URBAN TRANSPORTATION IN CANADA

A Committee Report on Urban Transportation Problems

CANADIENNE DES MAIRES ET DES MUNICIPALITÉS
FEDERATION OF MAYORS AND MUNICIPALITIES

URBAN TRANSPORTATION IN CANADA

REPORT OF THE TECHNICAL ADVISORY COMMITTEE
ON
URBAN TRANSPORTATION
OF THE
CANADIAN FEDERATION OF MAYORS AND MUNICIPALITIES

Author : DONALD I. MacDONALD

Research Assistant : GEORGE R. HEBERT

Published jointly by the
CANADIAN FEDERATION OF MAYORS AND MUNICIPALITIES
and the
CENTRAL MORTGAGE AND HOUSING CORPORATION

ACKNOWLEDGEMENT:

The Canadian Federation of Mayors and Municipalities acknowledges with appreciation the financial assistance received from the Central Mortgage and Housing Corporation under Part V of the National Housing Act. This assistance was extended to cover 75 per cent of the costs involved in the research required and in the cost of publishing the results of this research. The authors also acknowledge the research assistance provided by the Canadian Transit Association.

TABLE OF CONTENTS

Tables

FOREWORD

At a meeting in September, 1964, the National Executive of the Canadian Federation of Mayors and Municipalities resolved to undertake a study of urban transportation; to authorize the President to appoint a committee for this purpose; to empower the committee to appoint a technical advisory committee; and to approach senior governments for technical and financial assistance.

The President of the Federation (then Mayor Charles A. Vaughan of Halifax) issued a further statement at that time explaining that the Federation felt that it was necessary to develop a coherent and economical transportation programme in each urban area, since roads, railroads and public transit facilities were interrelated and since an orderly development of all urban facilities depended upon an orderly and well-conceived transportation plan within the framework of a basic land use plan.

The President appointed an Urban Transportation Committee under the Chairmanship of Mayor William G. Rathie (then mayor of the City of Vancouver). This committee met in March and June, 1965, and established a Technical Advisory Committee under the Chairmanship of Mr. D. I. MacDonald of Winnipeg. The Metropolitan Corporation of Greater Winnipeg made available to the Technical Advisory Committee the services of the Research Officer, Mr. George R. Hebert, on a half-time basis. The Urban Transportation Committee also determined that the initial step would be to have a "fact-finding" enquiry carried out with a view to establishing a reasonably accurate picture of the urban transportation problems now confronting Canadian cities, having in mind the need of the municipalities to find, in co-operation with senior governments, sound and adequate means to finance urban transportation requirements.

An appropriation of $5,000 was made by the Federation to launch the "fact-finding" enquiry. Subsequent representations made to the Central Mortgage and Housing Corporation resulted in a CMHC grant to cover 75 per cent of the costs of the enquiry up to a maximum total cost of $20,000.

The membership of the Urban Transportation Committee during 1965-1966 was as follows:

Mayor William G. Rathie, City of Vancouver, Chairman
Mayor Gilles Lamontagne, Quebec City
Reeve A. M. Campbell, Scarborough Township
Mayor Victor K. Copps, Hamilton
Mayor Marcel D'Amour, Hull
Mayor Joseph P. Guay, St. Boniface
Controller Ernie Jones, Ottawa
Mayor J. C. Leslie, Calgary
Mayor Charles A. Vaughan, Halifax
Mayor Philip G. Givens, Q.C., Toronto

The Technical Advisory Committee membership is as follows:

Mr. D. I. MacDonald, Director (Chairman)
Streets and Transit
Metropolitan Corporation of Greater Winnipeg

Mr. George R. Hebert (Secretary)
Research Officer
Metro Winnipeg

Lucien L'Allier, P.Eng.
Chairman and General Manager
Montreal Transportation Commission

Dr. Eric Beecroft, Chairman
Department of Political Science
University of Western Ontario

George R. Brady
General Manager
Ottawa Transportation Commission

Dr. Gordon D. Campbell
Director of Technical Services
Canadian Good Roads Association

David Jones
Consultant on Research
Dominion Bureau of Statistics

Roy D. Cowley, Director
Traffic Engineering Branch
Ontario Department of Transport

George O. Grant
Commissioner of Roads
Metro Toronto

Eric Thrift
General Manager
National Capital Commission

Ken S. Vaughan-Birch, Director
Traffic Division, Engineering Dept.
City of Vancouver

On June 9th, 1966, the membership of the Canadian Federation of Mayors and Municipalities, at its Vancouver Conference, resolved that the report of the Technical Advisory Committee of the Urban Transportation Committee be received as an interim report; this resolution was adopted.

Conclusions reached in this report may be very briefly summarized as follows:

1. The need for substantially improved transportation facilities, urban highways and public transit, has been demonstrated.
2. While the provincial governments are becoming increasingly aware of the needs in this field and most are increasing their aid programmes, generally the needs are not being adequately met; the rate of capital investment in urban transportation facilities must be substantially increased.
3. The financial resources of urban municipalities must be supplemented by increased aid from senior levels of government in order that capital investment in urban transportation facilities achieves an adequate level.
4. Financial assistance to urban municipalities in meeting their transportation needs must be accompanied by a coherent national policy in this field, senior government legislation outlining long-range financial policy applicable to this field, and definite financial and technical assistance toward planning and implementing future capital investment in urban transportation facilities.

