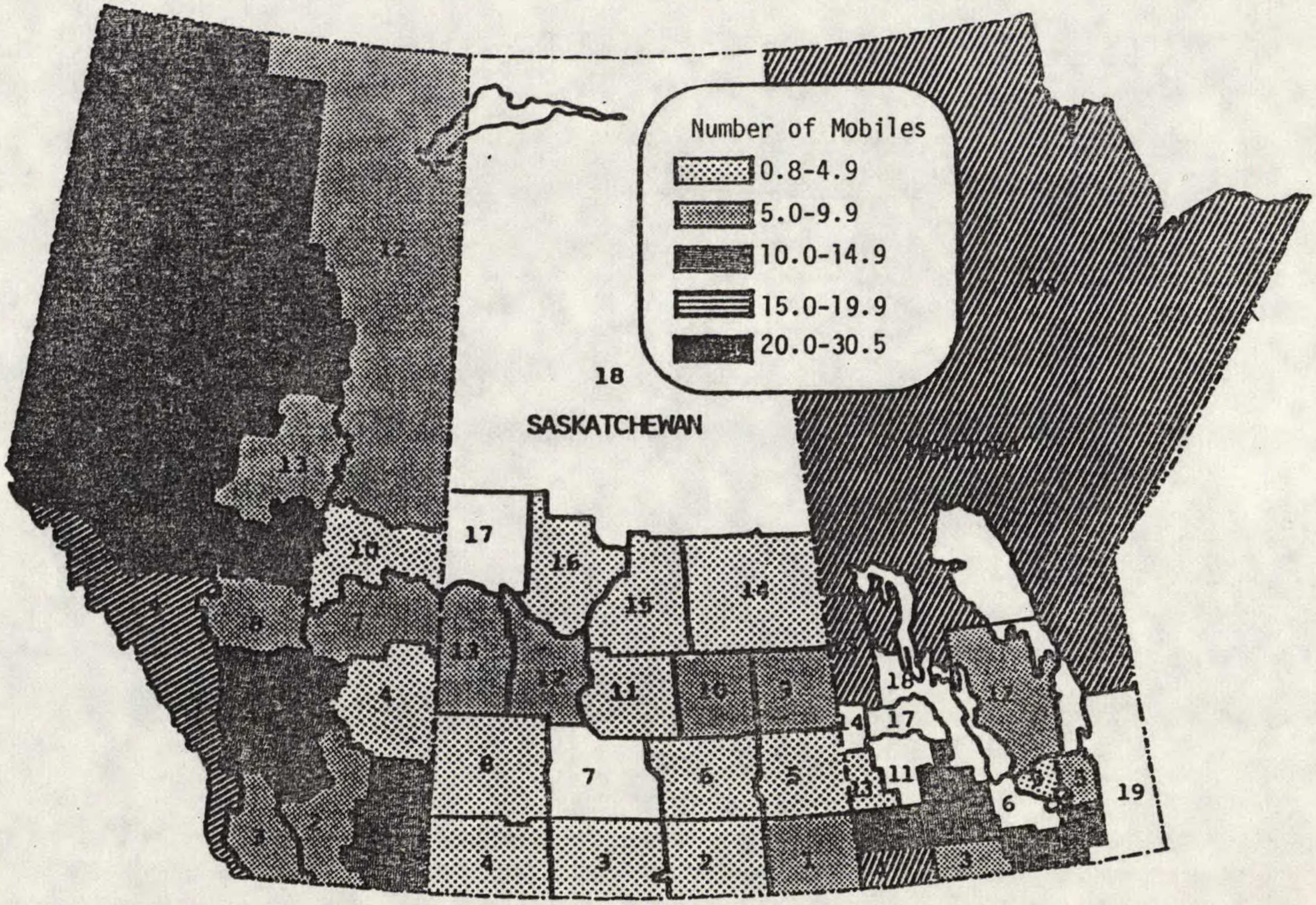


FIGURE 39 NUMBER OF PRIVATE RADIO MOBILES PER 1000 POPULATION, FOR URBAN CENTERS UNDER 5000 POPULATION, BY CENSUS DIVISIONS

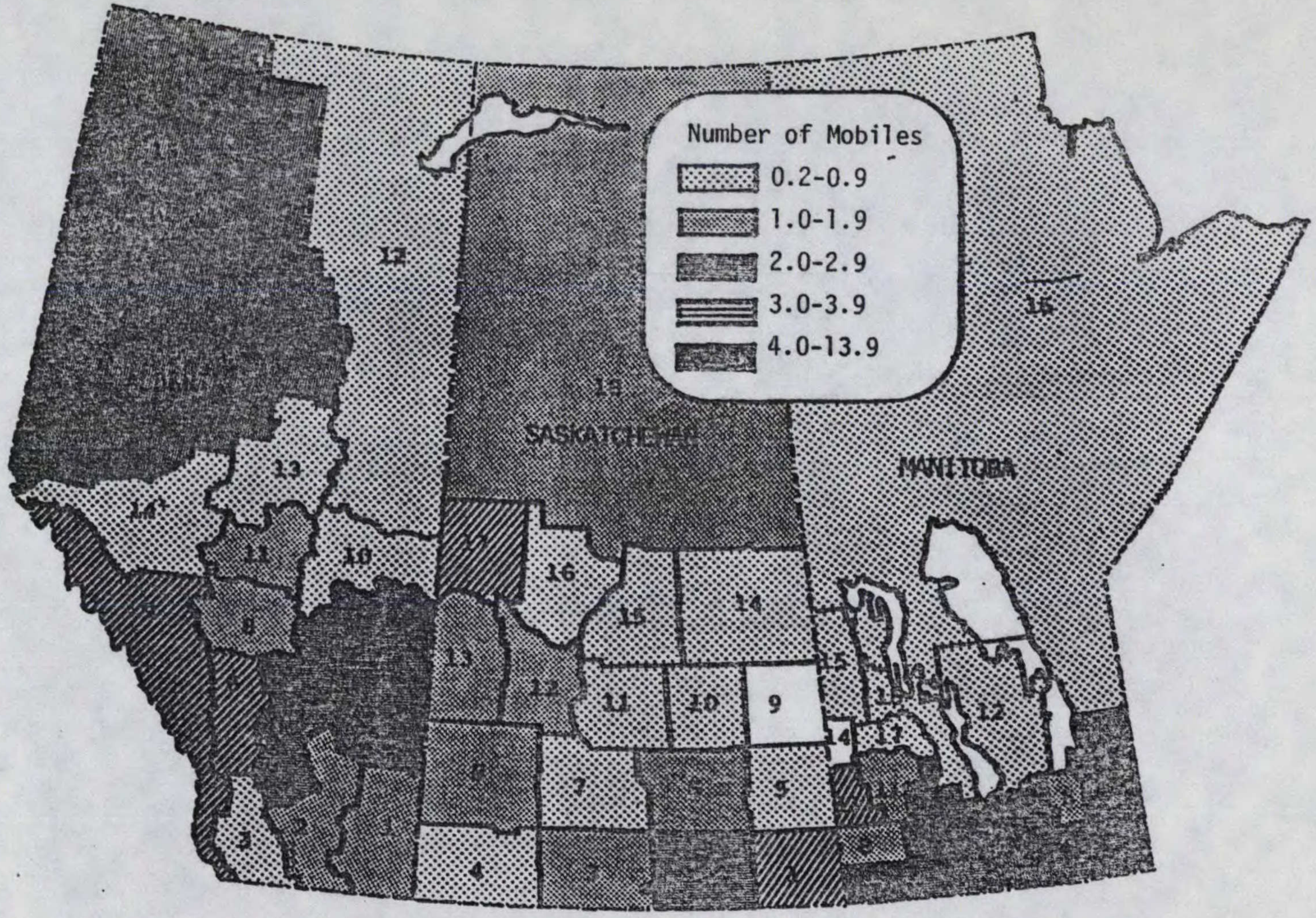


FIGURE 40 NUMBER OF PRIVATE RADIO MOBILES PER 1000 POPULATION, FOR RURAL AREAS, BY CENSUS DIVISIONS

somewhat higher penetrations in the Weyburn-Estevan and Lloydminister areas noted previously as possessing high urban penetrations. However, compared to the rest of the region, the penetration in Saskatchewan is consistently low. Even with a smaller proportion of rural systems, Alberta shows higher penetrations.

In order to better assess these penetrations, Figures 40 to 43 depict the distribution of private mobile radio systems in each of the provinces. Both the urban and rural distributions have been mapped for Alberta. If one compares these distributions with the distribution of communities which were illustrated in Chapter 4 (Figures 11, 12, 13), certain characteristics of the distribution of the mobile systems are brought out. On a gross scale, the lack of similarity between the two representations for Saskatchewan has a dominant impact as similarities for Alberta and Manitoba are evident. The nucleations of mobile systems which coincide with the farm cities are missing in Saskatchewan, compared to the distribution in the other two provinces.

Also noticeable is the consistent under-utilization of these systems in the fringe areas, especially in Manitoba and northeastern Alberta. The less dense distribution in the semi-arid portion of the region is also apparent.

While the next chapter will investigate some factors which help to explain this distribution, the situations which exist in the GLMRS and GRS categories must be presented first.

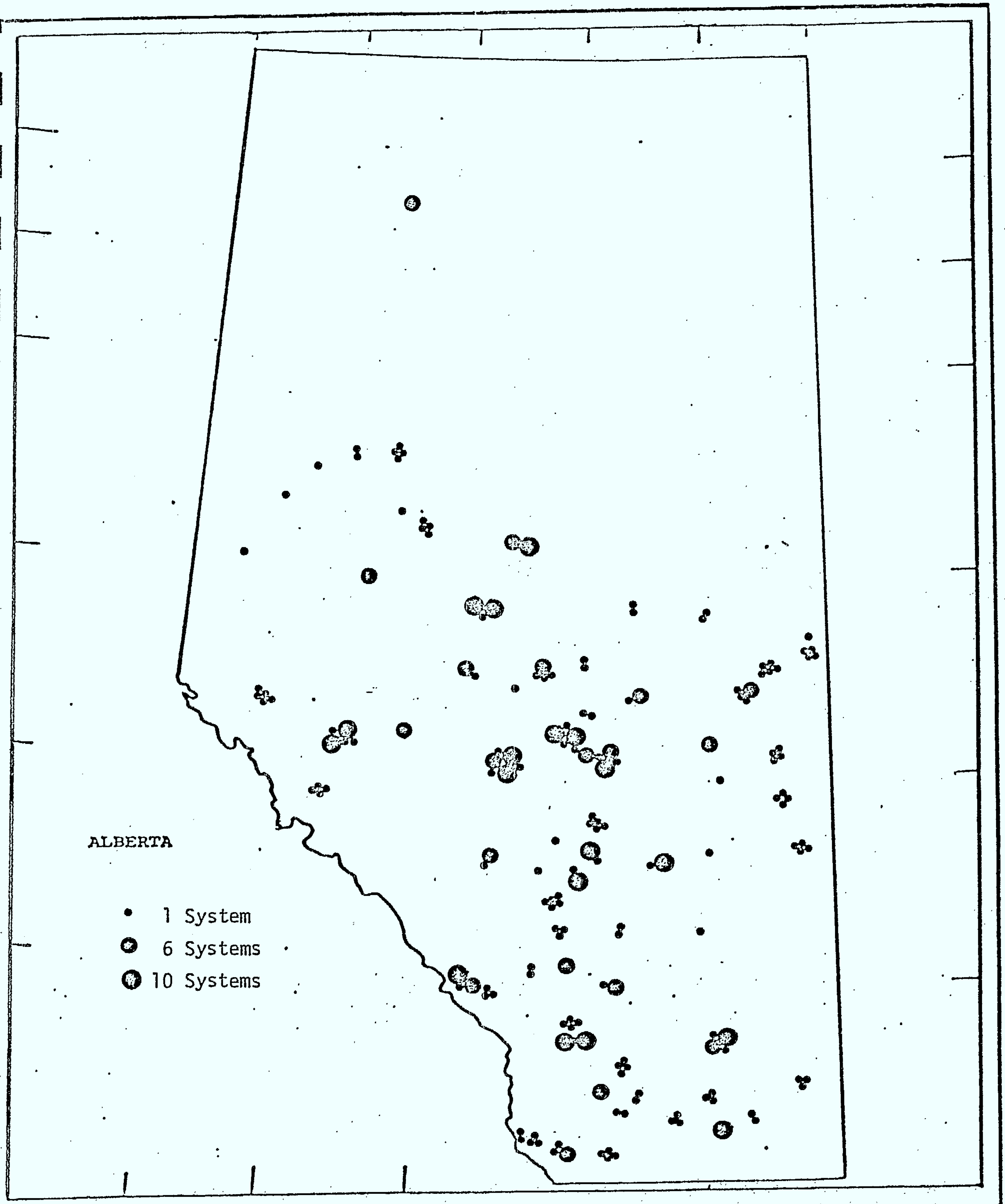


FIGURE 41 DISTRIBUTION OF PRIVATE RADIO SYSTEMS IN URBAN CENTRES OF 1000-5000 POPULATION IN ALBERTA

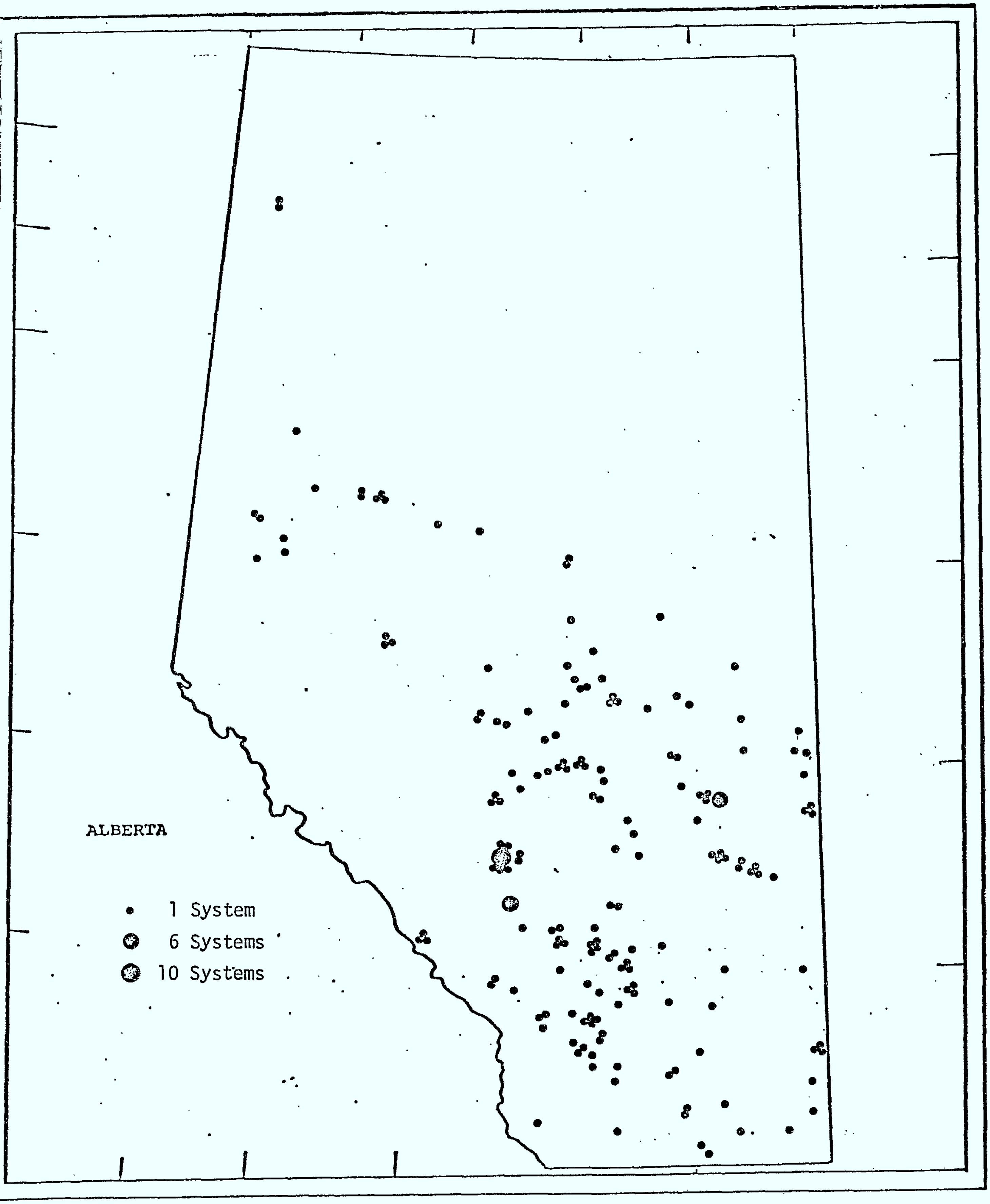


FIGURE 42 DISTRIBUTION OF PRIVATE MOBILE SYSTEMS IN RURAL ALBERTA

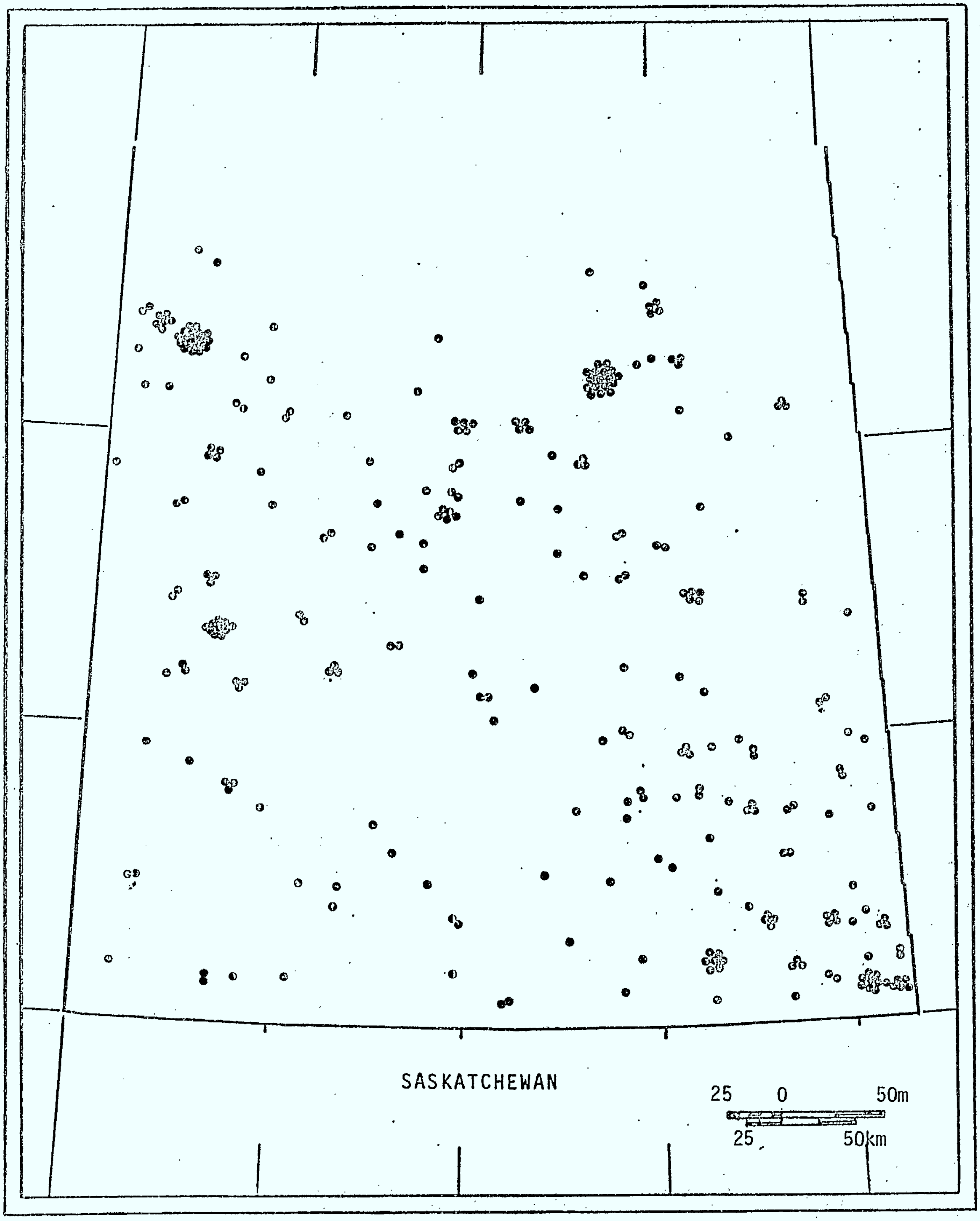


FIGURE 43 DISTRIBUTION OF PRIVATE MOBILE SYSTEMS IN URBAN CENTRES OF 1000-5000 POPULATION AND RURAL AREAS OF SASKATCHEWAN

FIGURE 44 DISTRIBUTION OF PRIVATE MOBILE SYSTEMS IN URBAN CENTRES OF 1000-5000 POPULATION AND RURAL AREAS OF MANITOBA

6.2 General Land Mobile Radio Services

This type of mobile communications is distinguished from other types by connection to the telephone system. There exists no standard terminology to describe this service, which is alternately described as General Mobile, Public Mobile, Radio-telephone or Mobile Telephone. The telephone connection provides the GLMRS user with a much more flexible communications pattern. If the user is within range of a base station, he can contact anyone in the world who has a telephone.

In the Prairie Provinces there are three different telephone companies, each of which is a crown corporation having provincial jurisdiction, which provide access to the telephone network from mobile units. In this respect, GLMRS differs from private radio communications in that a GLMRS user must operate within a given system while Private users can theoretically have a system designed to their specific needs. As the GLMRS situation is outlined in more detail, the variation in the different systems will become more apparent.

General Land Mobile Systems operate on a fixed number of channels which are open to all users. It is a general policy of the telephone companies to only provide as many channels in any one area as can accommodate the number of users. Contiguous areas are typically given different channels. However, the concentration of users in some urban areas has resulted in channel congestion. While the technology for automatic systems is available, cost factors do not warrant such systems in the region. Thus, all calls are handled by mobile telephone operators.

Individual mobile radios are typically leased for approximately $75 per month. Connection to the system is also provided to users owning their own units for about $30 per month. The cost of calls is over and above this charge with either a flat rate per call or a charge per minute determining the cost.

Due to the very important role which is played by the telephone companies in the provision of this service, it is seen to be advisable to first define the respective delivery systems. Generally, the information available concerning the systems dates back to 1959 and is largely gleaned from the companies' annual reports, and from published statistics.

Perhaps the very first distinction between the provinces in regards to GLMRS is the overwhelming dominance of Alberta. In fact, the number of mobile units in use in Alberta in 1961 was greater than the number in use in both Manitoba and Saskatchewan combined in 1974. From 1958 to 1974, Alberta experienced an average growth of 482 new units per year with the greatest increases occurring in the latter two years, which saw an additional 3163 units. In the same period, the level of use in Manitoba experienced fluctuations and no growth in the long term. Saskatchewan experienced a slow growth of an average 22 units per year which approximately tripled the level of use over the period. Thus, from 1958 when Manitoba had 148 mobiles, Saskatchewan had 190 mobiles and Alberta had 189 mobiles, different growth patterns resulted in the levels of use being 87, 545 and 7906 respectively for 1974.

In terms of the relationship of this level of use in the Prairie Provinces to the total Canadian situation, the growth pattern of Alberta enabled the region to slowly increase its share of the total Canadian mobile telephone population from 31% in 1958 to 38% in 1972. From 1972 onwards, the unprecedented rate of growth which was experienced in Alberta shot this figure up to 59% of which 4% is contributed by Manitoba and Saskatchewan combined.

FIGURE 45

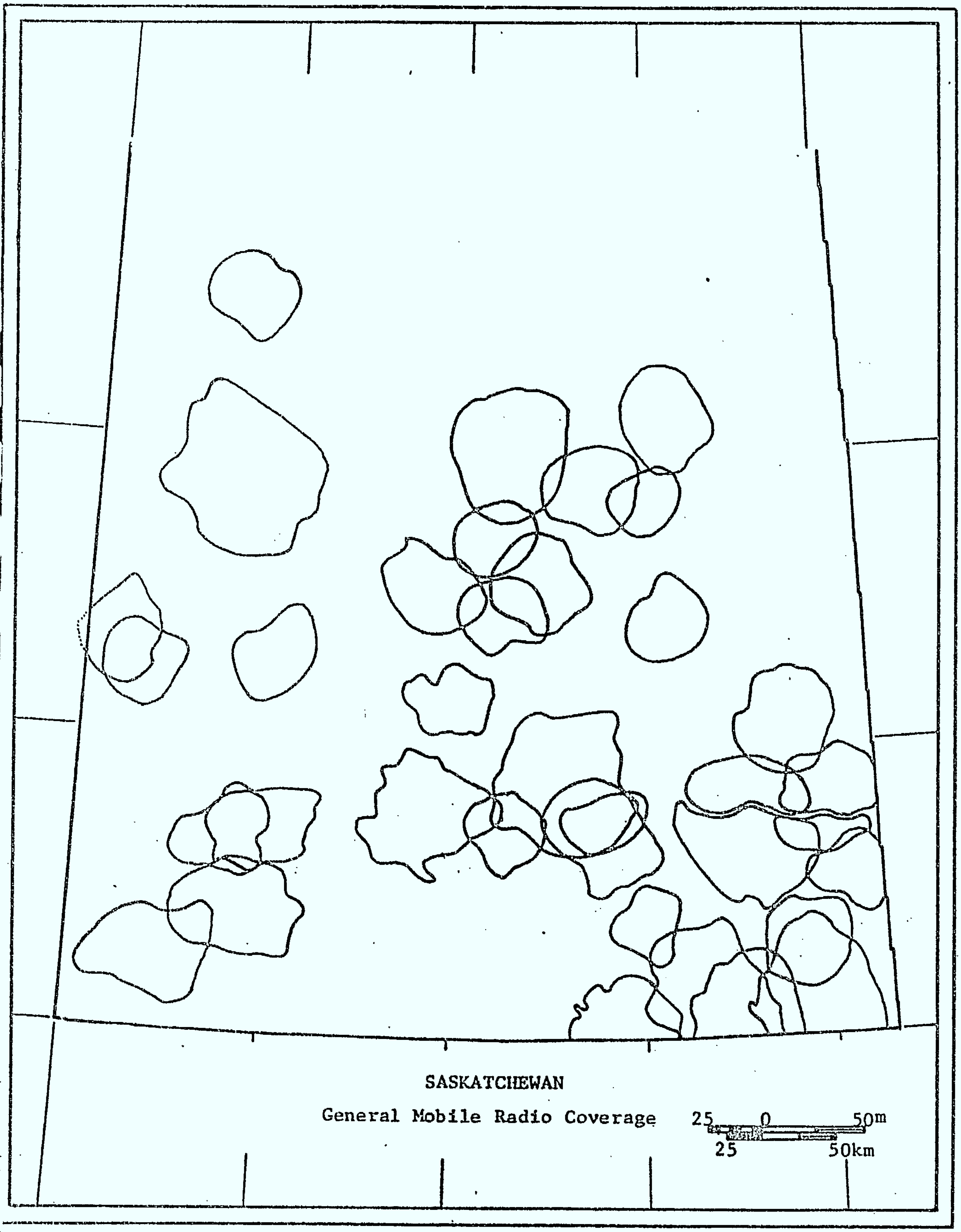

SASKATCHEWAN
General Mobile Radio Coverage
25 0 50m
25 50km

FIGURE 46

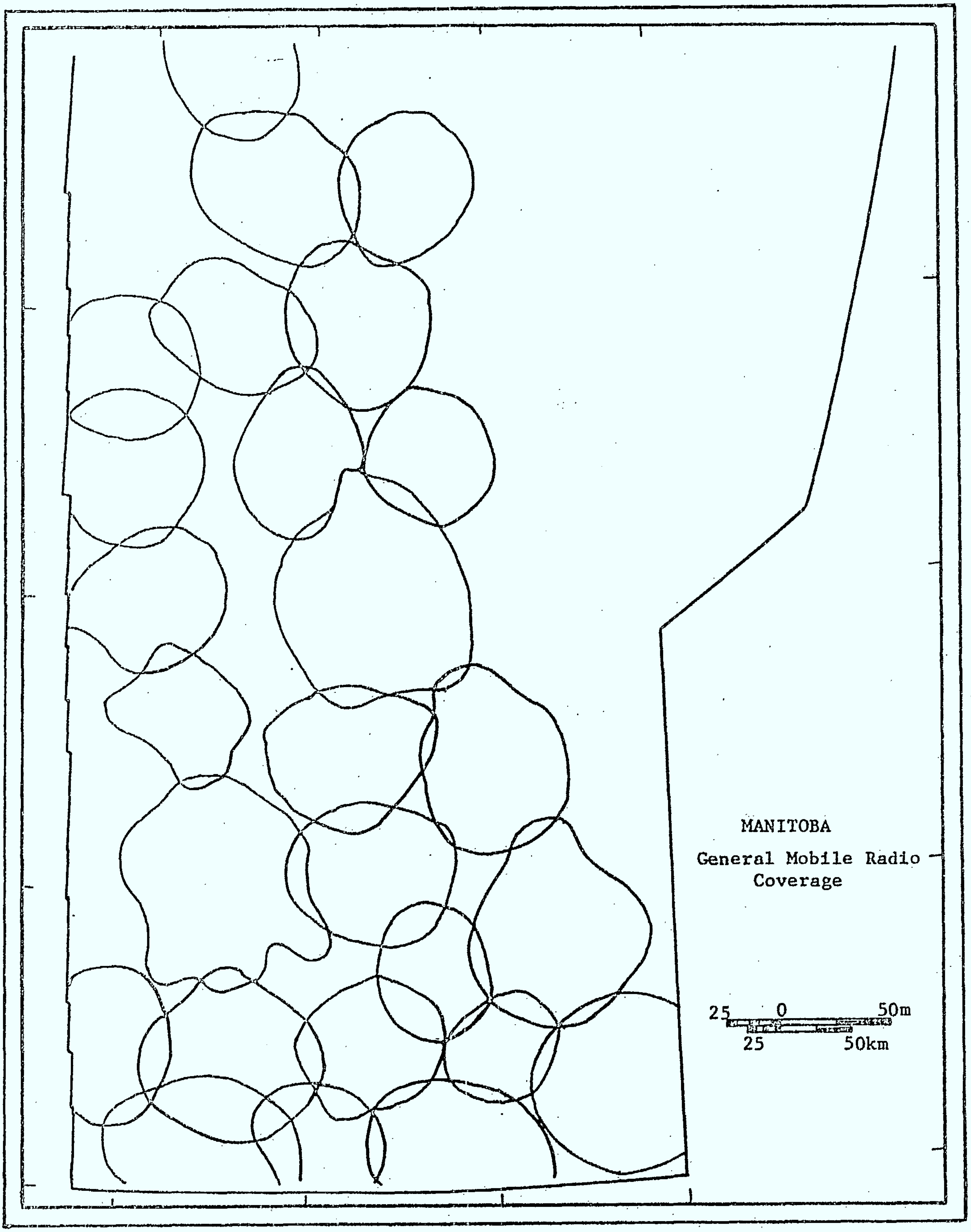


FIGURE 47

Anyone asked to explain this divergent pattern of growth within the region will undoubtedly give credit to the propulsive growth of oil and gas operations in Alberta. In fact, the annual report of Alberta Government Telephones for 1958-59 states that they were supplying general mobile service to seven pipeline companies and a refinery in Edmonton. By 1964-65, the annual report states that the final link in the AGT chain of mobile radio towers in southern Alberta was completed. Then they turned to developing the system in the northern parts. In 1971, they added nine base stations to the network, bringing the total to 76. The result is one of the most extensive and complete general mobile radio networks in Canada.

But the other two provinces did not possess an industry which was both growing and mobile. The domination of the province of Manitoba by Winnipeg promoted initial coverage of this area, with limited extensions of coverage area in the following years. It is only in recent years that further extensions to the coverage area were implemented. In Saskatchewan, initial coverage was given to the urban areas and the southeast portion of the province. The coverage pattern was extended to fill in the gaps along the Trans-Canada route and the Estevan-Regina-Saskatoon corridor subsequently. Other additions were generally based upon an exhibited demand. Whereas there were nine areas of coverage in 1966, there were 36 in 1976 for Saskatchewan.

With respect to the present situation, the general land mobile population as of February 28, 1977 provides the basis for analysis. The same level of licensing information as was available for the Private category was available for GLMRS. This information received identical treatment with the survey population consisting of licensees having a mailing address in a centre with under 5000 population. Certain aspects of GLMRS usage can be best brought by comparison with respect to private radio systems. Besides

TABLE 9

CLASSIFICATION OF GENERAL LAND MOBILES AND LABOUR FORCE PENETRATION BY POPULATION CLASSIFICATIONS

	No. of Systems	No. of Mobiles	Average System Size	No. in Work Force 1971	Mobiles/1000 Work Force
Province of Alberta	4,655	8,415	1.8	756,665	11.1
Centres over 100,000	2,348	4,894	2.1	416,585	11.7
Centres 10,000-99,999	553	895	1.6	57,155	15.6
Centres 5,000- 9,999	214	347	1.6	20,870	16.6
Centres under 5,000	1,021	1,642	1.6	72,865	22.5
Rural	519	637	1.2	189,195	3.4
Province of Saskatchewan	552	676	1.2	410,070	1.6
Centres over 100,000	225	286	1.3	125,190	2.3
Centres 10,000- 99,999	86	100	1.2	46,680	2.1
Centres 5,000- 9,999	25	43	1.7	12,200	3.5
Centres under 5,000	113	134	1.2	37,500	3.6
Rural	103	113	1.1	188,490	0.6
Province of Manitoba	383	414	1.1	458,920	0.9
Centres over 100,000	282	302	1.1	263,035	1.1
Centres 10,000- 99,999	23	24	1.0	33,715	0.7
Centres 5,000- 9,999	12	13	1.1	12,865	1.0
Centres under 5,000	26	31	1.2	24,615	1.3
Rural	40	44	1.1	124,865	0.4
TOTAL	5,590	9,505	1.7	1,625,655	5.8

the greater concentration in Alberta noted above, the average number of mobiles per licensees is significantly smaller. The only places where an average of two mobiles is exceeded are the cities of Calgary and Edmonton. Within Alberta, the other urban places show a greater tendency towards a larger number of mobiles than does the rural population. In Saskatchewan, the centres in the 5000 to 9,999 category are higher in this category, reflecting the urban centres of Estevan and Weyburn. In Manitoba, all segments of the population show little tendency to have more than one mobile.

The number of general mobiles per 1000 persons in the work force for these different population segments was also computed. Obviously, the penetration in Alberta is exceptional. Yet within the population, there is a greater penetration as the class of urban centre gets smaller. The rural penetration in Alberta is even greater than the penetration into the cities of Saskatoon, Regina and Winnipeg. In Saskatchewan, the values for urban places under 10,000 population are a little higher than those places over 10,000. All segments of the Manitoba population show a low penetration. The rural areas of these two provinces reveal that about one in every two thousand workers has a general mobile.

Figures for the number of mobiles per 1000 total population for the individual urban centres provide greater definition. For the five cities over 100,000, Calgary presents a value of 7.3 and Edmonton a value of 4.4 compared to low values of 1.0, 1.1 and 1.2 for Saskatoon, Regina and Winnipeg. Of interest is the difference in industrial mix for each of these cities. The dominant industrial activity from the point of view of GLMRS usage for the city of Calgary is the community, business and personal services group. The majority of general mobiles within this group are utilized for business services reflecting the concentration of financial activities related to

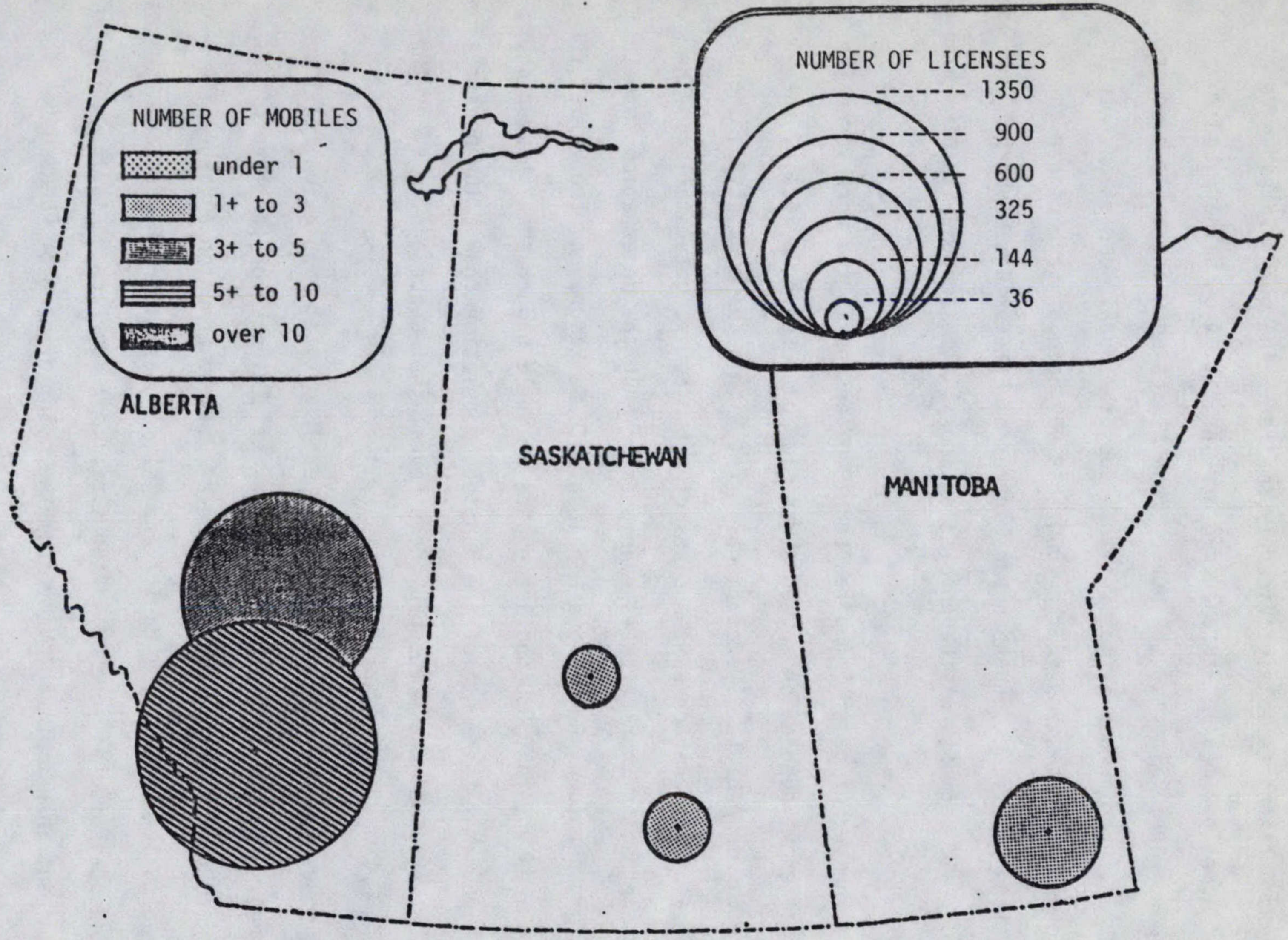


FIGURE 48

NUMBER OF GLMRS LICENSEES IN URBAN CENTERS OVER 100,000 POPULATION, SHOWING NUMBER OF MOBILES PER 1000 POPULATION

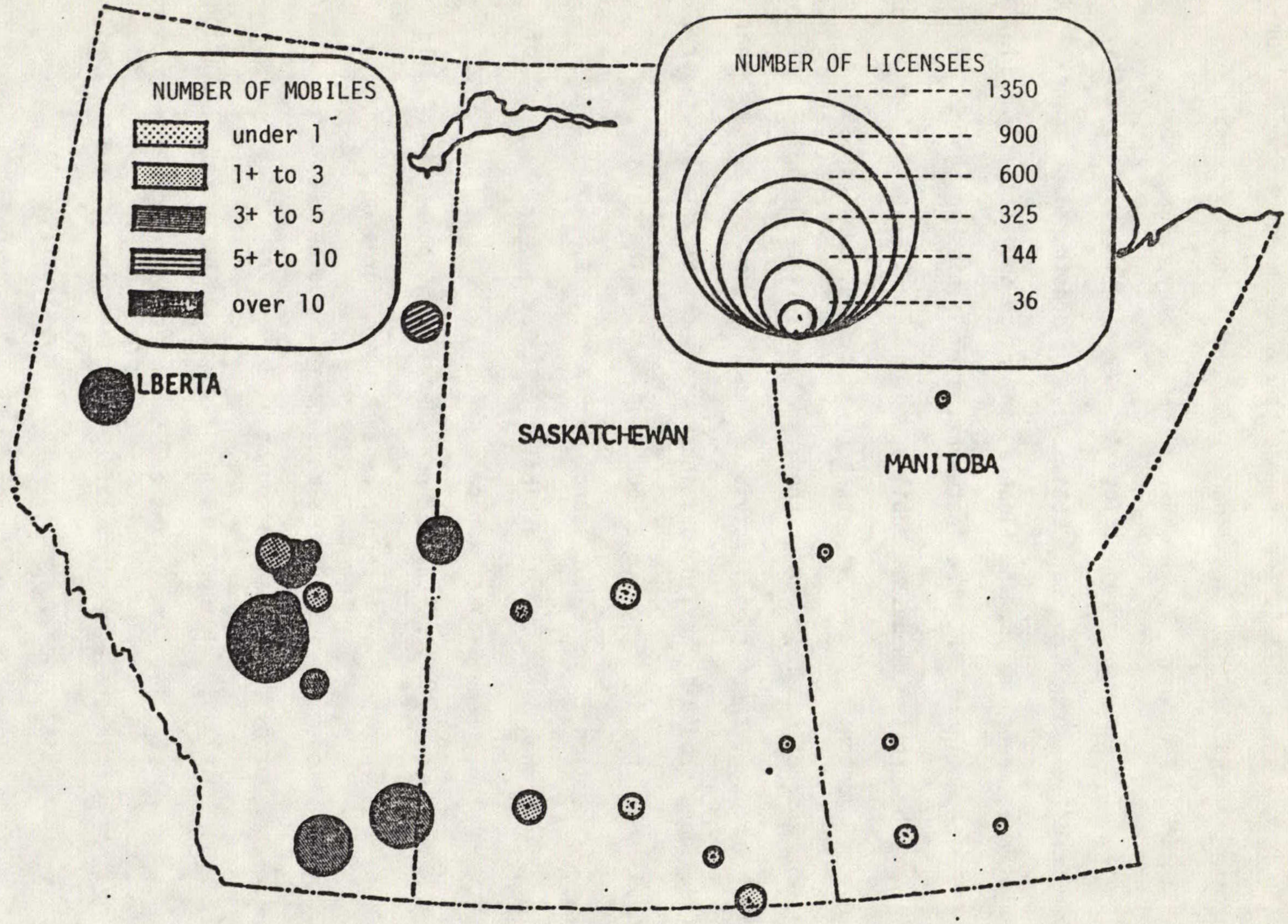


FIGURE 49

NUMBER OF GLMRS LICENSEES IN INDIVIDUAL URBAN CENTERS FROM 5000 to 100,000 POPULATION, SHOWING NUMBER OF MOBILES PER 1000 POPULATION the petroleum industry. For Calgary, other activities which are significant general mobile users, in their order of importance, are mines and oils, construction trade, manufacturing, and finance, insurance and real estate. Edmonton has about a thousand fewer mobiles than Calgary and a somewhat different mix. The service and oil categories are also the biggest users, but only marginally. Other dominant activities are construction, transportation, trade, manufacturing and finance, insurance and real estate, in that order. The dominant difference between the two cities in these activities is the greater amount of mobiles employed in transportation activities in Edmonton. In the two Saskatchewan cities, the highest use category is construction, followed by the trade and service groups. For the city of Winnipeg, these three activities are also dominant, except that the most dominant group is the finance, insurance and real estate category.

For the smaller urban places over 5000 population, the pattern is similar. Construction is the major source of GLMRS users. Those places with relatively higher penetrations exhibit a relatively greater amount of usage by the mining, trade and service categories.

Comparisons between the survey and non-survey GLMRS populations yield some important differences. The larger centres have a greater propensity towards larger systems. Agriculture is more conspicuous as a source of users, but it is not as significant a source as in the Private category. Transportation activities are much more significant in the survey population. But service and construction activities are still dominant.

