

**VOLUME ONE**  
BASE CONDITIONS

# WINNIPEG AREA TRANSPORTATION STUDY

Prepared for  
The Council of the Metropolitan Corporation of  
Greater Winnipeg

by  
**The Streets and Transit Division**  
**Transportation Planning Branch**  
**Streets and Traffic Department**  
February 1966

## FOREWARD

Throughout the recorded history of Western Canada the junction of the Red and Assiniboine Rivers, the site of Greater Winnipeg, has been an important strategic location. Here fur trading interests, travelling by water routes from Montreal, established a post in 1738 and called it Fort Rouge.

The first agricultural settlement in the area was established in 1812 when Lord Selkirk brought settlers from Scotland and located them in Point Douglas on the Red River not far north of its junction with the Assiniboine River.

The colony managed to survive in spite of severe difficulties but substantial settlement and agricultural development in Western Canada did not begin until Confederation in 1867 and the subsequent era of railroad building. The decision to route the main line of the C.P.R. through Winnipeg and establish its shops in the growing community assured that the strategic advantages conferred by water transportation would be maintained by the rails. In 1873, with a population of approximately 3,000 people, the community was incorporated as the City of Winnipeg.

Continued railroad construction and an aggressive immigration policy, along with the disappearance of free land in the Western United States, resulted in rapid settlement of the Canadian prairies particularly after 1900. Winnipeg as the transportation centre of the prairies grew with equal rapidity, particularly with respect to warehousing and wholesaling functions.

Boom conditions prevailed prior to World War I and, in addition to a great deal of private development, the City embarked on a major public works program which included the construction of municipal hospitals, hydro-electric developments on the Winnipeg River, bridges across the Red and Assiniboine Rivers, an extensive system of public parks and the beginning of an aqueduct from Shoal Lake to provide an assured supply of fresh water. Electric street car lines, operated by the private Winnipeg Electric Street Railway Company, fanned out on radial routes from the City Centre and helped to spark the speculative real estate boom which saw subdivisions laid out at distances of up to twelve miles from the central area.

All this activity was brought to a halt by World War I. After the war the improvement in the economy of Western Canada brought renewed activity in the City in the middle and latter 1920's but the great depression of the 1930s, accompanied by widespread drought on the prairies, brought staggering economic problems to the West.

Ten years of depression were followed by World War II and an immediate acceleration of economic activity, particularly in those fields related to the war effort. The economy of Western Canada continued to expand and diversify after the war and the population of the urban centres increased rapidly due to immigration, natural increase and the rural-urban migration which accompanied the mechanization of agriculture.

However, sixteen years of depression and war had brought public works activities to a standstill and in some respects the Greater Winnipeg area was not well equipped to cope with the problems of increasing urban development. In particular, many of the suburban areas, some of which had been the scenes of limited and modest housing development, now began to attract large scale housing, commercial and industrial developments. This trend became accentuated as

the City proper filled up.

Problems existing or anticipated began to engage the attention of both the local and Provincial Governments with respect to such matters as power supply, river pollution, public transportation and other inter-municipal transportation facilities and similar services of an area wide nature. Government sponsored studies of one sort or another were carried out during the 1950's and as urban growth and development continued unabated, the Provincial Government in 1955 appointed the Greater Winnipeg Investigating Commission to consider and report on the problems of local government in the metropolitan community.

After a most intensive study the Commission recommended a substantial reorganization of municipal boundaries in the Greater Winnipeg area and the establishment of a Metropolitan form of government to administer a number of public services of an area-wide nature. Legislation was subsequently enacted by the Provincial Government which established The Metropolitan Corporation of Greater Winnipeg but which did not alter existing municipal boundaries.

The first elected Metropolitan Council took office on November 1, 1960, and assumed jurisdiction over a number of metropolitan services in the following year. These services included land use planning along with zoning and building controls, the disposal of waste and the wholesale supply of water to the member municipalities, major parks and civil defence, assessments, public transportation and a system of major or Metropolitan Streets.

It is with the administration of these last two mentioned services that the Streets and Transit Division of the Corporation is concerned. This Division is comprised of two Departments — the Transit Department which operates and maintains the public transportation system for the entire Metropolitan Area and the Streets and Traffic Department which is responsible for the planning, design, supervision of construction and maintenance of the Metropolitan Street System and for the traffic operations and control thereon. Thus the Streets and Transit Division represents a public service agency which is probably unique for both public and private intra-urban transportation is carried out within the framework of a single organization.

In 1962, the recognition of one of the major responsibilities of this Division, that of planning the orderly development of transportation facilities for the future, it was considered essential to undertake a comprehensive study of future transportation requirements for Metropolitan Winnipeg. It is only by establishing needs and determining the types of facilities required to meet these needs well in advance, that capital investment in transportation improvements can proceed in a regulated manner. It is our hope that the Winnipeg Area Transportation Study will constitute a major contribution to the sound and orderly development of Metropolitan Winnipeg.

## ACKNOWLEDGEMENTS

The completion of this first phase of the Winnipeg Area Transportation Study was made possible through the assistance and co-operation of many organizations, agencies and individuals. Particular acknowledgement must be given to the Planning, Assessment and Finance Divisions of the Metropolitan Corporation of Greater Winnipeg who provided not only their co-operation but also the time of their staff members who organized the gathering of much of the information contained in this report.

In addition, the following organizations outside the Corporation made their files and facilities available during the stages of data collection and processing:

Motor Vehicle Branch — Province of Manitoba

Manitoba Hydro Tabulation Centre

City of Winnipeg Tabulation Centre

Highways Branch — Province of Manitoba

Registration and Planning Offices — University of Manitoba

National Employment Service

Dominion Bureau of Statistics

Administrative staffs of the various Cities and Municipalities comprising Metropolitan Winnipeg.

Finally, sincere appreciation is extended to the citizens of Metropolitan Winnipeg and the many firms and industries who readily responded to interviews and questionnaires which provided the information necessary to complete this phase of the Transportation Study.

## INTRODUCTION

One of the major responsibilities of the Streets and Transit Committee is the consideration of capital expenditures for the construction of transportation facilities in the metropolitan area for recommendation to the Metropolitan Council. By the spring of 1962, this Committee had already recommended two major capital works programs subsequently approved by the Council involving the construction of roads, bridges and related facilities.

Growth in Metropolitan Winnipeg in the post war period indicated a possible doubling of population by the year 2000. Accompanying this growth, will be demands for transportation facilities to meet the needs of this expanding community necessitating the expenditures of large sums of money. It is important that these monies be spent on projects determined on a priority needs basis to improve transportation conditions but it is equally important that these investments of capital be made in facilities that can be integrated with future stages of the transportation system.