Canadian Federation of
Mayors and Municipalities
30 Metcalfe Street, Ottawa
January, 1967.

Chapter 1. INTRODUCTION

Problems of urban transportation have existed as long as cities have existed. The Romans, the first great road builders, found it necessary to restrict vehicular traffic (with the exception of chariots and state vehicles) to the night hours. However the problem which the modern metropolis faces is not an ancient one, for although people first started to live in cities several thousand years ago, urban development, as we know it in the more advanced urbanized societies of today, is a relatively recent step in man's social evolution. It is a product of the industrial revolution, of the latter half of the 19th century and of the 20th century.

> "Neither the recency nor the speed of this evolutionary development is widely appreciated. Before 1850 no society could be described as predominantly urbanized and by 1900 only one — Great Britain — could be so regarded. Today only 65 years later, all industrial nations are highly urbanized, and in the world as a whole the process of urbanization is accelerating rapidly . . . This change in human life is so recent that even the most urbanized countries still exihibit the rural origins of their institutions. Its full implications for man's organic and social evolution can only be surmised."[1]

The rapid growth of cities in the last 100 years or so and specialization of functions which accompanied the growth and was an indispensable part of it required a higher degree of mobility on the part of the urban population. The decline of handicraft and the growth of the machine industry required the working population to travel from their place of residence to their place of employment. Until some means of transport could be devised, cities were of necessity limited in size and greatly overcrowded as people were compelled to live within walking distance of their place of daily work.

The development of various means of transportation within the city is the story of man's ingenious but for the most part imperfect efforts to cope with this aspect of urban living. These developments in turn have had a profound effect on the shape and character of the cities themselves.

In North America, until almost the middle of the 19th century, the only means of travel in cities was on foot or horseback, or for the wealthy few, in private horse-drawn carriages. The first form of public conveyance was the horse-drawn carriage known as the omnibus, which became quite common in the cities of the Eastern United States. By 1860 these vehicles had become so numerous in New York that there was an average of one in each direction every 15 seconds on Broadway at Chambers Street.

Judging from a comment in the New York Herald of October 2nd, 1864, this early form of public transportation left something to be desired:

> "Modern martyrdom may be succintly defined as riding in a New York omnibus. The discomforts, inconveniences, and annoyances of a trip on one of these vehicles are almost intolerable. From the beginning to the end of the journey a constant quarrel is progressing. The driver quarrels with the passengers, and the passengers quarrel with the driver. There are quarrels about getting out and quarrels about getting in. There are quarrels about change and quarrels about ticket swindle. The driver swears at the passengers and the

[1]Kingsley Davis, "Urbanization of the Human Population", *The Scientific American*, Sept., 1965.

passengers harangue "the driver through the strap hole — a position in which even Demosthenes could not be eloquent. Respectable clergymen in white chokers are obliged to listen to loud oaths. Ladies are disgusted, frightened, and insulted. Children are alarmed and lift up their voices and weep. Indignant gentlemen rise to remonstrate with the irate Jehu and are suddenly bumped back into their seats, twice as indignant as before, besides being involved in supplementary quarrels with those other passengers upon whose corns they have accidentally trodden. Thus the omnibus rolls along, a perfect Bedlam on wheels."[2]

The Civil War gave a great impetus to industrial development and urban growth in the Northern States and the expanding cities made improved means of transportation an imperative requirement. The answer was the horse-drawn street car. It was an adaptation of the omnibus which it quickly replaced due to the superiority of flanged metal wheels operating on steel rails laid in the streets. After 1890 a large number of American cities had horse-car systems and by 1890 this form of public transportation had reached its peak of popularity. The American Street Railway Association proudly reported that there were more than 100,000 horses and mules engaged in pulling 18,000 street cars over 3,000 miles of track in cities all over the United States. There were in addition about a dozen systems in Canada.

The biggest operating problem on the street railways centered around the horse himself. It was necessary to have several shifts of horses for each car and some of the larger systems had over a thousand horses. The investment in animals and stable facilities accounted for about 40% of the entire investment.

Then, as now, street railway managers had strong views on matters related to their business.