Variations within the survey population in the region serve to somewhat qualify these differences. Mobiles used in transportation are concentrated in Alberta where they equal construction as a source of users. This is not the case in Manitoba and Saskatchewan where construction out-

TABLE 10

NUMBER OF SYSTEMS, NUMBER OF MOBILES AND AVERAGE SYSTEM SIZE, FOR GENERAL MOBILE RADIO SYSTEMS IN CENTRAL REGION, BY BY INDUSTRIAL DIVISIONS

	Centers Over 5000 Population			Centers Under 5000 Population			Total All Centers	
	# Systems	# Mobiles	Ave System Size	# Systems	# Mobiles	Ave System Size	# Systems	# Mobiles
griculture	70	89	1.3	145	153	1.1	215	242
orestry	18	34	1.9	32	37	1.2	40	73
Fishing, Trapping	3	6	2.0	3	3	1.0	6	9
ines, Quarries, Oil Wells	453	1470	3.2	230	355	1.5	683	1825
nufacturing	198	396	2.0	61	77	1.3	259	473
Construction	932	1472	1.6	463	657	1.4	1395	2129
ansportation	409	630	1.5	390	557	1.4	799	1187
ade	372	620	1.7	171	207	1.2	543	827
Finance, Real Est.	346	385	1.1	34	37	1.1	380	422
mmunity, Business, Personal Services	972	1908	2.0	401	541	1.3	1373	2449
her	9	9	1.0	37	44	1.2	46	53
	3782	7019	1.9	1967	2668	1.4	5749	9687

TABLE 11

CLASSIFICATION OF GENERAL MOBILE RADIO SYSTEMS
BY FIELD OFFICE LOCATION AND INDUSTRIAL DIVISIONS

(Licensees from Urban Centers over 5000 are excluded)

	Agriculture	Forestry	Fishing, Trapping	Mines, Quarries, Oil Wells	Manufacturing	Construction	Transportation	Trade	Finance, Insurance, Real Estate	Community, Business, Personal Service	Other	TOTALS
Edmonton	23	14		106	21	196	145	77	16	169	3	770
Calgary	55	3		58	20	92	124	48	7	95	4	406
Grande Prairie	12	14	1	45	10	79	87	21	2	67	26	364
Regina	28			7	1	26	5	7		21	2	97
Saskatoon	22	1		13	3	31	7	11	5	26		119
Winnipeg	5		1		3	26	6	4	4	13	2	64
Thompson							2					2
Fort Smith					2	3	7	1		5		18
Yellowknife			1	1	1	10	7	2		5		27
TOTALS	145	32	3	230	61	463	390	171	34	401	37	1967

TABLE 12

CLASSIFICATION OF INDIVIDUAL GENERAL MOBILE RADIOS SYSTEMS
BY FIELD OFFICE LOCATION AND INDUSTRIAL DIVISIONS

(Licensees from Urban Centers over 5000 are excluded)

	Agriculture	Forestry	Fishing, Trapping	Mines, Quarries, Oil Wells	Manufacturing	Construction	Transportation	Trade	Finance, Insurance, Real Estate	Community, Business, Personal Service	Other	TOTALS
Edmonton	26	14		162	23	288	211	92	18	213	9	1056
Calgary	58	3		84	28	122	163	54	7	140	5	664
Grande Prairie	12	19	1	79	12	127	139	30	2	112	26	559
Regina	28			8	1	29	5	11		23	2	107
Saskatoon	23	1		21	3	35	9	12	6	30		140
Winnipeg	6		1		3	32	6	4	4	13	2	71
Thompson							4					4
Fort Smith					6	5	9	2		5		27
Yellowknife			1	1	1	19	11	2		5		40
TOTALS	153	37	3	355	77	657	557	207	37	541	44	2668

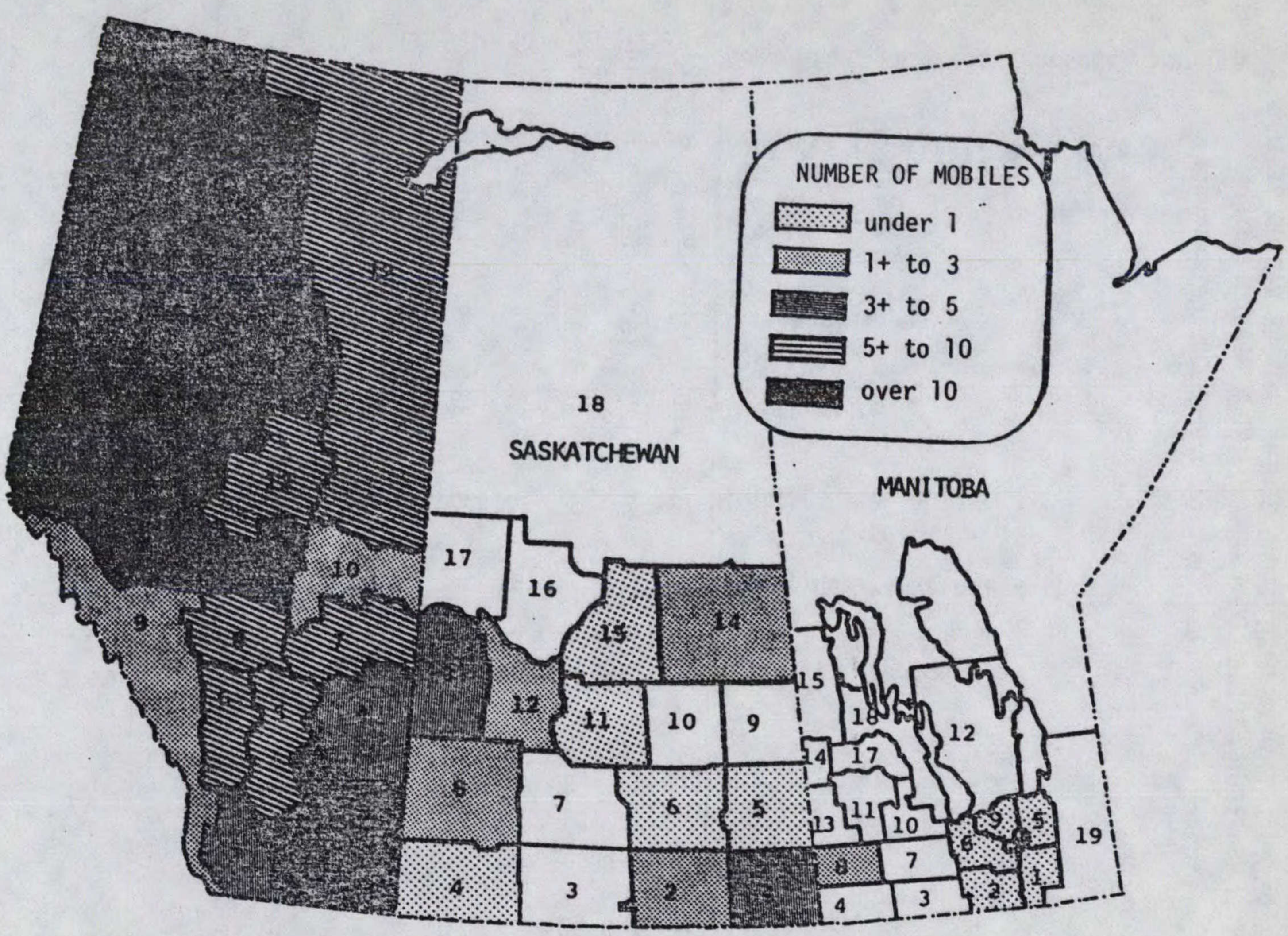


FIGURE 50

NUMBER OF GLMRS PER 1000 POPULATION FOR URBAN CENTERS

UNDER 5000 POPULATION BY CENSUS DIVISIONS

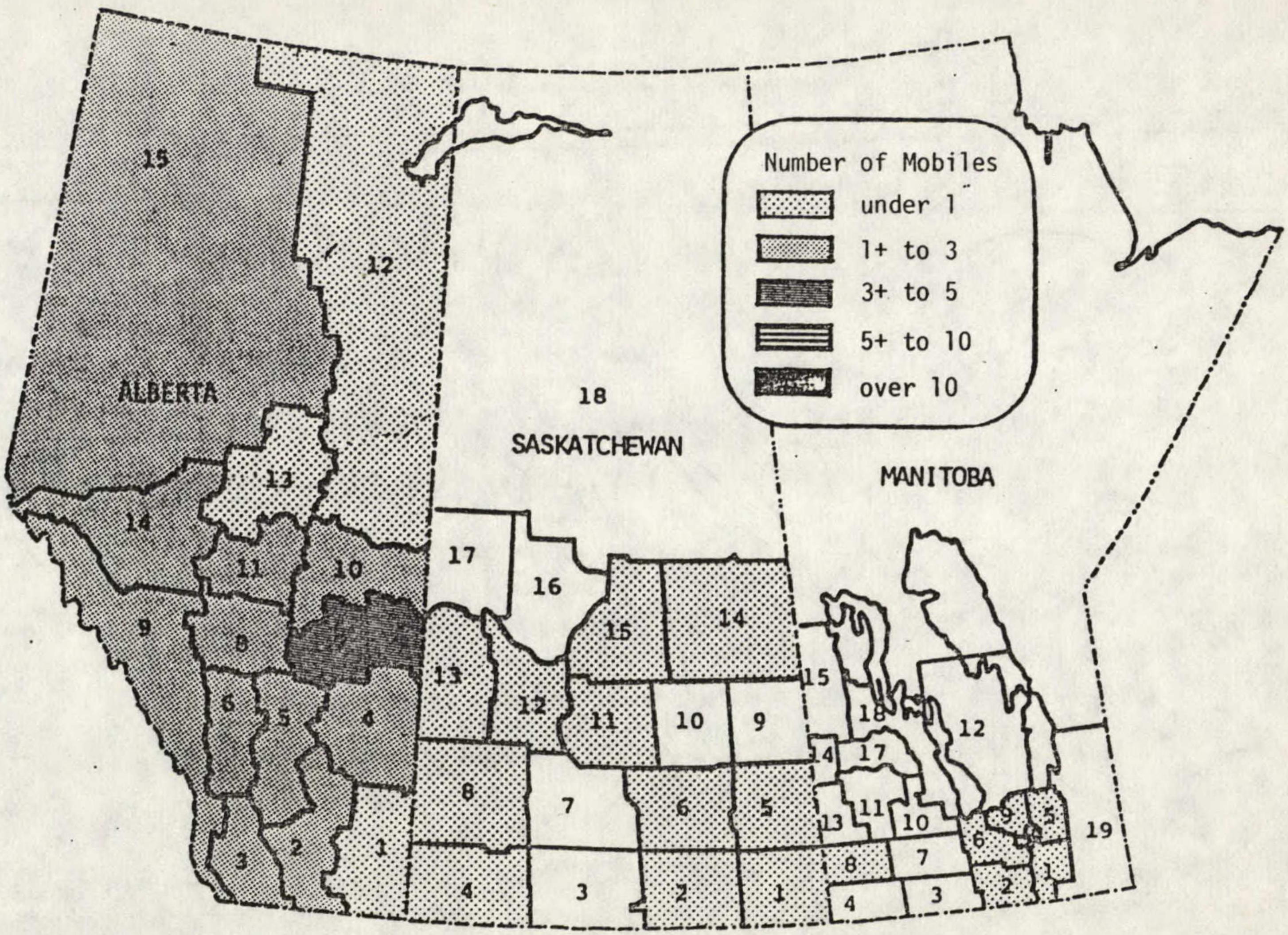


FIGURE 51

NUMBER OF GLMRS MOBILES PER 1000 POPULATION FOR RURAL AREAS

BY CENSUS DIVISIONS

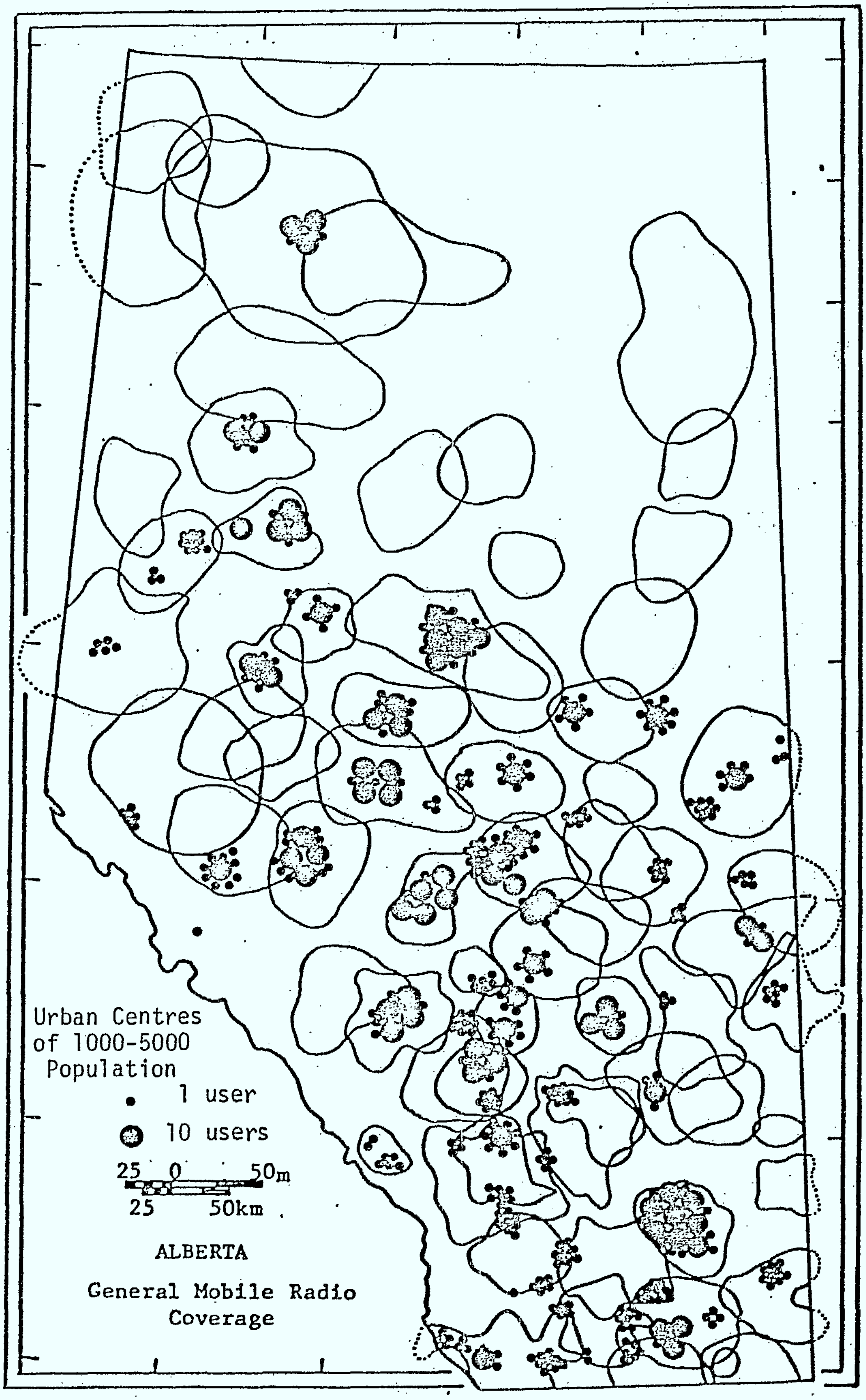


FIGURE 52 DISTRIBUTION OF GLMRS USERS

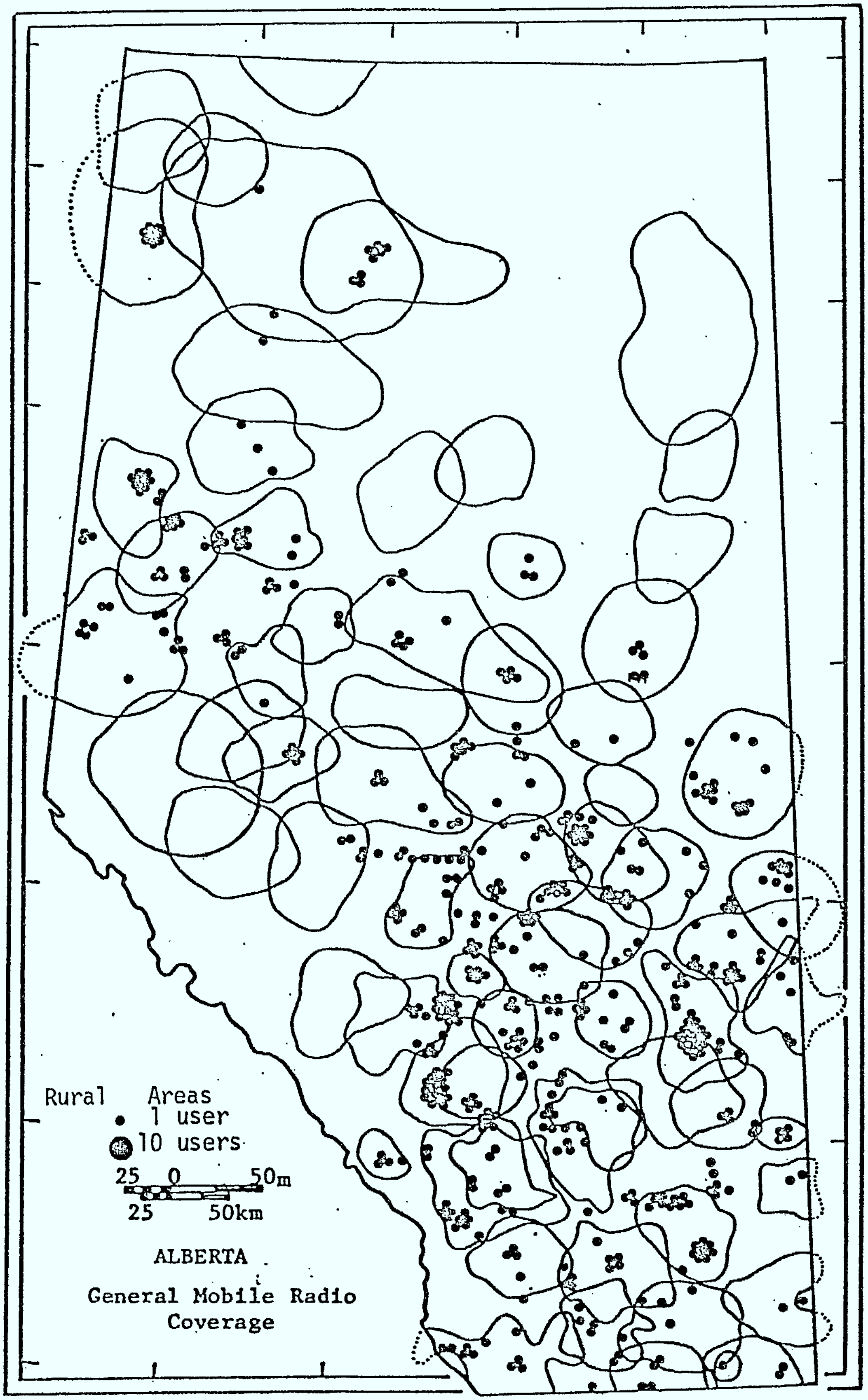


FIGURE 53 DISTRIBUTION OF GLMRS USERS

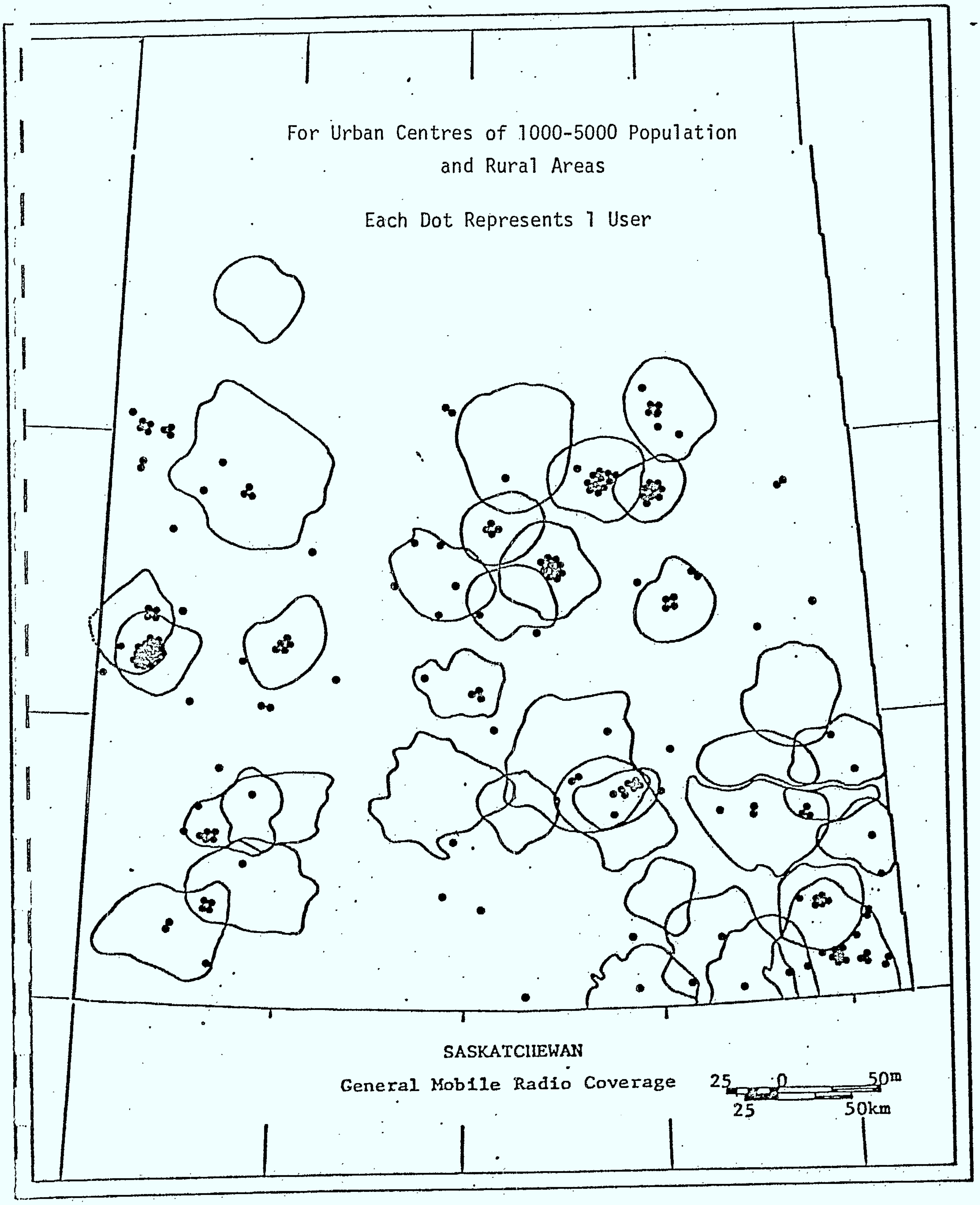


FIGURE 54 DISTRIBUTION OF GLMRS USERS

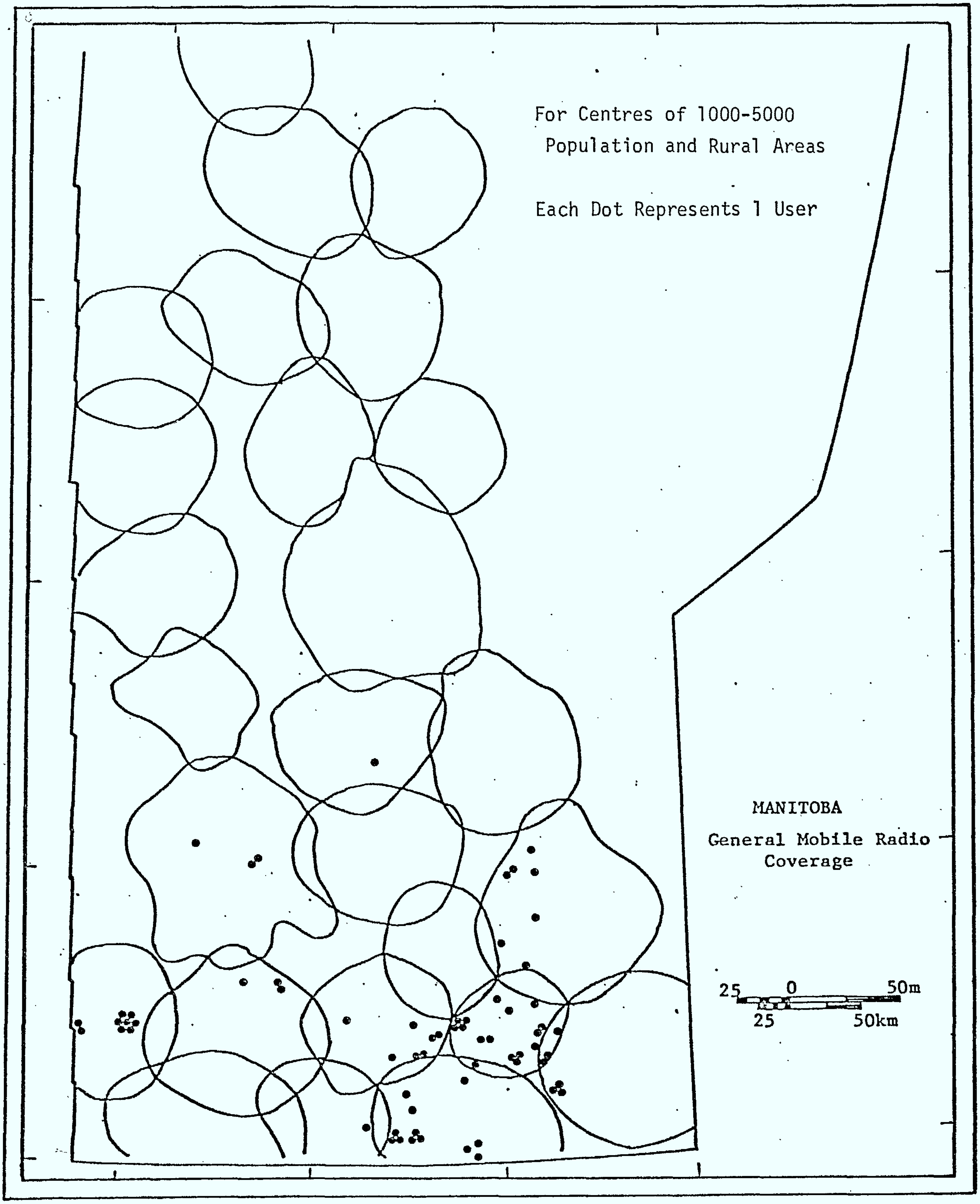


FIGURE 55 DISTRIBUTION OF GLMRS USERS

numbers transportation by five to six times. This can perhaps be interpreted as reflecting the inadequacy of mobile coverage in the areas outside the major circulation arteries in these provinces. As transportation is a very mobile activity, a virtually blanket coverage is needed to conform to its activity space. Typically, agriculture is a more dominant user in Saskatchewan.

The pattern of penetration into the major segments of the survey population has also been mapped for those areas which are deemed to have virtually full area coverage. Manitoba has low penetration in all areas. Saskatchewan shows a somewhat higher penetration for the small urban places in areas with oil and mining activity, but is otherwise low. Alberta is relatively high with urban places in the 1000 to 4999 range showing lower penetration in the western and northeastern fringes. As well, the variation in the adoption of general mobiles between the urban and rural portions of the survey population is very noticeable. This urban-rural difference, as well as the low penetrations elswhere, are illustrated in the distributional representations of GLMRS licensees by province.

6.3 General Radio Services

General Radio Service is a Canadian designation which describes the same category of mobile communications as is termed Citizen's Band or "CB" in the United States. To say that this is a rapidly growing method of communication is a gross understatement. From the time that this population was sampled for the survey to the writing of the report, the number of licensed GRS sets in the region has doubled. Thus, levels of use which are represented here are a part of history.

Distinguishing characteristics of this category of service, over and above its popularity with the general population, centre around the lack of constraints associated with its use. Compared to Private and GLMRS communications, GRS is low cost and is becoming increasingly so. Cost of equipment is 10% to 20% of the initial cost for a private system of comparable size. There is no continuing service charge and cost per call as there is for General Land Mobile Services. Licensing an approved GRS unit merely involves filling out a simple one-page form and paying a \$13.50 fee for a three-year license.

Popularization of this communications service has coincided with rising costs of gasoline. More and more people are realizing the amount of time and money savings which can be realized through reduced travel. The status of this communications method is very hazy because of its rapid growth. As with anything else, a fast pace of growth does not promote order.

All GRS users share a fixed number of channels - 23 when the survey was taken and 40 as of April 1, 1977. It is very elementary to realize that a greater number of problems will surface where there are concentrations of people and therefore GRS units. At the end of November 1976, when the GRS sample was taken, there were in excess of 88,000 licensed GRS units in the Prairie Provinces. The comparable figure for July 1977 is in the neighbourhood of 150,000. At the time of the sample, approximately 44% of the total units were used in urban areas over 5000 population. The probabilities for problems in urban areas as opposed to rural areas are magnified.

TABLE 13

GRS PENETRATION INTO THE PRAIRIE PROVINCES
NOVEMBER 1976

	Total No. of GRS Units	Estimated Penetration No. of Units/1000 Population Total	Urban	Rural
Alberta	40,483	24.9	20.8	31.9
Saskatchewan	31,491	34.0	24.2	41.5
Manitoba	16,369	16.6	12.2	24.3

However, our concern is with GRS users in rural areas. In terms of GRS penetration, computations show that rural areas have adopted this method of communications to a greater degree than urban areas. From a provincial viewpoint, Saskatchewan has the highest penetration, followed by Alberta and Manitoba. This same ordering is apparent in the survey and non-survey population breakdown. However, the relatively greater number of mobiles per 1000 population in the survey population favours Manitoba, Saskatchewan and Alberta, in that order.

Based upon the locations of the GRS users which were sampled, estimates were made of the penetration into the survey population. These estimates show that for the combined population, consisting of urban centres under 5000, rural farm and non-farm, the highest adoption rates are in the southern and western portions of Saskatchewan and continue into eastern Alberta. Penetration into the northern areas is low with the exception of the Peace River area. In terms of the continuously settled area, Saskatchewan has a more consistent penetration than Alberta or Manitoba.

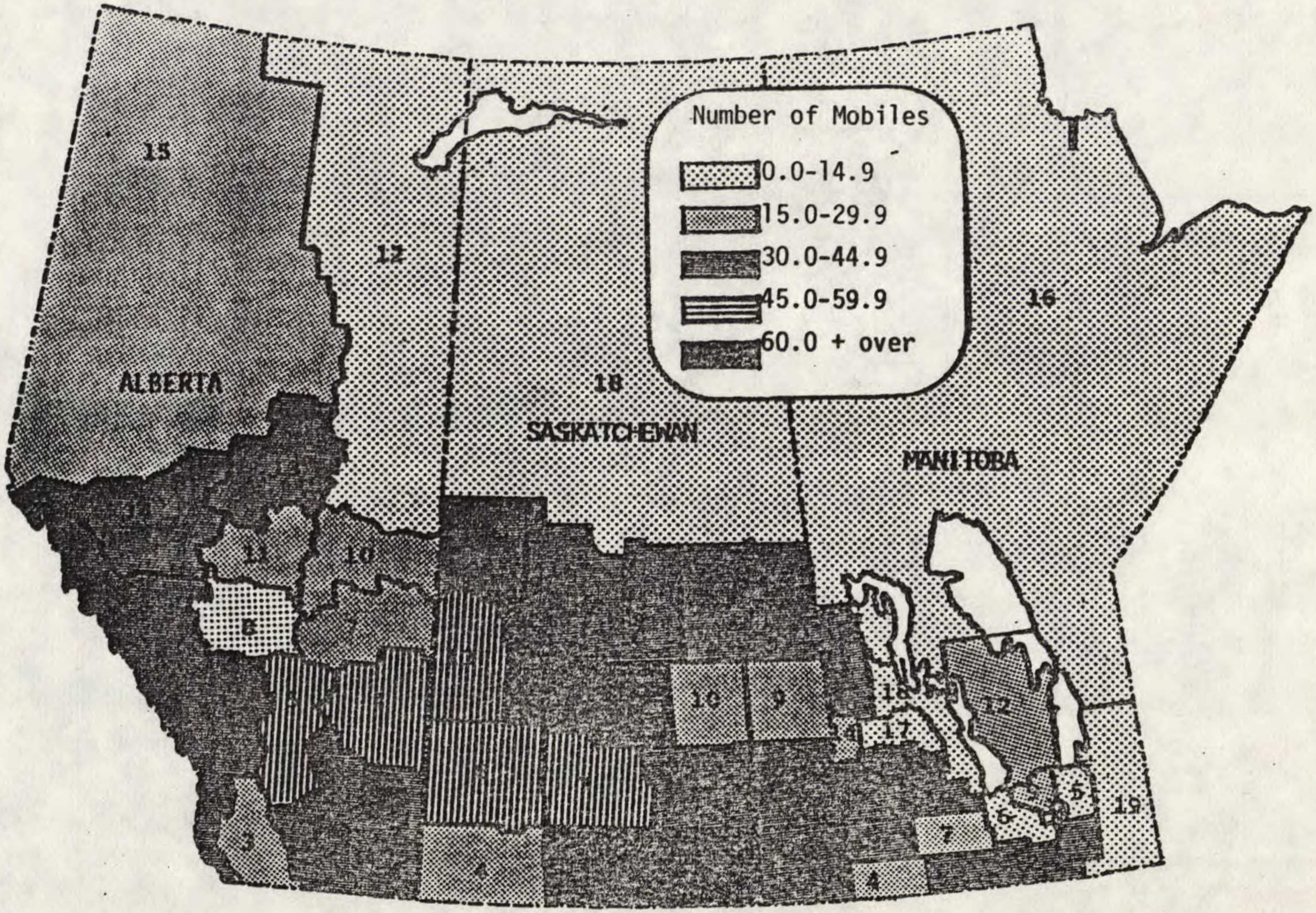


FIGURE 56 ESTIMATED NUMBER OF GENERAL RADIO SERVICE MOBILES PER 1000 POPULATION, FOR URBAN CENTERS UNDER 5000 POPULATION AND RURAL POPULATION, BY CENSUS DIVISION

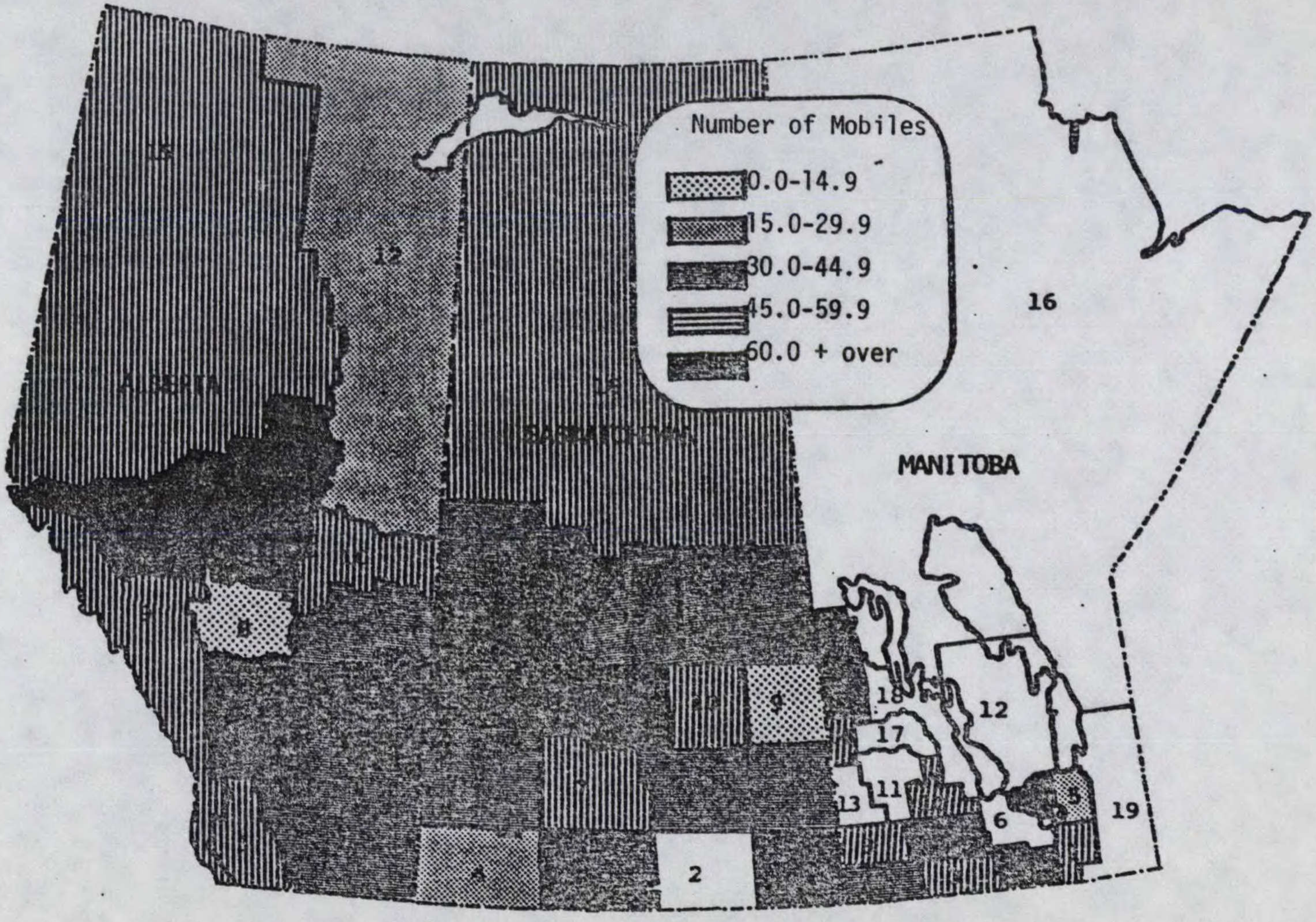


FIGURE 57 ESTIMATED NUMBER OF GENERAL RADIO SERVICE MOBILES PER 1000 PERSONS, FOR URBAN CENTERS UNDER 5000 POPULATION, BY CENSUS DIVISIONS

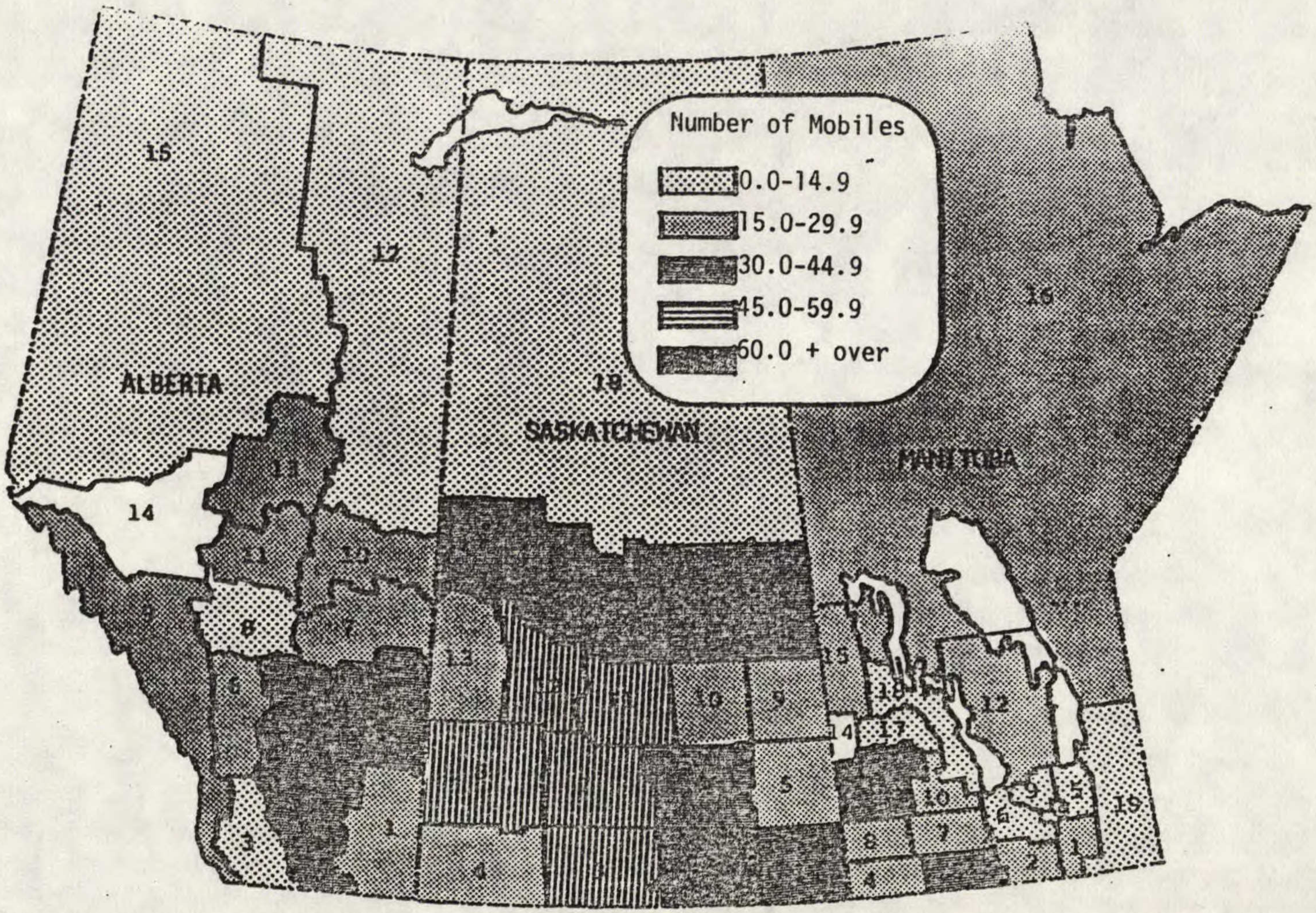


FIGURE 58 ESTIMATED NUMBER OF GENERAL RADIO SERVICE MOBILES PER 1000 POPULATION IN RURAL AREAS, BY CENSUS DIVISIONS

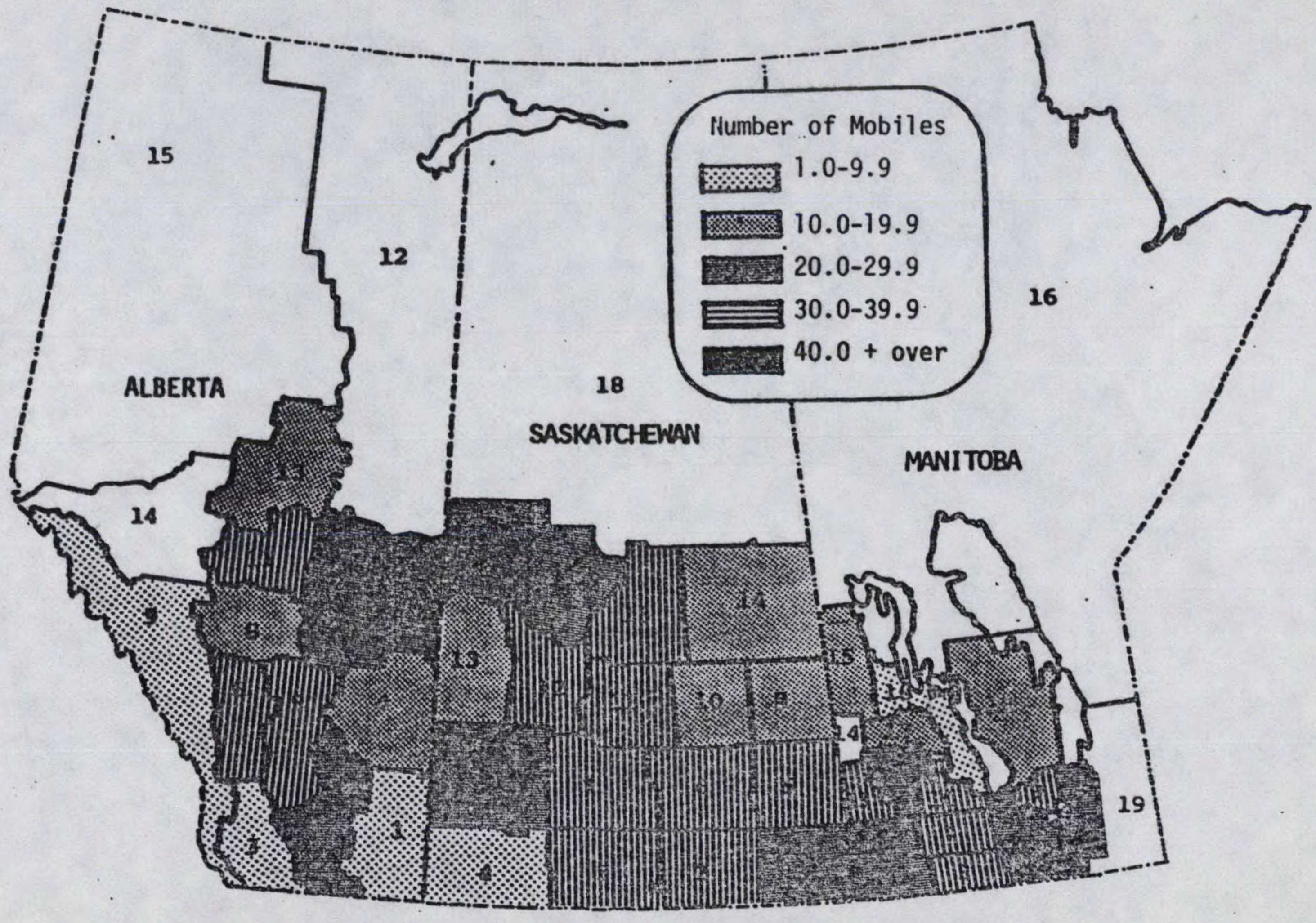


FIGURE 59 ESTIMATED NUMBER OF GENERAL RADIO SERVICE MOBILES PER 10 SQUARE MILES, EXCLUDING ALL URBAN MOBILES, BY CENSUS DIVISIONS

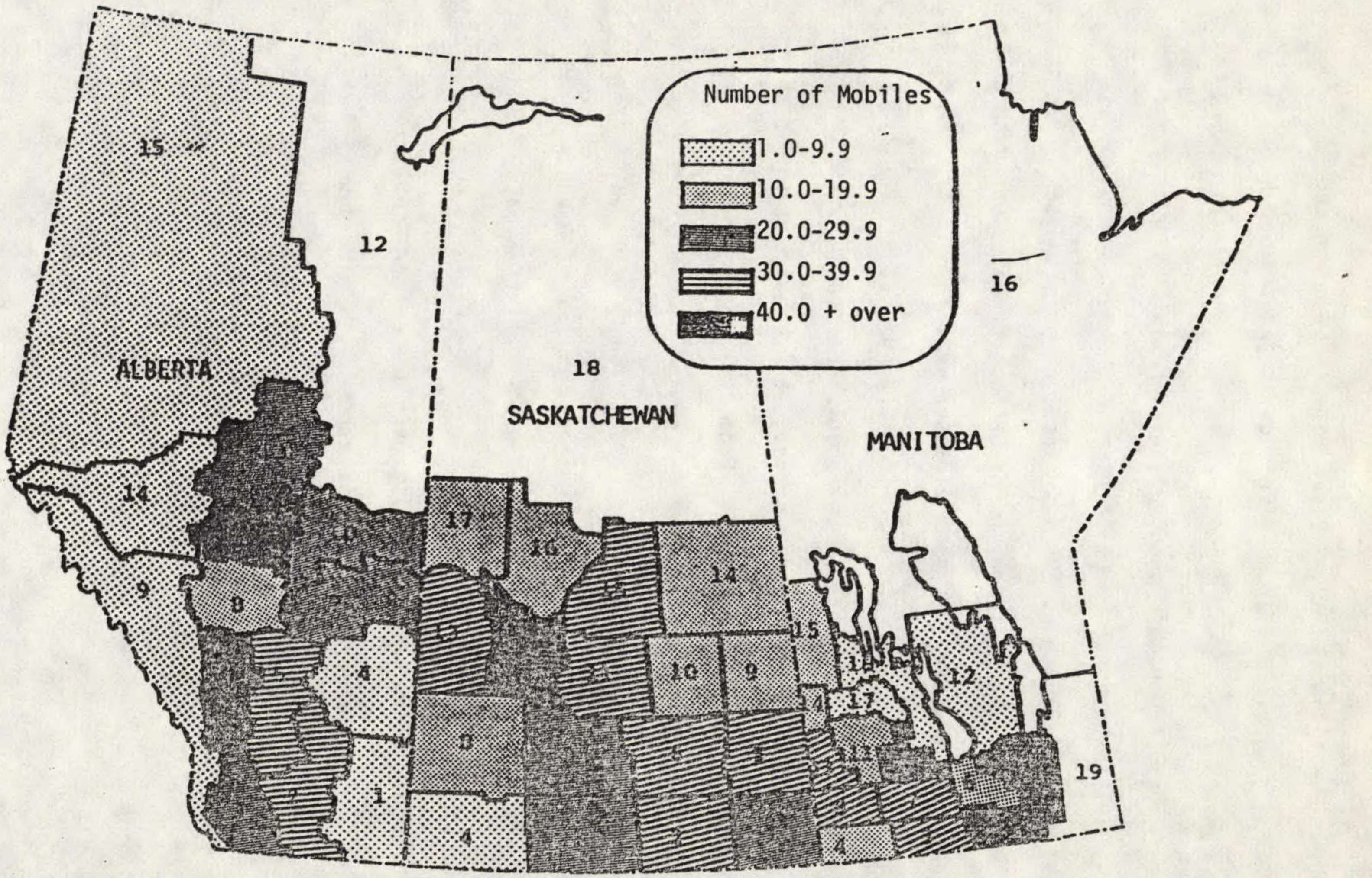


FIGURE 60 ESTIMATED NUMBER OF GENERAL RADIO SERVICE MOBILES PER TEN SQUARE MILES, EXCLUDING MOBILES LOCATED IN URBAN CENTERS EXCEEDING 5000 POPULATION, BY CENSUS DIVISIONS

When these estimates are divided into their urban and rural components, it is very noticeable that the difference in penetration between these small urban centres and the rural population is much greater in both Alberta and Manitoba. Thus, the higher penetration in Saskatchewan can be accredited in large part to a higher adoption rate in the rural population.