Recognizing this need, the Streets and Transit Committee authorized the Streets and Transit Division to undertake a comprehensive transportation study to investigate and report on the anticipated transportation needs of the metropolitan area to the year 1986. Accordingly the terms of reference established for this study were:

1. To determine the present travel patterns and the characteristics of existing transportation facilities
2. To forecast future travel conditions
3. To develop a transportation plan which could be staged to meet the transportation needs of this area during the next quarter century.

Since the function of urban transportation is to move people and goods efficiently and not just to move vehicles, this study has been designed to investigate both public and private modes of transportation. The objective of the study is to develop a program for an efficient, rational transportation system designed to meet the transportation and development requirements of the metropolitan area.

The first phase of the study involved the gathering of data to describe existing conditions including the characteristics of land use which influence travel patterns themselves and an analysis of the transportation facilities available at that time. This phase of the study is now complete and the findings are summarized in this report. This first report will be followed by two others reporting on the second and third phases of the study.

As part of the second phase of the study, work has been underway for about a year on the development of relationships between travel habits and land use and related characteristics in Metropolitan Winnipeg. The second report, therefore, will analyze factors influencing travel in the metropolitan area and from this analysis a mathematical model will be developed to simulate existing travel patterns.

The third phase of the study will utilize the mathematical model to correlate the relationships between land use and travel habits with anticipated future land use and economic development of the area to develop projections of future travel patterns. Accordingly, the third report will include predictions of future growth and travel patterns which will be the basis for testing the need for, and adequacy of, various transportation plans. The final objective of the third report will be to recommend a rational transportation system and implementation program staged to meet the developing travel needs of the metropolitan area.

## STUDY DESIGN

In order that a study of this scope and depth can be carried out successfully, predetermined guide lines must be set up to ensure the proper inter-relationship of successive study phases. A basic format for carrying out a comprehensive transportation study has evolved in recent years through research and experience gained in transportation studies in a number of major metropolitan areas. Although general guide lines for study procedures have been established, additional procedures must be developed to account for local conditions which demand the experience and knowledge of local staff.

Transportation studies carried out in the last decade have generally followed a format involving three phases as follows:

### Phase I

A study area is defined and an inventory of existing base year conditions is prepared which includes such items as land use, population, employment, vehicle registration, transportation facilities and travel statistics.

### Phase II

Relationships are developed between base year travel patterns and demands and base year conditions.

### Phase III

Predictions of future conditions and travel demands are made based on the relationships developed in Phase II. Then, alternative transportation plans are tested and evaluated to determine a plan which will most satisfactorily accommodate these future travel requirements.

Details of these general procedures will be explained and illustrated in this and subsequent publications. This first volume, however, deals solely with the inventory of base conditions and as such provides the background data and facts for later phases of the study.

## BASE INVENTORIES

Three broad basic inventories were necessary to accurately portray existing conditions in Metropolitan Winnipeg at the time of the study. These included inventories of land use, transportation facilities and travel patterns.

The land use inventory, besides locating areas of various land use activity, also included such related statistics as population, employment, families, dwelling units and vehicle registration. The two prime sources for most of this information were the Planning and Assessment Divisions of the Metropolitan Corporation.

The transportation facility inventory included a thorough check on both the supply and adequacy of transportation facilities available for both private automobile and transit travel. The information for this survey was obtained by this Division.

The third inventory, that of existing travel patterns in the metropolitan area, required a decision as to the type of travel investigation to be undertaken. From a study of volume distribution throughout the day it became quite evident that any existing travel problems in Metropolitan Winnipeg were primarily

concentrated within the periods of 7 to 9 in the morning and 4 to 6 in the afternoon. Furthermore, there was no indication that these periods of the day would not continue to offer the greatest resistance to travel in the future and that future transportation facilities would have to be designed to accommodate these periods of travel. Subsequently it was decided that the study would concentrate on peak hour activity in the metropolitan area. It was further decided that since the home-to-work and work-to-home trip represented the greater majority of total trips during the peak hours, these trips would form the basis for developing trip patterns or desires for the peak hours. Having made these decisions, a work trip origin-destination home interview survey was then conducted. This survey was carried out by utilizing personnel hired annually by the Assessment Division of the Metropolitan Corporation and other area cities and municipalities to do enumeration work for the annual preparation of voters' lists. Each household in the study area (a 100 per cent survey) was canvassed and in addition to the enumeration questions, all employed occupants were queried on their work trip habits. The questions relating to their work trip travel patterns included place of residence, place of work, time of departure for work, time of arrival at home from work and mode of travel to and from work. The summary of this information resulted in the production of a detailed and accurate picture of work trip patterns in the metropolitan area for any desired period of the day.

As will be described in some detail later in this report, the difference in total volume between the A.M. and P.M. peak hours of travel is not substantial. However, work trips account for a larger majority of the trips in the morning peak hour than in the afternoon peak hour. Therefore, a higher level of confidence can be gained in the development of peak hour total trip patterns if the A.M. peak hour work trips are utilized. In addition, future projections of total peak hour patterns are simplified since they involve, primarily, trips to work. It was for this reason that the A.M. peak period from 7:30 to 8:30 was chosen as the design period for this transportation study.

---

# THE STUDY AREA

---

## **METROPOLITAN WINNIPEG'S LOCATION**

Metropolitan Winnipeg, Canada's fourth largest metropolitan area, is located at the confluence of the Red and Assiniboine Rivers in the south-central portion of the Province of Manitoba. Its census area population of 475,99 recorded by the Dominion Bureau of Statistics in 1961 represents better than half the total population of the Province. However, although of considerable size itself, the Metropolitan Winnipeg area in a geographical sense is relatively isolated. Its nearest major cities are Regina, Saskatchewan 460 miles to the south-east and Fort William-Port Arthur, Ontario at the head of the Great Lakes approximately 440 miles to the east.

Throughout its history, Metropolitan Winnipeg has held a position of considerable importance as a major transportation center in Canada's east-west transportation network. The rugged topographical barriers to the north and the proximity of the American border to the south have made it quite natural for all ground travel of persons and goods between Eastern and Western Canada to be funnelled through the Winnipeg area. The main transcontinental lines of both major railroads, the Canadian Pacific and Canadian National, pass through the metropolitan area. In addition, these railroads have established Metropolitan Winnipeg as headquarters for their western Canadian operations. The Trans-Canada Highway, another important link in Canada's national transportation system, also passes through the Metropolitan Winnipeg area.

Because of its geographic isolation, the influence of Metropolitan Winnipeg probably extends over a larger area than cities of comparable size in other regions of Canada or the United States. Besides being the largest grain center on the North American continent, Metropolitan Winnipeg stands as the cultural, financial, commercial, wholesale and manufacturing center of the Canadian mid-west.