"I am convinced," said one, referring to the kind of horses he wanted, "that nothing will average equal to the roan, so far as you can get it, from the strawberry roan to the steel roan. A dark gray is good and there is nothing better than a dark dun with a black stripe down the back and black legs. Dark grays are also good; what is known as a flea-bitten gray, with little specks all over him is very good. If you can avoid it, never get a horse with a white hoof."[3]

Well before the development of the horse-drawn street car had reached its peak of popularity in the United States, the first application of mechanical power to urban transportation vehicles had been successfully accomplished. This came with the introduction of cable cars, probably in San Francisco, where the steep grades precluded the possibility of city-wide horse-car operations which could not negotiate grades much over 5%. Operation of cable cars was found to be quite practical on grades up to 20% and the use of these vehicles spread to a number of cities. Chicago, in particular, developed an extensive cable car system. By 1894 there were eighty-six miles of cable tracks in that city with 469 grip cars and approximately twice that number of trailers. By 1890 there were 500 miles of cable track railway in the United States and some 5,000 cars in about fifteen cities. This peculiarly American institution did not long survive the development of the electric street car. Several factors evidently contributed to its decline — the high cost of construction, limited speed and limitations on the distance from which cables could be run from a central power station.

2John Anderson Miller, *Fares Please.*
3*Ibid.*

These early forms of public transportation, rudimentary as they may now seem, had an important effect in that they permitted for the first time a substantial segregation between places of business or employment and residential areas. The area of definitely urban living could be expanded and it became quite possible for many people to live distances of two or three miles from their work.

The continued growth of cities required a faster and more reliable type of transportation. Experimental work on electrical propulsion of vehicles had been carried on for a number of years and the many technical difficulties involved were gradually being overcome. After a number of temporary installations and false starts the first commercially operated electric street car system was established in Montgomery, Alabama, in 1886. Two years later a much more ambitious undertaking was installed in Richmond, Virginia.

The astonishing thing about electric traction was the rapidity with which this new concept was adopted and the way in which it spread to North American cities. By 1889 there were 200 electric railways in operation.

Whereas horse-car operation had been usually limited to short distances and highly developed areas, the higher speed of electric cars made possible longer lines and extensions into sparsely developed or undeveloped areas. Many of these areas were rapidly built up following the extension of the transit system and the typical city took on a star shaped configuration with development radiating out along the street car lines. Land speculators and real estate promoters were not slow to appreciate the effect of these transportation improvements on land values.

As North American cities rapidly adopted the electric street car, there were continuing improvements in the vehicles and their propulsion equipment as well as in track and roadbed. All this, along with a much greater extent of the systems, required far greater capital investment than had been the case with the horse cars. In addition the operators of these systems were customarily required to pay a variety of special taxes, such as franchise tax, special vehicle licences, taxes on gross earnings, paving and other streets maintenance charges, and often to carry policemen and firemen free. Many of these archaic imposts remain to the present time.

The first urban subway system in the United States was constructed in Boston in 1897 and was used by conventional surface street cars. The number of passengers carried on the street car system had increased so rapidly that it was impossible to place enough cars in service on Tremont Street to handle the traffic. New York City subsequently built a much more elaborate system which was opened for service in 1904.

Urban Transportation Developments in Canada

Urbanization and urban development in Canada has followed patterns generally similar to those in the United States and this country has borrowed its urban transportation technology from the United States. Horse car systems were established in Toronto and Montreal in 1861 and over the next thirty grew to be substantial undertakings. By 1890 there were 68 miles of track in Toronto, 262 cars, 100 sleighs and 1,372 horses used on the system which carried 55,000 passengers daily.

Other Canadian cities adopted similar systems. The Ottawa City Passenger Railway Company was incorporated in 1866 for the purposes of establishing a horse car system. Service was inaugurated in Halifax and Hamilton in the 1870's and in Winnipeg in 1882. In Vancouver a horse car system which had been planned almost ready to operate was converted at the last minute to electric power. Electrification of street car lines, once proven feasible, spread rapidly in Canada as in the United States. Routes were extended and equipment improved. Double truck cars were introduced, heating systems installed, electric snow sweepers developed for winter service, entrance doors installed and air brakes developed. In Eastern Canada generally these transit systems were privately owned and in a number of instances were associated with electric power undertakings.

Street railway systems were constructed in Edmonton in 1908, in Calgary in 1909, in Regina in 1911 and in Saskatoon in 1913. It is interesting to note that these prairie systems were all publicly owned and operated from their inception, a development which has doubtless had a considerable bearing on public attitudes towards these transit operations right up until the present time.

The first twenty years or so of the Twentieth Century were the heyday of the electric street car. However, World War I brought severe financial problems as operating costs increased much more sharply than revenues. The Canadian Electric Railway Association reported that operating expenses per car mile increased from approximately 15¢ in 1912 to 33¢ in 1920. The long decline of urban rail operations began in the 1920's as street railway companies attempted to improve their financial operations by the adoption of economies such as one-man operation, the curtailment of over-expanded systems and the introduction of motor buses on more lightly used services.

In 1921 a variety of transit systems operating in Toronto were brought under public ownership and integrated into a unified system. The transit facilities were expanded and improved and programs initiated which were ultimately to produce what was probably the finest surface system in North America, which made the initials "T.T.C." synonymous with everything progressive in public transit and which no doubt helped in later years to create an atmosphere favorable to public ownership of transit systems in this country.

The basic problems facing street railway systems were vastly complicated by the second major development affecting urban transportation, the advent of the passenger automobile.