However, as the use of GRS was perceived as being sensitive to the density of users, the distribution of GRS users was compared to a land measurement as opposed to a people measurement. Disregarding the GRS users in the urban places excluded from the survey, the variation in density is between the total survey population and the rural portion is very interesting. For the total survey, an exceedingly high density surrounding Winnipeg was outlined. From this point westward, a density of over 30 GRS units was estimated for areas which also house most of the major urban places in the prairies, the main exception being the Medicine Hat area in the sparsely settled southeast corner of Alberta. When this is compared to the densities for the rural population only, the pattern seems to expand from these areas. What is suggested is that there existed at the time of the survey a definite decrease in the density of GRS units away from the major urban places. Whether or not the doubling of GRS units in the region has substantially altered this pattern is not known.

7. RELATIONSHIPS BETWEEN LEVELS OF MOBILE RADIO UTILIZATION AND SOCIOECONOMIC CHARACTERISTICS OF THE POPULATION

Up to this point, mobile communications has been presented first as a technological tool used for private economic pursuits and secondly as a reflection of the mobility and subsequent need for interaction of certain segments of the society. Then, the parameters of the study area were outlined as well as the basic characteristics of the dominant radio service categories. This part of the report is concerned with investigating possible functional relationships between patterns of utilization of the different radio service categories and selected social and economic characteristics of the population.

Some of the reasoning behind this investigation lies in the more theoretical viewpoints of mobile communications which were presented earlier. Do areas of high usage have some inherant characteristics which promote a greater adoption of mobile communications? Is the level of utilization related to the level of urbanization? Are economic characteristics more important than social characteristics? Do different segments of the population adopt different radio services? While we are able to establish, for instance, that there is a difference in utilization between the urban and rural portions of the survey population, we are unable to determine how closely these differences are reflected by differences in the respective environments unless a suitable statistical technique is used.

Therefore, a number of functional relationships were tested through the use of correlation and regression techniques. For the three major service categories - Private, GLMRS and GRS - the number of licensees and mobiles were arranged into census division groupings so as to conform to available census data. These mobile communications population figures were then statistically compared to various population figures for each census division. The characteristics selected included population breakdowns by residence, by settlement size, by age, by incomes, by industrial activity groups and by selected agricultural characteristics. As well, the levels of utilization for the service categories were compared to each other.

The concern here was to determine whether a functional relationship was evident between the level of use on one hand and the population characteristic on the other. It should be noted that these functional relationships are not the same as causal relationships, but they do provide a rational basis for discussion of possible cause-and-effect situations. As well, variations between the different service categories and with respect to the strength of the relationships was expected to be somewhat illuminating. In any respect, it was thought to be a vast improvement over common sense thinking.

Simple correlation is a method for determining the extent to which a change in the value of one variable is accompanied by a change in the value of another variable. The hypothesis which is tested is whether there exists a linear relationship between the values of the two variables. The strength of this relationship is represented by the coefficient of correlation which measures the extent to which the actual value conforms to the theoretical (straight-line) values. The values of the coefficient can range from 0 (no correlation) to +1.0 (perfect positive correlation) or to -1.0 (perfect negative correlation). The larger the coefficient, whatever the sign, the better the 'fit'. However, the coefficient does not tell anything about the amount of change in one variable that accompanies a change in the other.

7.1 Relationships Between Service Categories

Perhaps the first question to be asked in this kind of investigation is how strongly do the variations in service categories coincide? Of the major service categories the strongest relationship is between Private and GLMRS which has a coefficient of .73. When these mobile population figures are broken down into their urban and rural components the urban components have a correlation of .80, compared to a value of .39 for the rural components. As well, the rural Private systems have a very low correlation with urban GLMRS (.20) compared to the association between urban Private and rural GLMRS (.71). It should be noted that all the correlation coefficients which are computed with GLMRS population figures as one of the variables include only the census divisions which were deemed to have full coverage.

The relationship of the GRS population to Private and GLMRS is .57 and .51 respectively with the weakest relationship being with the rural Private population. In fact, the only relationship of significance which this rural Private population presented was with the total Private survey population (.72). The comparable figure for GLMRS is .93.

Thus, the Private and GLMRS categories display the greatest similarities due largely to the similarity in their urban components. The rural component of the Private category does not display any great amount of sensitivity with other population figures. GRS is shown to not have a strong relationship with either of the other two categories.

7.2 Relationships Between Levels of Use and Population Characteristics

All of the service categories displayed the same pattern of association with population figures broken into their urban, rural, rural non-farm and

TABLE 14

See Appendix B for explanation of variable names

CORRELATION ANALYSIS OF CENSUS DIVISION DATA 07/28/77
NUMBER OF MOBILE LICENSES
FILE MRQCD (CREATION DATE = 07/04/77) CENSUS DATA FOR MOBILE RADIO STUDY

- - - - - - - - - - - - - - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S - - -

	NLGRU5	NLPRU5	NLGLU5	NLPRU1	NLPRIT5	NLGLU1	NLGLIT5
NLGRU5	1.0000	0.5737	0.5082	0.3006	0.5704	0.5127	0.4858
	(0)	(53)	(39)	(53)	(53)	(39)	(39)
	S=0.001	S=0.001	S=0.001	S=0.029	S=0.001	S=0.001	S=0.002
NLPRU5	0.5737	1.0000	0.7348	0.7169	0.9077	0.7230	0.7098
	(53)	(0)	(39)	(53)	(53)	(39)	(39)
	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001
NLGLU5	0.5082	0.7348	1.0000	0.2594	0.7967	0.9274	0.9887
	(39)	(39)	(0)	(39)	(39)	(39)	(39)
	S=0.001	S=0.001	S=0.001	S=0.111	S=0.001	S=0.001	S=0.001
NLPRU1	0.3006	0.7169	0.2594	1.0000	0.3771	0.3898	0.1967
	(53)	(53)	(39)	(0)	(53)	(39)	(39)
	S=0.029	S=0.001	S=0.111	S=0.001	S=0.005	S=0.014	S=0.230
NLPRIT5	0.5704	0.9077	0.7967	0.3771	1.0000	0.7091	0.7996
	(53)	(53)	(39)	(53)	(0)	(39)	(39)
	S=0.001	S=0.001	S=0.001	S=0.005	S=0.001	S=0.001	S=0.001
NLGLU1	0.5127	0.7230	0.9274	0.3898	0.7091	1.0000	0.8608
	(39)	(39)	(39)	(39)	(39)	(0)	(39)
	S=0.001	S=0.001	S=0.001	S=0.014	S=0.001	S=0.001	S=0.001
NLGLIT5	0.4858	0.7098	0.9887	0.1967	0.7996	0.8608	1.0000
	(39)	(39)	(39)	(39)	(39)	(39)	(0)
	S=0.002	S=0.001	S=0.001	S=0.230	S=0.001	S=0.001	S=0.001

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT ...

TABLE 15

CORRELATION ANALYSIS OF CENSUS DIVISION DATA 07/28/77
NUMBER OF MOBILE UNITS
FILE MRQCD (CREATION DATE = 07/04/77) CENSUS DATA FOR MOBILE RADIO STUDY

- - - - - - - - - - - - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S - - -

	NLGRU5	NMPRU5	NMGLU5	NMPRU1	NMPRIT5	NMGLU1	NMGLIT5
NLGRU5	1.0000	0.5538	0.4925	0.2899	0.5480	0.4907	0.4744
	(0)	(53)	(39)	(53)	(53)	(39)	(39)
	S=0.001	S=0.001	S=0.001	S=0.035	S=0.001	S=0.002	S=0.002
NMPRU5	0.5538	1.0000	0.8231	0.5927	0.9679	0.7413	0.8178
	(53)	(0)	(39)	(53)	(53)	(39)	(39)
	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001
NMGLU5	0.4925	0.8231	1.0000	0.4278	0.8157	0.9078	0.9912
	(39)	(39)	(0)	(39)	(39)	(39)	(39)
	S=0.001	S=0.001	S=0.001	S=0.007	S=0.001	S=0.001	S=0.001
NMPRU1	0.2899	0.5927	0.4278	1.0000	0.3711	0.5116	0.3852
	(53)	(53)	(39)	(0)	(53)	(39)	(39)
	S=0.035	S=0.001	S=0.007	S=0.001	S=0.006	S=0.001	S=0.015
NMPRIT5	0.5480	0.9679	0.8157	0.3711	1.0000	0.7002	0.8212
	(53)	(53)	(39)	(53)	(0)	(39)	(39)
	S=0.001	S=0.001	S=0.001	S=0.006	S=0.001	S=0.001	S=0.001
NMGLU1	0.4907	0.7413	0.9078	0.5116	0.7002	1.0000	0.8444
	(39)	(39)	(39)	(39)	(39)	(0)	(39)
	S=0.002	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001
NMGLIT5	0.4744	0.8178	0.9912	0.3852	0.8212	0.8444	1.0000
	(39)	(39)	(39)	(39)	(39)	(39)	(0)
	S=0.002	S=0.001	S=0.001	S=0.015	S=0.001	S=0.001	S=0.001

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CA

TABLE 16

CORRELATION ANALYSIS OF CENSUS DIVISION DATA 07/28/77
NUMBER OF MOBILE LICENSES WITH POPULATION BY RESIDENCE
FILE MRQCC (CREATION DATE = 07/04/77) CENSUS DATA FOR MOBILE RADIO STUDY

- - - - - - - - - - - - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S - - -

	POPTOT	POPTU	POPTR	POPTRNF	POPTRF
NLGRU5	0.3042	0.2417	0.7103	0.5219	0.7342
	(53)	(53)	(53)	(53)	(53)
	S=0.027	S=0.081	S=0.001	S=0.001	S=0.001
NLPRU5	0.4454	0.4000	0.5869	0.5110	0.5383
	(53)	(53)	(53)	(53)	(53)
	S=0.001	S=0.003	S=0.001	S=0.001	S=0.001
NLGLU5	0.2889	0.2361	0.6245	0.5195	0.5940
	(39)	(39)	(39)	(39)	(39)
	S=0.074	S=0.148	S=0.001	S=0.001	S=0.001
NLPRU1	0.2592	0.2358	0.3144	0.2406	0.3167
	(53)	(53)	(53)	(53)	(53)
	S=0.061	S=0.089	S=0.022	S=0.083	S=0.021
NLPRIT5	0.3903	0.3422	0.5922	0.5259	0.5344
	(53)	(53)	(53)	(53)	(53)
	S=0.004	S=0.012	S=0.001	S=0.001	S=0.001
NLGLU1	0.3205	0.2604	0.7073	0.5657	0.6922
	(39)	(39)	(39)	(39)	(39)
	S=0.047	S=0.109	S=0.001	S=0.001	S=0.001
NLGLIT5	0.2645	0.2167	0.5661	0.4800	0.5306
	(39)	(39)	(39)	(39)	(39)
	S=0.104	S=0.185	S=0.001	S=0.002	S=0.001

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TABLE 17

CORRELATION ANALYSIS OF CENSUS DIVISION DATA 07/28/77
NUMBER OF MOBILE LICENSES WITH POPULATION BY SETTLEMENT S
FILE MRQCD (CREATION DATE = 07/04/77) CENSUS DATA FOR MOBILE RADIO STUDY

- - - - - - - - - - - - - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S - - -

	POPCU2	POPC2T4	POPC5T1K	POPC1K25	POPCG25
NLGRU5	0.7769	0.5079	0.3430	0.4646	0.2285
	(53)	(53)	(53)	(53)	(53)
	S=0.001	S=0.001	S=0.012	S=0.001	S=0.100
NLPRU5	0.4839	0.2243	0.2077	0.5596	0.3861
	(53)	(53)	(53)	(53)	(53)
	S=0.001	S=0.106	S=0.136	S=0.001	S=0.004
NLGLU5	0.3802	0.4370	0.0599	0.6795	0.2195
	(39)	(39)	(39)	(39)	(39)
	S=0.017	S=0.005	S=0.717	S=0.001	S=0.179
NLPRU1	0.2663	0.1089	0.2605	0.2055	0.2307
	(53)	(53)	(53)	(53)	(53)
	S=0.054	S=0.438	S=0.060	S=0.140	S=0.096
NLPR1T5	0.4871	0.2420	0.1116	0.6332	0.3263
	(53)	(53)	(53)	(53)	(53)
	S=0.001	S=0.081	S=0.426	S=0.001	S=0.017
NLGLU1	0.4294	0.4838	0.1895	0.6357	0.2451
	(39)	(39)	(39)	(39)	(39)
	S=0.006	S=0.002	S=0.248	S=0.001	S=0.133
NLGL1T5	0.3452	0.4005	0.0055	0.6696	0.2003
	(39)	(39)	(39)	(39)	(39)
	S=0.031	S=0.012	S=0.974	S=0.001	S=0.221

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CA

rural farm components. The highest correlation was with the rural population which is not surprising considering the nature of the survey population. In addition, the association was consistently higher with the farm population compared to the non-farm. The Private category showed a greater, although still weak, association with the corresponding urban population. GRS protrayed a higher association with both the total rural and rural farm populations. The association of all three categories with the rural non-farm were very close. Surprisingly, the urban Private population had a higher correlation with the rural population than did the rural Private. The opposite was true for GLMRS. Thus, we see that both GRS and GLMRS reflect to a greater degree the variation in rural populations than does the Private category.

In an attempt to better adapt the population breakdown for the purposes of this study, the population figures for the settlements in each census division were classified to bring greater detail to population variation in the smaller settlements. Thus, the rural non-farm population was divided into groups reflecting the number of people residing in centres under 200 population, from 200 to 499 and 500 to 999 population. The urban population was put in population classes from 1000 to 2499 and 2500 and over.

When these classifications were correlated against the mobile populations, there was a tendency for the associations within the rural component to increase with decreasing settlement size. The association again increased for the population in urban centres in the 1000 to 2499 class. The higher correlation with the rural farm group displayed above and the rural non-farm population in settlements under 200 on the one hand and the smallest urban centres on the other hand seem to suggest that there the intermediate group is not exhibiting a consistent propensity for mobile communications. The associations seem to be higher with the agricultural group and the larger service centres. However, the direction of this tendency seems to vary between categories with GRS favouring the agricultural class and GLMRS favouring the service centre population, while Private exhibits a slight tendency towards the service centres.

When the levels of utilization are compared to the population classified by age, some further differences between categories are apparent. All three categories have a moderate correlation with the 15 to 24 and 25 to 34 age groups. The association with the 35 to 44 age group is somewhat lower, but of the three categories, Private has a conspicuously higher association. For the older groups (45-54, 55-64, 65 and over) there is a significantly higher correlation for GRS.

Because of the large difference in the cost structure between the service categories, it was decided to look into the correlation between use levels and income figures for the region. Three different sets of income figures were used - average wage and salary incomes for all persons broken down into urban and rural components, average employment income for males only for the total, urban, rural, rural non-farm and rural farm populations, as well as the number of people in these same population groups having an income of over $10,000.

Generally, the correlations between the average income figures were low, although some differences were outlined. While still in value, the correlation for Private and GLMRS were significantly higher than for GRS. This is no doubt a reflection of the higher cost of these services. Within the average employment income breakdown, GRS showed some evidence of association to urban income levels as did GLMRS on a somewhat higher level. The Private category displayed no favouritism. However, because these average

TABLE 18

CORRELATION ANALYSIS OF CENSUS DIVISION DATA 07/28/77
NUMBER OF MOBILE UNITS WITH NUMBER IN $10,000 + GROUP
FILE MRQCD (CREATION DATE = 07/04/77) CENSUS DATA FOR MOBILE RADIO STUDY

- - - - - - - - - - - - - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S - - -

	NIG10T	NIG10U	NIG10R	NIG10RNF	NIG10RF
NLGRU5	0.2895	0.2643	0.6549	0.5024	0.7038
	(53)	(53)	(53)	(53)	(53)
	S=0.035	S=0.056	S=0.001	S=0.001	S=0.001
NMPRU5	0.4192	0.4005	0.6239	0.6139	0.5009
	(53)	(53)	(53)	(53)	(53)
	S=0.002	S=0.003	S=0.001	S=0.001	S=0.001
NMGLU5	0.2562	0.2355	0.5873	0.4809	0.5472
	(39)	(39)	(39)	(39)	(39)
	S=0.115	S=0.149	S=0.001	S=0.002	S=0.001
NMPRU1	0.2402	0.2293	0.3575	0.2914	0.3365
	(53)	(53)	(53)	(53)	(53)
	S=0.083	S=0.099	S=0.009	S=0.034	S=0.014
NMPR1T5	0.4084	0.3902	0.6077	0.6168	0.4724
	(53)	(53)	(53)	(53)	(53)
	S=0.002	S=0.004	S=0.001	S=0.001	S=0.001
NMGLU1	0.3028	0.2778	0.7068	0.5510	0.6792
	(39)	(39)	(39)	(39)	(39)
	S=0.061	S=0.087	S=0.001	S=0.001	S=0.001
NMGL1T5	0.2318	0.2133	0.5274	0.4406	0.4849
	(39)	(39)	(39)	(39)	(39)
	S=0.156	S=0.192	S=0.001	S=0.005	S=0.002

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figures hide the distributional aspects of income, it was expected that the third group of income figures would be a better indication of the association between income and the level of use. This was the case. In fact, all the correlations for the rural population were significant. The GRS category presented the highest correlation with the high income farm population. However, the pattern for both Private and GLMRS was somewhat different as both categories had a higher association with the high income group in the total population than either the non-farm or farm components.

In an attempt to outline if there existed any occupational preferences on the part of the different service categories, the level of use, as indicated by the number of systems, was compared to the number of people employed in 14 different occupation groups, as well as the total occupations. This occupation distribution excluded cities over 10,000 population. A moderate association was revealed for all three service categories with regards to the total number employed. However, there were some variations in sensitivities to the different occupation groups. For the GRS category, managerial and sales occupations varied most closely with the level of use. As these occupations are typically concentrated in urban centres, this is probably a reflection of the higher penetrations in the urban areas. These same occupation groups, while having similar degrees of association, were ranked lower for the other categories. The ranking for the Private category had fabricating and transportation at the top of the list, while GLMRS had the highest correlation with materials handling and transportation activities. Other noticeable variations were the relatively high sensitivity to farming occupations for GRS and the relatively high association with mining occupations for GLMRS. These values are thought to reflect the popularity of GRS and the orientation of the GLMRS study population towards Alberta. This conclusion as to the built-in bias of the GLMRS comparisons is supported by the relatively high association with forestry activities compared to the other two service categories. The association with contruction activities was lower for GRS.

The greater sensitivity of GRS usage to agriculture which was noted above was confirmed when correlations were computed against some selected parameters of the farm population. In fact, this degree of sensitivity was the most significant difference between the three groups. When compared to the total number of census farms, the coefficients of correlation are .75 for GRS, .42 for Private and .50 for GLMRS. However, the gap is narrowed somewhat when the association with the number of owner farms and the number of resident farms is considered as the values for the latter two categories increase somewhat, while the value for GRS declines. The different nature of the service categories is further defined when matched against the number of private individual farms and the number of incorporated farms. These separate farm classifications are considered to be indicators of the variations in managerial outlooks which exist in the area with proprietor farms being the conventional outlook and incorporated farms reflecting a more modern type of management. The association with GRS for both groups are virtually the same and are significantly higher than both Private and GLMRS. But, both Private and GLMRS display a significantly higher sensitivity to variations in the incorporated farm population. In fact, the association with incorporated farms for these categories is the highest of all the agricultural parameters which were considered. In the same vein, while GRS had a characteristically higher association with both the number of farms with sales over $10,000 and

TABLE 19

CORRELATION ANALYSIS OF CENSUS DIVISION DATA 07/28/77
NUMBER OF MOBILE UNITS WITH AGRICULTURE
FILE MRQCD (CREATION DATE = 07/04/77) CENSUS DATA FOR MOBILE RADIO STUDY

- - - - - - - - - - - - - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S - - - - -

	NFARMT	NFARMO	NFARMR	NFARMPI	NFARMINC	NFTAUTO	NFTTRUCK	NFTTRACT
NLGRU5	0.7546	0.6931	0.7213	0.7495	0.7497	0.7589	0.8267	0.7427
	(53)	(53)	(53)	(53)	(53)	(53)	(53)	(53)
	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001
NMPRU5	0.3666	0.4349	0.4256	0.3563	0.4474	0.3280	0.3077	0.3261
	(53)	(53)	(53)	(53)	(53)	(53)	(53)	(53)
	S=0.007	S=0.001	S=0.001	S=0.009	S=0.001	S=0.016	S=0.025	S=0.016
NMGLU5	0.4743	0.5262	0.5273	0.4612	0.5822	0.3884	0.4411	0.4516
	(39)	(39)	(39)	(39)	(39)	(39)	(39)	(39)
	S=0.002	S=0.001	S=0.001	S=0.003	S=0.001	S=0.015	S=0.005	S=0.004
NMPRU1	0.2289	0.2452	0.2553	0.2199	0.2586	0.2688	0.2462	0.2319
	(53)	(53)	(53)	(53)	(53)	(53)	(53)	(53)
	S=0.099	S=0.077	S=0.065	S=0.114	S=0.061	S=0.052	S=0.076	S=0.095
NMPRIT5	0.3512	0.4249	0.4110	0.3421	0.4351	0.2942	0.2778	0.3058
	(53)	(53)	(53)	(53)	(53)	(53)	(53)	(53)
	S=0.010	S=0.002	S=0.002	S=0.012	S=0.001	S=0.032	S=0.044	S=0.026
NMGLU1	0.5863	0.6173	0.6473	0.5705	0.6647	0.5335	0.5456	0.5729
	(39)	(39)	(39)	(39)	(39)	(39)	(39)	(39)
	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001	S=0.001
NMGLIT5	0.4210	0.4775	0.4696	0.4093	0.5342	0.3280	0.3915	0.3963
	(39)	(39)	(39)	(39)	(39)	(39)	(39)	(39)
	S=0.008	S=0.002	S=0.003	S=0.010	S=0.001	S=0.041	S=0.014	S=0.013

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNO sales over $5,000, both Private and GLMRS favoured the higher income farm group, while GRS displayed a slight favouritism towards the lower income groups.

Some additional differences between GRS on one hand and Private and GLMRS on the other were also noted. The highest GRS association was exhibited with the number of farm trucks (.83) with the values for the number of automobiles and tractors being somewhat lower. GRS displayed a low positive correlation with average farm size, while the other groups displayed a low negative correlation. In terms of the age groups of farm operators, all categories had the highest values in the 25 to 34 and 35 to 44 categories.

7.3 Synthesis

While it was not expected that this avenue of investigation would provide cut and dry conclusions, it was expected that some indication of the nature of the different mobile radio services would be provided. In this respect, the exercise was successful. Perhaps the most important element which has surfaced is the relatively greater sensitivity of the level of GRS use to the parameters of the rural population. This is seen to be an indication of a greater consistency in the application of this service in rural areas. The indications are that this type of mobile communications has an appeal to the agricultural based rural population which is not exhibited by either Private or GLMRS communications.

With respect to Private and GLMRS communications, while they are different in nature, they both seem to lack sensitivity to the varying levels of the rural population. The indications regarding this phenomena seem to lead to the conclusion that individual circumstances can better explain the utilization of these services than can be explained by general circumstances. For example, the greater sensitivity of these services to the higher income population and the number of incorporated farms can be interpreted as demonstrating the appeal of these mobile services to a particular subset of society. If this is the case, the utilization of these services will reflect the size of this subset. However, it is not easy to define this group of potential mobile radio users.

Nevertheless, the present state of Private and GLMRS communications is seen to illustrate some of the broad characteristics of the application of these methods of mobile communications. First, they are largely urban-oriented. Secondly, penetration into rural areas have shown to be somewhat smaller. The question is begged as to whether urban areas possess activities which have a greater requirement for mobile communications or whether these areas possess a more prodigious stock of entrepreneurs who have readily recognized the benefits of mobile communications and have adopted these services. The answer, no doubt, lies somewhere in between these factors.

Certain activities are more suited to the application of mobile communications. Transportation is the conventional application. Construction activities have been shown to be one of the most important sources of users. However, the distinguishing characteristics of urban places or some rural areas which have a significantly higher penetration is seen to follow two major themes. First, there are those areas which possess an unusual concentration of an economic activity - an activity which has adopted mobile communications. Secondly, there is a much greater adoption of mobile communications by activities other than the conventional ones. It is this second theme which will be the source of much of the future growth in mobile communications.

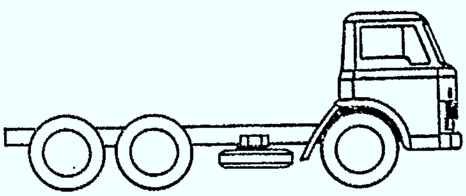
Of course, there are other characteristics of urban places which promote the greater application of mobile communications. Not only is most of the economic activity focussed upon these places, but these activities are organized into bigger units. Thus, there is both a greater number of establishments and the type of establishment which requires greater coordination. Other factors which are seen to have greater influence in urban environments are the competitive nature of the marketplace and the existence of close contact between establishments and activities. All of these factors are seen to promote the adoption of mobile communications technologies in urban areas to a much greater degree than rural areas.

Yet, perhaps the most significant factor which inhibits the adoption of mobile communications in rural areas is the cost factor. Both GLMRS and Private radio systems are an expensive tool from the point of view of a small establishment. When a relatively large outlay of money is involved, people and establishment are cautious. The advantages of mobile communications are not readily measured in dollars and cents, but the cost of these services certainly can be measured. Therefore, the decision to adopt mobile communications is, in many respects, dependent upon the ability of individuals to act as entrepreneurs - to be able to recognize the possible benefits and to assume the risk that they will be realized.

The tremendous growth of GRS communications, especially in the rural areas, is seen to be indicative of a need for mobile communications. The relatively easy access to this method of communications, especially from the viewpoint of cost, is a propelling force. The implications of this growth are many. Never before have so many people been involved in mobile communications. Never before have so many people been realizing its advantages. While GRS is not thought to be a form of business radio, the indications are that many users are applying it in everyday business operations. Questions can be raised as to whether this service will continue to lend itself to these applications in view of its present rate of growth. If, for example, the majority of GRS users who utilize their mobile radio system in their business enterprise decide in the future that an alternative method of mobile communications is more suitable to their needs, the alternatives are a Private radio system, GLMRS mobiles, RCCMRS mobiles, or Paging.

If such an exodus from GRS is realized in the future and given the sheer size of the GRS population, these different mobile communications technologies must be able to satisfy the various communications needs of these users. The possibility exists that these services may come up short in many respects.

SURVEY



8. CHARACTERISTICS OF MOBILE RADIO USERS

The collection of data through the use of mail-back questionnaires was the main task of the users survey. The questionnaire was designed to solicit information which identified certain characteristics of the user and his system, and which would define how the system was used. In addition, the user was asked to evaluate certain aspects of his system and outline possible system improvements. This chapter presents the information which serves to differentiate between users.

While some data was available concerning the location, size and industrial orientation of mobile radios in the Private and GLMRS categories, the GRS category constituted a virtually unknown group of communications users. As well, the portion of the Private category which were RCCMRS and Paging users was unknown. Therefore, the questionnaire was very illuminating in these areas. It should be noted that the questionnaire was designed to accommodate all categories of users and as GRS is not conventionally thought of as a class of business radio, some of the business-oriented questions were not answered as well as they were by the other categories. A detailed breakdown of the response rates to the different questions is provided in the Appendices.

The presentation of questionnaire data relies to a large degree upon the differences between the service categories. Therefore, when interpreting these category comparisons, it is important to remember the size of the different groups of users. Out of the total number of questionnaires returned, the category breakdown was 571 for GRS, 580 for Private, 229 for GLMRS, 42 for RCCMRS and 10 for Paging. Due to the small number of users in the RCCMRS and Paging categories, it was decided that additional analysis beyond the basis distribution of responses would not be carried out. Therefore, the depth of analysis for the other three categories is much greater.

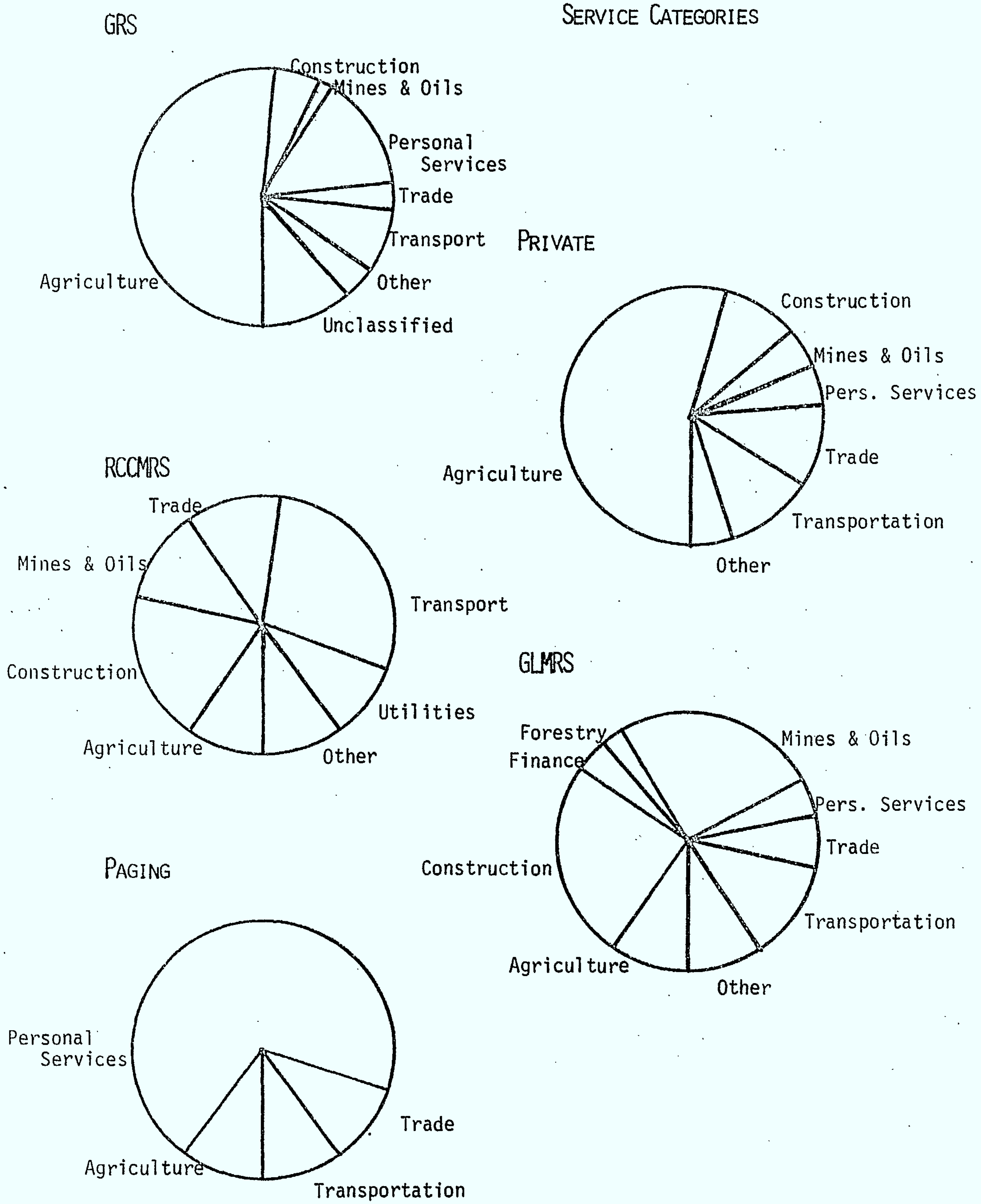
8.1 Industrial Orientation of Users

Perhaps the most basic classification of users is their industrial classification. It is logical to assume that the nature of a business will dictate the need for mobile communications. It is also possible to hypothesize that certain activities are better suited to certain methods of mobile communications. Of course, a multitude of human and economic factors enter into the picture. However, on a gross scale, the distribution of various industrial activities can be viewed as an indicator of the attractiveness of a certain communications method to these various activities.

Of the different categories, the GRS group had the greatest difficulty in classifying their mobile radios into an industrial group. The number of users who could not classify their radios plus a major portion of the users who selected personal services represent the non-business users. This characterization of the personal services group is based upon evidence contained in other portions of the questionnaire. Of the business users, the agriculture population is the source of over half of the total users, with construction and transportation having much smaller, yet significant, representation. On the basis of this information, the breakdown of users into business and non-business users for the GRS users surveyed is approximately 75% and 25%, respectively.

The Private category displays a structure similar to that of GRS. The agricultural category is still dominant with construction and transportation having smaller, but significant representation. However, the representation of mines, oils and trade activities is greater. The GLMRS breakdown is quite different as construction and mines and oils are the dominant groups, followed by transportation and agriculture. The personal services users are comparable

FIGURE 61 CLASSIFICATION OF USERS BY INDUSTIAL CLASSIFICATIONS AND SERVICE CATEGORIES



in size to the Private category, while trade represents a smaller portion.

RCCMRS has primary orientations towards transportation and construction with agriculture, mines and oils and trade having secondary roles. The utilities group is also significant in this category. Paging displays a definite bias towards the personal services category, no doubt reflecting its application by medical personnel.

8.2 Location

There are two different locational characteristics by which the users can be classified from the questionnaire information. The first is the location of the base station which the users have designated as being appropriate. The second is the size of the settlement in which the user's post office is located. This information is thought to be indicative of the rural orientation of the different services.

The GRS category again displayed its agricultural orientation with over half the base stations being located on farms. The base stations which were designated as being located in either rural non-farm or in places under 1000 (which are different ways of defining the same group) is second in size. The number of users who displayed a roaming orientation by selecting all locations was under 10%. From the point of view of the size of settlement with which the user is identified, the GRS group did not show any preference.

The Private category, as compared to the GRS group, showed a higher proportion of base stations in urban places having from 1000 to 5000 population. As well, the settlement size classification for this category showed a tendency towards location in the larger places. However, this tendency was not as strong as that displayed by the GLMRS category, which had a definite

FIGURE 62

CLASSIFICATION OF USERS BY BASE STATION AND SERVICE CATEGORIES

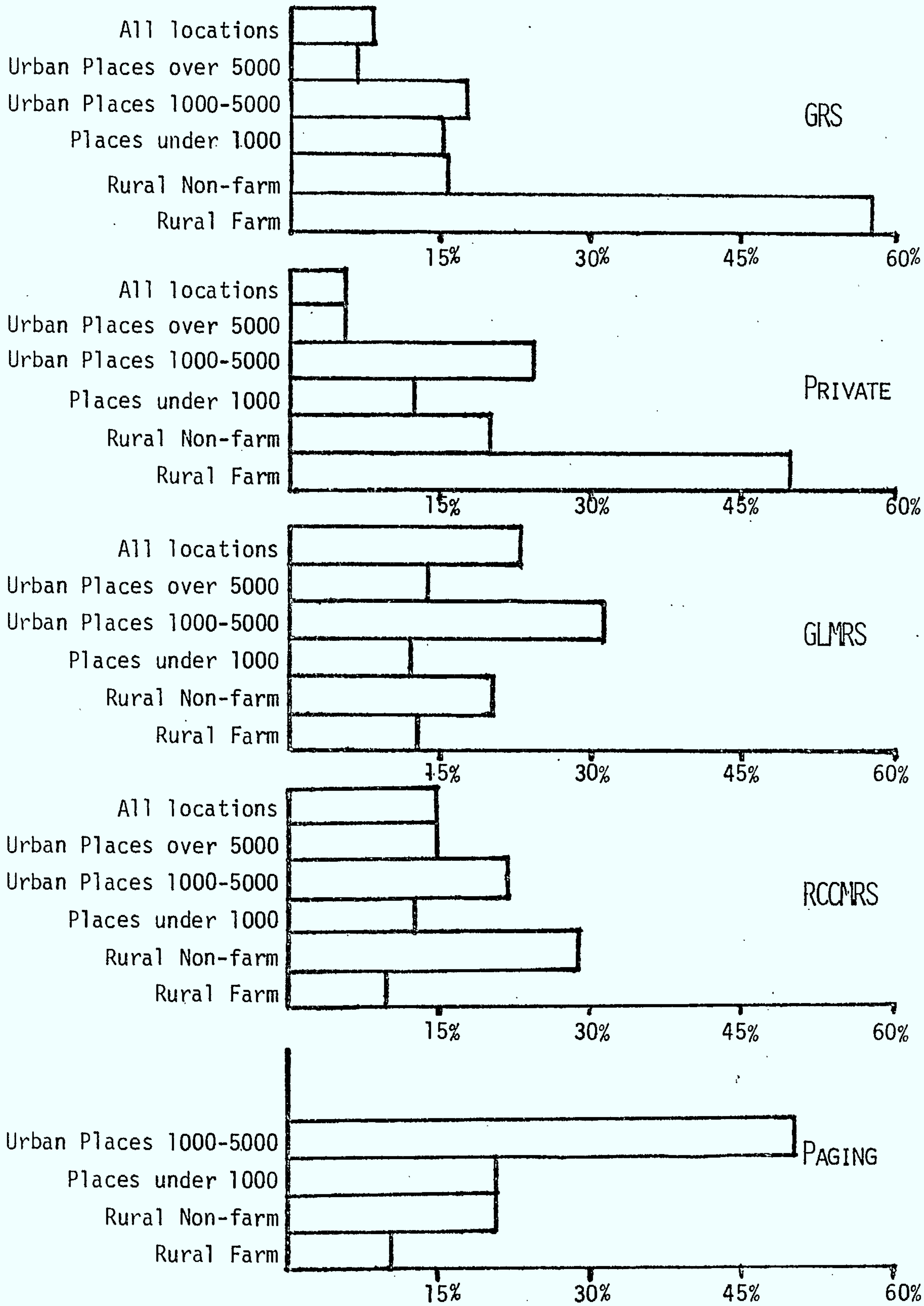
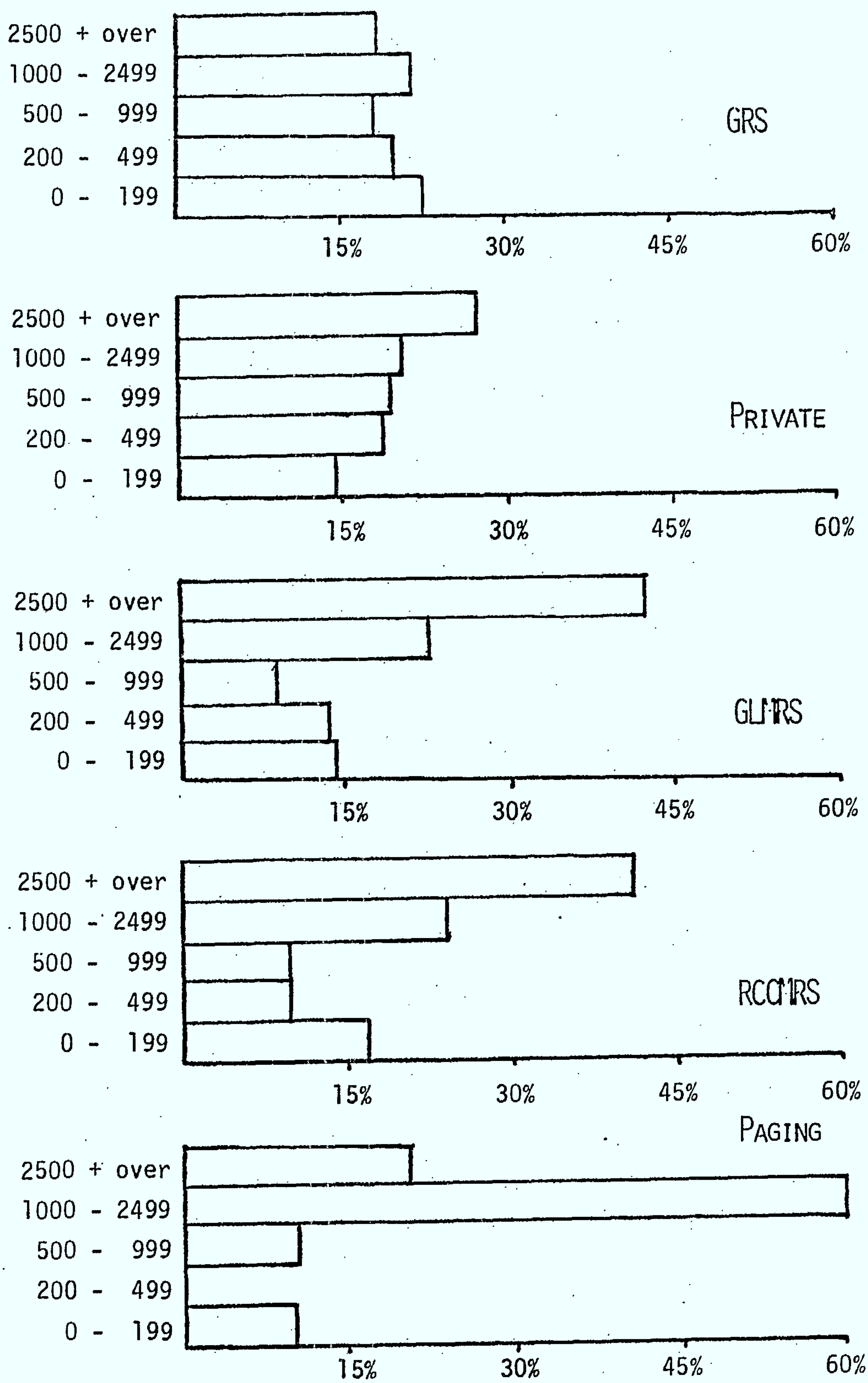


FIGURE 63

CLASSIFICATION OF USERS BY SIZE OF SETTLEMENT AND SERVICE CATEGORY



bias towards these urban places. The GLMRS category can also be distinguished by the relatively high number of roaming users. This bias towards urban places is also exhibited by the RCCMRS and Paging users.

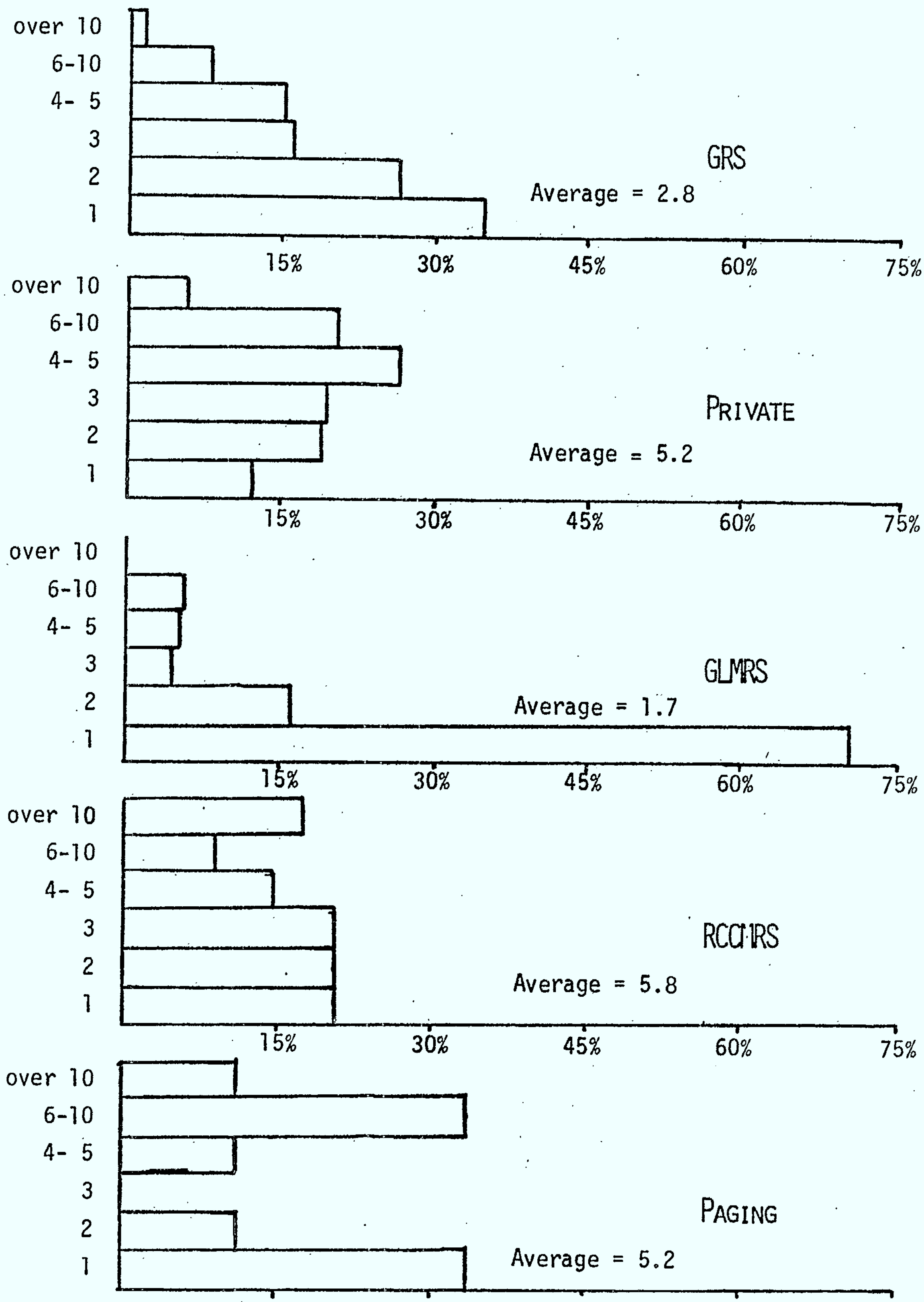
8.3 Size of Mobile Radio System

Classification of users by the number of mobile units in their systems showed that GLMRS had the greatest number of users having a small number of units. This is interpreted as reflecting the characteristically open-ended communications which are possible with this service making it more suitable to individual users. The preference towards a small number of units was also apparent, although to a smaller degree, in the GRS category. On the other hand, the Private, GLMRS and Paging users displayed a preference towards larger systems.

Further analysis of this variable was performed for the GRS, Private and GLMRS categories. The cross-tabulation of the number of mobile units with the industrial classifications revealed the orientation of different industries towards small or large systems. The breakdown of the number of mobile units for locational groupings in each major industrial group within the three service categories provided greater insight. This analysis was only done for the dominant industries of agriculture, construction, mines and oils, personal services, trade and transportation. All other categories were grouped into a residual for this analysis.