## HISTORICAL TREND COMPARISONS

### POPULATION INDEX

Statistics published by the Dominion Bureau of Statistics reveal that Canada's population of 10,376,786 in 1931 has increased by 76 percent to 18,238,247 in 1961. The population of the Province of Manitoba, however, has increased by only 32 percent in the same 30 year period indicating a much lower population growth rate than Canada as a whole. Metropolitan Winnipeg during the same 1931 to 1961 period experienced a population growth of 62 percent which was almost double the Manitoba growth rate and just 14 percent less than the national average. Over the last 20 years, Metropolitan Winnipeg's growth has been very near the Canadian average. This latest population growth trend, however, is still considerably lower than that experienced by many other larger metropolitan areas in Canada. For example, in the 10 year census period 1951 to 1961, Metropolitan Winnipeg experienced a population growth of 34.4 percent as compared to Toronto's 63.3 percent, Montreal's 51.2 percent and Vancouver's 40.6 percent during the same period.

### LABOR FORCE INDEX

Labor force statistics for particular geographic areas can generally be directly related to the population of the respective areas. The illustration on the opposite page shows that the graphs of labor force index are very similar to those of population index for the areas involved. The Province of Manitoba again indicates a lower growth rate than the national average and Metropolitan Winnipeg shows a growth rate almost comparable to the Canadian rate for the 30 year period. In fact, during the decade 1951 to 1961, the labor force growth rate for Metropolitan Winnipeg exceeded that of Canada as a whole. In comparing the labor force per capita has not remained constant, but has actually declined over the 30 year period 1931 to 1961. For example, while Canada experienced an increase in population of 76 percent over this period, it only experienced an increase of 65 percent in labor force. This decline in labor force per capita can be largely explained by the continuing increase in teen-age and senior citizen groups in the population age distribution and the decrease in male participation in the labor force for ages 14 to 19, 20 to 24 and 65 plus.

### WAGE PER WAGE EARNER INDEX

Although remaining almost static for the period between 1931 and 1941, the average annual wage per wage earner in Canada increased 275 percent from \$848 in 1931 to \$3,182 in 1961. The Province of Manitoba has kept very close pace with the national average, recording an increase of 260 percent from the \$847 received in 1931 to the \$3,044 received on the average in 1961. the rate of growth of wage per wage earner recorded for metropolitan Winnipeg as compared to the Province of Manitoba and Canada as a whole, is rather misleading. While it is true that the wage per wage earner in Metropolitan Winnipeg increased only 227 percent from 1931 to 1961 it should be pointed out that the average annual wage per wage earning in Metropolitan Winnipeg in 1931 was \$988. This figure is considerably higher than that recorded for Canada or the Province of Manitoba for that year. Increasing this figure by 227 percent results in a recorded \$3,235 annual wage per wage earner in Metropolitan Winnipeg for 1961. This figure is again higher than that recorded for the Province of Manitoba or Canada as a whole for the same year.

## **AUTOMOBILE REGISTRATION INDEX**

Automobile registrations in Canada have risen from 1,030,594 in 1931 to 4,325,682 in 1961, an increase of 320 percent. The major increases in automobile registrations have taken place within the last decade or so. From 1951 to 1961 automobile registrations in Canada increased approximately 106 percent. Metropolitan Winnipeg's growth in automobile registrations has closely paralleled that of the national average. The Province of Manitoba on the other hand has not experienced as rapid a growth in automobile registrations as has Canada as a whole or Metropolitan Winnipeg. Its registrations have increased only 247 percent in the 30 year period 1931 to 1961 as compared to 320 percent increase recorded for all of Canada.

## **HISTORICAL TRENDS IN METROPOLITAN WINNIPEG**

### **POPULATION**

In 1901, the population of Metropolitan Winnipeg was approximately 48,000. In 1961, the Dominion Bureau of Statistics recorded a population of 475,989 for the Metropolitan Winnipeg Census Area. In 1901 the Metropolitan Winnipeg area comprised only 19 percent of the provincial population of 255,211. Over the past 60 or so years this percentage has steadily increased to the point where in 1961, the Metropolitan Winnipeg population represented roughly 52 percent of the total provincial population. At present there are no indications that this trend towards urbanized living will be reversed and it can be expected that for the foreseeable future the metropolitan population as a percentage of the Manitoba population will continue to increase.

### **LABOR FORCE**

The trends in labor force growth for both Metropolitan Winnipeg and the Province very nearly parallel the population growth for the respective areas. The metropolitan labor force in 1901 was recorded at approximately 21,000. This figure has increased almost linearly to the 194,000 recorded in 1961, representing a growth of 4 percent per year compounded annually over the 60 year period.

### **INCOME**

Average income in Metropolitan Winnipeg, as in the rest of Canada, has of course increased dramatically since the early 1900's. The average annual wage per wage earner in Metropolitan Winnipeg in 1901 as recorded by the Dominion Bureau of Statistics was approximately \$500. From \$500, the average annual wage in Metropolitan Winnipeg rose to \$1,217 in 1921. During the depression and early war years between 1921 and 1941 there was actually a decrease in average annual wage per wage earner. The wage earner in 1941 earned about \$200 per year less than he did in 1921. The period from 1941 to the present, however, has seen considerable growth in annual wages. From \$1,000 in 1941, the average annual wage in Metropolitan Winnipeg has risen to \$3,235 in 1961. This approximates a 225 percent increase in 20 years or an increase of approximately 6 percent per year compounded annually.

### **TRANSPORTATION**

The trend towards increased use of the private vehicle for travel rather than public transportation has been evidenced for some time in Metropolitan Winnipeg. Since 1946 when a peak figure of 328 transit rides per capita per year was recorded, there has been a continuous decline in per capita usage of transit to the 119 rides per capita registered in 1961. Decline in transit usage within the last few years has been at a much slower rate than experienced in the period 1946 to 1961 and in fact indicates that transit rides per capita per year in Metropolitan Winnipeg appear to be levelling off at approximately 116. In 1946, at the time of peak transit usage, there were 11.1 persons for each automobile registered. In 1961 this figure was 4.3 persons per automobile and registrations were increasing rapidly. Much of the decrease in per capita transit usage experienced since 1946 can of course be directly attributed to this increasing availability of the automobile for trip making. All present trends indicate that the availability and use of the automobile will continue to increase. Therefore, public

transportation will have to be made more competitive with the private automobile if it is to become an attractive alternative mode of intra-city travel.