From 1904 to 1920 there were approximately 230,000 motor vehicles produced in Canada, about one-half the current annual production. In the period 1921-25, 609,000 vehicles were produced and this increased to 1,042,000 in between 1926-30. Observing this phenomenon in 1927 at its annual convention, the Canadian Electric Railway Association was moved to observe with a good deal more optimism than foresight that "the effect of the private automobile on future electric railway traffic will undoubtedly be slight. The definite volume of traffic that this new agency of modern transportation has attached to itself is, for the most part, pleasure riding formerly carried by the streets cars on Sundays, holidays and in the evenings after working hours and now can be regarded as permanently lost to the railways. The indications are that this loss has about reached the maximum which the railways are likely to sustain from this source. . . . It is obvious that future increases in automobile registrations must be relatively small. The automobile industry is becoming stabilized. It has established itself in the field of transportation and the future should witness both private automobile transportation and public common

carrier transportation increasing respectively in proportion to the growth of the country."[4]

It would take nearly twenty years to prove how decisively wrong this prediction was going to be. For ten years after 1929 the Canadian economy stagnated in depression. While motor vehicle registration increased gradually, there was a drastic decline in production and sales, particularly in the first five years of depression. There was only a hint of the vast increase in the use of motor vehicles for private transportation and goods transport which was to come later on. Municipal financial problems, including widespread default on debenture obligations precluded expenditures on roads. Public transit systems, still for the most part privately owned, suffered substantial losses in passenger volumes and revenues and generally were unable or unwilling to invest any new capital in their aging rail systems. Rail abandonments, particularly where the street car systems were overextended, were common and motor buses were substituted for street car operation in many instances with a view to obtaining economies in operation and avoiding costs of maintenance and rehabilitation of track and roadbed.

The outbreak of war in 1939 and the subsequent conversion of the economy to support the war effort produced, among other things, further abnormalities in the urban transportation picture. The cessation of production of motor vehicles for private use and the rationing of tires and gasoline threw virtually the whole burden of urban transportation on the country's mass transit systems. Full employment and "round the clock" economic activity added to transportation requirements of the cities. The total number of annual revenue passengers reported by the Canadian Transit Association increased from 633,000,000 in 1939 to 1,505,000,000 in the immediate post-war period.

Canadian cities thus emerged from World War II with approximately 25 years of accumulated obsolence in their urban transportation facilities. The street railway systems were for the most part worn out and in need of replacement and the urban road systems had been largely laid out and constructed in an era when the motor vehicle was a curiosity. This was the situation facing Canadian Cities on the eve of what was to be an era of unprecedented economic development and urban expansion along with the full flowering of the automotive age.

[4]Canadian Electric Railway Association, *Electric Railway Statistics.*

Chapter 2. THE POST WAR PERIOD

The years since World War II have witnessed revolutionary changes in this country. The population has increased from 11,500,000 in 1941 to over 18,000,000 at the present time and the trend toward urbanization (see Chart I) has continued. Whereas 54% of the population lived in urban areas in 1941, over 70% now can be classed as urban dwellers, with the result that the urban population has more than doubled.

> "With 70 per cent of its population residing in urban areas in 1961, Canada is one of the most highly urbanized countries in the world. Together with the United States it forms one of the most urbanized regions in the world. In a preliminary report to the Thirteenth Session of the United Nations Population Commission, the United Nations Secretary General (UN, Econ. and Soc., 1965) ranks Australia and New Zealand, North-West Europe, and North America, (including the United States and Canada) in that order from first to third in regard to the per cent of population residing in localities of 20,000 and over around 1960. Together with the USSR and Central and Southern Europe, the above-mentioned regions are termed the "more developed regions" (UN, Econ. and Soc., 1965,) and these regions exhibit much higher degrees of urbanization (2) than the remainder of the world. Among 100 countries for which the requisite data are available, Canada ranks in the top 20 around 1960 in regard to the degree of urbanization, according to the Secretary General's report."[5]

This great growth in urban population has been accompanied by a substantial expansion and diversification of the country's economic base and much of the related physical development has taken place in the urban centres. There appears to be no end in sight and most studies of future population growth and urban development point to a continuation of these past trends.

The post-war expansion of urban centres quickly occupied undeveloped areas of the central cities and spilled over into previously dormant satellite municipalities. The thirty-five urban areas shown on Tables I and II had 69% of their population living in the central city and 31% in the other urban municipalities in 1951, but by 1961 these percentages had changed to 57% and 43% respectively. This rapid "suburbanization" appears to have occurred at an even more dramatic rate in the larger metropolitan centres. In Toronto and Montreal combined the central city population decreased from 68% of the total for the Metropolitan area in 1951 to 47% in 1961 while the suburban areas' population increased from 32% of the total in 1951 to 53% in the same period.