Within the GRS category, all industries except personal services and the residual group exhibited more users having two mobiles than one mobile. As a mobile system requires a base and a mobile unit, and as both base and mobile units have the same license, it is necessary for a licensee to have

FIGURE 64
CLASSIFICATION OF USERS BY NUMBER OF MOBILE UNITS IN SYSTEM AND SERVICE CATEGORY



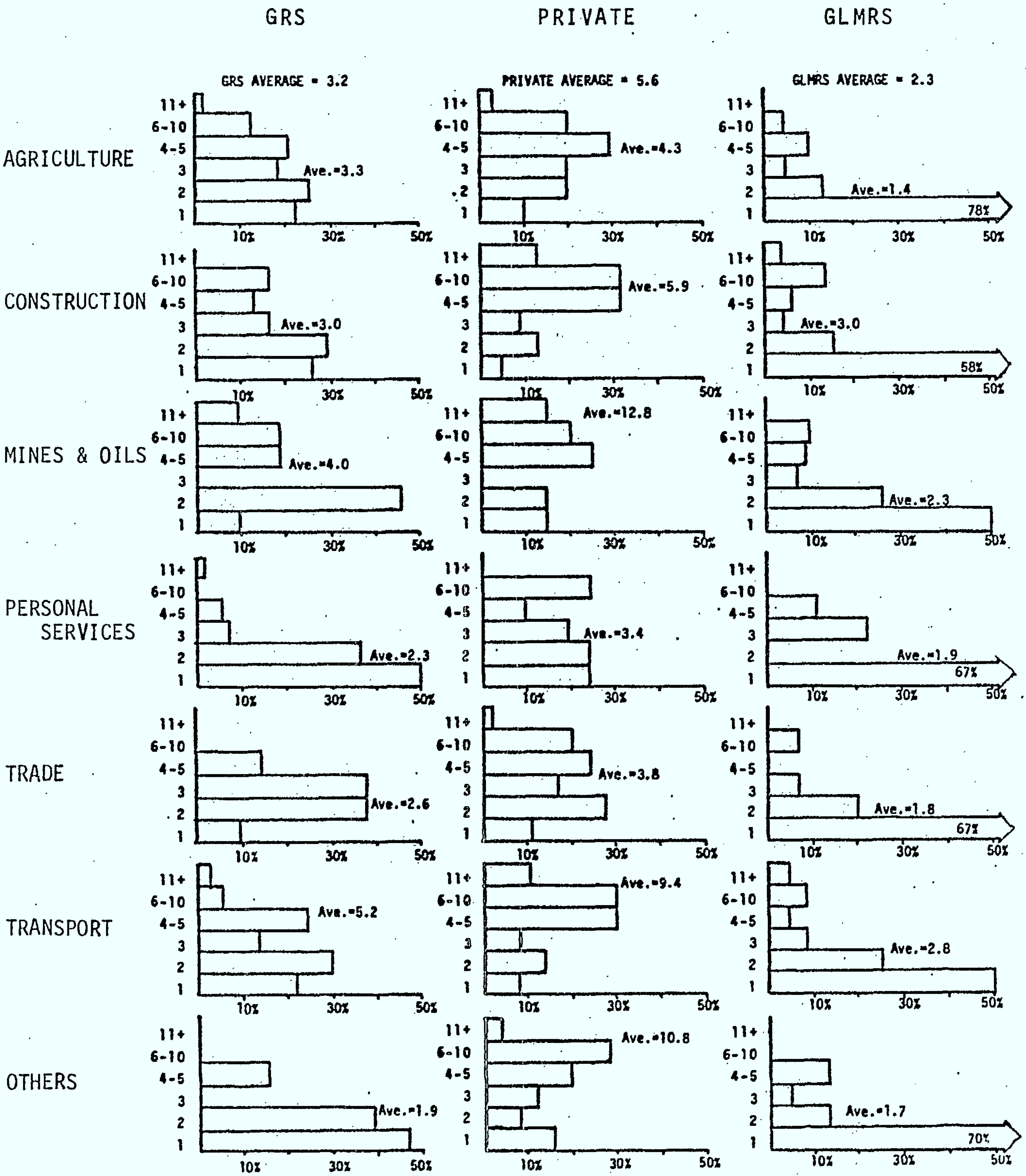
at least two units so as to possess a mobile system. Of the classifications, mines and oils, agriculture and construction show a significant number of users having more than two mobiles. In terms of larger systems, there are four reporting having over twenty mobiles and four reporting ten to twenty mobiles. Of the largest, one is in mines and oils and two are used in the transportation industry. Of the second largest group, three are agricultural and one is utilized in mines and oils activities.

The breakdown of the number of mobile units into the average number of units for each province and for the different settlement size groups was computed for each industrial classification in each service category. Thus, for GRS, the transportation category had the largest average number of mobile units, largely due to the significant effect of the larger systems in this category. From the breakdown analysis, it is found that these large systems are found in Saskatchewan and are in the 200 to 499 population class. Compared to Saskatchewan, the average number of units used for transportation activities in both Manitoba and Saskatchewan is small.

The industry with the next highest average is mines and oils, most of which are located in Alberta and in urban centres. Agriculture possesses the third highest average with the average increasing from Manitoba to Saskatchewan to Alberta. Over 50% of the systems are attached to the 0 to 199 and 200 to 499 settlement groups, while the settlement group with the highest average number of mobiles is the 500 to 999 group.

Construction and trade both register below average and both show concentrations in Saskatchewan and Alberta. However, construction shows the highest average in the 200 to 499 and the 2500 and over categories, while trade favours the 0 to 199 class. Both personal services and the residual

FIGURE 65 DISTRIBUTION OF USERS BY INDUSTRIAL CLASSIFICATIONS AND NUMBER OF MOBILE UNITS FOR MAJOR SERVICE CATEGORIES



categories have means well below the average for the entire GRS category and both show systems to be somewhat greater in Saskatchewan.

The Private category has been previously characterized as having a tendency towards larger systems. This is found to especially be the case in construction and transportation. However, the industry having the highest average number of units is mines and oils. It is found that the larger systems for this activity are concentrated in the urban centres included in the survey and are severely concentrated in Saskatchewan and Alberta. Transportation displays the second highest average number of units and is also significantly above the average for the entire category. In this sub-group, both Manitoba and Alberta have about twice as many systems as Saskatchewan, with the Alberta systems being the largest and the systems in Saskatchewan being the smallest. These systems also display a tendency to be located in the urban centres, although the systems in the 500 to 999 class have the highest average number of units. Systems in the construction category display a somewhat more uniform distribution with the mean not differing significantly from province to province. However, approximately 50% of the systems are located in Alberta with the remainder being divided evenly between the other two provinces. This sub-group also favours the urban centres which house about 80% of the systems. In terms of system size, the 500 to 999 and 1000 to 2499 have significantly larger average system sizes.

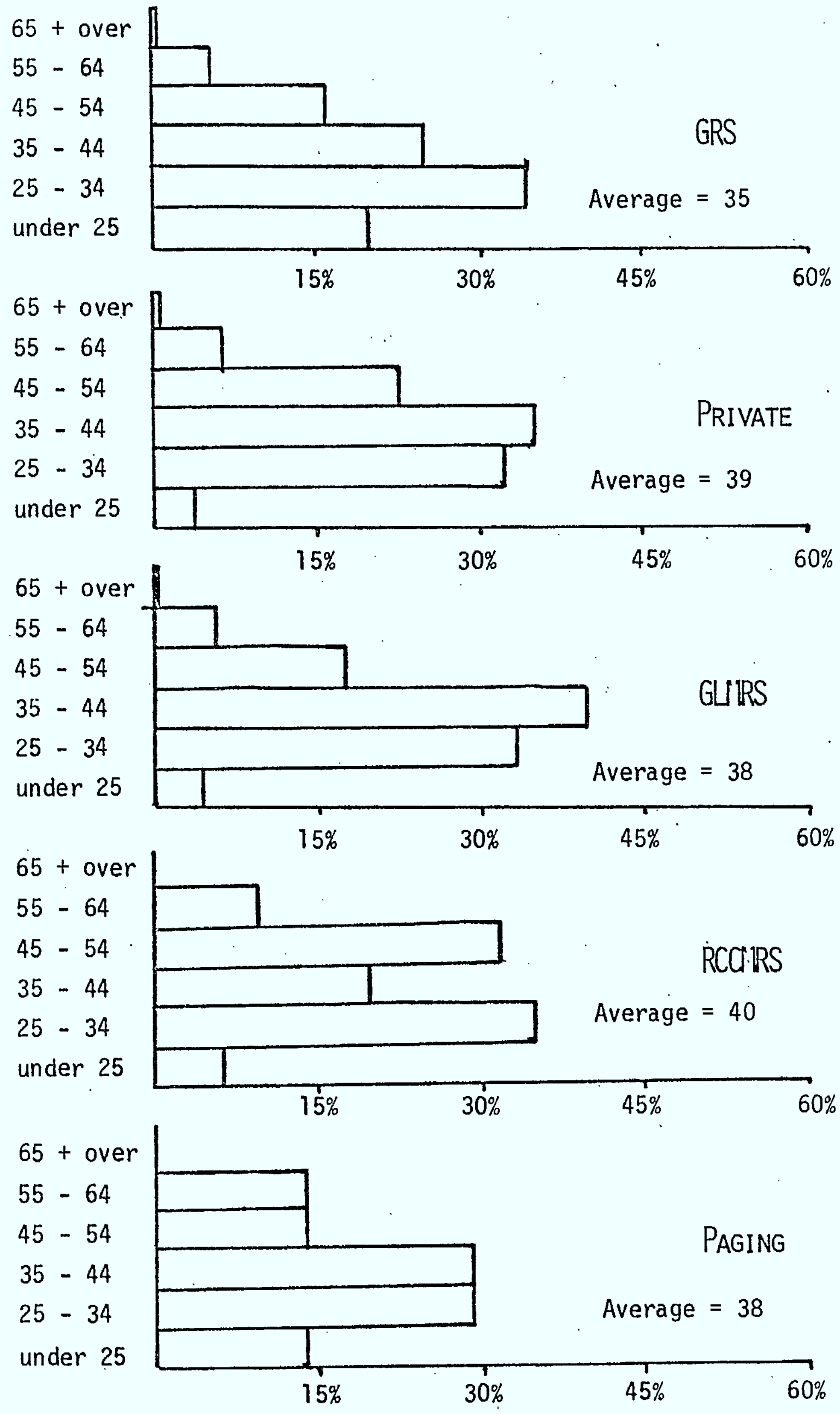
The distribution of Private radio systems used in agriculture shows a slight concentration in Manitoba and no distinct favouritism for any settlement class. In terms of system size, above average values are displayed for Manitoba systems and for systems located in the 0 to 199 and the 2500 and over classes. The distinguishing characteristics of systems utilized for trade purposes are below average system sizes, a lack of representation in Saskatchewan, and no distinct preference for any settlement classes in terms of both the number of systems and the size of systems. Systems in the personal services category display a tendency for larger systems in Alberta and in the urban centres. The residual category also possesses this characteristic.

The situation in the GLMRS category is characterized by the domination of Alberta, both in terms of the number of users and the size of system. In fact, the only exception is in the agricultural class in which Saskatchewan has the greatest representation and also tends to have a larger number of units. However, in terms of the average number of units, this classification ranks last. Construction and transportation are the only classifications displaying above average values for this category. As well, they both show a favouritism towards urban centres, although it is not as well defined in the case of transportation. Generally speaking, this favouritism is shared by the other categories also.

8.4 Age of Users

While the average age of the users in the different service categories do not differ significantly, with the lowest being an average age of 35 for GRS and the highest being an average of 40 for RCCMRS, the distribution of the ages is more variable. GRS shows significantly more users in the under 25 category than the other service categories. It also differs from Private and GLMRS in that the 25-34 age group is higher than the 35-44 age group, whereas the opposite is the case for the other two groups. The age structure

FIGURE 66
CLASSIFICATION OF USERS BY AGE AND SERVICE CATEGORY



for Private and GLMRS are very similar. RCCMRS can be seen to display a bias towards older users which is not apparent in the other categories.

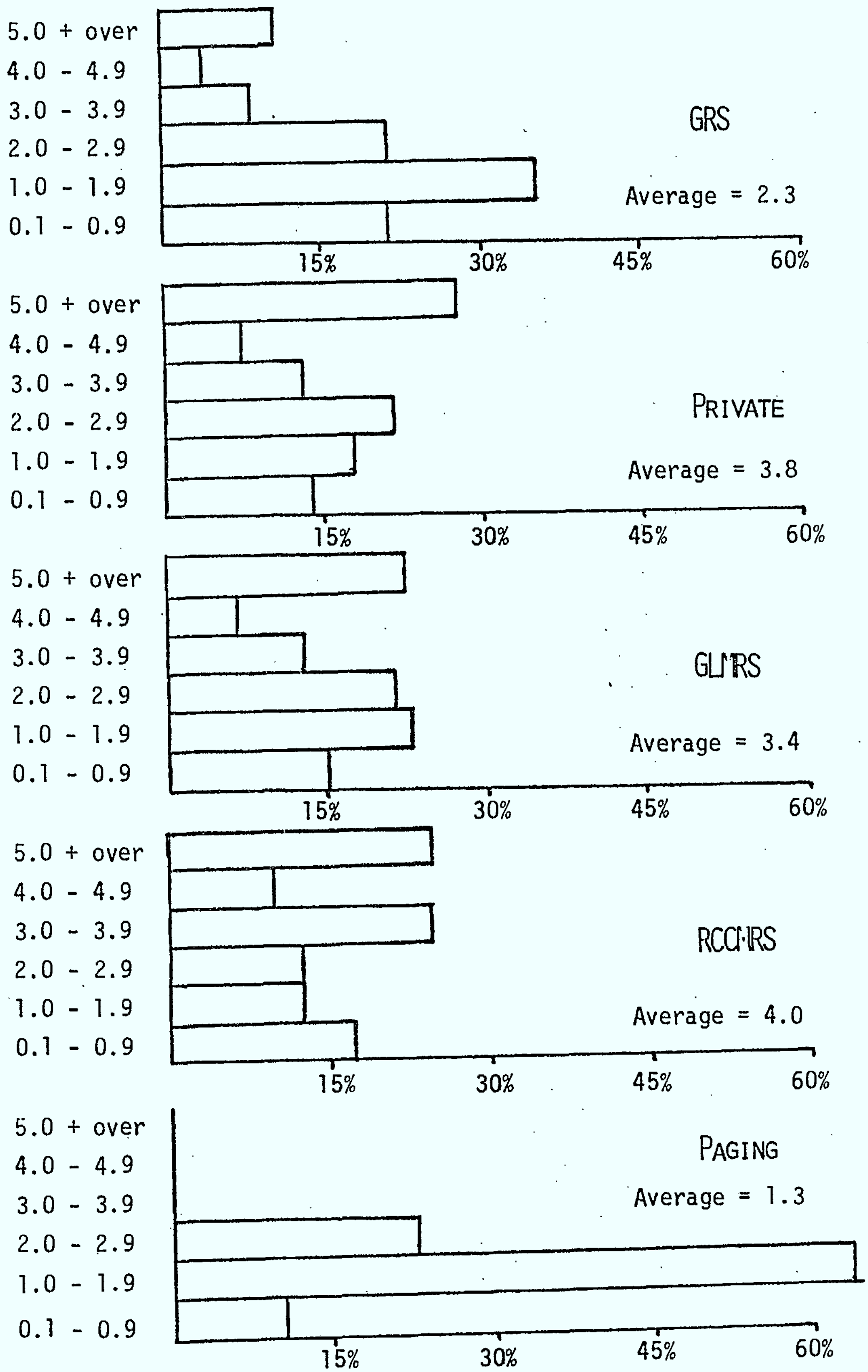
The breakdown of this variable shows, that for the GRS category, the only activity which is significantly above average is the trade category. Within this sub-group, users in Saskatchewan are significantly older while users in the 500 to 999 class are significantly younger. Agriculture is the only other activity having an above average mean age and is seen to favour Saskatchewan in this respect as well. The other activities in order of decreasing mean age are mines and oils, construction, others, transportation and personal services. Noticeable variations in these categories are the absence of any older users in the 200 to 499 class for the personal services category and the consistently low average age for all settlement classes in the transportation category.

The age breakdown for the Private category has no distinguishing variation with the construction, trade and others category being somewhat above average. This lack of variation is even more apparent for the GLMRS category.

8.5 Mobile Radio Experience

The distribution of users on the basis of the number of years that the particular mobile radio service was used illustrates the growth characteristic of the GRS category, the relative longetivity of the Private, GLMRS and RCCMRS categories, as well as the relatively new nature of Paging services in these predominantly rural areas. The breakdown of this variable was pursued to outline any trends in adoption of the various services, both from an industrial sector viewpoint and a geographical outlook.

FIGURE 67
CLASSIFICATION OF USERS BY NUMBER OF YEARS SERVICE USED
AND SERVICE CATEGORY



Trade activities represent the most experienced group of users in the GRS category. Within this group, the Saskatchewan and Alberta users are significantly more experienced and the 0 to 199 settlement class has twice as much experience on the average than any other class. As well, the 500 to 999 class has significantly less experience. The least experienced group of users are those that classify themselves in the personal services and the residual categories, which seemingly indicates a more recent application of GRS communications to activities other than the conventional ones. Also noticeable are the more experienced agricultural and transportation users in Saskatchewan, the more experienced construction users in Alberta and the more experienced user in the trade classification in both Saskatchewan and Alberta. However, in terms of the settlement classes, there is no apparent pattern, although there are significant differences between classes in any one industrial group.

Transportation, trade and mines and oils are the three most experienced groups in the Private category. The average years of experience declines from Alberta to Saskatchewan to Manitoba for the transportation classification. The trade classification shows more experience in Saskatchewan, although there are fewer systems in the province. Mines and oils show more experience and systems in Alberta. Construction activities do not favour any province, while systems used for personal services seem to be relatively new to Manitoba. Agriculture has the lowest experience rating of all the groups and displays a west to east pattern with Alberta having the largest value. The breakdown of the experience factor by settlement size shows no well-defined pattern, although the users in urban places seem to be somewhat more experienced.

The GLMRS category is distinguished by a significantly more experienced group of users in the mines and oils classification, in all provinces and most of the settlement classes. In fact, this activity has the only value which exceeds the average for the entire GLMRS category. The next experienced group is engaged in construction activities and is considerably more experienced than the other classifications. Of the other activities, personal services and trade are the most recent group of users. From a provincial viewpoint, there appears to be no pattern. In fact, the recent phenomenal growth in Alberta users practically invalidates any comparisons based upon average values.

8.6 Reliability of Mobile Radio Units

In an attempt to discover whether any relationships exist between the length of time that users in the different service categories used that service and the age of their mobile radio unit, as well as between the age of the unit and the time since it was last serviced, the data pertaining to these factors was correlated for each service category. It is assumed that if all users were using the same mobile units as when they first utilized the radio service, then the correlation would approximate a perfect positive value. In terms of the servicing aspect, it was thought to be beneficial to determine, for those users reporting that their unit was serviced, whether any relationship existed between the age of the unit and its need for servicing.

The correlation between the length of time the service was used and the length of time which expired since the unit was purchased or leased resulted in coefficients of correlation having values of .71 for GRS, .66 for Private and .39 for GLMRS. Therefore, from this point of view, GRS and Private users have a greater tendency to be using mobile units which were purchased when the service was first adopted. However, this tendency is somewhat less for GLMRS users. Of course, the users who report relatively new mobile units, compared to the length of time they have used mobile communications could be using a mobile which was purchased at a later date to expand their system rather than a replacement mobile unit. In the case of GLMRS, where the leasing of units is typical, seasonal users can be expected to display relatively newer units compared to experience. The scattergrams of these values graphically illustrate the deviation from a linear relationship for these major categories.

With respect to servicing, 23% of the GRS users, 43% of the Private users and 45% of the GLMRS users reported servicing of their mobile units. It is assumed that those users who returned the questionnaire but did not note any servicing did so because servicing was not required. The low rate of servicing for GRS is to be expected as these users are relatively newcomers to the mobile communications field. The correlation coefficients which relate the age of the unit to its last servicing are .70 for GRS, .27 for Private and .34 for GLMRS. The relatively high value for GRS is interpreted to reflect the relatively more closely grouped population of users. An examination of the servicing pattern reveals that for those users reporting servicing, in all three categories, 70 to 76% report servicing in the six months previous to the survey and 89 to 95% within the previous year. On the basis of the regression line which was computed and which should be taken only as an indicator of the differences between the service categories, the amount of time after a unit was purchased that servicing would be required is 15 months for GRS, 31 months for Private and 19 months for GLMRS. This is interpreted as revealing that Private mobiles are somewhat more dependable.

9. THE USE OF MOBILE RADIO SYSTEMS

Having identified the parameters pertaining to the characteristics of the radio users which were surveyed, the next step is to present the data pertaining to the use to which their systems are put. This information is couched largely in terms of the type, the magnitude and the purpose of mobile communications.

9.1 Seasonal Variation

The users were asked to indicate the seasons of the year in which they get the most use out of their mobile radios. In all categories, year round usage was dominant. This group of users constituted 59% of GRS users, 56% of Private users, 66% of GLMRS users and 62% of RCCMRS. As well, nine out of the ten Paging users indicated year round applications. Of the other possible combinations of seasons, there were some variations between the service categories. The remainder of the GRS users were quite evenly divided between maximum use in one season (12%), two seasons (13%) and three seasons (16%). The one-season sub-group favoured summer, while the three-season sub-group omitted winter most often. The Private category displayed some preference towards three-season use (21%) over two-season (12%) and one-season (11%). Winter was again omitted most often in the case of high use in three seasons. GLMRS users, on the other hand, had a larger orientation towards maximum use in one season (19%) as opposed to two seasons (5%) or one season (10%). And in this case, winter was the most frequent selection for single season use, but was also omitted most often by the users selecting three seasons of use. RCCMRS also possessed an orientation towards single season use (21%).

9.2 Types of Calls

Users were asked to rank certain types of calls which were differentiated on the basis of originations and destinations. Five types of calls were provided although it was thought that only three would be applicable to any one user. The calls were to be ranked on the basis of frequency of use and the user was not required to rank all calls differently. Therefore, it was possible for a user to give all types of calls a high ranking.

Users in the GRS category favoured calls from mobile units to the base station with 62% of the users giving it a rank of 1 and 36% giving it a rank of 2. Calls from the base station to the mobile unit were given a rank of 2 by 45% of the users and a rank of 1 by 35% of the users. However, calls originating from the base station were ranked third by 20% of the users as compared to 2% for calls from mobile units to base station. Mobile to mobile communications were ranked first by 50% of the users, while 32% of the remainder of the users ranked it third. Thus, for the GRS category, calls originating from mobile units are more important than those originating from base stations.

Private users also favoured mobile to base communications with 66% ranking it as 1 and 33% gave it a rank of 2. However, mobile communications were not as popular as in the GRS category, while base to mobile were more popular. The most frequent rank given to base to mobile calls was 1, which was selected by 49% of the users as opposed to mobile to mobile calls, which received a rank of 3 from 46% of the users.

GLMRS users displayed an even greater bias towards calls originated by the mobile user, other than mobile to mobile calls, with 84% of the users ranking the mobile to telephone system type of call as the most frequent. The telephone system to mobile unit type of call and the mobile to mobile type were shown to be of less importance with the former being ranked second in importance most often, while the latter was ranked third most frequently. The relatively unimportant nature of mobile to mobile calls stands out for the GLMRS users.

The ranking of call types by the 42 RCCMRS users provided some information about the use of this type of service, which was previously not known. This information came from the selection of the mobile to telephone system type of call by 11 users, 7 of which gave it a rank of 1 with the other 4 ranking it second. The telephone system to mobile unit communications pattern was selected by 5 users. The existence of a telephone interconnection for this type of service was unexpected, even though it was still the lease frequent selection. As with the other categories, the base station to mobile and the mobile to base station were shown to be more important than mobile to mobile communications. However, all types of calls were selected as being most important more often than they were indicated of secondary importance.

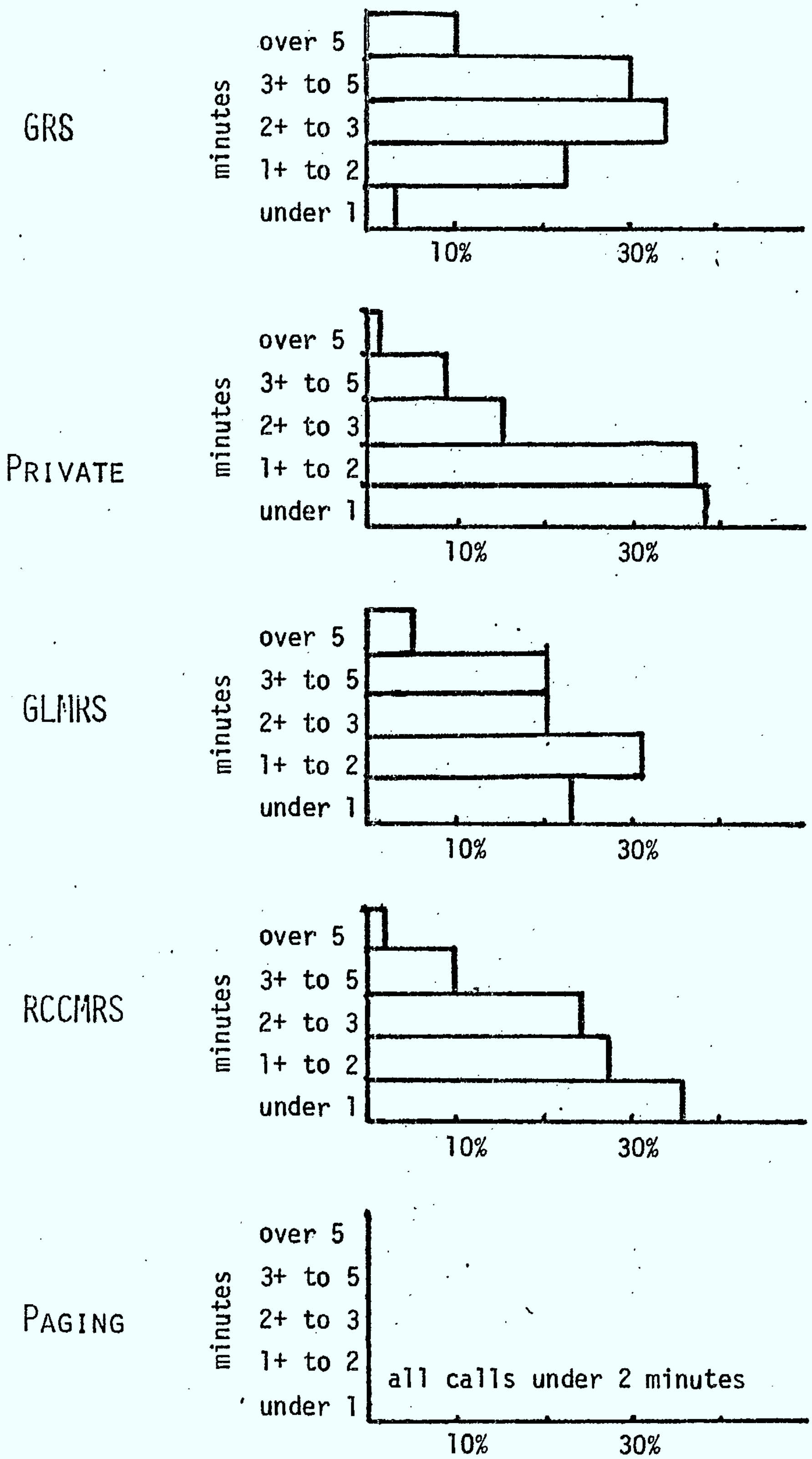
Paging users indicated a bias towards base station originated calls. This was to be expected and is consistent with the nature of this service.

9.3 Duration of Calls

The classification of users according to the average duration of the calls which they send and receive can be seen to further define the general character of the different service categories. Private users and RCCMRS users tend to make their communications short and concise. GRS is characterized by users being quite uniformly distributed in the duration classes up to five minutes. GLMRS users tend to be somewhat more talkative, having relatively few users reporting communications

FIGURE 68

CLASSIFICATION OF USERS BY DURATION OF CALLS AND SERVICE CATEGORY



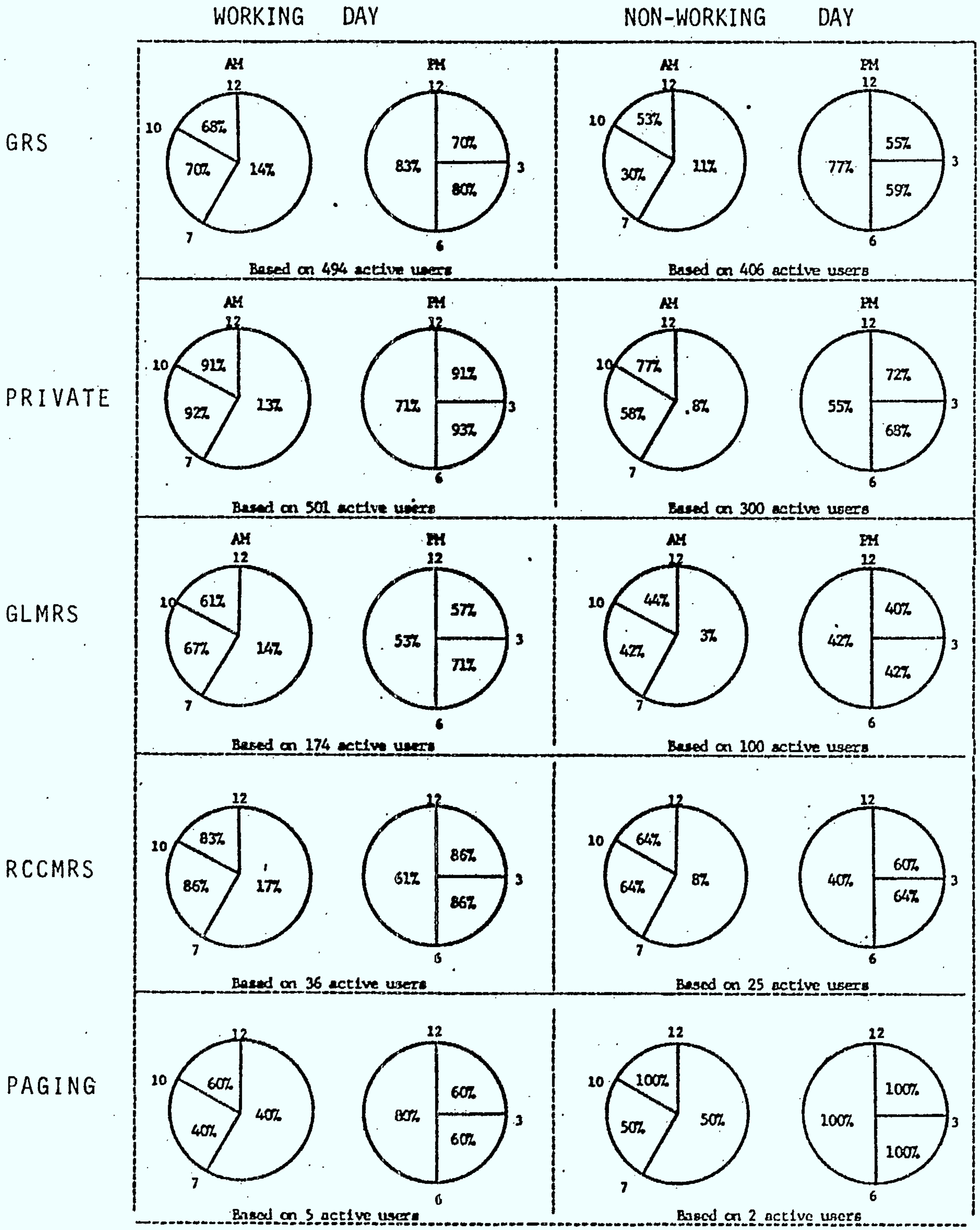
under two minutes. All paging users report communications as being under two minutes.

In an effort to determine whether the number of mobiles in a system has any effect upon the duration of calls, the users in the different duration categories were classified on the basis of the number of mobiles for the GRS, Private and GLMRS categories. Both the Private and GLMRS categories displayed an absence of any significant variations. There were similar distributions of system sizes for the duration categories in the group of Private users. The possibility of any variations within the GLMRS category is minimal as fully 60% of GLMRS users have only one mobile. However, the variation within the GRS group of users was quite conspicuous. As the duration of calls increases, there is a noticeably greater number of users who have only one mobile. For example, of the users reporting calls under one minute, 19% were in the one-mobile classification, while 50% of the users reporting calls averaging three to five minutes were in the one-mobile classification. It is apparent that users with one mobile have a greater tendency to socialize as opposed to those with more than one mobile.

9.4 Number of Calls

The questionnaire asked the user to note the number of calls which were both sent and received on his mobile unit in the different time periods of typical working and non-working days in his high usage season. Of all the questions which were put to the users, these two possessed consistently low response rates. Some users noted that their call patterns were too irregular to be measured in this manner. It is therefore assumed that the users who did not provide an answer for these questions were

FIGURE 69 PERCENTAGE OF DAILY USERS ACTIVE IN VARIOUS TIME PERIODS, WORKING AND NON-WORKING DAYS, BY SERVICE CATEGORIES



predominantly users characterized by sporadic communications patterns, whatever the reason. These users represented 13% of GRS, 14% of Private and 24% of GLMRS users making calls on a working day. The comparable figures for a typical non-working day are 29%, 48% and 56%, respectively.

In terms of the magnitude of calls, the average number of calls per user for the different time periods in both working and non-working days were computed by two different methods. First, the average was calculated for only those users who reported calls in a certain time period. Secondly, the average was computed using the number of users reporting calls in any time period during the day. Before presenting the results of these two groups of computations, it is seen to be useful to look at the different patterns of use of the different service categories.

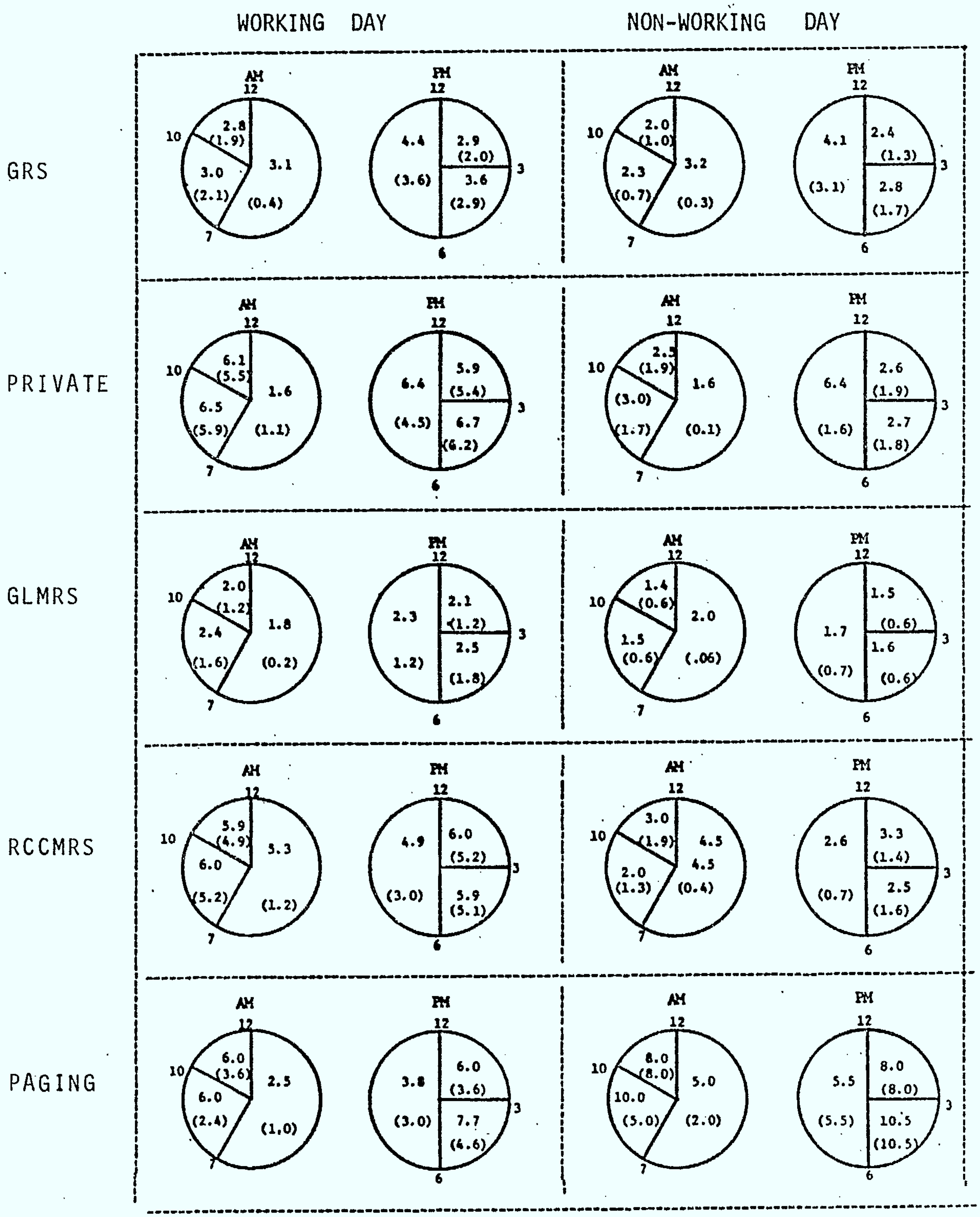
From the point of view of the number of users making calls in a particular time period in relation to the total group of users making calls in a day, it is possible to delineate certain differences between the service categories. The figures for the Private category show that over 90% of the users are making calls in the time periods between 7:00 a.m. and 6:00 p.m. Comparable figures for the other categories are from 68 to 80% for GRS, 57 to 71% for GLMRS, 83 to 86% for RCCMRS and 40 to 60% for Paging. Therefore, Private users as a group make more use of their communications systems. As well, within this same period, which roughly corresponds to typical working hours, the major categories display two peak periods of use. The first is 7:00 a.m. to 10:00 a.m., while the second is 3:00 p.m. to 6:00 p.m. The number of users in the latter period is somewhat larger. For the time period from 6:00 p.m. to midnight on a typical working day, the pattern is somewhat different. Both GRS and Paging users exhibit a greater tendency to communicate in this time period than any other. This is attributed to the non-business uses of GRS and the emergency nature of Paging systems. Although the other service categories experience a significant drop in use in these periods, the majority of users in each category are still making calls. For the time period from midnight to 7:00 a.m., RCCMRS and Paging have the highest proportion of active users, while the Private category has somewhat less although significantly more than either GRS or GLMRS. This suggests that the first three categories have greater applications in functions operating at night.

The relationship between users on a working day to those on a non-working day serves to further promote the existence of non-business applications of GRS. It was found that 82% of GRS users were active on non-working days. The comparable values for the other categories were 60% for Private, 57% for GLMRS, 69% for RCCMRS and 40% for Paging. The proportion of the GRS users who were active on non-working days was found to steadily increase as the day passed and reached a peak of 77% in the 6:00 p.m. to midnight period. On the other hand, both Private and GLMRS categories displayed a peak in the 10:00 a.m. to noon time period.

In terms of the number of calls, it was found that on a working day, the average number of calls per user was 13.0 for GRS, 28.8 for Private, 7.4 for GLMRS, 24.6 for RCCMRS and 17.2 for Paging. Thus, it is seen that Private and RCCMRS users make the most calls, while GLMRS users tend to make fewer calls. In terms of the calls per user on non-working days these same high use categories had the greatest decrease in the number of calls per active user. This is interpreted as supporting the conclusion that Private and GLMRS users are more business-oriented than GLMRS

FIGURE 70 NUMBER OF CALLS IN TIME PERIODS, WORKING AND NON-WORKING DAYS, BY SERVICE CATEGORIES

Shows average calls for active users in time period and average calls per time period for daily active users (in parentheses).



or GRS users. Typically, GRS users had the smallest decrease in the number of calls.

The computation of the average number of calls per user for each individual time period and for only those users active in that time period served to reinforce certain aspects of the different service categories which have already been noted. GRS users who are active in the evening tend to make the most calls, followed by those users active in the early morning and late afternoon. Those GRS users active in the time period after midnight are more vocal compared to other GRS users than are comparable users in the other categories. Both Private and GLMRS show higher calls per user in the early morning and late afternoon with the latter group being slightly more vocal. These tendencies refer to users active on working days.

Users who reported being active on non-working days were found to be more vocal in the evening and at night for the GRS category, in the early morning for the Private category, and in the late afternoon and early evening for the GLMRS category.

The breakdown of the average number of calls per active user in each of the major service categories according to the industrial classification and locational criteria which were outlined previously was thought to be a useful exercise. Again, the purpose was to outline any significant variations in this variable when viewed from these vantage points.

It was found that within the GRS category, transportation users tended to make more calls in a working day than any other group. Users engaged in construction and trade activities were also above average. Private users engaged in mines and oils, as well as transportation activities tended to communicate much more frequently than other activities.

Construction users were slightly above average. Construction and trade activities were the leaders in terms of the average number of calls for the GLMRS users. Mines and oils were slightly above average in this category.

For the users reporting calls on non-working days, the personal services users within the GRS category showed significantly more calls than other classifications. It was previously noted that this group is thought to include a large number of non-business users and this conclusion is reinforced by the fact that these users make slightly more calls on non-working days than working days. The rankings for the other classifications stay the same as they all exhibit a tendency to make fewer calls on non-working days.

All the industrial classifications within the Private category made significantly fewer calls on non-working days. However, users in transportation made significantly more calls than any other classification. The number of calls made by the various groups of users within the GLMRS category failed to reveal any significant variations.

It was found that the breakdown of this variable within the industrial groupings and according to provincial and settlement size classifications did not produce any general results. However, the cross-tabulation of users using the number of calls and the number of mobiles as criteria did produce some interesting results. For all three of the major service categories, there was a tendency for users who were part of larger mobile systems to make more calls. This tendency was more apparent in the structure of calls made on working days than non-working days. The indication is that larger mobile radio systems tend to have users who communicate more frequently.

9.5 Initiation of Calls

The questionnaire solicited the user to provide the percentage of his total calls which were initiated by him. The classification of users on the basis of their responses shows that, for GRS and Private categories, the typical response was 50%. In addition, the GRS category had a slight tendency towards users initiating more than 50% of the calls. GLMRS users did not display this central tendency to the same degree, although it was also noticeable. The 70 to 80% initiation classification housed the greatest number of users within this category. As well, both RCCMRS and Paging users tended to initiate more than half of their calls.

The cross-tabulation of the distribution of users classified by the percentage of calls initiated against the ranking which was given to the mobile unit to base station (or telephone system) type calls verified that, for the higher user-initiated classes, a higher proportion gave a high ranking to this type of call. This was most noticeable for the GLMRS group and least noticeable for GRS.

9.6 The Purpose of Calls

The last two questions in the section on the use of the mobile radio system asked the user to indicate the percentages of calls, both transmitted and received, which were for emergency, business and personal matters. While an ideal answer would add up to 100%, this was not always the case. In fact, many users provided the percentage of their calls which were of a business nature, but did not allocate the remaining percentage to the other two categories. As well, some users allocated all their calls into one classification. Therefore, for the breakdown of calls according to purpose, three different sets of averages were computed. One is based upon the average for those users who indicated a percentage of calls in that particular classification. Another includes only those users with percentages adding up to 100. And yet another is computed using the number of users who provided a percentage in any classification regardless whether or not the sum is 100. The last two sets of computations did not yield a significant amount of difference and therefore the third breakdown is not presented here. It is sufficient to say that it tends to be marginally smaller than the results of the second method.

Generally, the averages for transmitted calls are only slightly different from the averages for calls which are received by the user. Therefore, if the difference between transmitted and received calls is not noted, it can be assumed that they are approximately the same.

It is seen to be useful to present the number of users in each classification who indicated what percentages of their calls were for any particular purpose. In all categories, the users who indicated calls for business purposes outnumber those who indicated calls in either of the other two classifications. There were 456 GRS users, 543 Private users, 219 GLMRS users and 40 RCCMRS users who recorded business applications for their radios. The population count for the GRS category represents the only one which is substantially below the total number of users in the respective categories. As a matter of fact, there were 52 more GRS users who answered the question pertaining to transmitted calls completed (percentages add up to 100) than the number which indicated a value for business purposes. This group of 52 users obviously used their mobile radio entirely for emergency and personal purposes only. The other categories did not display this same characteristic.

Using the number of users who noted a proportion of calls for business purposes as a base figure, the number of users who indicated some degree of emergency and personal use can be expressed as a percentage of this base group so as to illustrate the orientation of the different service categories towards these uses. The respective figures for emergency and personal use are 47% and 96% for GRS, 34% and 55% for Private, 23% and 52% for GLMRS, and 30% and 30% for RCCMRS. It is obvious that, in relation to business orientation, GRS users are much more inclined to personal uses than the other categories. As well, there are more inclined to emergency applications especially as compared to GLMRS users.

With these considerations in mind, the actual percentages are somewhat more meaningful. Of all the users who reported business use, the average percentage was 69% for GRS, 88% for both Private and GLMRS, and 91% for RCCMRS. When these figures are adjusted to eliminate incomplete responses, the only value which changes significantly is that for GRS which declines by 10 percentage points to 59%. Comparable figures for emergency use are 11%, 22%, 25% and 27% for the respective categories. These figures are substantially lowered when adjustments are made with the highest value being 7% for the Private category. This indicates a sizeable number of users, mostly outside the GRS category who have recorded a relatively high emergency orientation. The values for the personal use component are 44%, 15%, 17%, and 10% respectively before adjustments. After adjustments, the GRS average value is 37%, while the Private and GLMRS categories display values of 8% and 9% respectively.

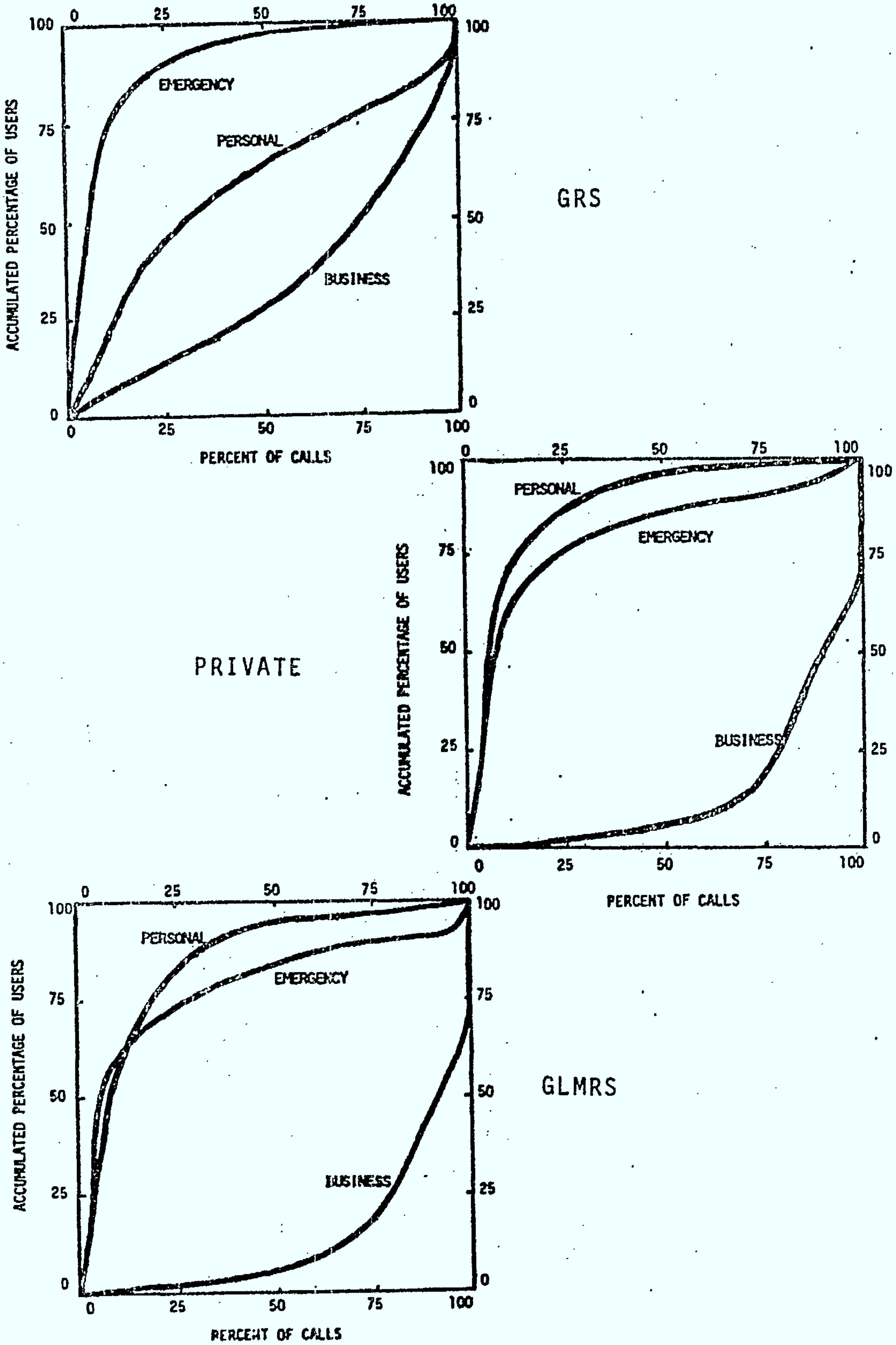
Everything considered, indications are that the GRS category is distinguished by a greater orientation towards personal applications in terms of both frequency and magnitude. It is distinguished by a greater orientation towards emergency purposes in terms of frequency, but not magnitude. The other categories are dominated by business uses in terms of both frequency and magnitude. However, while the Private category is more oriented towards emergency uses in terms of frequency in comparison to GLMRS, it is not so oriented in terms of magnitude.