## LOCAL GOVERNMENT AREAS

The cities, towns and municipalities comprising or lying within the immediate vicinity of Metropolitan Winnipeg are shown in the illustration opposite. At the time of study, the Metropolitan Corporation of Greater Winnipeg as an area government extended over nineteen municipalities. Eleven municipalities were wholly within the Metropolitan boundaries: Winnipeg, St. James, St. Boniface, West and East Kildonan, Fort Garry, Transcona, Tuxedo, Old and North Kildonan and Brooklands. Five have considerable portions within the boundaries: St. Vital, Charleswood, Assiniboia and West and East St. Paul. Three municipalities had only slight portions within the boundaries: Rosser, MacDonald and Springfield. In 1964, an amendment to the Metropolitan Winnipeg Act deleted the municipalities of West and East St. Paul, Rosser, MacDonald and Springfield from the Metropolitan Winnipeg Area.

The City of Winnipeg, the capital city of the Province of Manitoba, contains by far the largest population of any of the municipalities in the metropolitan area. Winnipeg's population at the time of study was 256,622, representing approximately 55 percent of the total metropolitan area population. At the present time, it provides the great majority of the medical, cultural, recreational, public service and commercial facilities now available to the metropolitan population. It is not surprising, therefore, that better than 70 percent of the metropolitan area labour force finds employment within the City of Winnipeg.

The following table indicates some general statistics concerning the various political areas in the transportation study area. It should be pointed out that the study area does not coincide with the Metropolitan Winnipeg Census Area nor with the political boundary of Metropolitan Winnipeg. The study area embodies what is considered to be the substantially urbanized portion of the Metropolitan Winnipeg area and vicinity. As such, it includes only portions of some municipalities. The exact definition of the transportation study area boundary is illustrated on subsequent pages of this report.

Municipality	Total Area (Sq. Miles)	Area Included in Study (Sq. Miles)	Land In Urban Use (Sq. Miles)	Study Population
Assiniboia	33.5	13.2	2.1	8,039
Brooklands	1.0	1.0	0.6	4,307
Charleswood	36.7	15.1	2.4	6,458
East Kildonan	3.2	3.2	2.5	27,600
East St. Paul	16.4	2.2	0.4	1,982
Fort Garry	26.8	18.9	4.0	18,359
North Kildonan	9.3	9.3	1.7	9,460
Old Kildonan	9.4	9.4	0.6	1,315
Rosser	163.0	1.5		
St. Boniface	18.2	17.7	7.1	37,866
St. James	8.0	8.0	4.3	34,030
		170.7	59.4	471,400

<b>Municipality</b>	<b>Total Area (Sq. Miles)</b>	<b>Area Included in Study (Sq. Miles)</b>	<b>Land In Urban Use (Sq. Miles)</b>	<b>Study Population</b>
St. Vital	22.6	17.9	4.0	26,754
Transcona	8.6	8.6	3.5	15,202
Tuxedo	7.2	7.2	1.5	1,635
West Kildonan	2.8	2.8	1.9	19,980
West St. Paul	31.6	4.0	1.2	1,891
Winnipeg	30.7	30.7	21.6	256,622
		170.7	59.4	471,400

---

# TRAFFIC ZONE CHARACTERISTICS

---

## LAND USE

Land use is the dominant factor in determining travel requirements in major metropolitan areas. As an urban center grows, its land use is segregated either freely or through the application of land use controls into various areas of activity. While one area may develop as purely residential in nature, another will be basically commercial and yet a third may be primarily industrial in character. It is the geographic distribution of these areas of activity that establishes the need for the conveyance of persons and goods between these areas which in turn is the fundamental reason for the development of a transportation system. In addition to generating the need for a transportation system, the predominant land uses in an area are largely responsible for the types of transportation facilities that develop.

While the basic need and initial composition of a transportation system is related to existing land use patterns, it is also true that, developing or planned transportation facilities play extremely important roles in shaping the future development of the urban area. Such metropolitan cities as Toronto, Boston, Chicago and Pittsburgh have demonstrated that prime locations for land use development are invariably those areas where existing or committed transportation facilities for the efficient and convenient interchange of persons and goods with other parts of the metropolitan area.

These relationships between land use and transportation exemplify the need for co-ordination in land use and transportation planning. Certainly one should not attempt to plan for one without giving full consideration to the other.

Many major transportation studies of late have illustrated that mathematical relationships can be developed linking travel requirements to and from a particular area with specific land use characteristics of that area. The number of work trips generated from a residential subdivision, for example, might be shown to be related to the population, vehicle registration, and number of dwelling units contained in the given area. The study and identification of these land use — travel relationships for today's conditions establishes the basic framework for predicting future transportation patterns associated with anticipated land use development and socio-economic conditions.

Plate number 6 illustrates, in generalized categories, the land use pattern of Metropolitan Winnipeg as it existed during the study year. The information required to produce this illustration was obtained from the Planning Division of the Metropolitan Corporation.

Although land uses can be identified by numerous classifications, for analytical purposes in the Metropolitan Winnipeg area they were grouped into six general categories. These categories included residential, commercial, industrial, public service, parks and vacant or rural areas.

An investigation of the land uses found within the transportation study area reveals that of the total study area of 171 square miles, approximately 60 square miles are in urban use. The remaining 111 square miles are at the present time either basically undeveloped or being utilized for agricultural purposes. Of the 60 square miles of land presently in urban use in the study area, approximately 50 percent is residential in nature. Industrial areas (17 percent) and major utility rights-of-way (10 percent) such as transmission lines, railway lines and drainage ditches account for another 27 percent. Public institutional areas take up 8 percent while cemeteries, parks and recreational areas comprise approximately 11 percent of existing urban development. Commercial areas are the least extensive in land size accounting for only 4 percent of the developed metropolitan area.

## POPULATION

According to information provided by the Assessment Division of the Metropolitan Corporation of Greater Winnipeg, the transportation study area population during the base year 1962-63 was 471,000. The distribution of this population throughout the metropolitan area is illustrated on plate number 7. The population statistics indicated for the various traffic zones in the study area refer to what are often termed "night time" or "resident" populations. They are true figures only for that portion of the day when all members of a family are home. "Day time" population can of course be quite different, usually less in residential areas and greater in industrial, commercial districts.

The City of Winnipeg, with a population of 256,622, represents approximately 55 percent of the total study area population. This percentage has decreased slowly but significantly since 1901 when this city accounted for 87 percent of the metropolitan area population. Because of the present trend toward suburban living and the fact that the residential lands of the City of Winnipeg are almost fully developed, it is expected that Winnipeg's proportion of the metropolitan area population will continue to decrease in the future. The Downtown Study Area, located entirely within the City of Winnipeg, contains only a small portion, about 4 percent, of the study area's total "night time" population.

During the base year there were 116,246 families living in the study area with the average family size being 3.5 persons. Average family size ranged from a low of 2.6 persons, in the Downtown Study Area, to a high of 4.1 persons for a traffic zone in Old Kildonan.