> "In Toronto the population soon filled the city and spilled over the borders. The population of the city has remained static at about 700,000 while the population in the suburbs has increased at an amazing rate, from less than 100,000 in 1945 to over 800,000 at the present time. That is eight times in twelve years.
>
> "It was obvious that such an explosive development could not take place under conditions of peace, order and good government. The metropolitan area

---

[5]Leroy O. Stone, *Selected Highlights of Canadian Urban Development, 1851 to 1961* (Ottawa; Dominion Bureau of Statistics).

had become balkanized into thirteen local municipalities, one city, three villages, four towns, and five urbanized townships. Their boundaries were purely artificial. You could not tell where one started and the other ended. Each was geared to a local pattern of development; none was concerned about what was happening to its immediately adjoining neighbor; and what was worse no one was able to solve the problem of how the metropolitan services which were required for the whole area could be provided on a cooperative basis."[6]

The same story was repeated in varying degrees across the country. The thirty-five urban areas referred to above were governed by 339 local governments (cities, towns, villages, etc.) The requirements of the multiplying numbers of the urban population for educational services, welfare services, hospitals, roads, water, sanitary facilities, etc., have placed a severe financial strain upon the principal source of municipal revenues — the tax on real property. Education requirements have pre-empted up to or in excess of 50% of the annual yield of the real property tax, leaving little for the many other demands on local governments. Further complications have been due to the essential metropolitan character of many of the services such as transit, major thoroughfares, water supply and sewage disposal, the inability of municipalities operating independently to provide these services in an orderly way and the absence of effective governmental structures to deal with these area-wide problems.

Moreover industrial and residential development have not and could not take place evenly with resultant serious imbalance in the tax structure of local governments. In particular the "dormitory" suburbs devoid of industrial taxation have encountered severe financial problems. The central cities have seen many of their more affluent citizens migrate to the suburbs while the welfare cases have tended to locate in the city.

All of these problems and many others arising from this post-war development are well known and can only be mentioned in passing. Undoubtedly the many other substantial problems which have been associated with urban expansion and the costs of dealing with them have had an important bearing on the ability of the local governments to deal with requirements for urban transportation.

The task of providing expanded urban transportation facilities would have been formidable enough under a reasonably stable transportation technology but the task has been immeasurably complicated by a revolution in the means of urban transportation accompanied by other changes of equal magnitude in what may be described, for want of a better phrase, as our "way of life."

> "The transformation was set in motion toward the end of the 19th century and early in the 20th with the invention of the telephone, the electric street car, the subway and the powered elevator. Even more far-reaching was the impact on the city of the automobile and the truck. With the acquisition of these aids to communication and mobility the city burst its egg-shell and emerged as a metropolis. (It is worth noting that the telephone and the automobile had equally profound effects on rural life, fragmenting the old farm village and giving rise to huge, scattered farms.)
>
> "The centripetal migration from the country to the city continues unabated, but now there is an equally powerful centrifugal wave of migration from the city to the suburbs. Although on a national scale more and more of the population is becoming urban, within the urban areas there is increasing

[6]Frederick G. Gardiner, an address entitled "Metro's Progress 1958".

decentralization. The interaction of these two trends has produced the new form of settlement we call the metropolis."[7]

Almost all of the great social and economic changes which have taken place in urban society in the last twenty years have had an adverse effect on public transit. The growth of the low density suburbs and the superior speed and convenience of the automobile for the suburban commuter, rising incomes, television and changing patterns of leisure activity, the shift from the six-day to the five-day work week, the decentralization of shopping and employment activities have all contributed to the decline in the use of public transit. The decline has been absolute as well as relative. (See Chart II.)

While patronage of transit systems and revenues have declined, costs have increased due to increased average length of ride and route miles, slowing of service due to traffic congestion and generally rising costs. In particular the very high labour content in costs of public transit has made these systems vulnerable to inflation and to the efforts of transit workers to become participating members of the affluent society. (See Table III and Chart II.)

Transit systems reacted by raising fares, converting obsolete high cost electric railways systems to more economical and more flexible motor and trolley buses, the latter enjoying a brief period of popularity in the five years following the war. In the field of public policy the most important development was the early recognition in this country that public transit could not survive as a privately owned enterprise and the subsequent acquisition of most of the private companies either by the cities concerned or their agencies.

Public ownership was the rule from the outset in the larger prairie centres of Alberta and Saskatchewan and was of long standing in Toronto. The assets of the Ottawa Street Railway Company were purchased by the City of Ottawa in 1948. Montreal Tramways became Montreal Transportation Commission in 1950; London Street Railway was acquired by the City and operated by the London Transportation Commission in 1951; Hamilton Street Railway became publicly owned by the City of Hamilton in 1960. In Western Canada the transit system of Winnipeg Electric Company was acquired by a publicly appointed Metropolitan Commission in 1953 and subsequently transferred to the jurisdiction of the Metropolitan Council of Greater Winnipeg in 1961. In 1962 the transit systems of Vancouver and Victoria became the property of the British Columbia Hydro and Power Authority, a Provincial Crown Corporation.

With publicly owned transit systems the tendency in Eastern Canada has been towards administration by publicly appointed commissions established by Provincial Statute. In Western Canada, with the exception of the unique situation in British Columbia, the transit systems are a direct responsibility of elected councils.