These characteristics are more graphically illustrated through the use of Lorenz curves relating the percentage of calls for the three different uses to the percentage of users. A Lorenz curve is a curve designed to show to what extent a given distribution is uneven, compared with an even distribution. The curves for each of the major service categories illustrate the degree to which each category of users is distributed towards a high or low percentages of calls for the different purposes.

It was previously noted that the differences in purposes for calls transmitted as opposed to calls received was minimal. The general tendency is for the proportion of calls for emergency and personal purposes to be somewhat less for calls transmitted than received. The only place where this difference is more noticeable is with regards to calls of an emergency nature in the GLMRS category. The higher proportion of emergency calls received is interpreted, in this case, as indicating the importance of these mobile users to some emergency situation.

It is quite reasonable to assume that the nature of an industrial activity will influence to what degree communication in that activity will be oriented to emergency and personal applications. In fact, the breakdown of mobile communications first is its purpose and secondly by major industrial groupings reveals that two activities significantly

FIGURE 71 NUMBER OF USERS VERSUS PURPOSE OF CALLS



deviate from the norm for each category. These activities are personal services and transportation. The personal services sub-group for GRS displays a marginally high value for emergency use as well as extemely low business use and a corresponding high personal use. Transportation is distinguished by a marginally higher transportation orientation. These same activities within the Private category are distinguished by abnormally high emergency components, which detract from the business orientation. But it should be noted that this emergency component is twice as high for personal services as for transportation which is in turn three times as high as the next highest group. When these activities are again compared for the GLMRS category, while they both show high emergency components, it is transportation which is substantially higher than personal services. The personal services category shows an extremely high orientation to personal uses.

10. EVALUATION OF MOBILE RADIO SYSTEMS

In an effort to determine to what extent users were satisfied with their mobile communications, they were asked to both state why their activities required mobile communications and to evaluate certain aspects of their communications by selecting one of five possible answers in a positive-negative continuum.

10.1 Why Mobile Communications?

The response of the users to the question asking them to provide a short statement of why their activities required mobile communications was quite high with over 90% of the users providing a response. The subsequent treatment of the written responses attempted to reduce the many answers into a manageable number of classifications. The classifications which were decided upon were based largely upon the nature of the answers in the first questionnaires returned. The ten classifications which were thought to best represent the range of mobile communications requirements are as follows:

- The realization of time and money savings
- The separation of work areas
- The lack of other communication facilities
- Better management of operations
- The provision of better service to customers
- The ability to contact personnel and vehicles
- The ability to contact the base of operations
- The need for communications in time of emergency
- The efficient provision of emergency services
- Other

The response of each individual user was classified according to these criteria. Because many individuals provided more than one response, it was decided to allow a maximum of three different responses for any one user. As a general rule, about one quarter of users gave more than one answer with very few providing more than two different reasons.

The ability of the users in the different service categories to conform to the classifications varied somewhat as 67% of the GRS, 75% of the Private and 91% of the GLMRS responses fell into one of the specific classifications and not in the residual category. The inability of some responses to be classified generally resulted from the responses being too general in nature. This did not permit classification into a more specific communications requirement class.

The three most frequently-mentioned reasons for the GRS users were the realization of time and money savings, the separation of work areas and the ability to contact personnel and vehicles. These same reasons were also mentioned most often by the Private users. However, the GLMRS users presented the lack of other communications facilities as the most frequent reasons. Overall, the similarities between the reasons given by GRS and Private are quite noticeable. On the other hand, the GLMRS users exhibited a much smaller affinity for the separation of work areas classification and a consequent higher affinity for the reasons pertaining to better management and the provision of better service.

The role of these different radio services in emergency communications was not dominant for any of the major categories. However, GRS users showed a greater application of their mobile units in emergency situations than did Private and GLMRS users. The latter two categories, on the other hand, displayed a higher application in the provision of emergency services. It should be noted that the few Paging users which were surveyed were largely oriented towards the provision of emergency services.

Generally, the classification of these responses confirms certain characteristics of the different radio services which have been brought into view previously. The greater proportion of GRS and Private users who noted the separation of work areas as a reason is quite likely a reflection of the agricultural orientation of these services. The propensity of GLMRS users to note the lack of other communications facilities as well as noting the benefits from a managerial viewpoint are seen to be indications of the application of this service in construction and extraction activities.

10.2 The Necessity of Mobile Communications

From the users viewpoint, mobile communications are viewed as being of more importance to users in the RCCMRS, Private and GLMRS categories. Paging users are not consistent in their assessment of the importance of their service, while GRS users have a greater tendency to view their service as representing a convenience or a luxury than do the other services. There is also a subset within the GLMRS category who view their mobile unit as a convenience.

Within the GRS category, transportation users display the highest tendency towards considering their mobile units as being absolutely necessary while tne personal services subset has the lowest tendency. Construction and mines and oils are above average, while agriculture and trade are average.

Mines and oils, followed by transportation and construction, attach more importance to mobile communication within the Private category. Agriculture, trade and personal services are below average. Personal services

FIGURE 72

CLASSIFICATION OF USERS BY THEIR EVALUATION

OF THE NECESSITY OF MOBILE COMMUNICATIONS AND BY SERVICE CATEGORY

1 = Absolutely Necessary

2 = Of Considerable Importance

3 = Important

4 = A Convenience

5 = A Luxury

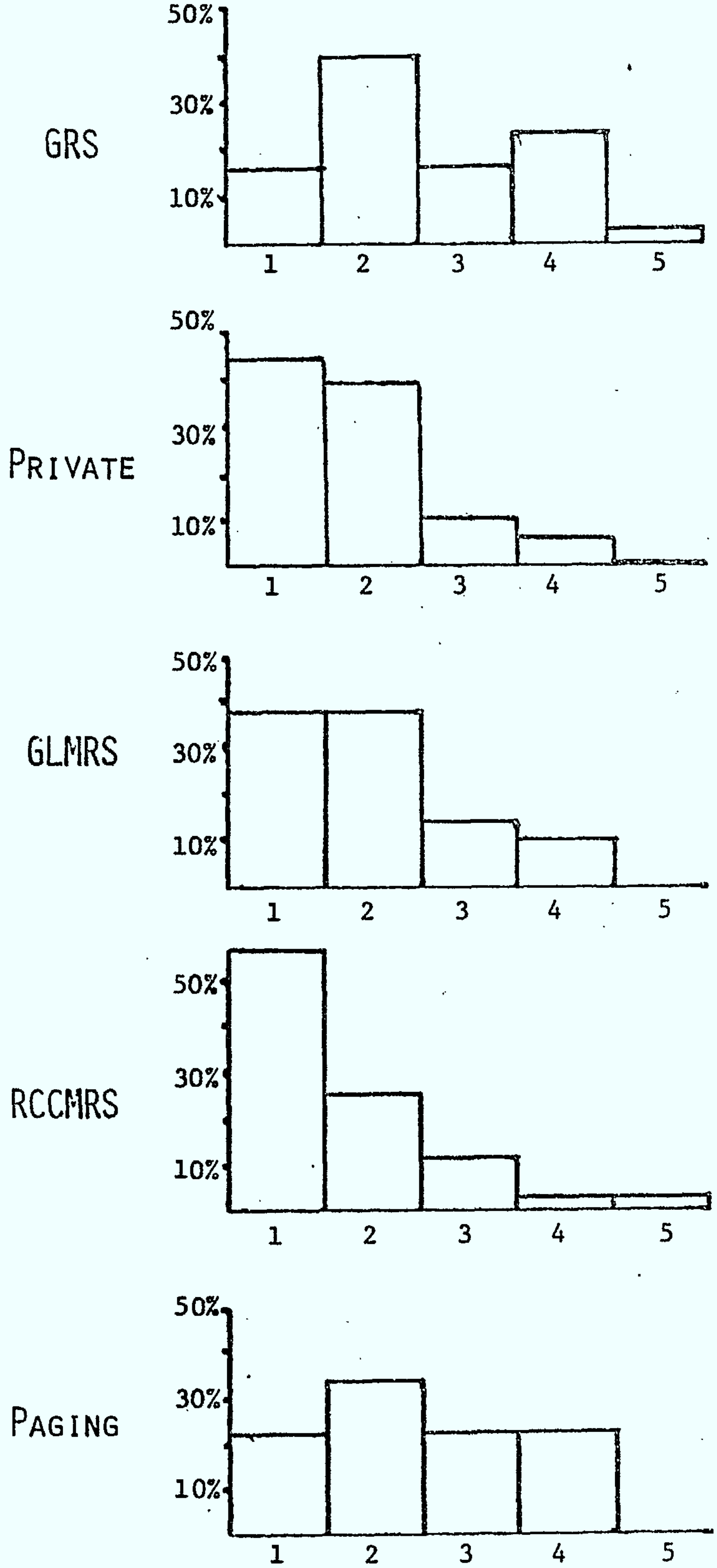


FIGURE 73
CLASSIFICATION OF USERS BY THEIR EVALUATION
OF THE RATE OF USE AND BY SERVICE CATEGORY

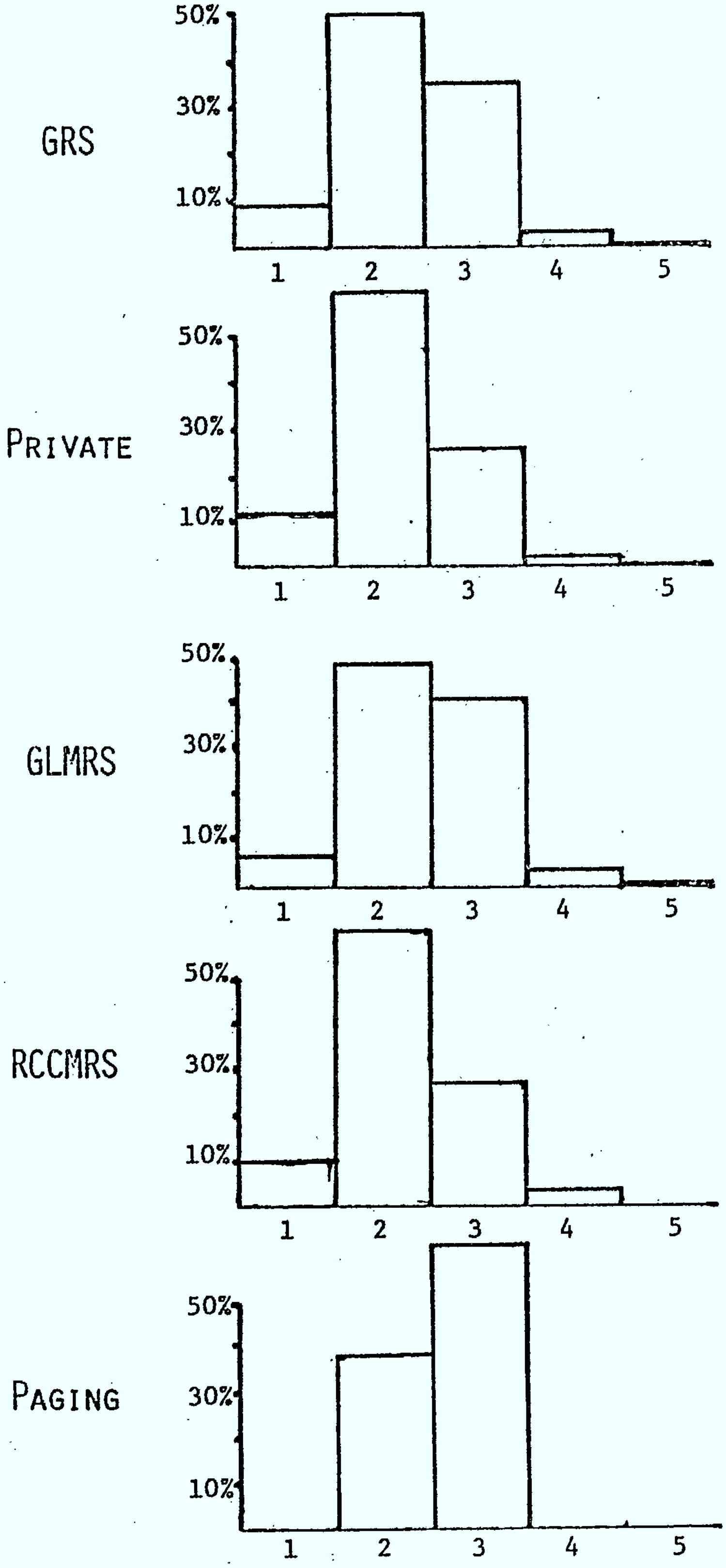
1 = Increasing Rapidly

2 = Increasing

3 = Constant

4 = Decreasing

5 = Decreasing Rapidly



display a strong tendency for the necessity to increase as the size of the settlement increases. Trade users, on the other hand, display a tendency for the necessity to increase as the size of settlement decreases.

Mines and oils are the only identifiable industrial group which has an above average rating for the necessity of GLMRS communications. Personal services, construction and transportation are slightly below average, while agriculture and trade are more so.

10.3 Tendency Towards Increasing Use

All the service categories, with the exception of Paging, show a tendency towards increasing use of mobile communications. This tendency is strongest for the Private and RCCMRS categories. Activities which display the greatest growth components are construction, trade and transportation in the GRS category, construction in the Private category and mines and oils in the GLMRS group of users. The growth component for the construction industry in the Private category is located largely in the smaller rural settlements.

10.4 Adequacy of Range

The GRS and GLMRS categories are somewhat more dissatisfied with the range of their communications. Within the GRS category, the construction and personal services users exhibit the greatest dissatisfaction. Construction users also give the lowest rating to the adequacy of range in both the Private and GLMRS categories.

Figure 74

Classification of Users by their Evaluation of the Adequacy of Range and by Service Category

1 = Always out of Range

2 = Out of Range Most of the Time

3 = Out of Range Half of the Time

4 = Out of Range Not Very Often

5 = Never out of Range

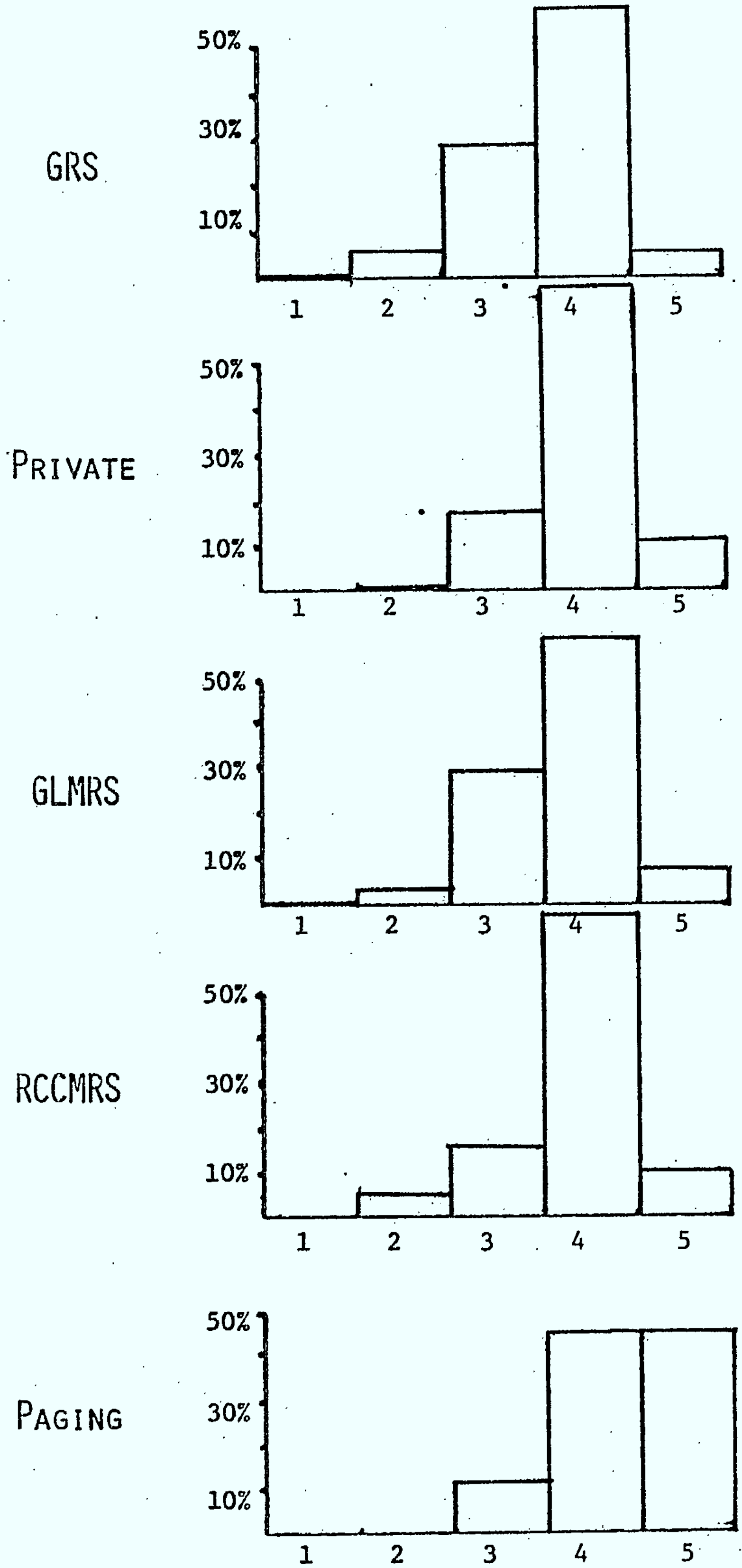


FIGURE 75

CLASSIFICATION OF USERS BY THEIR EVALUATION OF THE DELAY TO CONGESTION AND BY SERVICE CATEGORY

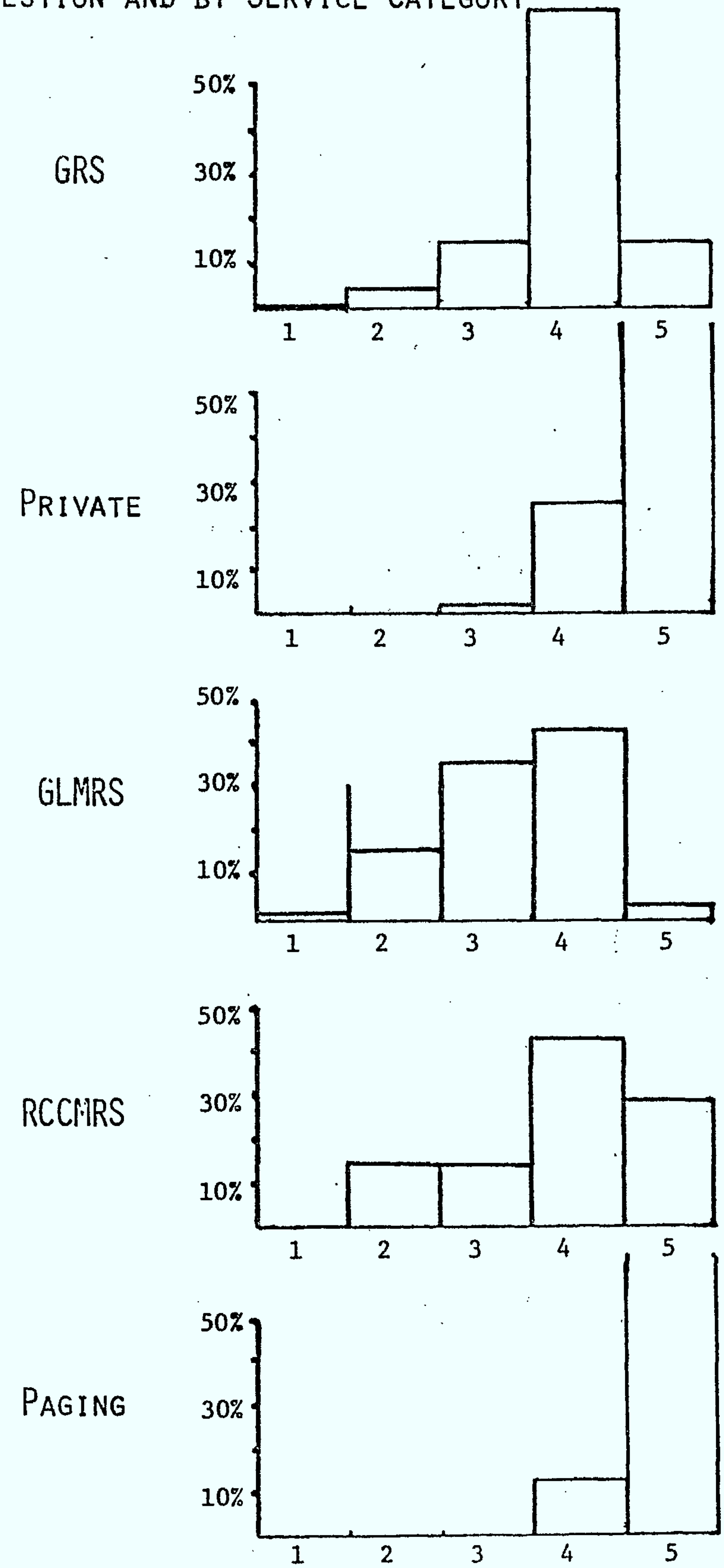
1 = Always

2 = Most of the Time

3 = Half of the Time

4 = Little of the Time

5 = Never



10.5 Congestion Delays

The GLMRS users had the greatest proportion of users experiencing channel congestion when making a call. As well, there were some users in both the GRS and RCCMRS categories who noted some difficulty in this respect. Generally speaking, the GLMRS users who had this difficulty were located in Alberta. Users reporting any degree of congestion with respect to GRS were largely located in the larger urban places covered by the survey.

10.6 Obstacles to Conversation

The existence of any uncontrollable factors such as noise, interference and distortion which served to hinder conversation were most noticeable within the GRS category. These phenomena were reported as being less frequent for GLMRS and RCCMRS users.

10.7 Privacy of Communications

Again, GRS was the most frequent source of negative answers, followed by GLMRS and RCCMRS. Within the GRS category, agriculture and construction users had above average values. Mines and oils, personal services and trade were the groups of users displaying values above the average for the GLMRS category.

10.8 Ease of Servicing

All categories, on the average, evaluated the ability to get their radio unit serviced as being more than adequate.

FIGURE 76
CLASSIFICATION OF USERS BY THEIR EVALUATION
OF THE DIFFICULTY OF CONVERSATION AND BY SERVICE CATEGORY

1 = Always

2 = Most of the Time

3 = Half of the Time

4 = Little of the Time

5 = Never

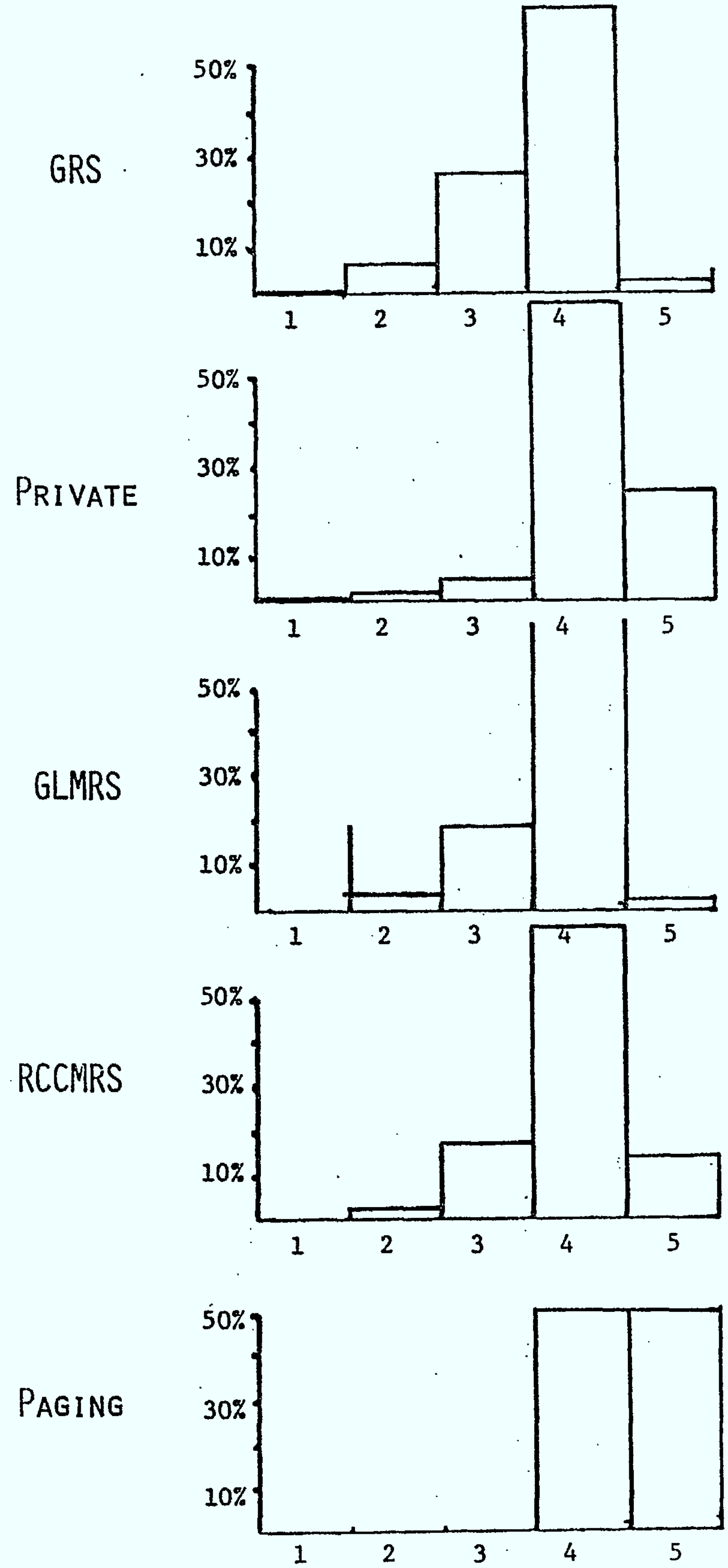


FIGURE 77
CLASSIFICATION OF USERS BY THEIR EVALUATION
OF THE PRIVACY OF MOBILE COMMUNICATIONS AND BY SERVICE CATEGORY

1 = Always

2 = Usually

3 = 50% of the Time

4 = Dissatisfied

5 = Very Dissatisfied

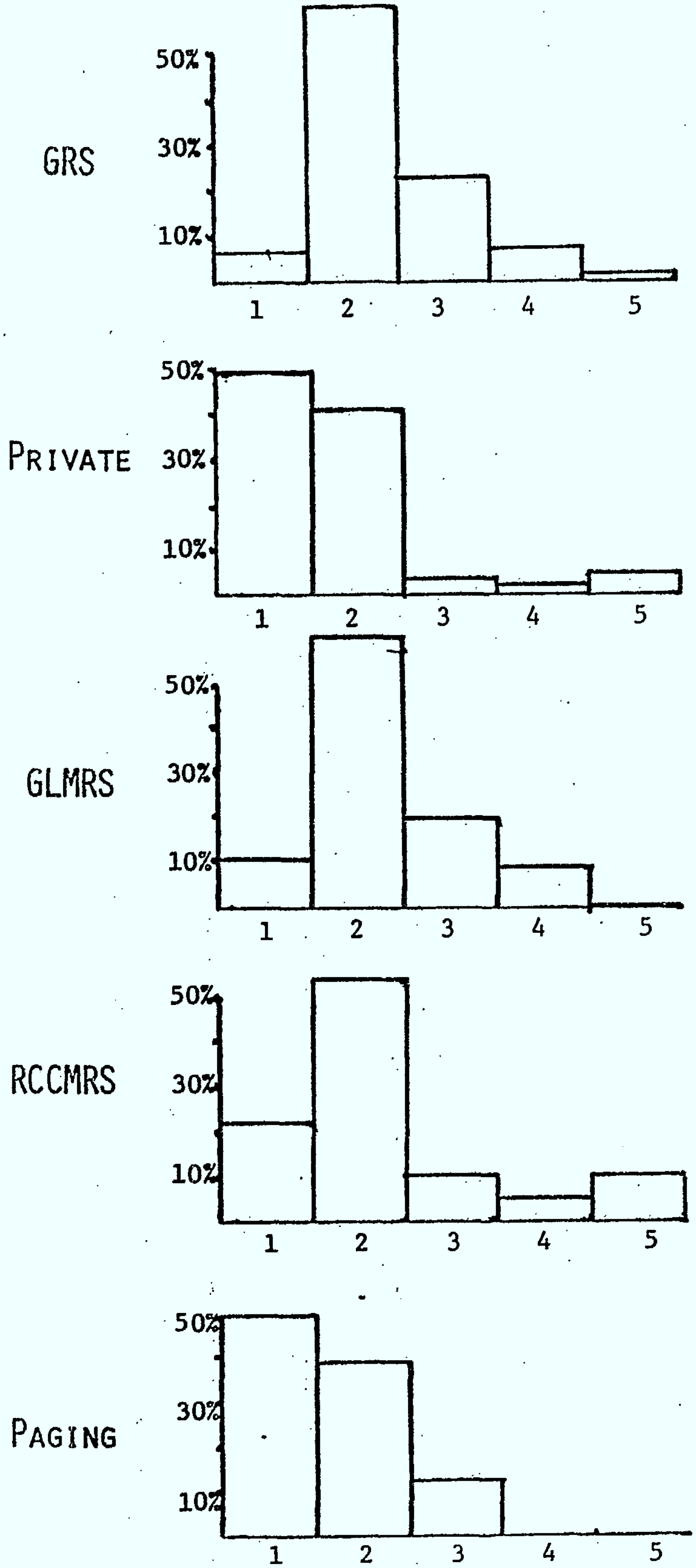
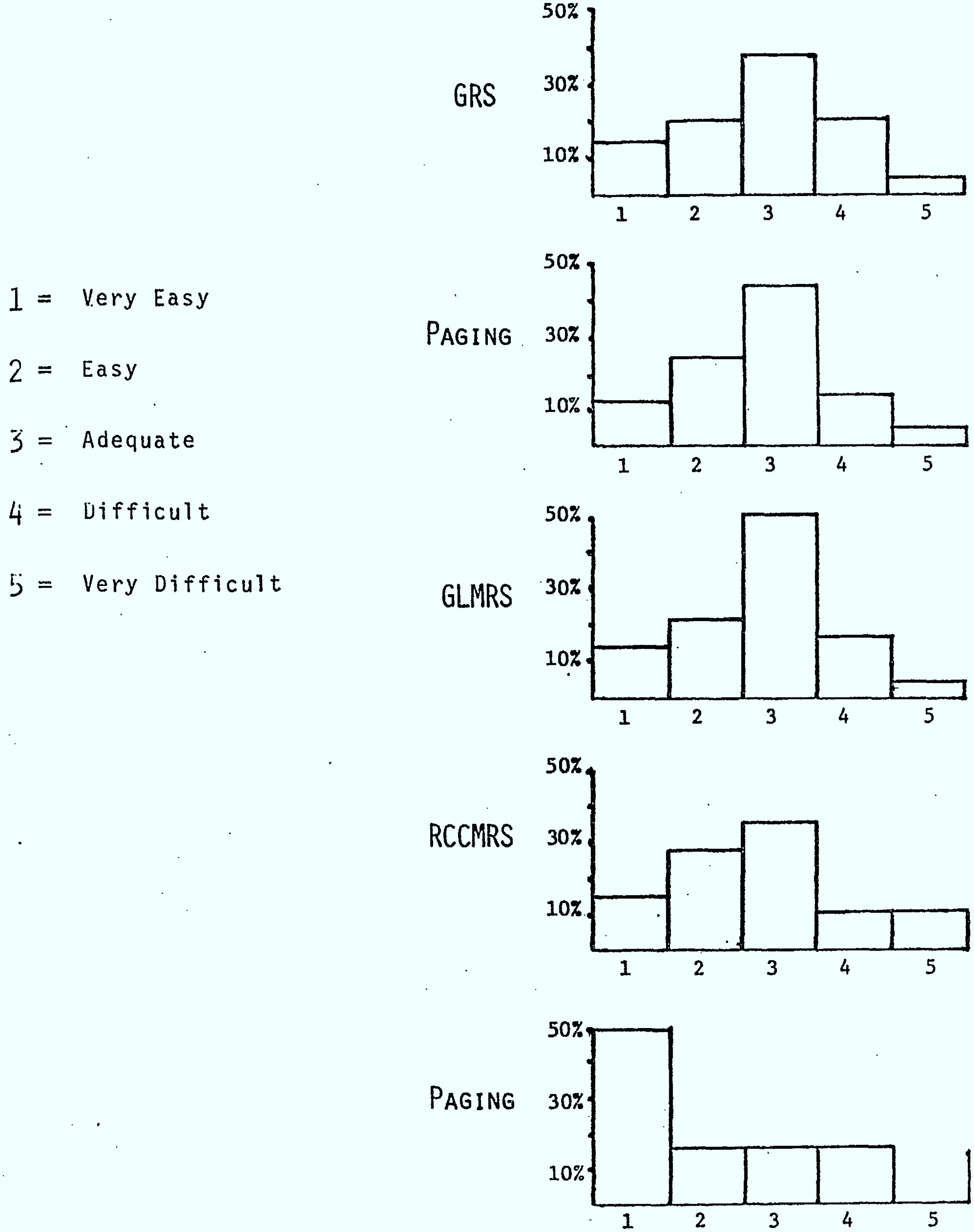


FIGURE 78
CLASSIFICATION OF USERS BY THEIR EVALUATION
OF THE EASE OF SERVICING AND BY SERVICE CATEGORY



10.9 The General Satisfaction of Users

Generally, all the service categories exhibited a high degree of satisfaction with their respective methods of mobile communications. As a measure of the overall satisfaction, a composite satisfaction index was computed. This index was based upon the responses to the questions pertaining to range, congestion, interference, privacy and ease of service. Based upon these index figures, the order of the various services from high to low satisfaction are Private, RCCMRS, Paging, GRS and GLMRS. However, the range of values for the index does not vary to a great extent from one service to another. Investigations as to whether these index values varied significantly between industrial classifications did not produce any highly significant results. Of passing interest was the fact that, of the six major industrial groups which are mobile radio users, agriculture and trade were the two most satisfied groups for GRS, for Private and for GLMRS.

It was decided to compare high satisfaction users against low satisfaction users as defined by the index values. These subsets of each of the three major categories were composed of approximately the top and bottom 10% of the users. Using a statistical procedure known as a T-test, it was possible to compare the two groups within the respective service categories and to determine the areas in which they differed. The nature of this test is covered in greater detail in the Appendices. It suffices to say here that this technique outlined which variables were significantly different - significant in a statistical sense - between the high and low satisfaction users. Based upon these findings, it is possible to present the most probable characteristics of a low satisfaction user within each of the three major categories.

FIGURE 79

CLASSIFICATION OF USERS BY SATISFACTION INDEX AND BY SERVICE CATEGORY

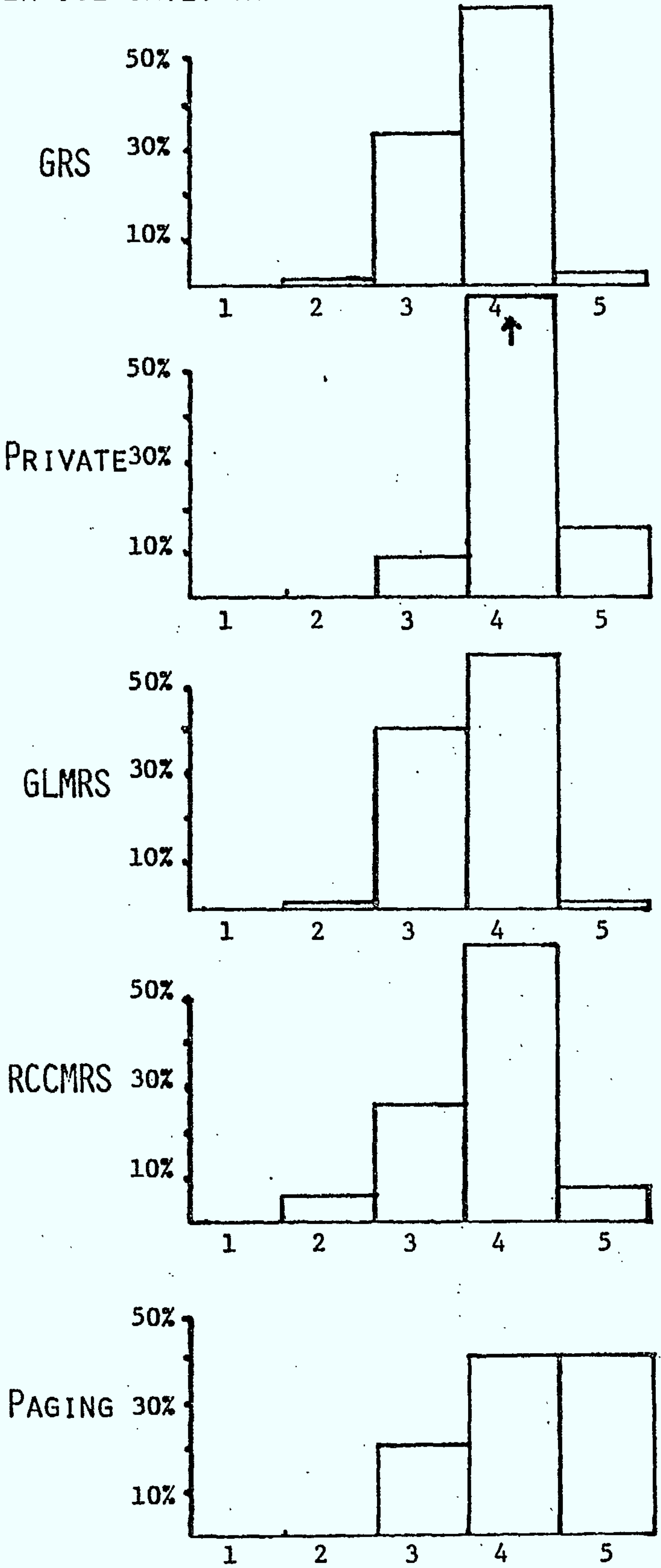
1 = Very High

2 = High

3 = Moderate

4 = Low

5 = Very Low



A low satisfaction GRS user is likely to use either a Private or a GLMRS mobile unit in addition to his GRS unit. He has tended to use GRS for a longer period of time than a high satisfaction user. He tends to make less calls during typical working hours on a working day and more calls in non-working hours on a working day. He also tends to make more calls at night during non-working days. As well, he reports more total calls on a non-working day than does his high satisfaction counterpart. He also reports a significantly greater number of calls for emergency purposes. His evaluation of the service differs mostly with respect to congestion, interference and privacy. In summary, the indications are that the typical low satisfaction GRS user has more experience, both in GRS as well as other mobile services and has a tendency to make calls in time periods which have been characterized as possessing an active non-business segment.

A typical user with a low degree of satisfaction in the Private category is found to be less likely to possess a GRS unit, but more likely to have a GLMRS unit than a high satisfaction user. He possesses significantly more mobile units when the number of units of all types are considered, but there is not as much difference when only the number of Private units are considered. He tends to have used a Private mobile unit for a longer period of time. He has more frequent communications as he make more calls on both working and non-working days in most time periods. He also tends to use his system somewhat less for business purposes and somewhat more for personal purposes.

A comparable GLMRS user has fewer GLMRS units than a high satisfaction user. As well, he shows a tendency to have had his particular radio unit for a shorter period of time although there is no significant difference in the length of time that GLMRS services have been used or the data of last servicing. In terms of the calls on a working day, he makes significantly more in the 3:00 p.m. to midnight time period and significantly less in the midnight to 7:00 a.m. period. In terms of total calls, he tends to make more on working days and less on non-working days than his high satisfaction counterpart. There is no appreciable difference in the purpose of calls. His use of the service is not increasing as much and by far the most significant difference in satisfaction is in terms of the obstacles to conversation. The impression which results from these differences is that these low satisfaction users have quite likely been operating with a poor mobile unit in the past.

11. POSSIBLE SYSTEM IMPROVEMENTS

The last part of the questionnaire attempted to collect information concerning the factors which the user viewed as being integral to an improved mobile radio system and the factors which inhibit those improvements. In addition, the users were asked whether they would be altering their system in the next five years and if so, in what respect.

The user was provided with seven specific areas of upgrading and was asked to choose the two which were seen to be of the greatest importance. The changes which were covered by the array of choices included changes both within the control of the user as well as changes not within his control. The actual improvement factors which were provided are as follows:

- Less congestion
- Quality equipment
- Low cost equipment
- More privacy
- Better area coverage
- More mobile units
- Connection to the telephone system

In terms of the obstacles to improvement, the user was asked to select two out of a total of six. These obstacles again included factors both within his control and external to his situation. The possible choices in this case were as follows:

- Lack of knowledge about alternative systems
- Needed improvements are too expensive
- Inability to get the needed radio-telephone service in your area
- Inability to get paging service in your area

- Doubtful whether improvements are needed
- Increased benefits outweighed by increased costs

The results of these questions, as well as their relationship to certain characteristics of the respective radio services, will be presented by individual mobile radio service categories.

11.1 The General Radio Service

The two most important factors in an improved GRS communications system as outlined by the users choices are better area coverage and quality equipment. Individually, they represented 34% and 22% of the responses. The other factors were less popular as approximately 10% wanted more privacy, 10% desired connection to the telephone system, 9% chose less congestion, 7% desired more mobile units and 5% thought low cost equipment would improve their systems.

Of the many combinations of choices, four combinations stood out and all of these four included better area coverage as one of the choices. The desire for better coverage was coupled with the quality equipment factor 28% of the time, with the desire for greater privacy 11% of the time, with connection to the telephone system 10% of the time and was coupled with a desire for less congestion in 9% of the total two-part responses. The dominant role which better area coverage is perceived to play in improving GRS communications is very apparent.

In an attempt to differentiate between the users who selected different factors as being of importance in improving their system, the other characteristics of the users as contained in the responses to the preceding sections of the questionnaire were computed using the response to the upgrading question to differentiate between the users. In this way, it was possible to note which characteristics assumed noticeably high or low values. This proved to be more successful for some upgrading factors than for others.

Users who chose less congestion as an upgrading factor proved to have used GRS longer than average, were more likely to have a base station located in an urban centre, tended to make a moderately high number of calls on a working day and a substantially higher number of calls on a non-working day. As well, users engaged in transportation activities were less inclined to choose this factor.

The inclination towards quality equipment was uniformly displayed throughout all the groups of user characteristics, with two exceptions. Users reporting communications with all base station locations had a low affinity for this factor as did users engaged in construction activities.

Users who selected low quality equipment had tendencies to have used GRS longer, to not be located near large urban centres, to make fewer calls on a working day, to regard his mobile unit as less of a necessity. Yet this group displayed a high degree of satisfaction with GRS in terms of the average value of the satisfaction index.

The users who wanted more privacy were found to have quite a few distinguishing characteristics. They possessed a relatively high number of mobiles, but tended to have used GRS for a shorter period of time. Users reporting base stations located on farms chose this factor more often. The number of calls on a working day proved to be moderately high as was the proportion of calls for business purposes, while the proportion for personal purposes was low. Compared to the users who chose other factors, this group of users displayed the highest value in terms of the necessity of their mobile units. They also displayed a moderately high propensity towards increasing use. But their satisfaction level was the lowest of all. Agricultural users had a greater tendency to choose this factor, while construction and transportation users had a slight tendency.

Better area coverage was the most frequently chosen; yet, like the quality equipment factor, it did not vary widely through most of the user characteristics. However, the many users choosing this factor had an above average number of mobiles. As well, construction users were very consistent in choosing this factor, while transportation users were less inclined, but still above average.

The desire for more mobiles was the most successful factor in terms of being able to distinguish characteristics of any subset of users. They displayed a relatively low number of mobiles and tended to have used GRS for a shorter period of time. This desire was seen to diminish progressively from a high level for users with base stations on a farm to the lowest level for users with a base station in large urban centres. They show a low number of calls being made on non-working days and a moderately high degree of business use. Their communications were seen to be on the increase and their level of satisfaction was high. Taken together, these factors portray a group of users with a positive attitude towards GRS.

The desire for connection to the telephone system was found to be low for farm-based systems and low for the roaming users. As well, these users displayed a moderately high degree of personal use. The propensity to choose this factor was seen to be high for users in mines and oils and moderate for construction, trade and transportation.

The distribution of responses to the question regarding improvement obstacles outlined economic obstacles as being of the greatest importance as 60% of the total responses were divided equally between improvements being too expensive or the costs exceeding the benefits. Lack of knowledge was cited as an obstacle 16% of the time. The users expressed doubt as to whether improvements were needed 12% of the time. The lack of radio-telephone and paging services were the least frequent choices.

A high proportion of the users (36%) only provided one response to this question. Of the two-part responses, the two economic obstacles teamed up 37% of the time. The lack of knowledge was combined with the economic obstacles 24% of the time, compared to 14% of the responses which were associated with the existence of doubt.

Users who saw improvements as being too expensive were found to have a low number of mobiles on the average and were found to be concentrated in urban centres. Users who noted that the increased costs would exceed the benefits had a low concentration in the rural settlements and made a low number of calls on a working day. The deduction here is that these users are characterized by a lack of benefits compared to the other users.

Users who cited the lack of knowledge as an obstacle were shown to have used GRS for a shorter period of time and were concentrated outside of the large urban places. Users engaged in trade activities were especially low in choosing this response. Users who expressed doubt as to whether improvements were needed showed a high proportion of their communications were for personal purposes. While they exhibited a low tendency to be increasing their use of GRS, they displayed a high level of satisfaction with the service.