## POPULATION DENSITIES

The knowledge of the intensity of land use is extremely important in the development of a transportation plan. A very fundamental relationship exists between trip generation and attraction and land use intensity. An area of high rise apartments with a density of 100 persons per net acre, for example, will generate many more trips and in general make greater demands on a transportation system than would the same area occupied by single-family dwellings with a density of about 25 persons per net acre.

Plate number 8 illustrates in terms of persons per gross residential square mile, the relative densities of residential development as it existed in the Metropolitan Winnipeg area during the study year.

The highest residential population densities experienced in the study area occur in the west and south fringe areas of the Downtown Study Area. In these areas, densities exceed 20,000 persons per gross residential square mile. These locations are noted for their high rise apartment and rooming house areas. North Winnipeg and portions of St. Boniface are also areas of considerable population density. Densities in these areas range between 15,000 and 20,000 persons per gross residential square mile. The intensity of residential land use decreases considerably with increasing distance from the Downtown Study Area. Typical residential subdivisions near the outskirts of the study area, such as Windsor Park and Garden City, indicate population densities in the range of 5,000 to 10,000 persons per square mile. The study area average is 15,700 persons per gross residential square mile.

## EMPLOYMENT

In this study, the journey to and from work will provide the basis for making a number of transportation planning decisions. (The importance of work trip travel and its use in the study will be dealt with in more detail later). There is no better way to accurately reflect the attractiveness of a given area for work trips than to indicate the number of employment opportunities available in the specified area. Plate number 9 on the opposite page indicates the distribution of employment opportunities throughout the metropolitan study area.

The cumulative total of employment opportunities as shown on the illustration opposite is 149,764. These figures represent the "patterned" employment opportunities to be found in the study area. As defined by this study, a "patterned" opportunity is one that indicates that the person involved with the opportunity utilizes or creates a demand for some portion of the transportation system in his travel to and from work and that his work trip travel habits are regular and predictable. Hence, a person who resides in a residential area and who travels regularly by vehicle or transit or by some other means of travel to and from his place of employment is said to have a "patterned" employment opportunity. On the other hand, there are many employment opportunities in the study area that are not "patterned", that is, the persons involved with these opportunities do not create transportation demands or are not involved in "patterned" work trip travel. For example, nurses in training are statistically included as a portion of the metropolitan area's total labor force. However, the nature of their service is such that very few of them make demands of a transportation system in their daily work travel. The total number of "patterned" employment opportunities, therefore, is considerably different from the total labor force in the study area as estimated by the Dominion Bureau of Statistics.

It should be pointed out that for the purposes of this transportation study, University students, because of their concentrated demand on the transportation system, were considered as part of the "patterned" employment picture of the metropolitan area.

The "patterned" employment statistics illustrated in plate number 9 were obtained from the home interview work trip survey discussed in the "study design" section of this report. The results of this survey provided information on both the availability of employment and the generation of work trips on a traffic zone basis.

The Downtown Study Area houses by far the greatest number of "patterned" employment opportunities in the study area. Although, as pointed out previously, this area contains only 4 percent of the study area's "night time" population, it accommodates approximately 40 percent of all "patterned" employment found in the metropolitan area. The City of Winnipeg as a whole contains better than 70 percent of the available metropolitan employment. Outside the City of Winnipeg, the City of St. James ranks as the largest provider of employment opportunities for the metropolitan population. Its industrial-commercial area in the north-east portion of the city provides approximately 10,000 employment opportunities, representing better than 6 percent of the total "patterned" employment opportunities in the study area.

## TYPES OF EMPLOYMENT

While the home interview work trip survey revealed figures concerning the total number of "patterned" employment opportunities available in any given traffic zone, it did not indicate the various types of employment available in the area. In order to ascertain for each traffic zone the types of employment available and the number of persons employed in each type, a further study of employment in the metropolitan area was made. Questionnaires concerning the number and type of persons employed were mailed to approximately 90 percent of all registered business firms in the metropolitan area. By relating the information obtained from the returns of these questionnaires with the home interview work trip data, it was possible to arrive at the information desired. This data was then utilized in the preparation of the illustration shown opposite.

Of the 149,764 "patterned" employment opportunities available in the transportation study area during the study year, it was found that over 77,000 or approximately 52 percent of these were associated with industrial concerns. Commercial service organizations accounted for another 48,500 opportunities. The remaining 24,000 "patterned" opportunities, representing 16 percent of the total available, were classified as public service and included in the main government employee and University students.

The distribution of types of employment throughout the metropolitan area is shown in plate number 10. Nearly half of the Downtown Study Area's 60,429 available employment opportunities are in the commercial field. Traffic zones along Portage Avenue, west of the downtown area also indicate the availability of considerable commercial employment. Major areas of industrial employment exist in the Downtown Study Area, west and north-west Winnipeg, north-east St. James and portions of St. Boniface and Transcona. The considerable amount of public service employment indicated in traffic zone 460 in south Fort Garry is a result of the classification of University students as public service employees.

## OCCUPATION OF RESIDENTS

By combining information received from the employment questionnaires, the home interview survey, and certain publications of the Dominion Bureau of Statistics, it was possible to group the occupation of metropolitan area employees at their place of residence into three general occupational categories. The occupation of each employee was classified into two general groups, namely the managerial and office group or the unskilled and skilled labor and trade group. The combined managerial and office categories generally comprise what is often referred to as the "white collar" portion of the labor force. The unskilled and skilled labor force and trade group category effectively represents the "blue collar" portion of the labor force. For simplicity this latter category is termed "other" in the illustration on the opposite page.

The compilation of these statistics revealed that for the study area as a whole, 9 percent of the "patterned" employees could be classified as managers, 31 percent as office workers and 60 percent as "other".

The distribution of these three groupings of employees throughout the metropolitan area by their traffic zone of residence is shown in plate number 11. A large proportion of the residents of the south-west, south, and south-east sections of Metropolitan Winnipeg are managers and office workers. The Downtown Study Area, the fringe areas west and north of the downtown area, and in particular the north Winnipeg area are primarily occupied by "other" or "blue collar" employees.

## VEHICLE REGISTRATIONS

Motor vehicle registration information used in this study was obtained from two sources, the Motor Vehicle Branch of the Province of Manitoba and the Dominion Bureau of Statistics. These agencies indicated that during the base year there were approximately 150,000 motor vehicles registered in the metropolitan area. The number of private passenger automobiles in the area was estimated at 128,000 and the number of commercial vehicles, including trucks, taxis, buses and delivery cars at 22,000.

The distribution of passenger car and truck registrations throughout the study area is shown in plate number 12. As would be expected, there is a close correlation between the illustration and that showing land use. The large concentrations of passenger car registrations are connected with predominantly residential land uses and the truck registrations with industrial land uses.