Commission forms of administration are usually featured by a statutory obligation to operate the system as a self-supporting utility and have the further ostensible justification that they tend to "keep politics out of public transit." Whatever the merits of these alternative arrangements may be, the difference in practice appears to be that Council administrated systems are more apt to have tax-supported fare structures.

Although public transit systems in both Canada and the United States have been subject to the same general influences in the post-war period, the much larger population of the U.S. metropolitan areas has brought the resulting problems into

[7]Hans Blumenfeld, "The Modern Metropolis", *The Scientific American*, Sept., 1965.

much sharper focus. In addition, there appear to be certain fundamental differences in the public policies which have emerged with respect to urban transportation which have produced differences in the outcome, at least up until this point.

Public transit systems in Canada have, generally speaking, survived the onslaught of the post-war era in somewhat better style than their American counterparts. (See Charts IV and V and Tables IV and V.) Transit riding has been maintained at higher levels, fares are generally lower and there appears to be a much readier acceptance of policies of financial assistance from local governments. There are notable exceptions to the rule, of course, and New York, Boston, New Orleans and San Francisco could be mentioned as cities where transit has strong support from other than its own financial resources.

However, it would appear that the main reason for the generally better preservation of public transit in this country is probably due to the greater degree of public ownership and the earlier acceptance of that principle. With the main exceptions of Quebec City and Halifax, public transit in Canada is almost entirely publicly owned and has been for some time. In the United States, until quite recently and with certain notable exceptions, this public utility has been largely in private ownership and has inevitably been operated with a view to return on investment. The cities, for their part, were inclined to look upon the private transit company with an attitude that varied from indifference to outright hostility. In more recent years there has been a marked trend towards public ownership of transit, particularly in larger metropolitan areas as it became evident that private operators could no longer cope with the financial problems which confronted them and that the public interest required an end to increasing fares and deteriorating service. American governments at various levels now appear to be undergoing an "agonizing re-appraisal" of their historic attitudes toward public transportation.

With the stronger tradition of public ownership in this country, there appears to have been a greater degree of readiness to regard public transit as an integral part of the urban transportation system and consequently public policies designed to preserve or enhance these systems have developed more quickly, or perhaps it might be said, with less reluctance.

As an illustration of the above as it bears on the type of transit system provided, it is interesting to note that of 22 metropolitan areas in the United States with populations of over 1,000,000 only five had true rapid transit systems. In Canada, with two metropolitan areas in this population class, one, Toronto, has an expanding rapid transit system, and the other, Montreal, is building one.

A substantial part of the capital costs of rapid transit in Toronto is being provided by the Metropolitan Government and to a lesser degree by the Province of Ontario. In Montreal the subways system is being constructed and financed by the City of Montreal.

It is obvious that rapid transit must be largely financed from other resources than those of the transit systems themselves. As a result of these and other financial arrangements it is not always possible to determine the true net position of publicly owned transit systems from an examination of the financial statements of the utilities themselves. However, in addition to the financial assistance provided as indicated above in Toronto and Montreal, the six principal transit systems in Western Canada are all heavily supported by public funds and have been for some time as indicated below:

TRANSIT DEFICITS — PRAIRIES CITIES
YEARS 1962-65

Year	Calgary	Edmonton	Regina	Saskatoon	Winnipeg
1962	($509,600)	($320,687)	($145,465)	($139,379)	($ 310,283)
1963	(262,583)	(536,448)	(290,447)	(179,269)	(1,011,060)
1964	(352,748)	(788,530)	(364,839)	(153,962)	(1,456,383)
1965	(576,550)[a]	(956,189)	(313,683)	(248,950)[a]	(1,492,579)

[a]estimated

Note: The transit system in Vancouver operated by the Provincial Crown Corporation had a deficit of $2,754,076 in 1964.

If the first twenty years of this century were the heyday of the electric street car, the twenty years following World War II have been the heyday of the private automobile. Its widespread acceptance and use have made it the dominant factor in the urban transportation picture today.

In 1948 there were two million motor vehicles registered in Canada. This figure increased to three million in 1952, four million in 1956, five million in 1959 and six million in 1963. (See Charts VI and VII.) Not only did the number of vehicles in use increase rapidly but the average use of these vehicles evidently increased. Thus while vehicle registrations increased by 20% in the period 1959-63, the number of vehicle miles travelled increased by 25% in the same period. The migration of people to urban areas meant that a disproportionate number of motor vehicles were also being domiciled in the urban areas.

As an indication of the willingness of Canadians to spend money on private motor vehicles, the Dominion Bureau of Statistics indicated in a survey in 1963 that the average family living in a city spent 9.3% of the family income on the automobile as compared to 9.1% for clothing.

Over a third of the whole population is licensed to drive.

The impact on Provincial budgets has been substantial. Provincial revenues from motor vehicle user taxes will amount to an estimated $895 million in 1965-66, up from $651 million in 1962-63. (See Table VI.) Net Provincial expenditures on highways, roads and bridges are generally at a somewhat higher level than revenues from user charges. (See Table VII.)