Users who saw the lack of radio-telephone service in their area as a factor which inhibited improvements displayed tendencies to have an above average number of mobiles, to have used GRS longer, to be more concentrated in rural settlements, to make more calls on working days, to place a high value on mobile communication, to be increasing their use of GRS and to display a moderately low satisfaction with GRS. The deduction here is that these users view GRS as possessing a finite level of utility which is not sufficient to meed their needs.

On the other hand, the users desiring paging services showed an above average number of mobiles, a high proportion of calls in the emergency category and a low proportion in the personal category. They also regarded mobile communications as being less necessary as compared to the other groups of users classified on the basis of their response to this question.

The answers to the upgrading and obstacles questions are regarded as indications of the overall orientation of GRS users in these areas. The users were also asked whether it was probable that they would be altering their systems within the next five years and were given a choice of either yet, no, or don't know. Thirty-seven percent said that they would be altering their systems and forty-six percent said that they did not know. The residual seventeen percent who said they would not be altering their systems are obviously the users who are satisfied with GRS.

The users who said they would be altering their systems were also asked to provide details of the probable changes. It was found that 31% planned to add to their system, 52% planned to change their system in some way and 17% planned to adopt a different type of mobile radio service. Of the 31% looking to enlarge their system, 16%, or about half, planned to add more mobiles, while 12% planned to add a base station and 3% planned to add other equipment. Of the users who planned to change their system in some way, a slim majority were proposing to get better equipment, as opposed to modifying their system in some other manner. The users planning to adopt other mobile services were inclined to select Private radio systems (75%) as opposed to GLMRS.

Thus, it was seen that there are elements within the overall group of GRS users who are satisfied with their present situation, who are undecided as to their future, who are planning to reinforce their use of GRS and, of course, those who recognize that GRS cannot satisfy their communication needs. The overwhelming size of this service category cannot be discounted when considering these elements. Consider the users who definitely stated that they planned to adopt either Private radio or GLMRS communications within the next five years. When this group of users is compared to the total group of GRS users who sent in questionnaires they represent only 8% of the total. If it is assumed that this figure is valid for the entire GRS population, the magnitude of this attrition is astounding. Of the approximately 17,000 GRS systems (50,000 GRS mobiles averaging just under three per system) located outside of the cities in the Prairie Provinces at the time of the sample, 1360 of these users are predicted - assuming an 8% attrition rate - to be adopting these other services in the next five years. Remembering that three quarters of them desire to adopt private radio systems, this means that there will be 1020 new private systems in the next five years. <u>This is practically as many systems as there are in these areas at the present time</u>. This estimation may actually be too conservative. Consider the segment (46%) of GRS users who state they are undecided. Consider the approximately doubling in the number of GRS mobile units in the study area since the sampling of these users. Consider the problems which characterize this service and which may alienate an even greater proportion of users.

Up to this point, little mention has been made of the more controversial aspects of GRS. Nevertheless, a proper evaluation of the users of GRS and the ability of GRS to satisfy their communications needs must deal with these aspects in some manner. The last question which was presented to the users solicited any additional comments. Over half of the GRS users provided comments pertaining to GRS. The comments ranged from being pleased with GRS to being extremely annoyed with its application. In an attempt to quantify these comments, each comment was evaluated as to the attitude of the user and the nature of the comments were catalogued into ten classifications. Needless to say, the comments lose their personal nature and much of their impact when reduced in this manner. Therefore, they have been collected in their entirety and are included in the Appendices.

In terms of the attitudes of the users, 33% were classified as being positive and 67% were classified as being negative. In the positive group, approximately one half were classified as being informative and most of the remainder were thought to be pleased with GRS. The users who were classified as being constructive or who were seeking information were few. The breakdown of the attitudes of the negative group (67%) showed that half (34%) had a strong opinion, just under a quarter (15%) were downright complaining, a fewer number were seeking changes (13%) and some were experiencing radio problems (5%).

From the point of view of the information contained in the comments, about a third of the comments provided some explanation of how the system was set up, how they used their system or provided some insight into the use of GRS or mobile communications. These were the satisfied users. Ten percent of the users who provided comments stated that they wanted more power and range. Ten percent commented on the skip problems. Twenty-eight percent commented on the various abuses of GRS and eighteen percent provided an opinion as to the methods of eliminating these problems. As well, eighteen percent indicated a desire for more and better service on the part of DOC.

All in all, GRS users are a very vocal group. Their comments were to the point. This feedback is a valuable source of information. For instance, one of the main themes which ran through these comments was a commonly held desire for DOC to increase the qualifications needed to obtain a license. These qualifications do not refer to a need for communications, but a knowledge of how to use GRS. It is thought that if it was harder to obtain a GRS license, many of the users who are currently abusing the service would not be doing so. They obviously believe that ignorance should be overcome before a person uses mobile communications rather than after.

11.2 Private Radio Systems

Users in the Private category showed a preference for better area coverage much like the GRS users as 36% of all responses selected this factor. However, the desire for quality equipment was not as prevalent as the desire for more mobiles was selected more frequently. Fourth in terms of the frequency of selection was the desire for connection to the telephone system as 12% of the individual responses were in this category. As well, a significant number indicated a desire for low cost equipment. The three most common two-part answers were the combination of a desire for better area coverage coupled with a desire for either quality equipment, more mobiles or connection to the telephone system.

Surprisingly, some users expressed a desire for more privacy and less congestion which was not an expected response as this type of mobile communications is characterized by its privacy and lack of congestion. However, it was found that these users displayed an above average number of mobiles and calls per working day which can explain this phenomena, at least in part.

Comparison of the user sub-groups as defined by the response to the upgrading question was again performed for the Private category. Overall, fewer distinctions were found than for the GRS category. For the users who desired better area coverage, it was found than this desire diminished slightly from the rural users to the urban users and that it was more prevalent for trade users and somewhat less for users engaged in mines and oils activities. This slight decrease in desire from rural to urban was again noticeable for the users wanting more mobiles. This was supported by a high proportion of agricultural users wanting more mobiles. As well, these users displayed a moderately high propensity to be increasing their use of mobile communications and a high satisfaction level.

The desire for quality equipment was found to surface more often in users with more experience and less often in users who classified their base station as being located in a rural non-farm area. This desire was also found to be relatively more common for trade and transportation users. Users who expressed a desire for low cost equipment had a relatively low number of mobiles and a relatively high number of personal calls. As well, they tended to regard mobile communications as being less of a necessity.

The desire for connection to the telephone system was expressed by a group of users who can be characterized as having an above average number of mobiles, below average experience and a high satisfaction level. This desire was also more frequent in users classified in the personal services and transportation industrial groups. In terms of base station location, all types of users displayed a significant level of desire which ranged from 10% to 15% of the users.

The question regarding the obstacles to improvements saw most of the users selecting the factors pertaining to economic constraints. Approximately 20% expressed doubt whether improvements were needed and 15% outlined the lack of knowledge as a constraining factor. In addition, approximately 7% acknowledged the lack of other mobile radio services in their area as being a obstacle to improvements.

The users who saw improvements as being too expensive were found to have a low number of mobiles, but a moderately high level of increasing use. As well, they tended to favour the personal services and transportation industrial groups. The users who cited the lack of benefits as compared to costs as inhibiting improvement were found to again be in the personal services category, but also to be conspicuously low in the trade category. This was opposed to the users doubting whether improvements were needed who, besides displaying a high level of satisfaction, were found to have a low concentration in the personal services category and a high concentration in the trade category. Users admitting to a lack of knowledge were found to have used the service for a shorter than average length of time.

The lack of radio-telephone services in their particular area was cited by users showing a high number of mobiles, a high level of experience and a high proportion of emergency calls. But they also displayed a low level of satisfaction compared to the other groups. Users noting the lack of paging services also had a high proportion of emergency calls, but in this case, a small number of mobile units.

The users who stated that they would be altering their system within the next five years represented 26% of the users in the Private category. In addition, 40% were undecided and 34% stated they would not be altering their system. Of the users planning alterations, 30% of the changes were outlined to be the addition of mobile units and 15% would result in the addition of other equipment. As well, 44% of the changes indicated were oriented towards the adoption of another type of mobile radio service, in most cases GLMRS.

Comments were received from 35% of the users. Over a third of the users provided information about the system and approximately a fifth were classified as being pleased with their mobile communications. About a quarter were either seeking changes or had a strong opinion. Although the overall level of satisfaction was highest for Private users, the comments illustrate that there are some areas which the users believe can be improved. Most of the comments by these users were constructive in nature, although a significant amount of dissatisfaction was also recorded.

It is apparent from the comments that a significant number of users in the Private category previously used GRS and thought it inadequate for their needs. It is also apparent that many are aware of General Mobile services. In terms of their desires and wants, the need for more power and range was noted frequently. The high cost of equipment was also a frequent concern. Most of the frustration which was exhibited was directed towards those factors beyond their control.

Yet, whatever the problems which the users in the category possess, most of them suggest that this type of mobile communications is their best alternative at present. The common desire is to be able to maximize benefits.

11.3 General Land Mobile Radio Services

The response to the question pertaining to upgrading factors by the GLMRS users outlined that, like both GRS and Private users, they wanted better area coverage. GLMRS users selected this factor 34% of the time which is very similar to both the other categories. However, these users differed from the other categories with respect to the value they placed upon the other upgrading factors. The desire for less congestion was exhibited 21% of the time which can be compared to 9% for GRS. The desire for quality equipment (12%) was significantly lower than both the other categories. However, the desire for low cost equipment (11%) was significantly higher than the other categories. The desire for more privacy, while not high at 8%, is roughly comparable to that exhibited by GRS users. The desire for more mobiles was given a low priority. The fact that some users noted that the connection to the telephone system would serve to upgrade their system was baffling and is interpreted as reflecting a group of users who are currently using their mobiles in areas outside their home areas. This will become more apparent when the obstacles to improvements are discussed.

Comparing the response groups to the other user characteristics was again somewhat revealing. Users desiring better area coverage were distinguished only by a lower number of calls on non-working days, a lower percentage of emergency calls, and a relatively low satisfaction level. Users who expressed a desire for less congestion were found to make high use of this service showing a relatively high number of mobiles and a high number of calls on both working and non-working days. This was coupled with a relatively low satisfaction level. The desire for more privacy was more prevalent in centres under 1000 population and for roaming users. These users also displayed a high degree of necessity for mobile communications, as well as an increasing level of use.

Users who wished to enlarge their use of this service by adding more mobiles displayed that they were presently making good use of the service. They were characterized as having an above average number of mobiles at present, as making a high number of calls, a low number of personal calls, as regarding their mobile communication as a necessity and as possessing a high level of satisfaction with the service at present. As well, they were more concentrated in the agricultural, construction and trade categories.

The desire for quality equipment was expressed by a group of users who were found to have a relatively high experience level, made a low number of calls on non-working days, and regarded their mobile communications as being less of a necessity than other groups. They tended to be highly concentrated in the personal services category and tended to have a low concentration in construction and trade categories. The desire for low cost equipment was expressed by users having a low average level of experience, a high concentration in rural environments, and who tended to make a low number of calls per day.

The distribution of responses for the obstacles questions again outlined the dominance of economic constraints. What was surprising was that the third most frequent obstacle selected was the lack of radio-telephone service in the user's area. This seems to suggest a goodly portion of the users surveyed were of a roaming nature. Both the lack of knowledge and the existence of doubt as to whether improvements were needed were slightly less popular responses than for the other two major service categories. However, a significantly higher proportion noted the lack of paging services as a constraint.

The group of users who doubted whether improvements were needed were found to display a high degree of differentiation from the other users. They tended to have used GLMRS for an above average period of time, to make a lower number of calls, but a higher proportion of personal calls, to regard their communications as being necessary and to have a high level of satisfaction. They also tended to be more concentrated in the personal services category.

The users who noted the lack of radio-telephone service in their areas were found to make a high proportion of business calls and a low proportion of emergency and personal calls. They were found to be more concentrated in construction activities and to possess a relatively low level of satisfaction. Their dissatisfaction can possibly be interpreted as arising out of their need for this type of communications coupled with its absence in their immediate area.

The lack of paging service was noted by users having a low experience level, a high number of working day calls, a high number of emergency calls and an increasing level of use. The general indication is that these users are involved in emergency services.

The users who noted that they would be making alterations in the next five years represent 28% of the GLMRS users. Of the remainder, most stated they did not know if they would be making alterations. Of the changes which were outlined, 12% would result in larger systems, 47% would see a change of equipment or some other modification and 30% would see the adoption of some other mobile radio service. Of the users who noted they would be adopting another service, a little under a half of them were considering private systems and one third were considering paging services. In terms of the total GLMRS population represented, just under 10% of the users were looking at alternative communications.

The comments which were supplied by 43% of the GLMRS users showed a relatively high negative content. Over half of the users were classified as possessing a negative attitude of some kind. Most of the negative comments were preoccupied with some aspect in the provision of this service, whether it was poor range, poor coverage or the ignorance and inexperience of mobile operators. The high cost of this service was also mentioned frequently.

11.4 Radio Common Carrier Mobile Radio Service

Generally speaking, the users in the RCCMRS category displayed similar concerns, in terms of both upgrading and the constraints thereof, as compared to the other radio services. They expressed a desire for better area coverage most frequently, followed by quality equipment and less congestion. The desire for either low cost equipment, more privacy, more mobiles or a telephone connection was displayed less frequently. Economic factors were again the most frequent constraints, but the 13 users who doubted whether any improvements were needed is seen to be relatively high.

Of the 42 users in this category, 12 stated they were altering their system in the next five years, 13 said they were not and 16 were undecided. Two of the twelve planning changes were looking at adopting GLMRS and three were investigating private systems. Only one was planning to add more mobiles.

The comments which were provided by this user group were generally positive.

11.5 Paging

Paging users also displayed a preference for better area coverage. Three out of the ten users surveyed noted that more mobiles would be an improvement. Economic constraints were again the most frequently selected obstacles. It is interesting to note that none of these users planned any changes within the next five years, although four were undecided.

12. RELATIONSHIPS BETWEEN ATTRIBUTES OF MOBILE RADIO USE AND SOCIOECONOMIC CHARACTERISTICS OF THE POPULATION

In an attempt to discover whether certain attributes of the use of different mobile communications techniques varied within the study area in conjunction with variations in the general population, these attributes were compared for each census division within the major service categories. The attributes in question are the average number of mobiles, the average number of calls on working and non-working days, the average percentage of calls for business purposes and the satisfaction index. These variables were then correlated with the same population characteristics as were the levels of mobile radio use.

12.1 General Radio Service

The analysis of the GRS responses yielded a large number of significant correlations. The average number of mobiles in an area was found to vary with each of two variables at the .01 level of significance (99% level of probability), at the .05 level with two other variables and at the .10 level with three other variables. The most significant relationships were found with respect to the average number of improved acres per census farm and the number of farm operators under 25. Thus, areas with larger farms and larger populations of young farm operators tended to have larger systems. The relationships found to be significant at the .05 level were negative correlations with average rural incomes both in terms of wage and salary incomes and employment income for males only. Positive correlations with the number of persons in the 65 and over age group, the number of farm trucks, and the number of farms with sales greater than $5000 were significant at the .10 level.

It was noted previously that GRS users tend to make more use of their mobile units on non-working days. Some additional insight into the pattern of use is provided by the correlation of the number of calls with population characteristics. The number of calls on both working and non-working days was found to vary significantly (.62 to .71) with the total population and urban population levels. It was found to have a significant negative correlation with the 65 and over population group. It was found to vary negatively with the average number of improved acres per census farm and the number of farm operators under age 25. These relationships were higher for the number of calls on non-working days than working days. The opposite nature of the relationship between the number of calls and the general population compared to the relationships displayed by the average number of mobiles is very apparent. Generally, the average number of mobiles is seen to increase with characteristics associated with rural environments while the average number of calls vary with characteristics associated with urban environments.

A further indication of the difference in GRS application from urban to rural areas is deduced from the relationships expressed by the percentage of calls for business purposes. This variable was found to vary negatively with the total population and urban population levels, whereas the number of calls varied positively. It was also found to vary significantly (.062) with the level of population in the 200 to 499 settlement class and the level of population over 65 and over. It varied negatively with income levels and positively with farm indicators. The most significant relationships with the agricultural variables were with the size of farms and the operators under 25. Again, the indications are that business applications are higher in rural areas.

It was found that the only population characteristics which had a significant relationship with the level of satisfaction displayed by GRS users were the average income variables. It was discovered that satisfaction varied negatively with average urban income levels, in terms of both wage and salary and employment incomes. It also varied negatively with the average wage and salary income for rural areas. Therefore, lower income areas tend to have a greater amount of satisfaction.

12.2 Private Radio Systems

The attributes of the use of private radio systems did not display such a wide array of relationships as was displayed by GRS usage. The average number of mobiles was found to vary significantly only with the average income levels. The correlation was also positive. The number of calls in the various areas were found to vary positively with the average rural wage and salary income figure and to vary negatively with most of the farm indicators. The percentage of calls for business purposes was found to vary positively with the number of persons in the medical and health classification, as well as the number of farms with sales greater than $10,000. Thus, the average system size is seen to be sensitive to higher incomes, which are usually associated with urban areas, the magnitude of use is seen to be smaller in predominantly agricultural areas, the business orientation is higher in areas with larger medical populations and high income farm populations. The satisfaction level for the Private category did not vary significantly with any variable.

12.3 General Land Mobile Radio Service

The relationships displayed by GLMRS usage followed a somewhat different pattern. The number of mobiles vary positively with total average employment income. The number of calls on working days varied negatively with the population levels in the 15 to 24 and 25 to 34 age categories, as well as with the levels of service, processing and construction employment. The number of calls on a non-working day was found to vary negatively with average income variables. The percentage of calls for business purposes and the satisfaction level did not vary significantly with any variable. Generally, these factors serve to reinforce the urban orientation of this service.

13. PILOT STUDY

The terms of reference for this research project provided for the carrying out of a pilot study with the general objective of providing a methodological basis for future field work. The methodology was to be developed so as to assess the communications needs of a distince geographical setting. An interview format was adopted for this purpose and an interview was designed so as to solicit relevant information from mobile radio users and from telephone subscribers in the study area. The topics covered by the interview were as follows:

1. Physical Layout of the Radio System
2. Physical Layout of the Economic Unit
3. Human Involvement in the Economic Unit and Radio System
4. Adoption of the Radio System
5. Telephone Connections
6. Future Communications Plans

An agricultural area in east-central Saskatchewan was selected as the setting for the pilot study. Due to the difference in distribution of the different categories of respondents, the survey was performed within a larger area for Private and GLMRS users than for GRS users and telephone subscribers. The larger area included four urban places in the 1000 to 2000 population class, as well as several rural settlements. Two of the urban places have a farm city designation. The smaller study area was entirely a rural environment whose boundaries were defined by a rural telephone company coverage area. This smaller area included a village and a hamlet.

From the point of view of data collection, the pilot study cannot be termed a success. The original date for the field work was pushed back due to problems which were encountered in the questionnaire survey portion of the project. Thus, when the field work was performed it proved to be very difficult to contact the people to be interviewed. The underlying reason was because it was the spring season, practically the entire group of people to be interviewed were extremely preoccupied with their work. The time which was allocated for this field work was found to be somewhat short of adequate. Only a portion of the interviews were performed. Therefore, the information which is available from the field work is found to be inadequate for the type of analysis which was formulated. As a result, a general overview of the status of the different communications techniques will be provided. In addition, a brief assessment of the interview format (which is provided in Appendix B) will be given.

13.1 Private Radio Systems in the Area

There are 12 private radio systems in the study area, six of which are agricultural based. Of the remaining six, two were systems complementing the provision of veterinary services and one was utilized by a farm equipment dealership. Thus, three-quarters of the systems were agriculturally oriented. The remaining three systems were utilized by an ambulance service, a funeral home and a mobile home sales and service business.

Based upon the interviews which were performed within this group of mobile radio users, three general conclusions have been formulated. First, these individuals present a progressive image in the running of their operations. Secondly, personal contact was seen to be important in the adoption of these systems. Thirdly, the privacy of this communication method was strongly reinforced.

13.2 GLMRS Users in the Area

Of the seven GLMRS users in the area, two were farm operators, two were auctioneers, one was a farm equipment dealership, two were involved in road construction. The two involved in road construction were found to be roaming users and one did not use his mobile in the winter season. The interviews in this subset did not lend themselves to any general conclusions.

13.3 GRS Users in the Area

Most of the GRS users in the smaller study area were found to be farmers. There was some evidence that there existed a series of small GRS communities within the area. These communities were such that a number of closely grouped farmers who pooled their labour for certain tasks were using their mobiles for communicating with each other. The usefulness of GRS communications for small family farms - a farmer and his wife - was frequently noted. The importance of communications in spring seeding and fall harvest times was also stressed.

The application of GRS for social communications was also apparent. All family members were found to have some use for the GRS unit from this point of view.

13.4 Telephone Connections

The relationship of telephone communications to mobile communications was found to be an interesting one. Generally, the people were not satisfied with telephone communications when viewed from a business point of view. While all the farm operators surveyed were on a party line, the major dissatisfaction was not with the privacy aspect. While, in many instances, the reliability of the system was found to be a source of dissatisfaction, the major source of dissatisfaction with party lines was the inability to communicate when desired. One farmer who had a private radio system noted that it was inconsistent to have reliable communications to his base when it was not possible to rely upon the telephone system beyond that point.

Generally, the people who did not use mobile communications, accepted the telephone system as it was. From their point of view, the party line system has been there for years and would probably be there for many more.

13.5 Assessment of Interview Format

The interview format was relatively well received and the information was generally given quite freely. The only problems encountered were with the last section which dealt with future communications plans. Many mobile radio users were unable to abstract from the present situation in order to describe an ideal system which would satisfy their communication needs. The typical reaction was a rushed response rather than a thought out answer.

14. CONCLUSIONS

The purpose of this research project was to survey the use of mobile radio services in rural areas of the Prairie Provinces. Every attempt has been made to present the results of the various research tasks in a logical manner. First, some general considerations of mobile communications were noted. This was followed by an introduction to the people and resources of the study area. An examination of the present pattern of utilization of the various mobile radio services was the next step. Some explanation of the present pattern was given with the aid of correlation techniques. Following this was the results of the questionnaire survey. Then some attributes of the major service categories as measured in the questionnaire were related to the study area population. A brief note concerning the pilot study was the final step.

There is no doubt that a great deal of information has been processed. Ultimately, the value of this information lies in the conclusions which can be reached. The conclusions which are seen to be relevant to this research project pertain to the present status of mobile radio techniques and the future role which they will assume.

Perhaps the most obvious, and illuminating, results pertain to the status of GRS communications. It has been demonstrated that this communications technique stands up quite well when scrutinized from a 'business radio' point of view. Admittedly, there are elements within the service category which are non-business. But the indications are that these elements are concentrated in urban places. There is also an indication of friction between business and non-business users. The popularity of GRS communications in rural areas is unquestionable and it is tempting to conclude that the major reason for this popularity is the lower cost factor. Nevertheless, the recent growth of GRS has resulted in a greater number of mobile radio users than ever before.

The status of private radio systems in rural areas is not on the same level as that of GRS. The attraction of this type of communications system is greatest for services typically associated with farm cities and for the higher income farm population. The higher cost of this communications technique demands that greater benefits be realized.

Radio-telephone communications in rural areas has been shown to be concentrated in Alberta. But, like private radio communications, this service presents an urban orientation. The higher cost of this service is also seen to hamper its popularity.

Users in all three of the major service categories have demonstrated a desire for better area coverage. This may be the key element upon which future improvements should be concentrated. Generally, all rural residents are within forty miles of a farm city. In addition, agricultural units do not typically have contiguous parts but may be spread out over thirty miles or more. The ultimate communications system would be able to provide communications both within the sphere of operations and from that sphere to the service center locations.

Never before has mobile communications been within the reach of so many rural residents. The popularity of GRS at present is sure to reflect upon the alternative communications techniques in the future. The friction between responsible and non-responsible users will promote the adoption of these other services. But it is also possible that many users will be forced, from an economic viewpoint, to continue using this service even though it is not considered to be optimal.

institute for northern studies
university of saskatchewan, saskatoon S7N 0W0

Dear Sir or Madam:

The Institute for Northern Studies, located in Saskatoon, Saskatchewan, is conducting a survey of mobile radio users in the Prairie Provinces and adjoining parts of the Northwest Territories. This survey is being conducted only in areas outside of the large urban centers and you, as part of the group of individuals and businesses who are licensed to operate mobile radio units in these areas, are being asked to help us compile useful information regarding mobile communications in these locations.

The survey is sponsored by the Rural Communications Study Group of the Federal Department of Communications. This group is investigating methods of improving communications in rural areas of Canada. One of the communications methods in which they are very interested and which they need more detailed and accurate information is mobile radio communications. In order to provide this information we are turning to the people who have first-hand knowledge of this communications technique.

Although this letter is addressed to the mobile radio license holder; we realize that in many cases the licensee is not the operator of the radio unit. If this is the case, we would appreciate if the person who provides us with the information we seek is one who actually uses the radio unit from day to day.

The questionnaire which is attached to this letter is the method by which we are collecting our information. It is designed so as to enable you to answer the questions with a minimum amount of time and effort. In order to facilitate the answering of the questionnaire, we have included an information sheet which describes certain characteristics of different types of mobile radio systems. If it happens that you use more than one type of mobile radio system, please answer the questionnaire as if you use only one type of system - the one that you use most frequently.

The questions which are asked are intended to answer the following questions for us.

- What types of individuals and businesses are using the different types of mobile radio systems?
- How do they utilize their system?
- What is their assessment of certain aspects of their system?

All replies are treated as confidential by the Institute for Northern Studies and the anonymity of respondents is guaranteed.

It is hoped that you appreciate that we are relying very heavily on you to assist us in compiling an accurate information base from which we can report on the status of mobile radio techniques in the Prairie Provinces and the Northwest Territories.

Thank you very much for your time.

MOBILE RADIO INFORMATION SHEET

Definitions of the Categories of Mobile Radio Service

System: A mobile radio system consists of at least one fixed base station and at least one mobile radio unit capable of communicating with each other. Radios on different systems do not communicate with each other.

GRS: General Radio Service. GRS is the Canadian version of the American CB or Citizen's Band category. The user owns and operates his system on one or more of the channels allotted to this service.

Private: A private system is one in which the equipment is owned by a business enterprise and operated by its employees. It is licensed for operation on a specific channel(s) in the mobile radio band.

GLMRS: General Land Mobile Radio Service. This is a service offered by the telephone companies as an extension of their normal telephone service. It consists of a radio-telephone installed in a vehicle which can operate on one or more channels in a specific area. The terms General Mobile, Public Mobile, Radio-telephone and Mobile Telephone are all used to describe this type of service.

RCCMRS: Radio Common Carrier Mobile Radio Service. This service is distinguished by the rental of a repeater station operating on two frequencies - one sending and one receiving - to many users. The users may either own or lease their mobile equipment.

Paging: Paging is considered a "one-way" system and involve the transmitting of tone or tone and voice messages to pocket receivers. A paging system can accommodate many users.

Selected Characteristics of the Service Categories

	GRS	PRIVATE	GLMRS	RCCMRS	PAGING
Principal Feature	Low Cost	Privacy	Telephone Access	Rental of Equipment	Very Mobile
Typical User	Individual	Taxi Company	Business	Business	Doctor
User Owns or Leases	Owns	Usually Owns	Owns or Leases	Usually Leases	Usually Leases
Initial Cost per Mobile	$200 Average	$1000 Average	$1200 Average	$1200 Average	$350 Average
Monthly Cost (average)	None	None	$30;if owned $75;if leased	$10;if owned $40;if leased	$12;if owned $25;if leased
Telephone Access	NO	NO	YES	NO	NO
Type of Communication	Multi-Way Voice	Two-Way or Multi-Way	Two-Way Voice	Two-Way or Multi-Way	One-Way Paging

MOBILE RADIO QUESTIONNAIRE

SECTION I

CODE NO. ________

The following questions are intended to provide us with information concerning the characteristics of you and your mobile radio system.

1. Please indicate the number of mobiles that you use for:

GRS	[ ] 1	GLMRS	[ ] 3	Paging	[ ] 5
Private	[ ] 2	RCCMRS	[ ] 4	Other number	[ ] 6
				type	[ ] 7

See information sheet for definitions

2. Please indicate the one type of mobile radio that you use most frequently. ALL SUBSEQUENT QUESTIONS SHOULD BE ANSWERED AS IF YOU USE ONLY THIS TYPE OF SERVICE.

GRS	[ ] 1	GLMRS	[ ] 3	Paging	[ ] 5
Private	[ ] 2	RCCMRS	[ ] 4	Other: specify	[ ] 6

3. How long have you been using the above type mobile radio service? [ ] 1 years (use a fraction to express a portion of a year)

4. What is your age? [ ] 1 years

5. Please state the name of your post office [ ] 1

SECTION II

The following questions are intended to provide us with the information concerning the manner in which you use your mobile radio.

6. Please indicate which season(s) of the year you get the most use out of your mobile radio.

Spring	Summer	Autumn	Winter	All year round
[ ] 1	[ ] 2	[ ] 3	[ ] 4	[ ] 5

7. If your mobile radio us used for business or incustrial purposes, please indicate which of the following industrial classifications best describes the type of work in which it is used.

Agriculture	[ ] 1	Fishing, trapping	[ ] 5	Personal services	[ ] 9
Communications industry	[ ] 2	Forestry	[ ] 6	Trade	[ ] 10
Construction	[ ] 3	Manufacturing	[ ] 7	Transportation	[ ] 11
Finance, Insurance, Real Estate	[ ] 4	Mines & oils	[ ] 8	Utilities	[ ] 12
				Other: specify	[ ] 13

8. Please indicate which of the following rural areas or size of urban centre describes the location of the station(s) with which you usually communicate.

Farm	[ ] 1	Urban centre under 1000 pop.	[ ] 3	Urban centre over 5000 pop	[ ] 5
Rural non-farm	[ ] 2	Urban centre 1000-5000 pop.	[ ] 4	All, about equally	[ ] 6

9. Please rank the following types of calls in terms of their frequency of use (during the high-useage season indicated in question 6), by placing a number in the box opposite. (1 - most frequently used; 2 - second most frequently used, etc.) Omit any type(s) which does not apply.

Mobile unit to base station	[ ] 1	Mobile unit to telephone system	[ ] 4
Base station to mobile unit	[ ] 2	Telephone system to mobile unit	[ ] 5
Mobile unit to mobile unit	[ ] 3	Other: specity	[ ] 6

10. What is the average duration of your calls during the high useage season indicated in question 6?

[ ] 1 minutes

11. In a typical working day during the high useage season indicated in question 6, how many calls do you send and receive on one mobile in the following time periods (one call sent and one call received counts as two calls).

	Midnight to 6:59 am	7 am to 9:59 am	10 am to 11:59 am	Noon to 2:59 pm	3 pm to 5:59 pm	6 pm to 11:59 pm
No. of Calls	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

12. In a typical non-working day during the high useage season indicated in question 6, how many calls do you send and receive on one mobile in the following time periods?

	Midnight to 6:59 am	7 am to 9:59 am	10 am to 11:59 am	Noon to 2:59 pm	3 pm to 5:59 pm	6 pm to 11:59 pm
No. of Calls	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

13. What percentage of your total calls do you initiate? ☐ 1 percent

14. What percentage of your transmitted messages during the high useage season indicated in question 6, are for the following purposes:

Emergency ☐ 1 Business ☐ 2 Personal ☐ 3

15. What percentage of your received messages during the high useage season indicated in question 6, are for the following purposes:

Emergency ☐ 1 Business ☐ 2 Personal ☐ 3

SECTION III

The following questions ask you to evaluate certain characteristics of your mobile communications by indicating the response which you think is most applicable.

16. Do you consider your mobile radio a necessity or a luxury.

Absolutely Necessary	Of Considerable Importance	Important	A Convenience	A Luxury
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

17. Is the use of your mobile radio increasing or decreasing from year to year.

Increasing Rapidly	Increasing	Constant	Decreasing	Decreasing Rapidly
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

18. Would you please provide us with a short statement of why your activities require mobile communications:

____

____

19. Is the range of your system adequate.

Always Out of Range	Out of Range Most of the Time	Out of Range Half of the Time	Out of Range Not Very Often	Never out of Range
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

20. How often do you experience delays due to channel congestion when trying to make a call.

Always	Most of the Time	Half of the Time	Little of the Time	Never
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

21. How often do uncontrollable factors such as noise, interference and distortion make conversation difficult?

Always	Most of the Time	Half of the Time	Little of the Time	Never
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

22. Are you satisfied with the privacy of your mobile communications.

Always	Usually	50% of the time	Dissatisfied	Very Dissatisfied
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

23. My mobile unit was purchased or leased ☐ 1 , months ago and last required servicing ☐ 2 months ago. (Write NIL if no service ever required.

24. How easy is it to get your radio unit serviced when out of order.

Very Easy	Easy	Adequate	Difficult	Very Difficult
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

25. If you were to upgrade your mobile radio system which two of the following would you choose to be of the greatest importance.

Less congestion	☐ 1	More privacy	☐ 4	Connection to Telephone System	☐ 7
Quality equipment	☐ 2	Better area coverage	☐ 5	Other: specify	☐ 8
Low cost equipment	☐ 3	More mobile units	☐ 6		

26. Which two of the following do you see as the major obstacles to improving your system:

Lack of knowledge about alternative systems .... ☐ 1

Needed improvements are too expensive .... ☐ 2

Inability to get the needed radio-telephone service in your area .... ☐ 3

Inability to get paging service in your area .... ☐ 4

Doubtful whether improvements are needed .... ☐ 5

Increased benefits outweighed by increased costs .... ☐ 6

Other: specify ☐ 7

27. Is it probable that you will be altering your system within the next 5 years.

Yes	No	Don't know
☐ 1	☐ 2	☐ 3

If yes, give details ____

____

____

____

____

28. Do you have additional comments which may be of help to us?

____

____

____

THANK YOU.

ANALYSIS OF MRQCD FILE

DOCUMENTATION FOR SPSS FILE 'MRQCD ' CENSUS DATA FOR MOBILE RADIO STU

LIST OF THE 1 SUBFILES COMPRISING THE FILE

MRQCD N= 53

DOCUMENTATION FOR THE 210 VARIABLES IN THE FILE 'MRQCD '

REL POS	VARIABLE NAME	VARIABLE LABEL		MISSING VALUES	PRT FMT
1	SEQNUM			NONE	0
2	SUBFILE			NONE	A
3	CASWGT			NONE	4
4	LOCPRCD	LOCATION - PROVINCE, CENSUS DIVISION		NONE	0
5	NLGRU5	# GRS LICENSES <CENTRES < 5000>	=V001	NONE	0
6	NLPRU5	# PRIV LICENSES <CENTRES < 5000>	=V002	NONE	0
7	NLPR5T10	# PRIV LICENSES <CENTRES 5-10000>	=V003	NONE	0
8	NMPR5T10	# PRIV MOBILES <CENTRES 5-10000>	=V004	NONE	0
9	NLPRG10	# PRIV LICENSES <CENTRES > 10000>	=V005	NONE	0
10	NMPRG10	# PRIV MOBILES <CENTRES > 10000>	=V006	NONE	0
11	POPTOT	POPULATION <TOTAL>	=V008	NONE	0
12	POPTU	POPULATION <TOTAL URBAN>	=V009	NONE	0
13	POPTR	POPULATION <TOTAL RURAL>	=V010	NONE	0
14	POPTRNF	POPULATION <RURAL NON-FARM>	=V011	NONE	0
15	POPTRF	POPULATION <RURAL FARM>	=V012	NONE	0
16	POPCU2	POPULATION <CENTRES UNDER 200>	=V013	NONE	0
17	POPC2T4	POPULATION <CENTRES 200 - 499>	=V014	NONE	0
18	POPC5T1K	POPULATION <CENTRES 500 - 999>	=V015	NONE	0
19	POPC1K25	POPULATION <CENTRES 1000 - 2499>	=V016	NONE	0

ANALYSIS OF MRQCD FILE

DOCUMENTATION FOR THE 210 VARIABLES IN THE FILE 'MRQCD '

REL PCS	VARIABLE NAME	VARIABLE LABEL		MISSING VALUES	PRT FMT
20	POPCG25	POPULATION <CENTRES OVER 2499>	=V017	NONE	0
21	POPA1524	POPULATION - TOTAL <AGE 15 - 24>	=V018	NONE	0
22	POPA2534	POPULATION - TOTAL <AGE 25 - 34>	=V019	NONE	0
23	POPA3544	POPULATION - TOTAL <AGE 35 - 44>	=V020	NONE	0
24	POPA4554	POPULATION - TOTAL <AGE 45 - 54>	=V021	NONE	0
25	POPA5564	POPULATION - TOTAL <AGE 55 - 64>	=V022	NONE	0
26	POPAG64	POPULATION - TOTAL <AGE 65+>	=V023	NONE	0
27	AINCWST	AV. INCOME-WAGE&SALARY <TOTAL>	=V024	NONE	0
28	AINCWSU	AV. INCOME-WAGE&SALARY <TOTAL URB.>	=V025	NONE	0
29	AINCWSR	AV. INCOME-WAGE&SALARY <TOTAL RUR.>	=V026	NONE	0
30	AINCET	AV. INCOME-EMPLOY.-MALES <TOTAL>	=V027	NONE	0
31	AINCEU	AV. INCOME-EMPLOY.-MALES <URBAN>	=V028	NONE	0
32	AINCER	AV. INCOME-EMPLOY.-MALES <RURAL>	=V029	NONE	0
33	AINCERNF	AV. INCOME-EMPLOY.-MALES <NON-FARM>	=V030	NONE	0
34	AINCERF	AV. INCOME-EMPLOY.-MALES <FARM>	=V031	NONE	0
35	NIG10T	# PEOPLE-INCOMES > $10K <TOTAL>	=V032	NONE	0
36	NIG10U	# PEOPLE-INCOMES > $10K <URBAN>	=V033	NONE	0
37	NIG10R	# PEOPLE-INCOMES > $10K <RURAL>	=V034	NONE	0
38	NIG10RNF	# PEOPLE-INCOMES > $10K <NON-FARM>	=V035	NONE	0
39	NIG10RF	# PEOPLE-INCOMES > $10K <R.FARM>	=V036	NONE	0
40	NOCCALL	# IN OCCUPATIONS <ALL>	=V037	NONE	0
41	NOCCMAN	# IN OCCUPATIONS <MANAGE,ADMIN,REL>	=V038	NONE	0

DOCUMENTATION FOR THE 210 VARIABLES IN THE FILE 'MRQCD '

REL POS	VARIABLE NAME	VARIABLE LABEL		MISSING VALUES	PRT FMT
42	NOCCMED	# IN OCCUPATIONS <MEDICINE,HEALTH>	=V039	NONE	0
43	NOCCSALE	# IN OCCUPATIONS <SALES>	=V040	NONE	0
44	NOCCSERV	# IN OCCUPATIONS <SERVICE>	=V041	NONE	0
45	NOCCFARM	# IN OCCUPATIONS <FARMING,HORT,ETC>	=V042	NONE	0
46	NOCCFHT	# IN OCCUPATIONS <FISH,HUNT,TRAP>	=V043	NONE	0
47	NOCCFRST	# IN OCCUPATIONS <FORESTRY,LOGGING>	=V044	NONE	0
48	NOCCMINE	# IN OCCUPATIONS <MINING,OIL,GAS>	=V045	NONE	0
49	NOCCPROC	# IN OCCUPATIONS <PROCESSING>	=V046	NONE	0
50	NOCCMACH	# IN OCCUPATIONS <MACHINING,ETC>	=V047	NONE	0
51	NOCCFAB	# IN OCCUPATIONS <PROD FABRIC.,ETC>	=V048	NONE	0
52	NOCCCNST	# IN OCCUPATIONS <CONSTRUCTION>	=V049	NONE	0
53	NOCCTRAN	# IN OCCUPATIONS <TRANSPORT OPER>	=V050	NONE	0
54	NOCCMAT	# IN OCCUPATIONS <MATERIAL HANDLE>	=V051	NONE	0
55	NFARMT	NUMBER FARMS <TOTAL>	=V052	NONE	0
56	NFARMO	NUMBER FARMS <OWNER>	=V053	NONE	0
57	NFARMR	NUMBER FARMS <RESIDENT>	=V054	NONE	0
58	NFARMPI	NUMBER FARMS <PRIVATE INDIVIDUAL>	=V055	NONE	0
59	NFARMINC	NUMBER FARMS <INCORPORATED>	=V056	NONE	0
60	NFTAUTO	TOTAL NUMBER AUTOMOBILES ON FARMS	=V057	NONE	0
61	NFTTRUCK	TOTAL NUMBER MOTOR TRUCKS ON FARMS	=V058	NONE	0
62	NFTTRACT	TOTAL NUMBER TRACTORS ON FARMS	=V059	NONE	0
63	NFSG10K	NUMBER FARMS WITH SALES > $10,000	=V060	NONE	0

ANALYSIS OF MRQCD FILE

DOCUMENTATION FOR THE 210 VARIABLES IN THE FILE 'MRQCD '

REL POS	VARIABLE NAME	VARIABLE LABEL	MISSING VALUES	PRT FMT
64	NFSG5K	NUMBER FARMS WITH SALES > $5,000 =V061	NONE	0
65	NFAILA	AV. IMPR.LAND AREA PER FARM <ACRES>=V062	NONE	0
66	NFOU25	NUMBER FARM OPERATORS AGE UNDER 25 =V063	NONE	0
67	NFO2534	NUMBER FARM OPERATORS AGE 25 - 34 =V064	NONE	0
68	NFO3544	NUMBER FARM OPERATORS AGE 35 - 44 =V065	NONE	0
69	NFO4554	NUMBER FARM OPERATORS AGE 45 - 54 =V066	NONE	0
70	NFO5564	NUMBER FARM OPERATORS AGE 55 - 64 =V067	NONE	0
71	NFOG65	NUMBER FARM OPERATORS AGE OVER 64 =V068	NONE	0
72	NOCLALL	# OCC.-CENT.>10K <ALL> =V069	NONE	0
73	NOCLMAN	# OCC.-CENT.>10K <MANAGE,ADMIN,REL>=V070	NONE	0
74	NOCLMED	# OCC.-CENT.>10K <MEDICINE,HEALTH> =V071	NONE	0
75	NOCLSALE	# OCC.-CENT.>10K <SALES> =V072	NONE	0
76	NOCLSERV	# OCC.-CENT.>10K <SERVICE> =V073	NONE	0
77	NOCLFARM	# OCC.-CENT.>10K <FARMING,HORT,ETC>=V074	NONE	0
78	NOCLFHT	# OCC.-CENT.>10K <FISH,HUNT,TRAP> =V075	NONE	0
79	NOCLFRST	# OCC.-CENT.>10K <FORESTRY,LOGGING>=V076	NONE	0
80	NOCLMINE	# OCC.-CENT.>10K <MINING,OIL,GAS> =V077	NONE	0
81	NOCLPROC	# OCC.-CENT.>10K <PROCESSING> =V078	NONE	0
82	NOCLMACH	# OCC.-CENT.>10K <MACHINING,ETC> =V079	NONE	0
83	NOCLFAB	# OCC.-CENT.>10K <PROD FABRIC.,ETC>=V080	NONE	0
84	NOCLCNST	# OCC.-CENT.>10K <CONSTRUCTION> =V081	NONE	0
85	NOCLTRAN	# OCC.-CENT.>10K <TRANSPORT OPER> =V082	NONE	0

ANALYSIS OF MRQCD FILE

DOCUMENTATION FOR THE 210 VARIABLES IN THE FILE 'MRQCD '

REL POS	VARIABLE NAME	VARIABLE LABEL	MISSING VALUES	PRT FMT
86	NOCLMAT	# OCC.-CENT.>10K <MATERIAL HANDLE> =V083	NONE	0
87	POLA1524	POP. - CENTRES > 10000 <AGE 15-24>=V084	NONE	0
88	POLA2534	POP. - CENTRES > 10000 <AGE 25-34>=V085	NONE	0
89	POLA3544	POP. - CENTRES > 10000 <AGE 35-44>=V086	NONE	0
90	POLA4554	POP. - CENTRES > 10000 <AGE 45-54>=V087	NONE	0
91	POLA5564	POP. - CENTRES > 10000 <AGE 55-64>=V088	NONE	0
92	POLAG64	POP. - CENTRES > 10000 <AGE 65+> =V089	NONE	0
93	POSA1524	POP. - CENTRES < 10000 <AGE 15-24>=V090	NONE	0
94	POSA2534	POP. - CENTRES < 10000 <AGE 25-34>=V091	NONE	0
95	POSA3544	POP. - CENTRES < 10000 <AGE 35-44>=V092	NONE	0
96	POSA4554	POP. - CENTRES < 10000 <AGE 45-54>=V093	NONE	0
97	POSA5564	POP. - CENTRES < 10000 <AGE 55-64>=V094	NONE	0
98	POSAG64	POP. - CENTRES < 10000 <AGE 65+> =V095	NONE	0
99	NOCSALL	# OCC.-CENT.<10K <ALL> =V096	NONE	0
100	NOCSMAN	# OCC.-CENT.<10K <MANAGE,ADMIN,REL>=V097	NONE	0
101	NOCSMED	# OCC.-CENT.<10K <MEDICINE,HEALTH> =V098	NONE	0
102	NOCSSALE	# OCC.-CENT.<10K <SALES> =V099	NONE	0
103	NOCSSERV	# OCC.-CENT.<10K <SERVICE> =V100	NONE	0
104	NOCSFARM	# OCC.-CENT.<10K <FARMING,HORT,ETC>=V101	NONE	0
105	NOCSFHT	# OCC.-CENT.<10K <FISH,HUNT,TRAP> =V102	NONE	0
106	NOCSFRST	# OCC.-CENT.<10K <FORESTRY,LOGGING>=V103	NONE	0
107	NOCSMINE	# OCC.-CENT.<10K <MINING,OIL,GAS> =V104	NONE	0

ANALYSIS OF MRQCD FILE

DOCUMENTATION FOR THE 210 VARIABLES IN THE FILE 'MRQCD '