The 128,000 passenger automobiles registered in the study area represent an average automobile ownership rate of 272 automobiles per 100 persons. This compares with the automobiles per 1000 persons rate of 267 and 270 experienced by Toronto and Edmonton respectively.

The study area average automobile ownership rate can also be expressed as 3.67 persons per automobile. On an individual traffic zone basis this ratio varies from a low of 1.81 to a high of 6.23 persons per automobile.

## WORK TRIP MODE OF TRAVEL — LEAVING HOME

From the home interview work trip origin-destination survey referred to earlier in this report, it was ascertained that on the average work day during the study year, 149,764 "patterned" work trips were made. Of these total person work trips, 90,308, or roughly 60 percent were made by automobile. Buses carried 44,180, approximately 30 percent, while walking trips accounted for the remaining 10 percent of the total trips.

During the A.M. peak hour, 72,716 work trips were made, accounting for approximately 49 percent of the total daily trips made for this purpose. The modal split (extent to which the various modes of transportation are utilized) of these trips was found to be almost identical with that obtained for all day work trips.

Highest usages of transit for work trip travel were recorded in the fringe areas surrounding the Downtown Study Area and in the north Winnipeg area. Several traffic zones in these areas indicated that between 45 and 50 percent of all work trips from the zones were made by transit. It is interesting to note that these zones of highest transit usage coincide with areas of high population density and in a number of cases with low income areas.

Of the 72,716 work trips made during the peak hour on an average week day, approximately 10 percent are made on foot. The majority of the walking work trips originate in traffic zones on the fringe or within the Downtown Study Area. The nine traffic zones comprising the Downtown Study Area report walking as the mode of travel for between 35 and 65 percent of all generated peak hour work trips. A number of traffic zones on the fringe of the downtown area indicate walking as the mode of travel for up to 30 percent of the total peak hour work trips produced in their respective areas. A few traffic zones outside the immediate vicinity of the downtown area also exhibit a relatively high usage of walking as a work trip mode of travel. Most noticeable of these zones are zone 460, the University of Manitoba area, and zone 270 representing the City of Transcona. The majority of "patterned" walk work trips generated by the University area are made by students residing on campus. The City of Transcona reported at the time of the study that approximately 34 percent of its peak hour work trips were made on foot. This relatively high percentage of walk trips can be directly attributed to the fact that many employees of the Canadian National Railway shops located in this city reside in the immediate area.

The private vehicle is by far the preferred choice of mode of travel for the majority of the person work trips in the metropolitan area. As indicated previously, approximately 60 percent of all work trips are made by this means, either as a driver (53 percent) or a car pool passenger (7 percent). There are certain zones in the study area, however, that rely almost entirely upon the private vehicle as the mode of travel for their generated work trips. Some of these areas are not well serviced by transit and it is to be expected, therefore, that they would have a high motor vehicle usage. Other areas, however, area adequately serviced by transit but still indicate very heavy automobile usage. Traffic zone 340, the Windsor Park area, for example, indicates over 80 percent of its work trips are by private vehicle. Areas in Fort Garry indicate vehicle usage between 80 and 90 percent and Tuxedo reports mode of travel by vehicle for better than 90 percent of its work trips.

The areas recording the lightest usage of the automobile for work trip travel are found in the Downtown Study Area and its fringe areas. These locations are generally high population density areas and in some cases low income areas. Traffic zones 020 and 021 in the Downtown Study Area indicate that only 9 percent of the work trips generated by these areas are by private vehicle. Other zones comprising the Downtown Study Area do not exceed 30 percent in automobile usage for work trip travel.

## **WORK TRIP MODE OF TRAVEL — ARRIVING AT WORK**

The previous pages have described the means of transportation used by employees leaving for work from their respective traffic zones. The illustration on the opposite page now shows the mode of travel utilized by employees arriving at work in each traffic zone within the study area. Considering the study area as a whole and recalling what has been said previously, approximately 60 percent of all employees arrive at work by private vehicle, 30 percent by transit, and 10 percent on foot.

On the average week day, 31,646 peak hour work trips have destinations within the Downtown Study Area. This figure accounts for approximately 43 percent of the total number of work trips made during the peak hour in the entire study area. Of these 31,646 trips, approximately 47 percent arrive by automobile, 30 percent by transit, and 10 percent on foot. This mode of travel split, when compared with the overall study area average of 60 percent by vehicle, 30 percent by transit and 10 percent by foot, clearly points out where the greatest use of transit is presently being made. It also illustrates that the Downtown Study Area is the only area in which transit and the private vehicle share equally in the conveyance of persons to work. The 13,644 peak hour work trips arriving by transit in the Downtown Study Area represent 67 percent of the total peak hour transit work trips produced in the entire metropolitan area and further emphasizes the interdependence of the downtown area and the existing Metropolitan Transit System.

Statistics for the St. James industrial area show that of the 4,860 work trips destined to the area during the peak hour, 83 percent are made by vehicle, 5 percent by walking, and 12 percent by transit. Similar statistics for the University of Manitoba area reveal that of the 3,253 trips to the University during the peak hour, 75 percent are made by vehicle, 16 percent by transit and 9 percent by walk.

---

# TRAVEL BY TRANSIT

---

## TRANSIT COVERAGE

In 1962-63 the Streets and Transit Division of the Metropolitan Corporation maintained for public service a fleet of 425 transit vehicles. Of these, approximately 65 percent were diesel buses, 33 percent trolley coaches and the remaining 2 percent were gas buses. These vehicles were employed in the operation of 37 different transit routes throughout the Metropolitan Winnipeg area and during the year travelled over 13 million miles in providing this service.

Plate number 28 illustrates the transit route system and its resulting transit coverage area for the study year. All points within the defined transit coverage area are within one-quarter of a mile of a transit route. The transit coverage area as shown embodies approximately 35 percent of the transportation study area and roughly 95 percent of what could be considered extensively developed land within the study area. There are relatively few locations, therefore, within the study area which have considerable urban development and which are not within one-quarter of a mile of transit service.

The existing transit route network in Metropolitan Winnipeg can be generally described as being radial in nature with the center or attraction being the downtown area. The majority of transit routes in the area usually originate near the outer limits of urban development, follow a relatively direct route into the downtown area, loop in the downtown area and then return to the origin in the suburbs generally employing the same route outbound as they did inbound. In some instances, the routes do not loop in the downtown area but pass through and continue on to a terminal point at the outskirts of development on the opposite side of downtown to the route's origin. These lines form the system's crosstown routes but they are still vitally connected with downtown transit operations. A few additional routes serve as feeder lines for downtown or crosstown oriented traffic. There is very little circumferential routing in the existing transit network.