The spread of urban development and the shift from public to private means of transportation, dramatic as it has been in the post-war period, did not happen overnight. The previously uncongested streets only slowly filled up with rubber tired vehicles, and as this happened cities began to concern themselves with what became known as "the traffic problem."

Initial concern was largely with operational traffic problems. Canadian cities began to engage professional traffic engineers, charging them with the responsibility for this function, which in the typical case was previously a side-line of the Police or Works Department. In 1950 four cities had traffic engineers in their employ and there were 14 members of the Canadian Section of the Institute of Traffic Engineers. To-day there are 20 cities represented and 175 members of the Institute.

Canadian municipalities attacked the "traffic problem" in the years following World War II by improving the operational characteristics of their street systems and by extending and improving their arterial networks, and this work continues. Street widenings, the spread of traffic signal systems and their modernization, parking restrictions, one-way streets, new street connections, intersection improvements, higher standards of winter maintenance and many other stratagems and devices

aimed at more orderly and efficient traffic movement were introduced. These, along with the removal of practically all street railway operations served to improve the capacity of arterial street systems. The latest and apparently the most sophisticated step in this process has been the introduction of computer control to increase the efficiency of the traffic signal system in Metro Toronto.

At the same time the established arterial street systems in most cities have been substantially extended and improved by new construction and reconstruction. (See Table VIII.)

All this has been done with a view to "getting the most out of the existing street system," and the contribution of the traffic engineers to this end has been substantial. Nevertheless, it would appear that in the major Canadian urban centres this approach can alleviate but not solve the basic problem of providing for adequate mobility. There are several reasons for this. Firstly, it is obvious that the rate at which improvements of this type can be carried out cannot begin to match the productivity of the assembly lines of the automobile industry. Secondly, the basic arterial street system in any city serves the dual purpose of traffic movement and land access and these two functions come into conflict as traffic and land service demand increase. It does not appear possible to convert these arteries into facilities exclusively for the movement of traffic and even on many of the nation's busiest thoroughfares functions of parking and land access continue to be performed. Thirdly, many of the central city areas are the scenes of the worst traffic congestion and generally speaking these are the areas where conventional street improvements are the most difficult to carry out due to the intensity of development abutting the downtown arteries.

Consequently traffic congestion with its attendant frustrations, uneconomic consequences, and untoward effects appears to be steadily increasing. The high costs of correcting the situation have produced a good deal of wishful thinking plus a lot of acrimonious debate. Various proposals of an academic nature have been advanced and are now familiar by repetition — "ban the car"; provide "free" transit or alternatively forget about transit as it is outmoded; build freeways and neglect transit or build rapid transit systems and freeways will not be required; decentralize the central city and eliminate congestion with low density development or move everyone back into downtown in high rise apartments so they won't need transportation. All of these proposals have an engaging but unrealistic air about them and have at least one thing in common in which appears to be a complete lack of public support. They serve to confuse the real issue now facing major Canadian urban areas, which is the urgent need to create new transportation policies, systems and facilities designed to meet the requirements of the latter half of the 20th century and to do so in such a way as not only to improve their transportation systems and thus the economic efficiency of the urban society but to enhance the quality of urban living for the vast majority of Canadians who are now urban dwellers.

Urban Transportation Plans

As transportation problems became more critical in the middle 1950's and as it became increasingly evident that substantial capital costs were involved in

needed improvements, Canadian cities began to give these problems a more searching examination. Initially these studies tended to centre on one or another specialized aspects of urban transportation, such as parking, traffic operations, transit or the feasibility of an intricate but localized traffic facility. As the ramifications of the urban transportation problem came to be more widely appreciated and as research techniques improved, more comprehensive studies were undertaken, but this is a development of the last four or five years.

Of 85 studies reported by 25 Canadian cities in recent years, it would appear from general descriptions that they might be roughly classified as follows:

Comprehensive	9
Transit only	11
Expressway-Highway only	17
Traffic Operations	20
Parking or Specialized	17
General Planning	11
	85

Of these 85 studies, 55 were carried out by consultants, 30 by local governments or Provincial Highway Departments. However it should be noted that half of this latter group of thirty were carried out in Metropolitan Toronto.

The status of the plans which have emerged from these studies are only indicated in a very general way but may be summarized as follows with respect to implementation:

Completely implemented	10
Partially implemented	40
Not implemented at all	24
No indication given	11
	85

For the most part it appears that implementation, complete or partial, refers to specialized studies. Those comprehensive transportation studies which have been undertaken are of too recent origin and have such far reaching future plans that implementation involves long-range programming. Nevertheless it seems that Canadian municipalities are not moving vigorously to implement those transportation plans which have been developed up to this point. It would appear that they either lack confidence in these plans or they do not have the capacity to implement them. The rapid pace of urban development frequently renders key segments of transportation plans obsolete if decisions with respect to protecting them are not made.