REL POS	VARIABLE NAME	VARIABLE LABEL	MISSING VALUES	PRT FMT
108	NOCSPROC	# OCC.-CENT.<10K <PROCESSING> =V105	NONE	0
109	NOCSMACH	# OCC.-CENT.<10K <MACHINING,ETC> =V106	NONE	0
110	NOCSFAB	# OCC.-CENT.<10K <PROD FABRIC.,ETC>=V107	NONE	0
111	NOCSCNST	# OCC.-CENT.<10K <CONSTRUCTION> =V108	NONE	0
112	NOCSTRAN	# OCC.-CENT.<10K <TRANSPORT OPER> =V109	NONE	0
113	NOCSMAT	# OCC.-CENT.<10K <MATERIAL HANDLE> =V110	NONE	0
114	NLPRU1	# PRIV LICENSES <CENTRES < 1000> =V111	NONE	0
115	NMPRU1	# PRIV MOBILES <CENTRES < 1000> =V112	NONE	0
116	NLPR1T5	# PRIV LICENSES <CENTRES 1- 5000> =V113	NONE	0
117	NMPR1T5	# PRIV MOBILES <CENTRES 1- 5000> =V114	NONE	0
118	NMPRU5	# PRIV MOBILES <CENTRES < 5000> =V115	NONE	0
119	NLGLU1	# GLMRS LICENSES <CENTRES < 1000> =V116	NONE	0
120	NMGLU1	# GLMRS MOBILES <CENTRES < 1000> =V117	NONE	0
121	NLGL1T5	# GLMRS LICENSES <CENTRES 1- 5000> =V118	NONE	0
122	NMGL1T5	# GLMRS MOBILES <CENTRES 1- 5000> =V119	NONE	0
123	NLGLU5	# GLMRS LICENSES <CENTRES < 5000> =V120	NONE	0
124	NMGLU5	# GLMRS MOBILES <CENTRES < 5000> =V121	NONE	0
125	NLGLG10	# GLMRS LICENSES <CENTRES > 10000> =V122	NONE	0
126	NMGLG10	# GLMRS MOBILES <CENTRES > 10000> =V123	NONE	0
127	NLGL5T10	# GLMRS LICENSES <CENTRES 5-10000> =V124	NONE	0
128	NMGL5T10	# GLMRS MOBILES <CENTRES 5-10000> =V125	NONE	0
129	NLPRURB	# PRIV LICENSES <URBAN > 1000> =V126	NONE	0

DOCUMENTATION FOR THE 2.. VARIABLES IN THE FILE 'MRQCD '

REL POS	VARIABLE NAME	VARIABLE LABEL	MISSING VALUES	PRT FMT
130	NMPRURB	# PRIV MOBILES <URBAN > 1000> =V127	NONE	0
131	NLPRTOT	# PRIV LICENSES <TOTAL> =V128	NONE	0
132	NMPRTOT	# PRIV MOBILES <TOTAL> =V129	NONE	0
133	NLGLURB	# GLMRS LICENSES <URBAN > 1000> =V130	NONE	0
134	NMGLURB	# GLMRS MOBILES <URBAN > 1000> =V131	NONE	0
135	NLGLTOT	# GLMRS LICENSES <TOTAL> =V132	NONE	0
136	NMGLTOT	# GLMRS MOBILES <TOTAL> =V133	NONE	0
137	NMLAPRU	PRIV -AV. MOBILES PER LICENCE <URB>=V134	NONE	2
138	NMLAPRR	PRIV -AV. MOBILES PER LICENCE <RUR>=V135	NONE	2
139	NMLAPRT	PRIV -AV. MOBILES PER LICENSE <TOT>=V136	NONE	2
140	NMLAGLU	GLMRS-AV. MOBILES PER LICENSE <URB>=V137	NONE	2
141	NMLAGLR	GLMRS-AV. MOBILES PER LICENSE <RUR>=V138	NONE	2
142	NMLAGLT	GLMRS-AV. MOBILES PER LICENSE <TOT>=V139	NONE	2
143	GRNRESP	GRS: NUMBER OF MRQ RESPONSES =V201	-99999.	0
144	GRRESPRN	GRS: SAMPLE-RESPONSE RATE-LIC. % =V202	NONE	2
145	GRNMSUM	GRS: TOT. NUMBER OF GRS MOBILES=V203	-99999.	0
146	GRNMEAN	GRS: AV. # GRS MOBILES PER RESP=V205	-99999.00	2
147	GRNCWTA	GRS: AV. # CALLS <WORKING DAY> =V206	-99999.00	2
148	GRNCNTA	GRS: AV. # CALLS <NON-WORK. DAY> =V207	-99999.00	2
149	GRPTBA	GRS: AV. % CALLS TRANS.<BUSINESS>=V208	-99999.00	2
150	GRPRBA	GRS: AV. % CALLS RECD. <BUSINESS>=V209	-99999.00	2
151	GRSATA	GRS: AV. SATISFACTION INDEX =V210	-99999.00	2

ANALYSIS OF MRQCD FILE

DOCUMENTATION FOR THE 210 VARIABLES IN THE FILE 'MRQCD '

REL POS	VARIABLE NAME	VARIABLE LABEL	MISSING VALUES	PRT FMT
152	GRUPGPA1	GRS: PERCENT. UPGRADE <Q25> = 1 =V211	-99999.00	2
153	GRUPGPA2	GRS: PERCENT. UPGRADE <Q25> = 2 =V212	-99999.00	2
154	GRUPGPA3	GRS: PERCENT. UPGRADE <Q25> = 3 =V213	-99999.00	2
155	GRUPGPA4	GRS: PERCENT. UPGRADE <Q25> = 4 =V214	-99999.00	2
156	GRUPGPA5	GRS: PERCENT. UPGRADE <Q25> = 5 =V215	-99999.00	2
157	GRUPGPA6	GRS: PERCENT. UPGRADE <Q25> = 6 =V216	-99999.00	2
158	GRUPGPA7	GRS: PERCENT. UPGRADE <Q25> = 7 =V217	-99999.00	2
159	GRIMPPA1	GRS: PERCENT. IMPOBST <Q26> = 1 =V218	-99999.00	2
160	GRIMPPA2	GRS: PERCENT. IMPOBST <Q26> = 2 =V219	-99999.00	2
161	GRIMPPA3	GRS: PERCENT. IMPOBST <Q26> = 3 =V220	-99999.00	2
162	GRIMPPA4	GRS: PERCENT. IMPOBST <Q26> = 4 =V221	-99999.00	2
163	GRIMPPA5	GRS: PERCENT. IMPOBST <Q26> = 5 =V222	-99999.00	2
164	GRIMPPA6	GRS: PERCENT. IMPOBST <Q26> = 6 =V223	-99999.00	2
165	PRNRESP	PRIV: NUMBER OF MRQ RESPONSES =V301	-99999.	0
166	PRRESPRN	PRIV: SAMPLE-RESPONSE RATE-LIC. % =V302	NONE	2
167	PRNMSUM	PRIV: TOT. NUMBER OF PRIV MOBILES=V303	-99999.	0
168	PRRESPRM	PRIV: SAMPLE-RESPONSE RATE-MOB. % =V304	NONE	2
169	PRNMEAN	PRIV: AV. # PRIV MOBILES PER RESP=V305	-99999.00	2
170	PRNCWTA	PRIV: AV. # CALLS <WORKING DAY> =V306	-99999.00	2
171	PRNCNTA	PRIV: AV. # CALLS <NON-WORK. DAY> =V307	-99999.00	2
172	PRPTBA	PRIV: AV. % CALLS TRANS.<BUSINESS>=V308	-99999.00	2
173	PRPRBA	PRIV: AV. % CALLS RECD. <BUSINESS>=V309	-99999.00	2

DOCUMENTATION FOR THE 210 VARIABLES IN THE FILE 'MRQCD '

REL PCS	VARIABLE NAME	VARIABLE LABEL		MISSING VALUES	PRT FMT
174	PRSATA	PRIV: AV. SATISFACTION INDEX	=V310	-99999.00	2
175	PRUPGPA1	PRIV: PERCENT. UPGRADE <Q25> = 1	=V311	-99999.00	2
176	PRUPGPA2	PRIV: PERCENT. UPGRADE <Q25> = 2	=V312	-99999.00	2
177	PRUPGPA3	PRIV: PERCENT. UPGRADE <Q25> = 3	=V313	-99999.00	2
178	PRUPGPA4	PRIV: PERCENT. UPGRADE <Q25> = 4	=V314	-99999.00	2
179	PRUPGPA5	PRIV: PERCENT. UPGRADE <Q25> = 5	=V315	-99999.00	2
180	PRUPGPA6	PRIV: PERCENT. UPGRADE <Q25> = 6	=V316	-99999.00	2
181	PRUPGPA7	PRIV: PERCENT. UPGRADE <Q25> = 7	=V317	-99999.00	2
182	PRIMPPA1	PRIV: PERCENT. IMPOBST <Q26> = 1	=V318	-99999.00	2
183	PRIMPPA2	PRIV: PERCENT. IMPOBST <Q26> = 2	=V319	-99999.00	2
184	PRIMPPA3	PRIV: PERCENT. IMPOBST <Q26> = 3	=V320	-99999.00	2
185	PRIMPPA4	PRIV: PERCENT. IMPOBST <Q26> = 4	=V321	-99999.00	2
186	PRIMPPA5	PRIV: PERCENT. IMPOBST <Q26> = 5	=V322	-99999.00	2
187	PRIMPPA6	PRIV: PERCENT. IMPOBST <Q26> = 6	=V323	-99999.00	2
188	GLNRESP	GLMRS: NUMBER OF MRQ RESPONSES	=V401	-99999.	0
189	GLRESPRN	GLMRS: SAMPLE-RESPONSE RATE-LIC. %	=V402	NONE	2
190	GLNMSUM	GLMRS: TOT. NUMBER OF GLMRS MOBILES	=V403	-99999.	0
191	GLRESPRM	GLMRS: SAMPLE-RESPONSE RATE-MOB. %	=V404	NONE	2
192	GLNMEAN	GLMRS: AV. # GLMRS MOBILES PER RESP	=V405	-99999.00	2
193	GLNCWTA	GLMRS: AV. # CALLS <WORKING DAY>	=V406	-99999.00	2
194	GLNCNTA	GLMRS: AV. # CALLS <NON-WORK. DAY>	=V407	-99999.00	2
195	GLPTBA	GLMRS: AV. % CALLS TRANS.<BUSINESS>	=V408	-99999.00	2

ANALYSIS OF MRQCD FILE

DOCUMENTATION FOR THE 210 VARIABLES IN THE FILE 'MRQCD '

REL POS	VARIABLE NAME	VARIABLE LABEL	MISSING VALUES	PRT FMT
196	GLPRBA	GLMRS: AV. % CALLS RECD. <BUSINESS>=V409	-99999.00	2
197	GLSATA	GLMRS: AV. SATISFACTION INDEX =V410	-99999.00	2
198	GLUPGPA1	GLMRS: PERCENT. UPGRADE <Q25> = 1 =V411	-99999.00	2
199	GLUPGPA2	GLMRS: PERCENT. UPGRADE <Q25> = 2 =V412	-99999.00	2
200	GLUPGPA3	GLMRS: PERCENT. UPGRADE <Q25> = 3 =V413	-99999.00	2
201	GLUPGPA4	GLMRS: PERCENT. UPGRADE <Q25> = 4 =V414	-99999.00	2
202	GLUPGPA5	GLMRS: PERCENT. UPGRADE <Q25> = 5 =V415	-99999.00	2
203	GLUPGPA6	GLMRS: PERCENT. UPGRADE <Q25> = 6 =V416	-99999.00	2
204	GLUPGPA7	GLMRS: PERCENT. UPGRADE <Q25> = 7 =V417	-99999.00	2
205	GLIMPPA1	GLMRS: PERCENT. IMPOBST <Q26> = 1 =V418	-99999.00	2
206	GLIMPPA2	GLMRS: PERCENT. IMPOBST <Q26> = 2 =V419	-99999.00	2
207	GLIMPPA3	GLMRS: PERCENT. IMPOBST <Q26> = 3 =V420	-99999.00	2
208	GLIMPPA4	GLMRS: PERCENT. IMPOBST <Q26> = 4 =V421	-99999.00	2
209	GLIMPPA5	GLMRS: PERCENT. IMPOBST <Q26> = 5 =V422	-99999.00	2
210	GLIMPPA6	GLMRS: PERCENT. IMPOBST <Q26> = 6 =V423	-99999.00	2

APPENDIX E
COMMENTS FROM MOBILE RADIO USERS

The comments which compose this appendix have been collected from the questionnaires. They are arranged according to the service category in which the user is classified. They are reproduced just as they were written. Any spelling mistakes or grammatical errors were left untouched.

The usefulness of these comments resides with the reader. They can be useful just as a source of information or education. They can be applied to many aspects of mobile communications. The opinions are wide-rangeing and very candid.

COMMENTS FROM GRS USERS

My sets have a designated channel so congestion is no problem. Sets - one used for business only and one turned off at other times of the year when no farming activity is being carried out.

CB installed in all school buses and maintenance vehicles.

There is a definate lack of availability of proper instructions on usage of GRS in most areas thus causing a lot of improper use thus making it difficult to use effectively.

In many cases it is misuse that causes congestion. If appointed individuals or local radio clubs were given some authority to assist the DOC in controlling the misuse in local areas it might reduce some of the problems encountered.

I would like to know, through some sort of test, how cold it can get before the radio no longer functions properly. On a cold day on my mobile, turning the control knobs can be very difficult. I would like to see the different machines tested and the consumer informed so he can pick one that may work the best should the situation arise.

In fall when we are combining there are many times when you cannot radio from the combine to a truck on the other end of the field because of skip and noise.

Included in the answer to #1 is a base station - we run a 60' tower with a directional beam antenna which gives us a range or approx. 40-45 miles. The greatest frustration in trying to communicate wtih our mobiles is the skip experienced. It's unfortunate that the US has lost control over their CB. Hopefully stricter regulations will be instituted so that the original purpose of the GRS can be adhered to.

It would be handy to have Boosters to give us further talking distance.

The range on these CB units are very limited with certain climatic conditions. Sometimes I wonder if it's worth having.

Americans cutting in, and will let go if asked. Obscene language used by them and some in our own area, Canora, Sask. is bad for this. When asking for C.Q. for channel find that too many children using sets and will not give up channel. In past 5 years have guided 2 aircraft equipped with CB. One to Regina, one to Yorkton and one to Swan River as they were between 50 to 100 miles off course. Have responded to 4 other May Days from stalled cars in winter. Saved lives of 5 members of a family at 2 a.m. in morning last winter, as they were stalled in car between Hay River and Yellowknife. Their battery nearly dead and got Edmonton and Hay River to respond and picked them up in 3 hours. I was the only one to receive their May Day on my super scanner aerial.

GRS CONTINUED

One of the drawbacks of the GRS radio system is the interference of the power system in town which greatly reduces your reception.

CB radios have saved me a lot of miles walk on few occasions and I wouldn't be without a mobile unit for sure.

It would be nice to get mobile units (GRS) with a longer range.

Would like information for a CB business band Channel.

Too many people using CB as toys, without proper identification of themselves or any real message to relay, using only handles which mean nothing, talking too fast or too loud so no one can understand. Just too easy to be a CB; certain tests should be required.

CB's are a very handy thing so long as they are not misused by inconsiderate or unexperienced people.

There is too much garbage on CB radios and if it was harder to get licenses and more control on the use the radios would be used for what they are intended for. We used it for fighting fires this past year and it was a great help in moving equipment and men to spots that needed the work.

I returned my first set after a month because my range was only $1^1/2$ miles at times and less at others when mobile. But I will be, I hope, buying another set within 5 years, if there are some changes made, which I noted. It pleases me that someone is doing a survey on CB's. I hope that someday there will be a test or something to pass, instead of being able to purchase a license outright. It is too easy for someone to become a licensed CB or GRS operator. I suggest a course in common courtesy while operating their unit is essential. There are too many people abusing this means of communication, by talking too long, using emergency channels, swearing, and just talking because of the novelty of the radio. I'm sure that if you questioned other people who have owned CB radios for quite a while, they will probably give you the same answers. I hope that someone will take my suggestions as constructive criticism.

I don't think they are going to improve the system out here in the west with the 40 channel change. I think it's going to be too costly to maintain and for interference. I think this should be left to the provinces. Way down east it may be necessary where the population is greater. I'm well satisfied with the way it is.

Adequate for 5-10 radius from base to mobile, 5-6 miles mobile to mobile, which covers our operations.

More channels may help me in privacy. Skip interference worries me in the future.

In general I am fairly well satisfied with overall operation of my CB units.

GRS CONTINUED

Being satisifed with what I have is mostly because being used on the farm. The distance which I need to communicate is only about 8-10 miles around me, any farther I would say I need something better. Only use them from one tractor to another while working in the field which is only 0 to 10 miles away from one another and for this distance these are good 90% of the time, and the cost is low.

If various antennas and boosters would not be used so as to limit range the radios would not be as noisy and calls a lot clearer within a 25 mile radius.

The rising popularity of CB radios is naturally causing congestion and since a person must show good reason for acquiring a license I would like to see a stricter policy by the government concerning the granting of licenses, since once a license is granted it is very hard to prove that the licensee is misusing his radio rights.

I think 40 channel systems will improve some but cross-channeling is a bad factor with CB's.

I would like to see citizen's band radios with higher wattage output.

We purchased our GRS equipment before it became a "fad". We deplore the frivolous use of radios, which is becoming more and more common.... novices with their "mercy, mercy .. good buddy" tying up channels with their useles patter. I hope the fad soon dies. It is a privilege to use a radio not a right.

I hope they clean up the 'garbage talk' on GRS.

If I were to alter my system, I would move into a VHF FM or UHF FM type of band because the style in which the 'CB' type of band is operated is just a little bit too unprofessional, eg. it is too easy to obtain a license and radio. We, the radio users, pay $13.50 to DOC and all we get for it is a piece of paper. I expected a little bit of order and control to be maintained. The GRS regulations should not only be stated but enforced.

We have to have our base mobile turned up so high to receive a call from the farm that the noise is too great, but can receive better on mobile unit on farm.

'Social' callers (gossipers) should not be allowed to tie up channels for 3, 5 - 10 minutes as many (mostly women) do. Should be a time limit for every call made.

Radios equipped with crystals for designated channel so no interference is encountered.

The only comment or complaint that I have with CB radio is the people who have to spoil a good thing with their rudeness and misuse of the system.

I feel assigned call letters should be used (and enforced) at all times. Publicize rules and regulations (more so) governing the use of CB and enforce them more. In this way there would be less congestion on the bands and also proper use of sets.

GRS CONTINUED

It would be handy if we could have a few frequencies which would be free of skip from the USA as it gets pretty strong at times.

My only hope is that as the number of radios increases, that the people using them stay courteous to those needing a channel for valid use. There is too many kids on radios.

Too many people using them for a toy.

My base station has an awful lot of static on it, which I think comes from the main power line so close by. I hope to get it checked out. I call my home base or my neighbour from my tractor mobile just for a talk to help break the monotomy of the long day.

I am employed as a comm-tech by a mining company and so do my own servicing. As I'm often out of town, it can be very difficult for other users of GRS in the area to get their units serviced. There is no commercial shop in this area, and down time can be from 4 days to several weeks, with the added cost of sending the set out to Winnipeg. (Lynn Lake, Manitoba)

When we first had CBs they were considered as a gadget, but we have found that here on the farm they have become useful tools. They have saved many a mile of walking, precious hours during seeding and harvest, and also eliminates anxieties of the well being of people in the field.

I would like to get better distance as I am quite often over 20 miles from base. This may be fixed possibly by a better base radio. I find the radio saves me quite a few miles and this saves the Crop Insurance quite a bit of money as well as myself a lot of time.

If possible would like to go to a private system, to many kids in town with CBs playing around, interfering with out men who are trying to relay messages to other machines. Should be tighter control who gets CB. Kids in town use them for play toys using up time on CB and making nuisance of themselves.

Perhaps all side band would be nice. It's hard to know just what will happen in the future because of 40 channel, cost, and many other things. Outlow the abuse of CB Radio's by some kids little $12.00 unlicenced Walkie Talkie's that absorbs everything! More power! Outlow swearing!! With a few of the drawbacks that there is, there still the last friendly place, when things are tough.

Children using hand held CB units should be permitted I'd obtain chrystals for channel 19.... We live in an isolated area 90 miles from the next town. Extended range would be most beneficial in case of emergency on the highway.

Our area is fairly quiet, the Turtle Mountain Club has organized Channel 11 as a call channel and in an emergency everyone respects this and all works very well.

Hopeful to have directory the same as telephone and longer range equipment that is more reliable.

We have about 15 or 20 sets monitoring the same channel which is good because we often have to relay, however some of our operators insist on staying on that channel to visit. My wife gets so pissed off that she either turns the base down too low for me to call or off altogether.

I think that there is too many people with radio's that are not needed, this is a utility, not a luxury. The prime hours 8 a.m. and 6 p.m. - should be emergency or business not luxury or personal - the CB is not a tea party or a kids toy but rather a road report, weather report or for private and public enterprise or business.

Privacy not really possible on open channel system. Powerline interference occasionally.

The licensing set up is a rip off and too expensive.

I feel that most of the congestion in our area is caused by people whom have no real use for their radio.

If we were to change the system any it would be to put private crystals in our CB radios even though we would have to get the approved models, it would be cheaper than purchasing an FM system. The only thing that would hinder the private channels as I see it would and is the lack of DOC approval for our present radios. Then should be more brands approved for this use. Something else is the skip conditions at times, this sometimes gives me problems in range, more so than the output of the radio. This is probably very hard to do anything about and might be partially solved by putting private crystals in if the radios were approved for this use. I really see no reason why all or mostly all of them could not be approved for private crystals.

There should be some way to improve peoples knowledge how to use them such as learning that a call channel is to contact and then move for long calls. Also make it the licencees responsibility to keep children from playing on them.

Would like to see DOC in area often. Maybe then they could eliminate those in our area who harass honest CBers by playing music and transmit nonsense and obscene language over the air. And those who use boots to over ride other units.

No congestion in this area due to the fact that most people up here cooperate very well and with single side band features. A radio I have at present 60 channels to chase from if there is a lot of congestion and noise etc. This should almost be eliminated with the new controls of radio manufacturer and addition of 17 extra channels. 120 channels if you could single side band operation. Almost doubled capacity after April 1/77.

Possibly going to VHF-FM, advantage of greater clarity and range and privacy. Disadvantages are no communications with other units and significant extra cost. Would like to have another citizens band more like Ham radio, more restrictions, and selective for more serious users. Possibly higher frequency and more power. Reasonable examination required and higher licence fees to discourage general public misuse.

If the CB units were allowed a higher power output to compete with USA skips it would improve their use considerable.

My biggest complaint is lack of proper operating procedure - Use of nick names, no call numbers used - no proper clearing of channels. While this does not affect me, it shows the need for some kind of better licencing requirement than is now in effect. GRS owners procedures so they at least would have to be exposed to the rules and would not use ignorance for an excuse to not knowing better.

Should be a horn system in a machine to sound when you want to contact the operator of the machine and he is not in the machine at the time. Something similar to a mobile telephone buzzer.

Too many people using CB as a personal luxury.

Would like to have a system that is less subject to noise and interference from mobile units.

I am not looking forward to the US skip interference which will jam all channels during the day - approximately 1979 - 1892.

We would like to get our own channel and more range. Most of the people using CB radios are indulging in mundane, inane, nonsence. We really don't care that much about the privacy. Although it would be nice. We really need more range, our radios take the place of one more man.

There should be a written examination for the individuals applying for a radio station license with the GRS, so that they know the proper operation and usage of citizens band radio. There is not too much congestion on the air, if everyone would use their radios as they are meant to be used.

I think that people using the radios should get a notice as to how to operate them. First of all by giving their call numbers and staying on one channel instead of switching channels after making their calls and talking in on people that are already using that channel. We have alot of people using radios in this area that don't seem to have the knowledge of using a radio and unless they have a very good reason for having one shouldn't have one. They shouldn't be so readily available to just anyone. Seems to me this thing got out of hand because everyone and his dog has one.

May try 40 channel to see if there is less noise and interference.

System is working to my satisfaction except on skip hours or days.

I would like to get more information on mobile communications.

There are definitely too many radio's found in the area for luxury resulting in congestion of channels. Misuse is the work.

Expansion of GRS to 40 channel operation will alleviate congestion somewhat. Unlicenced stations appear to add to congestion problems and basic licencing regulations should receive some attention.

I feel that GRS is very satisfactory for what it was intended, namely low cost two way communications for the average citizen. However it is being abused by many users in many ways, for example many teenagers have mobile units in their vehicles and use them in a manner which I find questionable.

If I alternate my system, I would go to FM enabling more use of equipment for agricultural, emergency, etc. For example during seeding, due to short seeding period, to save time it is necessary to call and receive immediately in order to get parts, fuel, etc. When skip is bad some days we can't get anywhere. We have lots of trouble in our area with skip plus youths 12 and under. There should be more checking on licensing and equipment. Any idiot can get a licence.

I would like to see a little better range of the equipment for sale now.

Our main problem is interference and skip from American radios as far away as California, mostly from Montana and North Dakota.

Let us be able to push a little more power. Say 10 to 15 watts on AM channels.

I find the CB useful for farm use. The CB saves me time and money when needing parts or fuel, seed, chemicals, for me it's very useful.

Radio is used on job (hauling coal) for truck to truck communication, the haul in the mountains and range is very limited. I do not think the mobile unit could reach a base station in the town of Grande Cache which is from 12 to 24 miles distance.

Teach new owners to speak up then shut up. We could use a mocom 70, that would give a little better cover in the home town we service. We have our base 40 miles out of - but dispatch our units in Winnipeg mostly. In our home base in the fringe area, with our mocom 35 radio our units can only read us about 1/2 mile beyond our base as they leave Winnipeg, but most of the time between base and repeater they come in ok. Hope this will be helpful to your study.

CB work quite well on the farm - people are considerate and not too congested yet. Mobile units do not stand up on farm trucks especially the importo.

I would like to put higher lauer and side bands. It would help if we had more power, more information on how to operate properly and available literature on how to form clubs.

Some of the questions are difficult to use as the set is useful to communicate with my mother in law who spends 70% of her time in the bush at her trapping cabin. Usually only one shed a day is maintained in order to conserve battery power. The sheds are for personal satisfaction but also to determine that everything is ok as she is an old women. It is also used to verify that travellers going to her area have arrived ok. Point to point distance 15 miles.

I think that many units are got only for luxury use, and at times when the need of your radio is the greatest channel is congested with skip.

1. Keep your children off radio's (age 4-18)
2. Make licensee and user's pass an exam
3. People to stop playing with them (unnecessary B.S.)
4. People B. Sing for long transmissions (on channel 09).

Although I have an excellent machine now with excellent antenna, I may be changing over to even a better rig, but when and if I do will be up to me in the future. There are an extreme amount of CB radios in my area, and I get along well with them all of the time, so "10-17 and clear".

I'm very satisfied with my radios but I like them to have a better noise blanker on them, and have the same range.

CB radios are fairly well organized in the country but never use in Winnipeg of its too disorganized, crowded and there seems to be no standard call channel in Winnipeg.

Go to side band perhaps when the 40 channel units are sold and we would like to put up a tower for our base. I would suggest walkie talkies be done away with by this I mean the cheap ones. The children use as they jam the channels unless they were made to stay on Channel 14 as was first set out.

Most, with my base which is a mobile unit hook up to a power pac and raise my tower up higher for better coverage. If older CBers use the radio correctly the younger generation will also use properly.

Make sure buyer get better information on low of GRS before going on the air. Plus make sure he has license.

Don't sell CB equipment to anyone under 21 who doesn't need it for business.

I think you should allow to have higher output and input watts allowed.

Improve base and mobile quality to go channel SSB. I have two base stations and eventually both bases and all mobiles should be similarly equipped. Important that there be one or at most two call channels and that users switch to other channels for messages - If to be used in remote areas high gain base antennas and correctly installed and matched mobiler antennas are very important SSB if affordable is a great help.

More information on rules and regulations. Where can you get them.

Private system would be ideal but cost far outweighs benefits.

People should learn how to use them in our area.

If DOC would check some of the language some of the owners of CB uses on the air it is foul.

I would like to see stricter control on the use of Channel 11 for calling only. In this area they have unit using that channel too long.

DOC should make attempts to unlicence pranksters and abusers.

I like our base station so I know I can still get in contact with someone when our phones are out of order.

I would like to advance from a CB transcover to a radio telephone. My needs would be best fulfilled by the privacy and promptness of such a system. I would like to see stiffer regulations both the issuing of licences and the operating procedures. Necessary messages are too often delayed due to channel congestion.

We will probably go for a better quality set. Yes, wattage should be increased or allowed to increase on most sets.

Referring to the CBs service the technical limitations of the equipment and the almost total lack of control give rise to the large number of abuses witnessed on the air.

We would have more use of CB Band if there wasn't so much American interference coming in.

May change to business band or change from AM to single side band. When manufacturers improve quality of equipment. This is now in the works with new regulations. During 1966-1967 daytime use was impossible, due to skip conditions, this is forecast to happen in the near future again.

Our system serves our purpose well as the need range distances are not too great on our farm, also we can reach our machine dealers for parts and needed service.

We would like more privacy, we run a business. We don't use our radios for pleasure.

For our rural community the CB is an excellent way to contact neighbors who may be on the road or in the field but because of CB they can be reached without having to drive several miles. Also when driving on our poor road conditions we are alway able to contact someone for assistance if needed. Our area for no problems of over use and I feel that the range is adequate but could be increased as many farms are several miles apart.

Very useful for farming especially when seeding and harvesting. Only decreasing in personal conversation with friends. Radio is now too loaded to make unnecessary calls.

I find the power allowed me for relaying messages is not enough. The skip from Oregon and California especially overpower my sets if I am more than 2 or 3 miles from base.

I have an AM and SSB base station will be changing trucks to AM and SSB. We nearly all use CH 10 in this district as common calling channel. It works well. Would like to have RCMP and Emergency services monitor CH. 9.

Changing area of operation, more units in other self-propelled equipment. I have found that there are too many people abusing their priviledge of owning an operator's license and of normal CB channels there should be more monitoring by the DOC.

Some of the equipment I am using is by no means the best available. I feel quality equipment is a necessity for maximum range and performance. I do not feel 40 channel radios are required. Would like to see stricter regulations to help keep some of the garbage off the radios.

Might consider private bands - there should be an attempt made to cut down nonsense calls - these should instruction in proper radio communication procedure when using GRS band - placing calls - use of codes etc.

CB radio with more channels and have better noise suppressors. When I started with CB in 1968 we used area call numbers which we still try to. I think by using names now it has down graded CB and that there is not enough control.

Not enough range with the mobiles. Too noisy in the trucks with electronic ignition.

I would very much like to get a higher watt system but the DOC will not allow me to have one because I am a farmer.

Get trouble with 'Skip' a little. But have trouble with people who are impolite on the CB radios.

Too much static on the line.

Better equipment for base and mobile, as finances will permit. This is a very big and complex subject, perhaps a more rural area would give you a better overall view of it. I do not consider myself a typical user.

GRS in Manitoba is too expensive (equipment) because it is a fad and the retailers are taking advantage of this by either selling poor equipment at comparatively cheap prices and hiking the prices on accessories and good equipment sky high. If you can suggest a few ways to improve: the type of people using GRS the useage of GRS, and the ability and prices of GRS equipment.

Would like to see teenagers with CB radios take out licenses. Lot of them just use CBs all the time. I know they have no licenses, just use a handle instead of a call number. A lot in this area use the same channel.

Would like to see better control of GRS units, eg. unlicensed operators, perhaps test of operation before issuing.

There is too many using the CB radios as a toy or people using bad language and think it is fun: I think a test should be written so people know the rules and not think they do.

I think CBs are good things to have, not just time saving wise, but also in case of emergencies.

Would like to go to side-band where there are more channels for better private conversations. Two-way radios should only be used for business, not for fooling on.

DOC should be more strict who has and operates CBs (not every kid). Should be farming and business.

We are checking into cost and problems incurred in going to a business band for our business. Licenses are more expensive, but we are told we may have to change all our antennas. Along with new crystals, this makes for an expensive change over. The biggest mistake made was letting dealers sell 23 channel radios at half price. School kids are buying them and only using them to play with, which makes it impossible at times to use the radio for business purposes. DOC on Jan 27 in Saskatoon was issuing 100 licenses a day. This is congesting the air waves unnecessarily.

I would like to see some channels for the exclusive use of SSB operators. Also, to increase the standards for the manufacture of CB radios. I use SSB radios valued in the range of $400-$600 for mobiles. My ideas of a $79.00 radio is a pile of junk! Anybody can buy one of these and not have a clue how to operate, and/or these cheap radios cause interference by broadcasting on more than one channel at a time.

I have noticed particularly during my travels that the majority of people continue to use their sets in due respect to their intended use. I feel the use of GRS has provided a medium to get people talking to each other again and made more people alert to the art of communication. Because if you don't pay attention to the conversations you miss what the whole thing is all about. I personally hope that it is one of the things that are here to stay.

In urban areas, many CB users use their radios unnecessarily with idle chatter and repetitive conversations.

There is a need to have some regulation regarding the manufacture of the radios. The reason I mention this is that some brands of radios (CB) seem to interfer with TV reception on a continuous basis. Not just when transmitting or receiving as most do. I feel that if other brands don't interfere, why should others?

Higher frequency bands should be eased up on prices for business.

Most of the problems are the skip from USA. Skip will blot out any reception within a two mile radius of our base.

We are grateful for the use of 2-ways from farm to field which save time and fuel; and are usually able to talk on chosen channel semi-privately. After that, we don't have them for playing and are not interested in further range for visiting. Our power line is our greatest interference and would appreciate being rid of it.

Our CB radios are used in school buses for emergencies which might occur.

We drive a school bus (16 miles of back roads) with our private car. GRS is very comforting in stormy weather; nevertheless, we only average about 2 calls per month.

Reinforce DOC regulations. Half (if that) of stations operating have licenses, also underage persons operate stations at no risk.

Would like to see the transmitting power increased a little to give better range. As it is now, CB on AM is limited to approximately 20 to 30 miles or line of sight, not really enough.

Very happy with my CB. It saved me from walking when I ran out of gas.

Have been working system only three months. Satisfied for present. Spring and fall months are heaviest; will know then how satisfied we are.

DOC licencing should be more restrictive; too many cheap radios on GRS being sold to children as play toys.

Private channel with greater range would be helpful.

Need for instruction for using two-way radios. Use call channel, then go to another channel.

It is unfortunate and extremely upsetting to find so many kids using CB radios strictly for their own enjoyment who have very little regard for rules and regulations and it is equally disheartening to discover that the DOC seems to care less! We need to have some rules enforced NOW because it is already too late. I would be very interested in seeing this matter pursued by an organization such as yours, because it seems that the government pays no heed to the individual.

CB radios can either be of importance or a toy, depending how it is used. I find it important largely for off-road communication and in emergency situations. I have helped out persons in trouble who have called up and I have received their call. If I end up in an emergency situation, I will do the same. When travelling, it is convenient to call up and find locations of campgrounds, gas stations, etc. in unfamiliar areas. Since I do a lot of camping and fishing in wilderness and back woods areas, CB is a necessity in case of emergency. I have noted a large number of others in the same type of area, with CBs installed on their trucks or recreation vehicles. In Calgary (I use my CB in areas west of Calgary), a lot of people use it largely as a party line telephone. The channels are overcrowded and people are trying to talk over one another. There is even a couple of guys around who like to use profanity and whistle into the microphone. It would help if everyone stayed with regulations more or if we knew the regulations a bit better (I'm not trying to put down everyone who uses CB in Calgary, just stating some of my observations). Users of CB should have regulations readily available, possibly written in every day English, so they can be easily understood and perhaps enclosed with every CB unit sold. Misuse of CB could make things tougher for all users, depending on what the government decides to do. I would like to see CB power decreased from what it is or anything like that.

Units should not be sold to people under 21 like mine was and when a unit is sold, the mike should be sold separately one year after the licence is issued for that unit. So as everyone who wants to make garbage on the air must first listen to everyone else's garbage for a year.

The distance between farms in our area makes enroute communications very helpful. Should difficulties arise, the units have, in one season, cut down unnecessary messenger traffic to field and increase repair efficiency greatly.

Has increased my interest in electronics and communication.

I would like to have increased power (watts) so we could get better reception.

We are in the process of changing our GRS radios to private radios. We needed the privacy and the quieter radios in our operations. The skip and interference made it impossible to communicate at times.

I am a municipal councillor and would like more range in the mobiles. However, such equipment in this category, though available, is illegal. However, it seems to work in USA and seems to be necessary in some areas of business. I have the control of three snow plows and in fringe areas, it is difficult to communicate with same. This applies only to the mobile rather than the base station.

CB is one of the best methods of communication for this household (provided the channels remain relatively clear). This may be somewhat remedied when 40 channel sets come in.

The only thing is that I'm sure this survey will be very helpful if everyong fills it out.

I would like to see handheld transievers shrink in size and still keep a 4-watt output.

My biggest complaint would be noise and skip.

Too much misuse in and near urban centres.

Abusive language in CB. Too many are using CB as a toy.

The CB is well worth the money if a person spends any time on road.

So many CB radios coming into the community that new problems with congestion are anticipated. Privacy is not possible with present system. Many calls between my partner and I are of a private nature and for that reason we might change system unless we can work private channels into our present system. 'Skip' is a fairly big problem for us in combining time. A private channel for those of us who use CB radios in business would be a big advantage.

I think that there should be no limitations on distance that one talks to others.

Canadian regulations are fair, but USA interference (skip) is a major problem. Lack of experienced people using radio systems. Class in operation should be manditory before licence issued.

I feel that there should be some security to stop playing with radios.

CB use is catching on quite popularly and I am pleased with the way most people are using their sets.

It has been very useful to us since the past year.

A good feeling to know that you can contact someone in case of trouble when driving in rural areas in winter.

Not enough range for CBs and too much skip; too many inexperienced operators on the air with knowledge of codes and lack of manners, etc.

Better policing of those who use a CB for playing games. It has become a nuisance in high congestion areas to attempt to make a call.

I have a mobile radio only for pleasure and also in case of emergency. We live 200 miles from the nearest town, if anything should happen on the road and require assistance, I might be able to contact someone on the CB.

If CBs are allowed to have more channels, it would be better in congested areas.

A radio is a very helpful unit when needed and lot of fun at times when used right.

I would like to see a link up between CB and the telephone system. I feel that it would be to a great advantage.

Better devices to cut out noise in mobile units. Control of children on CBs and walkie-talkies. List of CBs in area like a small phone book with listings of mobiles and bases in areas as telephone companies use.

Besides farming, I seel CB (GRS) radio equipment. The equipment is very suitable for farming, as the cost is low and range is adequate for general usage. However, if we could use more power, say 50 watts in rural areas, the GRS band would be improved enormously. Party channel GRS equipment is welcome, but the 23 channel radios are adequate, here, so should definitely not be made illegal for licencing after July 1st as proposed.

Two, two-way transievers, not very much range. Not used very much for this reason. Cost too high for the range. Should reach 20 miles to be worth very much.

We no longer have our mobile radio system as the range was practically nil.

I will just make one complaint: some users think that there are certain channels for call channels, but all channels are call channels.

There is some language used on CBs. I wish this was cleaned up first. As for our area in the country it works pretty good as long as we stick together. Right now help trucks and cars on the highway in storm, etc.

I wish something could be done to eliminate the American skip which comes in especially during our seasons of most use.

I would like to see the wattage output on GRS increased to 10 watts.

Make it harder to get GRS licence and have stricter tests for radio manufacturers. Also stricter enforcement of regulations.

Too many not using numbers assigned them. Too many using them to talk about nothing when they could use a telephone. Sometimes too much skip from USA.

Ours is a GRS service with business band frequency modification.

The problem with CBs is that too many unimportant calls as "party-lines" are on telephones. People make use of "skip" which is very annoying. I believe CBs should be established for business use.

CBs are great and people should use them properly and not abuse them. Right now we only have one problem: the skip from the States and Mexico. Some days it is ok, but some you can't talk on at all.

Concerning GRS, I find a lot of the time, especially in and near large cities, a large percentage of CB users abuse the system. Suggestion: better policing of users and fines for infractions.

In our farming operation, our radios are adequate and necessary. It would be beneficial, however, it we could reach Souris and Brandon with less difficulty.

Under present conditions of relatively low utilization in the far north, GRS seems to represent the most cost-effective means of communications for us. Low initial cost coupled with ease of installation and operation are attractive features. With good SSB equipment and high-gain antennas, we can realize range of 50 miles or more. Presently, this system has provided us with cheap and generally reliable communications.

I feel too many people use their radios for personal communication and are rather hesitant to offer assistance in emergency situations.

CB is great for its intended purpose - rural, emergency and information otherwise unattainable.

I also use CNT mobile radio phone which I own. This is more for emergency uses. Also, I have two CB base, two CB mobiles and 1 SB AM walkie-talkie.

Power in the GRS class should be at least doubled or power boosters should be legalized to a certain limit.

I feel that this survey makes false assumptions about GRS. GRS is being used more as a pseudo-amateur service than business. As a result, I feel any results will be more erroneous unless the GRS replies are segregated and reviewed separately - In light of the outlaw aspect of GRS and the strong incentive to lie in a survey.

We find it a great convenience to have a mobile unit on all tractors and the combine for constant contact between machines as well as with home base at all times.

There should be more control over the radios used for business and the ones used for pleasure - perhaps time schedules for each category.

I feel there should be changes made in the radio telephone act. Governing GRS Stations and better regulations made as to the equipment sold on the market. GRS is a useful, important means of communication in rural areas and have used it enough to know there is a lot of very poor equipment on the market. A buyer's guide in layman's language would help a lot.

Channel 19 should be more closely regulated for contact and not for gossip conversation or usage other than that to establish contact.

On GRS radios, there are too many people using them as toys and sometimes people bother me while I'm using it.

Better or policing of the language (offensive) and duration of calls. Some talk 1/2 hr. to 1 hr. Better education on how to use their sets. Better instruction books and "10" language. As the base station operator, I feel the CB is a great asset and enjoyable.

There are far too many idiots on the radio today. The sooner DOC closes them down the better.

Would like to have less hydro interference on main highways.

The DOC should check up on people who sell and people who use linear amplifiers to amplify their GRS transmission signal.

I use my mobile unit to contact my son's logging operation and his home base.

We are near the US border and we feel their transmitting units are so much stronger and they can override our calls.

Should increase power of CB (GRS) radios and impose limit on size of aerials required, so you wouldn't need long aerials on vehicles or high towers on bases.

I feel DOC could possibly better check misuse of radio and over power. Possibly with better license checks and increased fines.

The radio service is very good to have. Send more information on the radio.

It would help if Channel 11 would be designated as a call channel only. More checking should be taken to ensure useage of radios is not abused.

Any way to stop skips.

We have a lot of power interference, which often limits our use of radio.

I feel that the type of mobile radio service that I have, I am completely satisfied with. I only hope that in the future the general public will treat the GRS system with respect, so that we can keep it as respectful as it should be.

Stricter checking of licenses and radios to get some of the illegal radio users off the air. They have no respect for it, otherwise they would go about it legally.

You haven't mentioned Business Band (27405 - 30560). You can use Business Band approved GRS equipment on these frequencies (thus you don't need any more money than CB). License $25/year. Base $10/mobile. As far as privacy goes, no radio transmission is private. You can buy receivers with UFP and listen to almost any frequency. SBE makes a scanner with capabilities of 16,000 frequencies. All you need to know is the MH_Z and KH_Z and you can listen.

I find that quite a few people are abusing the system and using foul language. Find that most users are very helpful.

It would be nice to have radios built to reject a lot more of the noises produced by other equipment other than GRS.

Too many people lack courtesy on CB and feel it is their "right" to use them, simply because they paid for a license. They don't realize they are interfering with others.

I have a GRS system for emergency purposes primarily. I communicate rarely on it as I am not given to using it for chat. At present, I am without a base, but am planning on the purchase of one.

I mostly listen to road reports when driving in larger centres.

A CB is a business tool not a play toy as many who own them seem to think it is. Need better control in use of them. Channel at times won't even be released by users for emergency.

Radio licenses are too easy to obtain and are used by individuals who have no cause or useful reason. Transmission should be short, curt and to the point. Eg. aircraft phoenetic system.

The CB are becoming more popular by the day and therefore the move to 40 channels is a good one, although I have a 8 channel base and 23 channel mobile.

A lot of our interference comes as so called skip from US. If it were of a business nature, would not be so bad, but it's mostly someone seeing how far he can reach with his powered up units. If social calls were kept to a minimum in Canada, it would help too.

There should be a better understanding between the US and Canada on the use of emergency and call channels.

Better enforcing of license checking by DOC. Better checking of unauthorized radios by DOC. Information supplied to us as to what to do to help DOC enforce their regulations.

It is my opinion that DOC should provide a written test and proof that a unit is necessary. There are too many people abusing the CB radio channels. These radios are good if they are used right, but not all people use them that way.

People will have to adhere to the rules of good communication more closely if the CB equipment is to be worth owning.

Just about everyone is the community has mobiles. Everyone it quite courteous and radios are used mostly for farm use (not too congested). Hence we have few problems.

We have found for radios to be a handy piece of equipment and consider them very useful, but are a bit annoyed with the use at night amongst kids in vehicles.

There should be more control on people who abuse their radio rights by talking about absolutely nothing and interfering with others who use them for business purposes.

Tell people to instead of getting linears, etc., get units to help improve your own pickup. We don't need any more earbusters.

More control by DOT in issuing licenses for radios which will only be used for personal amusement. This would relieve some of the channel congestion.

Need less makes of radios, but better quality.

The addition of 17 channels to a community this small is of no significance to CBers here.

The laws for GRS should be more strongly enforced. Police and Armed Forces could also have GRS uses.

Would like to improve my range with a better antenna. The outfits selling antennaes (and radios) do not give enough information on Range of units as applied to radios and antennaes combinations.

Hope to go to 40 channel in a year or so for base, will keep 23 channels a.m. in mobile. Also going up to 48 ft. self sustaining tower for base. One of 3 existing radios between 2 bases, 2 mobiles, will also go into the boat. We are lucky in the north not to have congestion. Also selfpolicing within an active club helps maintain good relationships and good technical operation.

Update equipment, as now more improved versions of GRS equipment become available. Suggest, that a law be enacted to prohibit persons from purchasing any GRS units without first presenting a license or permit to purchase. NOTE: Will be purchasing (2) more mobile units for use in auto and 1/2 ton truck. Probably (23) channel units as price of these units now are attractive and reasonable. Pending introduction of (40) channel models.

We use the citizen band radios for our business because of the cost of private FM radios. Our communication between truck to office is essential therefore CBs are all we can afford.

I find it more useful to use SSB especially for hunters and trappers or for search and rescue parties.

More power, more channels. In this questionnaire you only pursue legal useage of CB. You left out the illegal but popular practice of talking skip, using linears etc.

My husband has a CB too. I believe a CB radio is good if used properly. Some people abuse it though. Is there anyway a person can catch people abusing a CB priviledge. Is it law to have your call letters in the back window of your car. Maybe a person should then. You could catch a few of the offenders, I find Edmonton terrible for uncouth people. Here everyone respects one another. As it should be.

CBs are of a real benefit in case of blizzards and if anyone needs help in a hurry. But the licensing is getting pretty high when you consider TV and AM radios have no license.

Too much useless talk on CB radios, also too much skip from USA and other stations. Channel 9 not kept as call channel.

I would like more visits to Lynn Lake by the DOC as radio useage is very terribly misused in Lynn Lake.

Tighter control in use of CB radio is that were possible. Too much nonsense traffic by in many cases younger persons.

Would like to have more range (distance) especially in the car and truck.

We are very happy with the way in which our CBs assist us in our farming operation. Our only complaint is that the noise and skip problem experienced makes it difficult to use the radio often during times when it is most needed.

Where I live, the only communications is actually between friends and truck drivers. In the summer months, do listen to a bit of skip.

Our greatest problem is skip from USA that coincides with our busy season (spring and fall). Can make GRS useless when we need it most. Also need an emergency channel and common call channel.

I filled this form in as it was implied for the busy season. However, in the winter it is not the busy season, so I may be use it more for personal, but still for some transportation between base and car mobile in wife's occupation, so it has to be all year round with less farm or business in winter and more personal and visa versa in summer. CB would be very adequate if it just wasn't for that darn skip and last summer was terrible. With the next increase of channels, what should be done is Canada get five channels out of the extra 17 or 18 that the USA doesn't have and they get five channels that we don't have.