Although the detailed route system is not shown in this illustration, the Downtown Study Area is well served by transit. All 6 of the trolley coach lines and 19 of the 31 motor bus routes traverse the downtown area. The majority of these routes at one time or another make use of Portage Avenue, Main Street or Graham Avenue in the downtown area.

## **PASSENGER VOLUME VARIATIONS**

### **TRANSIT TRENDS**

Due to gasoline rationing, round the clock employment and more intense industrial activity, the World War II years precipitated a dramatic increase in transit ridership in the Metropolitan Winnipeg area. During 1946, a record high of over 105 million revenue passengers were carried by the transit system. Since then, however, there has been a gradual but continuous decrease in passengers carried to the 56 million recorded in 1961. This decreasing trend appeared to level off in 1961 and in fact, the last few years have seen a slight increase in the total number of revenue passengers carried by the transit system.

During 1946 while experiencing its passenger carrying peak, the transit system also experienced a peak in miles operated, logging some 15.8 million miles. With the decrease in passengers carried, there was a corresponding decrease in miles operated by the transit system. This decrease, however, was not nearly as great as the drop in passengers carried and in fact, for a number of years after 1952 the miles operated by the system had held fairly steady between 12.5 and 13 million vehicle miles per year. More recently, service extensions have resulted in increased mileage so that the annual total now approaches 14 million.

In 1946 the transit system carried 6.6 revenue passengers per mile operated. IN 1963 this figure had dropped to 4.3 passengers carried per mile operated. Much of this decrease can be explained by the natural growth and development of the metropolitan area. Each year, in order to provide for a growing population, development and in particular, residential development, has extended further and further from the city center. As new areas emerged, the transit system's routes were extended in order to provide these new areas with an acceptable transit service. The evolution of these new areas, however, did not alter the fact that the downtown Winnipeg area remained the center of attraction for transit trips. Thus, while the transit system gained a number of new passengers from these areas of residential growth, the increased route lengths to serve the new developments resulted in an overall reduction in the ratio of passengers carried per mile of transit vehicle travel.

### **HOURLY VARIATIONS**

The hourly variation of passengers carried by the transit system on an average week day is shown on plate number 29. The passengers carried during each hour of the 24 hour distribution is represented as a percentage of the passengers carried during the average hour. Marked peaks in passengers carried occur during the periods of 7:00 to 9:00 in the morning and 4:00 to 6:00 in the afternoon. During the 7:30 to 8:30 A.M. peak hour and 4:30 to 5:30 P.M. peak hour, passengers carried are 205 percent and 250 percent respectively of the passengers carried during the average hour.

### **DAILY VARIATIONS**

Statistics recorded during the study year indicate that the number of passengers carried daily by the transit system is fairly steady Monday through Wednesday, increases Thursday and peaks on Friday. The number of passengers carried by the system on an average Friday is approximately 130 percent of that carried on an average day of the week. Transit riding drops off considerably on Saturday and Sunday with the passengers carried on Sunday being only 27 percent of those carried on the average day of the week.

## **SEASONAL VARIATIONS**

At first glance, the seasonal variation in passengers carried may appear to be relatively minor. In actuality, however, these variations are responsible for considerable operational and scheduling adjustments on the part of the Transit Department. These changes are necessary to ensure maximum efficiency of transit operations throughout the year. The spring period is the season of highest transit usage; the summer season, the lowest. The passengers carried on an average spring day is approximately 104 percent of those carried on an average day of the year. On the other hand, the number of passengers carried on an average summer day is only 93.5 percent of those carried on the average day of the year.

## **TRANSIT VEHICLE FLOW**

The information used to prepare the following two illustrations of transit vehicle volumes was obtained from records kept by the Transit Department of this Division.

### **FRINGE AND OUTLYING AREAS**

The predominantly radial pattern of the metropolitan area network and the attraction of the downtown area for transit trips is clearly evident in the illustration opposite. As the various transit routes converge on the downtown area, the transit vehicle volumes build up considerably on those streets penetrating the downtown area.

During the A.M. peak hour of the study year, approximately 364 of the 425 available transit vehicles were in operation in the metropolitan area. Many of these transit units, in the immediate vicinity of the downtown area, utilized such heavily travelled transit vehicle routes as Osborne Street, Portage Avenue, Main Street, and St. Mary's Road. A two directional total of 106 transit vehicles were recorded passing through the Canadian Pacific Railroad underpass on Main Street north during the A.M. peak hour. During this same hour, 106 transit vehicles also passed through the Corydon Avenue, Pembina Highway, Osborne Street complex representing an average of 1 vehicle every 34 seconds.

## TRANSIT VEHICLE FLOW

### DOWNTOWN AREA

As indicated previously, the majority of the transit routes available in Metropolitan Winnipeg at one time or another either loop in or run through the downtown area. Although a number of different streets are utilized, the primary streets of transit vehicle penetration into the Downtown Study Area are Osborne Street, Portage Avenue, Main Street north and Main Street south. In the downtown core, Portage Avenue and Main Street carry by far the largest numbers of transit vehicles. In the blocks between Smith and Fort Streets along Portage Avenue during the A.M. peak hour, 106 transit vehicles were recorded in the east bound direction alone. Westbound on Portage Avenue between Garry and Hargrave Streets, transit vehicles numbered 104 during this same hour. Main Street between Portage and McDermot Avenues for the same peak hour carried very nearly this vehicle volume, recording 99 vehicles northbound and 106 southbound. Primarily due to the operational difficulties involved in handling the already large number of transit vehicles along Portage Avenue, Graham Avenue to the south of and paralleling Portage Avenue is also utilized rather extensively for transit vehicle routing.

## **TRANSIT PASSENGER FLOW**

The next two illustrations in this report depict A.M. peak hour transit passenger flow for the study year in Metropolitan Winnipeg. The information necessary to produce these illustrations resulted from a combination of data obtained from two sources. The home interview origin-destination survey, which forms the base for this transportation study, produced information on the origin, destination and quantity of work trips being made by transit during the peak hour. These trips were hand assigned to logical transit routes. The resulting pattern of work trip transit passenger flow was then up-dated to represent total passenger flow with the aid of strategically located field counts of total passenger volumes. These field counts, generally of 15 hour duration from 7:00 A.M. to 10:00 P.M., were taken at key transit check points throughout the metropolitan area and are a part of the Transit Department's continuing checking program. As in the case with trips by vehicle, transit work trips account for the largest majority of total transit trips made during the morning peak hour. Generally, on any given transit route, work trips accounted for better than 80 percent of the total transit trips during the peak.