Groups form to monitor a certain channel and claim to have DOC permission to use this CB channel as a private channel and tell people that they cannot use it. This is mostly city groups and is quite annoying to always be told that "this is a private channel" when CB channels are supposed to be open for communications except channel 9 as an emergency channel.

We live near the city of Winnipeg, so we have the big program of getting through to our home base when we leave work. The problem I speak of is the time the school children are on the air, mostly between the hours of 4:00 - 7:00. Same time as most mobiles are on the road home. You can't break through to your home base as the city bases have their squelch set up to hear only each other, who are in most cases only a few blocks apart. City bases hit the home base at the same strength as do your mobiles. A possible solution might be assigning some channels for cith, some for country use, especially around the city. Another problem we find is most people once purchasing a mobile unit, go on to buy a base and more mobile units. But only one license is purchased and that number used on all units. Rules and regulations should be made a lot stricter and enforced. In my radio experience, I have not witnessed or heard any policing from DOC. It's time they stepped on a few toes and fast, as citizen band communications are getting bigger by the minute and if DOC doesn't, they will lost complete control.

Consider there are too many brands on the market, some of which are difficult to service locally. Have had difficulty with Cobra. Radio Shack Realistic has given excellent service on base SSB. Realistic mobile SSB has not required any servicing.

Skip from high powered US stations cause interference.

The distance should be increased in the Peace River area. Our service trucks go as far as 100 miles. The range of communication is very important.

Single side band for greater coverage and privacy. Most use of react teams to aid truckers and motorists.

I would like to get involved in emergency radio, we can pick up mobile calls on our base station now, in approx. 25 mile range. And I would like to see Canada go (React) as they do in the US. I would be one of the first to divert my radio time to the emergency operation (now that there are so many CB mobiles on the road now). We are receiving about 1 call now per month on emergency and relaying help from other base stations in the appropriate areas.

I am planning on adding SS Band plus a stationary base with at least 2 mobiles probably only am. This will be a larger area, in southern Manitoba. I would like to see a designated channel for all areas concerning information regarding, service for radio and vehicle, food, recreation, and road conditions, etc. Any info is often inadequate. We back'em down now.

I think it is good that you are doing a survey on the use of radio in Rural areas.

Find that something should be done in cities such as Calgary. Suggestion, people should have a base when they have a mobile, it would cut out alot of garbage in cities.

All radio systems are improving and I believe a radio owners will probably gradually have their own frequencies especially those close to urban areas where too many people crowd the stations foolishly.

We are experiencing skip on our private frequency.

VHF costs too much.

I haven't had that good luck with the mobile in the tractor, but I think it probably wasn't properly installed. If it would work better I would use it more.

There are too many CBers on the air who haven't any idea of what they are doing and have had absolutely no instruction in radio techniques or in common every day manners. I feel that almost all GRS owners completely ignore any DOC regulations because they are very unrealistic and are very rarely ever enforced.

Raise watt power to legal 12 watt am 25 55B the same as VHF.

I think the GRS radios should be used more as informational, business and emergency than just for visiting.

I have had two way radios in my aircraft for some years, also a portable VHF for communications on the ground used for crop spraying.

Possibly more scanning to clean up channels.

In this country people use these radios in case of emergency in the winter as some have not got telephone and if you are stuck it is nice to be able to call for help rather than walking in a storm.

I feel mobile communications is a dawn of a whole new era and it has the potential to be extremely helpful not only in emergency situations but in every day use.

Better mobile antenna systems and more antenna FACTS available as most congestion is caused by people with poor ears walking over others that they cannot hear but who can hear them.

Some of the congestion would be greatly avoided if a person would learn the rules of GRS communications.

The system is abused by some who use power mikes. They SPLATTER over adjacent channels and spoil it for those who need to get thru on a matter of urgency. Skip noise and people who still find it a novelty tend to make CB base very noisy and annoying to secretary or housewife who has too listen for calls from mobile.

Congestion by idle chatter is the greatest problem I feel exists with the GRS system.

I feel that the airways are becoming more congested with "chatterbug" users rather than those using the radios for business. I feel there should be tighter restrictions on licences.

If you do this again, include model radio control.

Sometimes some of the younger set fool too much on channels and cause disruptions.

I used to use GRS for my farming operation but I found congestion and skip noise rendered them unusable much of the time. Since switching to business band I receive very little interference.

Since changing part of my system to VHF-FM I could only be happier if they were cheaper.

I would like to see more and closer service on CB radios and a much better guarantee issued then has been in the past.

Use any influence you have on government to make CB radios harder to obtain (license, too) and have strict rules and regulations for users and some people to enforce them.

The lower prices of antennas will help since most of the effectiveness of radio is in what antenna one uses.

I wish that FCC would approve more range, more coverage.

To me, there is not very much need to improve rural mobile communications in Canada. The need for improvement lies in the urban centers, where there seems to be no controls, at times. I believe many rural mobile radio users come in contact with urban "garbage of the air" and become disillusioned at its true practicality and usefulness.

I currently have a mobile GRS radio in my pick-up and one in my tractor and plan to install a base station in the house this spring.

I think that the laws should be more strict in letting people have CB radios.

Due to American and Mexican frequencies being higher, I wonder if skip coming in could be reduced in any way. I suggest installation or private crystals on one channel for convenience of private calls.

I think in smaller populated areas that more power output should be allowed (such as farm operations where interference would be low).

I would like to see the maximum output increased to make a 50 mile mobile-to-mobile conversation possible. I'd also like to mention that we do get a lot of "skip" rolling into this area, especially from the USA, and although there probably is nothing that can be done about it, we could certainly do without it.

We are a camp of approximately 250 people. We have a company UHF system to make long distance calls. There are approximately 30 CB radios here which are mainly for personal use. They are used to call neighbors or if anybody has a problem on road into camp and Flat Lake. There are semi-trailer trucks hauling from Watson Lake to Tungsten and the road is difficult to pass on in places and these radios help quite a bit when meeting.

Better control on misuse of GRS.

For rural areas I think it's an ideal thing, but in a city I couldn't see myself using one because of too much congestion.

We have only recently set up our radio system and for our areas we are pioneers, but by the surprising rate at which others are joining and the little control there is yet for basic courtesy rules, I do see congestion as a future problem. Also "skip" by our southern neighbors with their boosters is part of our area coverage problem, as we are continually forced to tune down our squelch to cut them out.

I think that radios should have good quality and a set standard. I also think that up till lately the prices have been out of line. eg. radio selling for $170.00 in July 76 now selling for $100.00

On the agriculture scene it would be very helpful to reach 40 miles mobile to base, as much of our business is done in surrounding towns 30 to 40 miles away.

One thing that DOC could consider is just issuing one license to cover all radio's used on the farm, especially tractor, combines, etc; our CB radios sure have been helpful in our farming operation. It is too bad that the channels become so conjested at times. It is also too bad that we have to put up with SKIP. That is the biggest menace.

There are too many children using them to do homework and discussing unnecessary matters. Using for play-toys and never given up for a break to get your party. We can always tell when school is out - channels are all tied up with children talking.

We are hoping the static problems can be overcome.

This is filled out for a CB. We also have mobile AGT phone.

As we operate a combined system GRS, GLMRS, GRS for local open comm. GLMRS for closed private or emergency comm.

I have a GLMRs switch is very useful but is very-very difficult to get an operator on so mostly use GRS to base and get the base to place my call on there telephone (land line).

Used mobile telephone until it became too costly.

Also I have a radio telephone (CNT) service is poor and cost of operation too high.

There are too many radio telephones and not enough operators to keep up in the busy part of the day.

I think that more controls shall be used with regards to citizens band operations and over-powered units with which they are using.

I feel there should be a lot done about the distance your able to call it should be a longer distance.

It would be beneficial to CB owners who use their radios for business to have an increase in wattage to accommodate an area of about 50 miles.

As mentioned above, could sure use an information service in some of our larger cities. Sure would be great to have a channel that we know would be monitored at all times that could provide good local information, emergency telephone calls, etc.

DOC could enforce present regulations much more, in fact, there is no enforcement whatsoever at this time.

CB radios need more range for my requirements. Ranch and construction work in remote areas.

I feel that GRS is being pitifully abused and that the money paid for GRS licenses is not being used to enforce the regulations set out by DOC. Further, I contend that if license fees were increased, people purchasing GRS equipment to use as a toy would be discouraged, therefore eliminating the increased congestion which is resulting in the high rate of measure.

Radios are used too much for pleasure and fooling around. They can be a great asset to the business community, but should be kept for business purposes.

The road service channel could phone for me to my home or to service station for help; as we are in isolated areas.

People should realize that the mobile radio if used properly, can prevent death, provide medical help, where needed, and should not be considered a toy. If on the air - BE COURTEOUS.

Some radio communication is a convenience and makes life easier. GRS is plagued by a lot of nonsense calls and whether that creates poor operating conditions. However, it's not bad and if I didn't have radios, I would gripe about that.

Most questions answered pertained to my mobile telephone, however, some applied to both CB and telephone and were answered as such.

COMMENTS FROM PRIVATE USERS

Unless you have a service contract with Motorola, it is very difficult to get service in our area. General coverage receivers tune us occasionally and I wish this could be prevented.

We have used CB and business band - max 4 watts. They are a waste of time and money and are not reliable. We are very pleased with our present units. We believe that CB has become a badly abused toy with no supervision.

We quit using GRS radios due to pollution of CB channels and many people had bad radios which would cross channels (which is very disturbing to listen to).

There must be a way in which those individuals on Business Band (private channel) can get co-operation from both Government and manufacturer to increase the wattage output - say from 5 watt to 10 watt or whatever.

Only wish I had purchased units years ago. It saves me much time and many a trip. Our farm land is scattered over about 15 miles and I have instant communication at any time or place on farm with home. If I travel to neighbouring towns for repairs, I can contact home from quite a distance. In the fall, my wife hauls grain as I combine. She can spend possibly a half hour or more at home preparing meals, etc. and doesn't have to wait in the field for a load of grain. I can tell her when the truck is full.

Best equipment (quality) first time around is cheaper in the end.

We need a cheap, efficient mobile telephone system. I would also like a private line so there is no interference from other parties when making a call. Sask-Tel could make the necessary changes, but they don't feel that way. I basically believe in a CHEAP, EFFICIENT service.

Stiffer fines and more monitoring of CB channels to prevent non-licensed use of radios.

As I have an FM radio and am on a wave length designated for veternarians only, I have no complaints as to the service I receive.

My only mistake is that I did not use an antenna tower that was high enough for the coverage needed.

Have not had system long enough to be able to answer some of the questions.

Sask-Tel should lower monthly rentals for mobile telephones.

My radio system is not yet in service, so cannot help in your survey.

For our business, our radios have saved us much time and expense.

Very satisfied with performance of VHF equipment within this operation.

The recent increase in the number of CB radios has rendered them useless as farm business communications. Thank Christ, I sold my CB system and bought the FM (VHF) system. My new system gives me excellent private service.

Twenty-two stores and some people have scanning monitor receivers and listen to taxi and police calls (they do not answer). We are just starting this game, antenna company in B.C. was on strike and took six months to get started and set-up, so I am not that much of a help to your survey.

If I was to change my radio system, I would get a GRS service with one private channel crystal installed.

If we should have to share our frequency with someone in our area of about 75 miles, it would really hinder our operation because mostly of the annoyance and interference on the fringe lines of their conversations. We are on the same frequency as a cement company in Edmonton 150 miles away and it doesn't bother us at all being as they use their's mostly close to Edmonton and ours near Paradise Valley. We hear their conversations when we go to Edmonton and them when they come here. If we were to have someone on the same frequency half way between here and Edmonton, it would be bad.
I used to have CB radios, but the talk and skip on them bothered us so bad we sold them and bought these. Our base is in our farm home and we leave it on day and night and if we had someone else on our frequency, that would not be possible to do.

The radio system to us is of great value. The system saves us time and money. In farming today, efficiency is a major factor and the two-way radio is just one of many of the factors.

The range our business covers requires VHF radio equipment, but the number of units required for this system would bringe the cost to a prohibitive level at present.

Regulations regarding GRS equipment should be looked into and enforced.

We used GRS for three years and at its peak had a system with 40 units. However, with the usual problems of congestion and range of reception, we found it necessary to adopt a private system.

We have a family farm and our business is in a range of 30 miles, so we use the FM system - the only way to make sure of contact.

We are a small business and my wife and I work alone in isolated locations for long hours and since there is an element of risk in our business, the radio gives us a link to alleviate worry. Also, our hired help in the summer months are often very young - 16-18 years and inexperienced and the radio keeps them in touch if something should go wrong. The radio is not in constant use, but some days we use it very much and others none at all. The private radio or VHF we leased was necessary because GRS could not give us the range we needed. Also, we did not like the congestion on the GRS.

VHF radio system chosen over GRS mainly because of GRS's poor coverage, interference and congestion even though VHF was four to five times more expensive.

Radios with more output power and better frequencies which would be free of skip from the USA as it gets pretty strong at times.

Private license is too much money for the area that is covered in comparison to the license that is payed by GRS.

Equipment becomes obsolete too fast

We are quite satisfied with our system. It would almost be impossible to operate our business without our communication system.

During the last two or three years, interference has increased on VHF. Department of Transport investigators explain this is due to mix of two other transmissions resulting in our frequency. Can be overcome with "cavity" - expensive and reduces range.

Yes, I am very unhappy with GRS; that is why I went to Private. But, I retained GRS for short distances around farm and much too expensive to complete units in tractors, combines, etc. But as I said earlier, I am very unhappy with GRS as people use them for toys and most times channels are full of garbage and hard to get through.

We formerly had CB equipment and find that Private is well worth the extra cost. Our equipment is operated under the name of Hec-Way Ltd., Box 722, Minnedosa, Manitoba.

Would be very useful to be able to use more watt-power for mobile units.

Yes, I strongly believe that we should be allowed more than one base. Sorry I have not been that helpful to you as you can see from just getting started.

As you can see, area coverage and noise are our biggest problems and quite a problem too. Now our dealer tells us that even if we get an expensive radio, this will not be improved. We tend to believe him since our base is the most expensive and the worst offender as far as noise and distortion are concerned. The electronic set up in vehicles today is terrible so that when you set your radio to cut out this noise you cut down on the range. In a new vehicle, we cannot even play our A.M. radio when the suction fan is on high. This came this way from the factory. We can see a great need for mobile radios, but cannot see how area coverage and noise can be improved, and there is a great need for improvement in this area.

We hope to be able to get increased wattage output from the DOC in order that we may get longer range for base to mobile. Radio communications is very important to our business because we are not able to get adequate telephone service; eg. private lines. It is the only way to communicate because of the mobility of our business and saves us many miles in transportation costs.

All I can say is that purchasing on FM Johnston system is one of the best things we have done for the farm business. I have also recently bought one CB mobile unit for emergency purposes for highway travel, especially when leaving home territory.

Our units are G.E. - FM equipment. We had CB for ten years, but it was too noisy with interference. What we have now works good, but is expensive.

In ambulance work, it is not the average person's business who is sick, what is wrong with them, etc.; and in a small centre such as Melfort, the gossip system is well developed already, so our aim is as much privacy as possible.

I will likely have to buy different mobile units as the ones we now have may go out of service and availability. I operate on a business frequency and we receive very little interference, but we know other local taxi companies can at times read most of our calls on their base station.

Base station at place of business in town seems to be interference. Areal location 65-70 feet high (power transformer?) affecting range of transmitter receive.

We use a VHF system operating on 40 watts base, 20 watts mobiles. Our channel is 166.2900. There is one other party on the same channel that we hear on the base some of the time. I think the license fee is too high compared to CB. I do not think the cost is necessary. The units cost four times as much to purchase, but they are well worth the added cost.

Interference was bad on assigned frequency until very expensive modifications for channel guard were installed.

Radios which are installed in fork lifts give a lot of static and seem to have more problems reaching base than service trucks out in the country.

We are in the process of setting up the units for private radio not operating yet.

We also deal in communications products and we eventually want to trade up to all new units as we sell a few used ones. We started off with old RCMP FM radios. Eventually, as more farmers get FM radios on the farmer frequencies, then you will be able to talk to your neighbours when you have to.

I would not like to see too many licenses issued so the channels become congested on the FM band. I would not like to have to share my channel with anyone, so I may maintain privacy.

There are times it would be convenient to be able to switch to other channels. Travel is reduced. Can change plans quickly and everyone knows.

We the CB bands prior to this and found them absolutely useless due to interference and congestion channels. They have become a play toy and in our operation they became useless and this is the reason we went to the L.M. radios and private channel. We find that you cannot put a dollar value on the savings we get by being in contact with our operations at the different locations and the time that is saved as well as expense. We are really satisfied with out communications at the present time.

The system may be enlarged according to business growth and number of machines and vehicles in use. Our VHF system gives us very good service and the privacy we want for its use as a business investment.

We have a repeater installed at mid-point of our school division.

We have one farmer with five mobiles in USA that is about 100 miles south of the border that comes in louder on our mobiles than our base does even with the mobiles sitting beside a base. I think they are putting out far more power than the border commission allows. We have complained to DOC but no results. It also gets very irritating with their voices coming in on our base much louder than our own mobile.

Radio messages have increased service by us, therefore increased business. Mobile telephone inadequate due to terrain.

Excellent system for us.

I've had CB radios for 11 years and consider them totally inadequate for my needs.

Private radios should have more range.

Our two-way VHF is used mainly for paging or short question and answer conversation.

I have FM equipment. This works very good. I feel that one should be able to get more power for mobiles to increase range from mobile to mobile. As this is a lot of time, I have had to go through base to make contact. I would like to see about 80 watt mobiles. As for the CB frequency, the hobbyist has ruined their use. Also, I feel for the ones that are using it should use it properly with assigned call signs not ship names and limit their conversations to business.

If I did alter it, I would probably install a private FM station it if is still possible to get a frequency by that time. I would like to see higher standards put on GRS because they sometimes cross channel into our private AM channel.

I am very satisfied with our equipment and the people that installed it suggested the watts tower on a high knoll as a spot for the aerial and it has given us a good 60-mile radius, which makes the equipment very important to our operation.

We used the GRS system before changing to the private system and were very unhappy with interference and restricted range with the GRS. We would heartily recommend a private system to any person needing radio communication in their business; particularly in farming where an operator's land is not all in one parcel.

We are selling our base station and mobiles because they have never worked properly and it is very impossible and expensive to get them serviced. Mobiles are very convenient and helpful if you receive good quality ones.

Very seldom use our radios in off season. Our radios are sent in for check up and repair annually.

We have good service with our present system. Prior system was lousy service which seems common with most.

The private radio system is adequate for the practice in every possible way.

We have very poor repair service. Regina is the closest; they are overworked so it may take six months. To have minor work done, I should have two radios extra licenced as spare. We need more local technicians.

Would like to see a user handbook on generally available equipment and suggested areas and types of equipment for various operations.

I am very pleased with the operation of our private FM mobile system. I don't at present get the area coverage I would want, however, one aspect is that my antenna is not in the best location and suffer signal loss in one direction because of building obstruction.

We cannot transmit to Lloydminister from our location and this could be rectified by more power. Not really necessary, but might be useful.

Channel allocation system by MOT very poor - USA interference.

We previously had citizen band type radio equipment, but found it unsatisfactory due to lack of distance, noise, and interference. VHF is more costly, but much more receivable.

Would like to see Alberta Government Telephones install more relay stations in our south east area. If this is not done, will have to try some other system.

We have a private system and AGT mobiles; it is not possible due to equipment difference to tie these together.

We plan to increase our base station antenna from 100 feet to 200 feet and move it onto a hill. We will be requiring more units and maybe a two-channel operation. We have 1-channel unit in our van now and plan to put one in our trucks so we can talk to other truckers. The paging units are also private channel. We use Motorola FM units Freq. 154.44, 1-Mocom 70 base station 8-Mocom 35, three pagers for yard foremen. We also want to hook up for telephone to mobile. The base station is run by remotes in each of our homes and in the office - five units.

We would like to see the coverage reach about 50 to 60 miles.

Have more frequencies available.

Better control of license.

Repair costs are quite high.

We are very satisfied with our private system. The range is adequate, we feel it is superior to the GLMRS which we used in the past.

I would like to see more frequencies in order to accommodate more channels so only our own messages are received. More power in equipment would be very good.

We are very satisfied with our system.

I feel the most important aspect is a mobile of quality that has sufficient range to do the job required.

Frequencies should carry a bit farther than what it does now, especially from mobile to mobile unit.

In my radio two-way communications would be very suitable in remote regions.

With the large numbers of GRS units in operation and with their multi-band capabilities of monitoring all types of communication, I wonder if much more complicated license system should not be instituted. Several GRS operate in our area have routine monitoring of RCMP and local police communications.

Costs of frequent servicing of our equipment are hard to bear.

There is a movement a foot to put all emergency services in Alberta on a private system of their own. This would involve our company changing from low band VHF, most likely. I feel there should be stricter laws regarding the manufacture, distribution, sale and use of monitoring equipment.

I have just changed from private frequency of 27.45 MH2 GRS type units to 49.004 MH2 low band VHF units to eliminate questions #21, 19 and because GRS is moving up into the 27.45 MH2 range. The use of these radios saves at least 30,000 miles per year of driving between three units (mobile), plus being able to relay through base to telephone.

It is the only way to be able to fly and be compensated!

More control on the abusers of the radio. In the truck, we use channel 19. There is one fellow in Calgary who spends all his time whistling on the radio whenever someone wants to use that channel. This has been going on for months and nothing has been done about it.

Our system started with CB equipment 12 years ago. This has been modified to operate in the private commercial band. I will discard all of my present equipment and replace with high quality VHF equipment. New equipment may raise my range from 15 up to 50 miles. Congestion and lack of privacy may be more of a problem.

Use of remote control to achieve greater range by increased antenna height. Political decisions and friends are most helpful rather than true need in frequency assignment.

I admore and enjoy the two-way radio system.

I am considering discontinuing my private frequency and staying strictly on GRS, since my employment is changing. This will probably be in May 1977. In urban areas, it is becoming increasingly difficult to use radio because of "splash-over" from nearby radios. Some radios in Lemberg "splash" the entire 23 channels. Many conversations have to be terminated because of this. This happens with the base stations basically. In my opinion, channels are too close together and the result is that when "skip" comes in, adjacent channels are picked up causing greating "squeeling" than would be the case with a wider spacing.

Service poor and can never get machine to work to our satisfaction most of the time.

Remote units in the homes are a tremendous aid.

In farming, if you had two channels: one private and one to another farmer in the area, it would save some time in the busy season.

Only comment is that we are satisfied with them.

If possible, I would have the power increased, but they would only consider this if it were a commercial unit. Even if a private operator is just as big, they won't look at you. My VHF units cost around $1,200 a piece, but only have a range of 15 miles between mobiles.

I would add more mobile units and would like much greater range. Twenty-five to 30 miles rather than 10 to 15. Having used it for three seasons, we find it almost indispensable. On the other hand, the purchase price is almost prohibitive.

The CB's are cross-channelling on my private band; I'm in the 27 band. My frequency is 27,920. I mached my antennas to the radios and frequency.

Service is our biggest problem. That is why we have and will continue to update our equipment.

Further range to reach. Our radios are capable of reaching our main business centre, then the DOC cut our power back on our unit base.

We feel that a network of repeaters should be set up for us, to enable us to communicate with distant medical facilities and ambulance companies. In case of on-the-road problems with the patient or vehicle.

A.G.T. in northern Alberta are of no use, telephone in automobile is of no use. You cannot get on channel, same in Fort Nelson, B.C.

We feel that the license fees are too high; that is the reason why we haven't got a set in all our trucks and tractors.

Servicing for quality equipment is sorely lacking. I wish I knew a private concern who would have access to parts and could service our units.

Not enough power granted to rural users. Paging systems haven't enough range.

We are well pleased with our system.

Please advise on the findings of this survey.

This has been a real time-saving device and service is good; equipment trouble free.

At present, our privacy is satisfactory, but from a safety point of view, we would not tolerate someone else in our vicinity on the same frequency. If this happened, we would need to change our system.

I would like to have better area coverage for radios used in rural areas.

Privacy is important, monitoring a station which is public, to hear your own mobile is practically impossible. The long days on a tractor and all the unnecessary Bla-Bla makes one very tired.

We own Motorola Macom 35's. We find we have to wait for months and months for parts and servicing is non-existent out here.

We feel that the VHF systems should be over 100 miles apart, as we quite often get interference from Winnipeg station, due mainly to atmospheric conditions.

Radio telephone has not complete coverage of Manitoba, and not private enough to spend $2,300 plus operation, $30 per month. I can do better by FM private channel and somewhat at home with telephone. Also, CB's have lost their value as far as operating a farm and business our size, because too many play on these lines.

Would like to be able to connect with telephone system, even to be able to converse over the radio with someone on my own telephone.

It is my belief that antenna height should be maximum and feed line loss should be minimum. Also, output power should be no more on the base station than necessary (i.e. there is no point in having a greater range with the base station than you can get back with the mobiles). Radios in my business are a necessity. Before I had them many of my customers had to wait. Now this has been minimized.

Original cost is high, but savings are realized in time, gasoline and frustration.

In the level terrain that we have, we need the power that we have, but get interference from a range of over a 100 miles.

I find your questions 11 and 12 difficult to answer, because I have had my system for such a short time and because no day on the farm is typical.

For the mobile telephones a station is needed north-east of the Lashburn area. We are out of range for Blackfoot and Battleford.

Motorola extremely expensive, but excellent quality and privacy.

When the high skip is on there is too many using the radio, just playing with it. Trying to talk skip with fool names. That should not be allowed.

DOT often assigns frequencies too close together in area where few units are in use. Space more and fill in when required. I sometimes get interference from adjacent channel.

I use a system as business and rent only five to six months a year, because of my seasonal operation.

Our mobile radios are rented by month from A.G.T. and are satisfactory, except our frequency is not available as a private unshared frequency in all areas.

Two-way radios are one of the best investments I ever made in regards to the whole operation of the farm.

We have private commercial license with an assigned frequency. The only interference we get is skip once in awhile. As of yet, we are the only ones on this frequency in this area.

We use GRS too, having "talk to anyone" capabilities is of help at times. Mr. Jim Essex, manager of Calgary DOC office and his staff deserve thanks for their work and help to us all.

I just got my radio two months ago and I can't answer too many of your questions yet. I got my own private business band in CB radios, three channels.

Have never been interested in CB. Ours is strictly private. When they work, they are a time and energy saver, but with the licenses and upkeep rising with farm net incomes reducing, the radio may have to be deleted from the farm equipment. I think there should be more information and research on base and mobile antennae. Mountings for mobile sets - tractors, combines, swathers and heavy trucks also on reliable hand sets.

Our communication system is Motorola; they used to send repairmen around, but now they give very poor service and is very expensive and end up with the same problem shortly after.

A.G.T. mobile telephone communication is very poor in our area.

The greatest benefit to us would be top quality service closer than 150 miles distant.

Would like to have stronger or higher wattage units for better range from mobile to mobile and also mobile to base.

We like these radios as far as privacy is concerned, but I feel they cost too much for the area they cover. We had CB radios first for about three or four years, but they weren't reliable as there were too many around to hear. I drive back and forth to the farm as I am a farmer and live in town. So my sister and I have to be able to get in contact.

There should be lower cost FM service radios so more farmers could afford it.

Haven't got enough experience in radio communication.

Occasional interference from someone near Calgary, approximately 45-50 miles distant, who must have assigned frequency very close to mine. Otherwise, satisfied with equipment.

Very good. Satisfied.

We started with GRS and lack of control and congestion made it useless at certain times for business purposes.

Very useful especially "Private". Well worth the extra investment. Satisfied with type of communication.

Two mobiles are only part of a system that has a base and remote, three hand helds with carrier operated pager with a direct link from hand helds and base and one mobile to Police on a separate channel. They are used as part of security system and a normal maintenance operation. Mobiles as such are a link in the complete chain and must be considered as a portion of the whole, not as a separate part. The radios allow the complete operation to be voice linked together and 24 hour immediate availability of supervision staff.

Be nice if government towers would be available to increase range service to our unit.

If it wasn't private, it would be of no use.

All ambulance services should have one emergency frequency across Canada so that travelling inter-province in case of trouble, you can call the nearest station for assistance.

Service on our mobile equipment (Motorola) is next to nothing; if we cannot repair it ourselves, we are in trouble.

Private mobile, operating on a private oil company channel(s).

Very pleased with both the private and mobile telephone system.

The operating range of my equipment could be improved by allowing an increase in power output of the units, especially the mobile units.

We had use of CB at first and had nothing but trouble. Since we went to FM, we are very satisfied and are completely private, and having very little trouble. Our only problem is our nearest repair is over 100 miles away and in busy times you don't get there that often.

Possibly access to telephone system with the same privacy would be helpful.

Our sets have no interference and I am wondering if anyone can hear us, or if we interfere.

I would like to see information published on types of systems and ratings as to compare the system and cost of each, so a person could evaluate a system in his budget range.

Although the initial cost of our Motorola VHF radios was high, we feel the benefits derived over a period of years will more than justify the capital outlay.

Mobile equipment becomes more valuable the further from service centres and towns. Rising costs of fuel and labour make mobiles more attractive because it can reduce these.

The DOC licensing procedure is inflexible with respect to license fees, for example most agricultural based operations wish to purchase a system during winter season. For spring use, in order to get frequency allocation, they must pay license fees for two years, often before they have their equipment installed. This is a result of government fiscal timing together with dogmatic policy and no consideration for wasteful and inefficient procedures on the part of government administration.

Rather doubt if this is much use to you as mobile I have licensed is operated as taxi in Saskatoon.

Response on usage of mobiles, call frequency and duration is best estimate only. We have never done a usage survey on our existing system.

CB appeared to be a fad for a while, but now seems to be used more reasonably and should be good in a short time. We may be lucky here as the population is smaller than around the big cities.

Interference from Gainsborough, Sask. Mobile for there is off frequency or same frequency.

I would add another unit and better aerial system for better range. I have CB system with channels 5-23 and an assigned frequency on Channel 1. Channels 1, 2, 3, and 4 were taken out for this reason. This gives me a private channel and when skip is bad, I have very little or no problems at all on 1. This makes a pretty good system. If we want to communicate with others, we still have channels 5-23, which we use some. I don't use the radio much for fun talk like some do. But use it mostly for my business, as this is the reason i bought it. I hope this answer is good enough, as it is hard to answer some of them. Questions 11 and 12 seemed the same; also 14 and 15. If I can be of any help, I will try. I have two mobiles and one base.

At present time, we are not getting the range that we were told we could get. If the service man can't overcome the problem, perhaps we should change to a different make or even go to a FM system. Also at present, the noise is very high if the SQUELCH is too low.

Considering adding pager. Radios deteriorate rapidly and may need replacing. Present equipment cost around $5,000. Three of my mobiles are several years old. If one quits, it takes ten days to get it going. Technician labour charges $20 per hour. Have had trouble with side band emissions. A larger spacing between channels could help. Have had conversations spill over to one business and to the Alberta Government Telephones.

We are very pleased with our present system and do not anticipate changing to a better system.

We may go to FM if finances allow. We have AM private frequency (Band 30.820) which is not as clear as FM, but less than half the cost. We can legally boost our one mobile and base. We cannot find proper equipment so far.

The receiving and sending range is not large enough, as a lot of time we are not able to communicate to the end of our destination.

We would not be without our two-way radios if we could help it. They are very expensive when it comes to setting up a large fleet, but performance and service are good.

We bale flat straw in fall and when travelling on road with loads, my wife driving behind can see the loads and tires and tell me if everything is okay.

I am very satisfied with my two side hand units and reasonably pleased with my two AM radios.

More range and less interference from high voltage power lines. We find these radios play a very large part in the management of our operation.

We have been having a great deal of trouble with interference from Sask Tel mobile operators.

These questions are pretty dumb and I don't keep track of calls. I got them for the farm to cut down time for me.

I feel there should be more outlets to settling and repairing VHF radios to put more competition into the area.

We do have our own private FM base and mobiles. I would not even consider CB's, because of congestion. People use them as glorified toys and say absolutely nothing.

VHF costs too much.

We would like to have use of a repeater to call our mobiles when in Calgary. But still have mobile to mobile simplex at home, but DOC says that would require three frequencies. Our system has served us well. We started with tube equipment but have since upgraded to solid state. Our service has been almost nil on this equipment.

Probably add more mobiles to the system. Also, better quality units that are more clearly audible and also a more powerful antenna set up if costs are not prohibitive. Telephone tie in would be nice, but too expensive to have both a private system (which is essential) and a mobile telephone. Also, too much space is required to mount all that equipment into the mobile. If one unit had both telephone and private system combined, we would be interested.

Starter delays.

The FM radio system can be relied on 99% of the time.

Operate an assigned FM station with two mobiles. Units are Mocom 35's and are very reliable.

None except they are terrific and we don't know what we would do without them now.

We would like to get over the hill with the handsets.

I have a FM two-way 60 watts for $1,250 each and my range is about 30 miles, which I believe for the price and watts that it should go farther than that.

Free trade for communication equipment between Japan-Canada-USA. No reason why we should have to pay $1,200 for VHF radios.

I am a radio service technician myself and do this type of work during winter months; therefore, some of my data pertaining to service, etc. may be unusual.

Repair men are not efficient. I think they do not have enough knowledge on how to repair the system. Cost is also too high.

The radios were purchased after our busy season, so we are not sure of how they will perform. We had GRS equipment before which was not reliable enough for our needs.

I used to use GRS for my farming operation, but found congestion and skip noise rendered them unusable much of the time. Since switching to business band, I receive very little interference.

Since changing part of my system to VHF-FM, I could only be happier if they were cheaper.

I feel that at times a rotable directional antenna is of advantage in effecting contact in the 25 to 35 mile range. Otherwise, use a little more power.

I am satisfied with my units. Sometimes, I wish I could reach better from mobile to base.

A system that would work like a telephone, meaning that you wouldn't have to press a button to speak into and release the button to receive. A system which could receive a taped message when you are temporarily away from the radio and which would leave answering light on when you get back into your vehicle. A system which could be hooked up to a telephone at the base station so you could speak on the telephone from a mobile unit.

An asset to any farm operation.

In some cases, DOC should be more selective in allotting frequencies on FM. Units are expensive and privacy in my own case is important, because a retail business is carried on with a farm enterprise.

Mobile would be practically perfect with mobiles, can call between vehicles in fields, but can't call for repairs unless someone at base station to call for you.

The assignment of frequency for privacy has been excellent in my case. I consider my radio as a safeguard should an emergency arise, especially when working alone on the road in winter.

We have some CB interference and also have some interference with another outfit on the same frequency about 100 miles away. At the time, we feel it is too expensive to change our frequency.

God bless Marconi.

Only with the price of a private system, we feel we should have more distance made available to us.

With the private channel in our set, I would like to have the power boosted to at least 10 watts output.

We get a lot of use of our radios in the spring of the year at calving time. My brother at Eston has one and we communicate real well. (Cabri to Eston)

I have a private VHF frequency and a mobile telephone in one set works very well; also, have a CB unit for private use.

I have already cancelled my mobile telephone because service was terrible. I understand they sold 160 units for three channels in our area, as a result, it is next to impossible to get a channel. Many times when four or five miles from a telephone, I was able to drive to a phone before a mobile line cleared. Also, they used telephone operators to look after the mobiles rather than specially trained mobile operators. This decreased the service by at least 30%. Several times I spent better than five minutes calling the operator. As far as I am concerned, the mobile phone is best if we were serviced properly. All other systems are also very expensive and I haven't spoken to any users who are very pleased with their system, so as yet haven't made a purchase.

COMMENTS FROM GENERAL MOBILE USERS

It would be interesting to find out the type of system used in large centres (i.e. Las Angeles) in the States. If they can connect to mobile telephone congestion problem, why can't we?

Going to make use of GRS or Private system as well as mobile telephone system to improve coverage.

Often calls do not go through due to the operator not taking enough time in dialling.

Too expensive at $44.00 a month rental for a radio telephone. Also, calls are more expensive as they have to be handled through an operator.

Would like to see some restrictions on who and how long larger firms can hold up air time.

I feel companies such as A.G.T. are renting out too many units. At times it isn't possible to use their equipment. Also, I think they are out dated and they are flooding their surplus onto the public.

When travelling, I find a number of out-of-range areas (Regina to Watson, Choiceland to Prince Albert). These are areas that I travel quite frequently.

Come up and see where we live. Don't send any more forms.

During winter months, circuits are overloaded. So busy that it is almost impossible to phone in or out.

Yes, found that considerable congestion was due to idle chatter on available channels in rural areas.

Rates for rental are getting too high; a much better and more fair method would be to charge according to amount of use.

I will likely remove units as cost is fast outweighing benefits and new systems require more operator time and I don't like operator-handled calls, because the operators are too ignorant of operation.

We are happy with our mobile telephone, but cannot see why there isn't better coverage, especially in the north. We go through Thompson, Manitoba to get home here to Tisdale and there is no reason why Sask Tel cannot provide coverage like this for the north.

At present, it is expensive, but useful. Would prefer more coverage (a base unit at Outlook would be useful).

In an area such as here, where we have oil fields and farming, one local channel is very insufficient. I have waited as long as two hours to get the local channel to complete a call.

Impossible to answer questions 11 and 12. Calls are made when the need arises.

Operators do not let vehicle horn operate long enough to give you time to answer.

Is it possible to have extra towers for winter operations in northern areas. Maybe cities like Edmonton could have special channels for oil and gas companies only.

When you receive calls and need more information, operators disconnect lines. Operators do not let phones ring long enough for us to answer.

Generally satisfactory.

A.G.T. has good equipment and excellent service.

The questions not answered are because they don't apply or because there is no reasonable answer.

My mobile telephone unit is just fine except our lack of adequate number of channels make existing channels too congested. Certain areas are hard or impossible to reach any call towers. This includes urban areas.

I am satisfied with system as is now.

I feel a lot of calls are never tried by the operator. They seem very slack.

A very important asset in my business.

Wish that I could be reached when outside of the area of my local tower. Operators could automatically try an adjacent channel.

During winter months, we operate near Fox Valley, Saskatchewan. In this area, we are unable to use mobiles; out of range.

In the area from which I have been making most of my calls from my mobile phone in the past 18 months, I have found that about 90% of the time I have been able to reach the A.G.T. operator and person I wish to speak to with reasonable ease, and usually on a choice of two to three channels, but during the same period of time, while in the same location, persons wishing to reach me on my mobile phone have found that most of the time it is very difficult or impossible to reach me.

I am very satisfied with the service I get from A.G.T.

It serves my purpose well; what else can we ask for?

We have a problem getting out of about a 300-400 ft valley at a reasonable cost.

We now have a 25-mile range in this area and my travelling takes me into the mountains where I cannot get reception. If this was improved, it would help considerably.

We need more towers north of Bonnyville because of oil field work in winter months.

We find a lot of dead spots in our operation where we are unable to receive or place calls.

More compact units and longer ranges on different channels.

New dial mobile facilities would be a great convenience.

If with GLMRS range and channels could be increased, a secondary system may not be necessary.

No comments, but would appreciate outcome of survey.

Occassionally operator response is lacking; chronically in some stations, i.e. Grande Prairie when calling mobile to land telephone terminal.

Am well satisfied with my GLMRS, but it is too costly to call, even in the immediate close area.

Our present system is too expensive and lack coverage, since most of our calls are directed to our head office, multi-way communication (RCCMRS) would be desirable.

In my district of Domremy, I seem to be out of transmission reach to the Prince Albert stations. Quite often the station can call, but our signal back is too weak to be heard.

More channels needed. Some of the areas of Alberta have poor reception, more remote towers needed.

Service through A.G.T. here leave things to be desired. Channels are also hard to get.

Our mobile radios, installed in our two vehicles are for ambulance service only. Ours is not a large business and our radios are used very little, as we are not busy. As much as a week can go by without use of ambulances or radio telephones.

As we make use of the unit for only one week in June, the above information may not be of much use in your survey.

Experience indicates that telephone operators are not well trained in placing mobile calls and many calls that should be completed are not because of the operator's inexperience.

Not enough coverage provided by telephone company.

The mobile service could be greatly improved by allowing more time for mobile owners to answer incoming mobile calls, also for mobile users with small businesses where work is seasonal, the rental rates seem quite expensive. If the mobile radio is removed from the unit until work picks up, then the mobile phone number is cancelled thus wasting all business cards and stationery with that number.

Phone is installed for emergency service mostly, which may never be used.

Get someone besides a government employee to write up a simpler form, i.e. pages 1, 2, and 3. Last two pages okay.

We need quicker repair service. You have to wait two weeks usually to get repairs done or whenever it is convenient for repair shop and you still have to pay lease.

We had unit removed due to inability to use when really needed and we felt the cost did not justify having it.

The area I cover is roughly 150 x 50 miles; I can't seem to get any system to completely cover that area; mobile phone is the closest. But I must phone five different communities on four different exchanges, none of which are the one in which the mobile owner is located, so I have long distance charges to pay as well as the basic, even if I phone my home base. It's too bad something couldn't be worked out to keep down the expenses. If this were to happen, I would be using the phone a lot more.

Would appreciate a copy of your study; only you have tabulated results and make recommendations.

Poor radio service in southeastern Manitoba because of towers being too far apart.

Try to get a GLMRS with a dial system direct to telephones communications.

I used the mobile for six months, only while I was on 24-hour call and found it very useful and by renting, I found that the price was right. Once I was no longer on call, the cost was a good incentive to give up the radio.

Most mobile equipment is such that in this area one is either out of range or the terrain is such that the mobile is useless. Need more sophisticated, long-range equipment.

A.G.T. wants too much money to implement the RCCMRS system for us.

Service is generally very good. Exceptionally pleasant.

When A.G.T. adds more channels to their GLMRS system, I will seek newer equipment. In the remote area where I live, two emergency calls per year of a life-saving nature more than offset the rental costs.

Congestion on the existing four channels in our area is so severe that it can take a couple of hours to get a free channel.

Our telephone mobile base in Minadosa should have more operators so they would answer faster when rung. While up north, service was excellent. But I have complained earlier and nothing has been done.

I will no doubt be cancelling my mobile telephone, because Sask Tel has seen fit to change the rate schedule to the disadvantage of the farmer, or small user. The new structure idea is alright had the fixed rental been lower. I feel my bill will rise 25%. I am extremely disappointed as I needed this service and now can't afford it.

We should only pay for each call we make at $1.00 or so per call, with no rental for service and let the people who use this for fun pay the shot.

Lower rental and privacy (one side of call blanked out).

We find the mobile phone monthly rental high, as our heavy usage is in May and September with usage for the balance of the year considerably less.

Get Sask Tel to improve their system.

Telephone system has too many areas of no service to be of true benefit. Also, a mobile telephone should be leased from your home number and calls in that exchange should be toll free; any calls outside of that exchange should be subject to long distance charges.

Need more channels.

Mobile telephone costs are almost making the service prohibitive.

I find that mobile telephone outranks other systems for communications. Sask Tel service is very good and there is a mobile outlet in every strategic part of the province. In our area, there are not very many of these phones because of the cost of rent which releases the congestion of use.

I will stop renting and purchase my own. Rental is far too expensive. I am disappointed in the fact that it costs so much to have a mobile telephone and some horse's ass can dial me in on a four-band radio that only costs him $50.00.

I think possibly a buzzer that I could carry with me that would let me know if I was called while out of touch would be a big help.

If I ever use it again (which I doubt), I would own my equipment. My main objection is to be reached by the family at home. They don't know how to find me. Out of province use is hopeless. I called from Newfoundland to Vancouver okay. However, in five months, I got calls in at which time the kids knew exactly where I was. In Quebec, if you don't speak French, forget it. I love the French people. They treated us 100%, but on mobile service if I gave a number 3574, they would call the 7 a 4 and the 3 a 6 or anything but what I gave them. Then they called my number in Kindersley and I was in Quebec. Just couldn't understand me and it was an English-speaking operator.

If the coverage was better my mobile phone would get considerably more use. Half of the time I cannot be reached or cannot call out.

Mobile telephone operators should be more qualified and more willing to assist the customer.

We are unable to get other units; operators always say he is out of the area when we know he is not.

My only comment is when going across Canada, I do not know what stations are in the area or what the call letters are. Also, some provinces charge for each call and others are free.

If Saskatchewan Government are going to issue close A Ambulance Licenses to others than high frequency such as CB radios, why should I have the more costly to obtain same license rating. I think the government are lowering the quality of our ambulance. Vehicles used for ambulance, private or otherwise, should pay less.

An improvement in mobile operator training would be beneficial. Particularly, dealing with 24-hour answering services.

I will likely remove units as cost is fast outweighing benefits and new systems require more operator time and I don't like operator-handled calls, because the operators are too ignorant of operation.

Would like to suggest a peeping system on conversations when mobile is used. Would make it more private.

Using business channels for strictly business (instead of exchanging menus or giving the old man hell) for short periods only.

System needs a complete overhaul and users should have to qualify to get mobile telephones. Too many social calls on system.

I feel the province should have better coverage. If I am not working near a large urban centre or in an oil producing area, my mobile is of little value.

Have a system to dial your own numbers rather than going through an operator.

COMMENTS FROM PAGING USERS

The paging system is used almost every day. (Lab call backs, doctor, Jubilee lodge, ambulance driver, maintenance man.) Excellent system.

We have had problems with distance we can cover with two-way pagers, due to fact some of the equipment only temporary, due to hospital construction. Expect this to be corrected this month.

I use my radio for personal use and not very often.

I had a GLMRS in my truck. It cost too much per month for the amount I used it and the channels were always busy. People calling me on the mobile got frustrated because telephone operators gave them a rough time. I have an automatic telephone answered (Code-A-Phone) on my telephone requesting people to call the pager service (TAS-Telephone Answering Service) but they never do.

COMMENTS FROM RCCMRS USERS

Would almost impossible to operate without radio communication.

We use 60 watt radios. We need 90 watt radios for more range.

Our system is AGT leased. Equipment is returned to AGT after peak season - twice - serviced then our bands are strictly seasonal.

Addition of Radio-telephone to cover areas outside of RCCMRS system. Increasing usage of mobile radio service is causing congestion, but needed for most industries and businesses.

System works well - to 50 mile radius from repeater (not from base). Base is our most southern limit of operation.

Instant communication between base and truck units, saving on gas, better and quicker service to customers increase business.

In reference to question 14 and 15, emergency calls are increased in summer period, due to fire hazard in forested areas.

We rent from AGT and are well satisfied except the cost is high. We use our sets from May 24 to Sept. 24. We have a base station, a mobile unit in each tour boat and one mobile hand set. Our range is 20 miles and we rarely have any interference.

You ask too many questions.

What is a government subsidized corporation such as AGT doing competing with private business firms in providing rental at very low cost due to mass buying?

I used a horn call in Alberta AGT, which was considerably better as you didn't have to be in your unit to here a call come in.

We have to little off channels available to us in comparison to radio users. At times we have to wait 2-3 hours to get a channel, which is very time consuming, and costly. Also certain channels should be available only for personal family calls.

By owning my own radios, I could buy a more expensive radio, than the ones I lease from AGT and I think get a better coverage in my work. I am interested as to why we have so many dead areas, where one cannot receive or send from.