### **FRINGE AND OUTLYING AREAS**

The transit passenger flow map for the peak hour, as would be expected, mirrors the transit vehicle flow map for the same period of time. The Downtown Study Area is clearly illustrated as the major attractor of transit trips in the peak hour. The number of transit passengers carried increases rapidly as the transit routes approach the Downtown Study Area. Heaviest passenger flows into this area during the A.M. peak hour are 3,280 inbound on Main Street at Higgins Avenue, 2,200 inbound on Portage Avenue at Sherbrook Street and 2,250 inbound on Main Street at the Assiniboine River.

## TRANSIT PASSENGER FLOW

### DOWNTOWN AREA

The Downtown Study Area has been shown to be the metropolitan area's major attractor of transit trips during the peak hour. As in the case of the previous illustration, the transit passenger flow map for the downtown area closely parallels the transit vehicle flow map for the same area and the same time. Portage Avenue between Donald Street and Carlton Street experiences the heaviest transit passenger flow during the peak hour when 4,250 passengers are carried eastbound by the system and 3,175 westbound. Osborne Street and Graham Avenues are other downtown streets which carry extensive transit passenger loads.

As a result of the large numbers of transit passengers boarding and alighting along Portage Avenue between Memorial Boulevard and Main Street, the curb lanes of the street are used almost exclusively by buses during the peak periods. This situation creates regular conflicts between buses operating in the curb lanes and vehicles attempting to turn right from the second lane on Portage Avenue. Sections of Main Street, particularly north of Portage Avenue, also experience similar difficulties.

## **CORDON CROSSINGS BY TRANSIT PASSENGERS**

Average weekday A.M. peak hour transit passenger crossings of the cordon line surrounding the Downtown Study Area are shown on plate number 34. The major locations of entrance and exit are Main Street north, Main Street south, Osborne Street and Portage Avenue. During the A.M. peak hour, 18,900 transit passengers entered the cordon area while only 5,900 departed. The former represents approximately 22 percent of the 88,000 transit passengers entering the downtown area between 7:00 A.M. and 7:00 P.M. on an average weekday.

Also shown on plate number 34 is a graph of accumulation of transit passengers within the cordon area. This diagram indicates that the maximum number of transit passengers are accumulated within the cordon area at approximately 3:00 in the afternoon. At this time, some 39,000 transit users are found within the area. The heaviest out-bound flow of transit passengers across the cordon line occurs between the hours of 4:30 and 6:30 in the afternoon. During this period, approximately 32,000 persons leave the cordon area by transit. Between 7:00 A.M. and 7:00 P.M., the hourly period with the maximum number of transit passengers crossing the cordon line is between 9:30 and 10:30 in the morning. During this time, 4,200 passengers were recorded entering the cordon area and only 1,700 leaving.

## TRANSIT TRAVEL TIMES

Transit travel times were obtained from the Transit Department's records on schedules and operating time checks for each transit route in the metropolitan area. Although information was collected for both peak and off-peak conditions, the time statistics quoted in this report refer to A.M. peak hour conditions on an average weekday during the study year. If more than one transit line traversed a given section of street, a weighted average of the travel times of the contributing lines was computed to determine the average travel time to be recorded for that portion of street.

Plate number 35 illustrates, by means of concentric isochronal lines, the time required to reach the intersection of Portage Avenue and Donald Street from various locations within the study area if travelling by transit during the A.M. peak hour. The times shown include all delays incurred but do not include time spent walking to and from the bus stop nor time spent waiting for the bus.

Most areas that are serviced by transit inside the confines of the Perimeter Highway are within 35 minutes travel time of Portage Avenue and Donald Street during the A.M. peak hour. Portage Avenue west near the Perimeter Highway is one of the exceptions, it being about 40 minutes from Portage Avenue and Donald Street. The close spacing of the 30 and 35 minute isochronal lines on St. Mary's Road is a result of the time required for transit passengers to transfer from a local feeder line to the downtown destined St. Mary's bus.

If this illustration is compared with its counterpart for vehicle flow, the time advantage enjoyed by the automobile over transit for trip making under present conditions is readily apparent. The comparison points out that a trip by transit to the downtown area during the A.M. peak hour takes approximately twice as long as the same trip by private vehicle. This relationship appears to hold for most locations in the metropolitan area where a choice of both modes of travel is available.

## **TRANSIT SPEEDS**

As indicated previously the information necessary to produce the following illustrations of average transit speeds in the metropolitan area was obtained from records kept by the Transit Department on running times for each transit route in the system. The speeds shown are overall route speeds for the sections of route indicated and as such include all delay time incurred in travelling that portion of the route as well as on-street operating time. It is interesting to note that with few exceptions, the transit speed recorded for a particular section of roadway is always one-half of the vehicle speed recorded for the same section of roadway. The exceptions generally are one those sections of roadway near the outskirts of development where because of the infrequency of stops for passengers, buses move at almost the same speed as the private vehicle.

### **FRINGE & OUTLYING AREAS**

In this first illustration, the speeds indicated are for the A.M. peak hour and peak direction. The peak direction in this case is almost invariably in-bound toward the downtown area.

The Transit Department's records reveal that transit route speeds outside the Downtown Study Area generally range between 9 and 17 miles per hour. Sections of Regent Avenue, Pembina Highway, Roblin Boulevard, and Portage Avenue, however, operate at overall speeds in excess of 20 miles per hour. The St. Norbert bus route operating on Pembina Highway indicates a speed of 30 miles per hour between the Perimeter Highway and a point just south of the intersection of Pembina Highway and University Crescent. The Transcona transit route also indicates speeds in the vicinity of 30 miles per hour in its operations on portions of Regent Avenue.

While there are a number of lines and sections of street outside of the downtown area where transit speeds dip to between 9 and 10 miles per hour, there are relatively few locations where transit speeds much lower than 9 miles and hour are sustained for any great distances. The lower limit of transit speed outside the Downtown Study Area, therefore, appears to be approximately 9 miles an hour.

## TRANSIT SPEEDS

### DOWNTOWN AREA

The transit speeds indicated in this illustration are again related to the A.M. peak hour. In this instance, however, speeds are recorded for both directions along a given street if two-directional transit movement takes place on the street.

In general, transit speeds in the Downtown Study Area are 20 to 30 percent lower than those experienced in the fringe and outlying areas. Few streets in the downtown area indicate transit speeds exceeding 14 miles per hour. The in-bound transit route over the Disraeli Bridge, however, averages a speed of 20 miles per hour, which is the maximum for the downtown area.

There are a number of street intersections in the downtown area where transit speeds dip to around 5 miles per hour. These transit speeds are the lowest recorded in the Metropolitan Winnipeg area and can be attributed to the congested traffic conditions on these streets and the heavy loading and discharging of passengers in these areas.