Transportation facilities have always had a dominent effect on urban land use and therefore on the shape and character of cities. Planned or unplanned, for better or worse, they will unquestionably continue to exert a similar influence on the cities of the future.

This close relationship between transportation, land use and urban development is now widely appreciated although obviously not all aspects of the relationship are as yet perfectly understood. Techniques are being developed in the field of urban land use and transportation planning which promise to improve very greatly our knowledge of the role of the various component elements of the transportation system, their interaction with one another and with other elements in the urban structure.

It is now generally agreed that the urban area planning must be comprehensive and must include the planning of transportation facilities. Similarly transportation planning must embrace the complete transportation system of an area and it is no longer sufficient to deal with highways, railroads, and mass transportation facilities as independent systems on an individual project basis.

> "To identify the exact nature of the problem both today and in the future, a comprehensive urban area transportation study is required. Consideration must be given to all forms of transportation, both public and private, in reference to the expected future economic and social development of the urban area. In a comprehensive study, it is necessary to coordinate the activities of all organizations and individuals engaged in shaping the future of the urban area, which will include transportation planners, city planners, economists, social scientists, governmental officials, and other specialized personnel. Indication will be given in this report of these specialized areas not directly the concern of the transportation engineer. However, the transportation planner must be aware of the gross effect which his plans will have on the urban environment."[8]

To be effective urban transportation planning must be carried out on a regional basis by a planning organization having the whole urban area as its concern. A group of municipalities in a typical urban community operating independently cannot be expected to achieve this goal. Most of the smaller municipalities do not have and probably never will have the staff required. The same municipalities acting in concert through an area planning board with "advisory" powers are not apt to do much better. In such a situation it is usually impossible to get unanimous agreement even on the planning concepts to say nothing of the subsequent financial arrangements and staging of construction.

Under the circumstances and in particular in the absence of administrative organizations of their own capable of dealing with transportation planning, Canadian cities have tended to rely on consultants. The majority of the plans on various aspects of urban transportation in this country in recent years have been prepared by consultants. While consulting organizations have played and will no doubt continue to play an important part in the planning of transportation facilities in Canadian cities, they cannot provide the continuing planning process which the situation calls for. Massive, "one-shot" studies projected into an urban situation where the political, administrative and financial capability to implement is not present will normally end up on a shelf.

Senior governments have developed policies which have had and continue to have a profound effect on the course of urban development in Canada. The vast suburban housing developments which have been built since the War, largely on the basis of Federally guaranteed loans, have left their legacy of transportation problems to the cities and municipalities. The concern with transportation facilities in these developments appears to begin and end with their local street system, which in the normal case will be designed in such a way as to preclude the possibility of convenient transit service. The suburban resident becomes a car commuter by necessity, as well as choice. He and his neighbors probably drive to work on established traffic arteries that were not designed to provide traffic service to these new communities and they, along with thousands of others, must find an all-day parking space when they get to work, usually in the downtown area.

This tendency to ignore the tremendous impact of post-war urban develop-

[8]Martin, Memmott and Bone, *Principles and Techniques of Predicting Future Demand for Urban Area Transportation* (Boston; Massachusetts Institute of Technology Press).

ment on inadequate urban transportation facilities is not confined to Federally sponsored suburban development. It appears also to be the case with respect to the Federal Government's urban renewal policies. Here the Government's policy appears to be confined to the local street system required to serve the renewal area, as though it were a self-contained unit.

Normally there tends to be a high degree of coincidence in the geographic locale of transportation and urban renewal needs. The central business district and the industrial and institutional areas around it make the centre of the city a massive traffic generator, so that increasing automobile, truck and transit traffic demand is a dominant factor in the need for transportation improvement. At the same time both land use and circulation facilities within the older inner areas and along many arterials in outlying areas are (because of age, structural standards and various frictions) suffering from obsolescence and deterioration — producing a need for both transportation improvement and urban renewal. The blighted districts around the central business core, particularly of the larger Canadian urban areas, must be re-built but this will be impossible unless the obsolete transportation facilities which now serve them are also rebuilt so as to provide the greatly enhanced accessibility needed to make them attractive to private investment.

The co-ordination potential is summarized as follows in a report dealing with this matter:

> "Traffic is probably the most serious single problem affecting the future development of cities. Traffic flow in a city is like the circulation of blood in the body; and the cities today, are, without exceptions, suffering from hardened arteries. Until satisfactory arterial systems can be created and the course of traffic not only freed from congestion but its volume held within calculable bounds, urban renewal — particularly where private investment is involved — is likely to be a hazardous and discouraging business. A logical and adequate traffic system (including appropriate means for parking and mass transportation) is thus a vital key to the future.
>
> "The prospects for continued urban renewal are intimately bound up with the possibility of solving the traffic problem. This is dependent upon the creation of street and block patterns which discourage through traffic within the neighborhood and at the same time are compatible with fast, free-flowing motor transport in the main highways. It is also dependent upon provision of adequate terminal facilities and, even more fundamental, upon control of the type and density of population in such manner as more broadly to distribute the origin and destination of traffic."[9]

It would appear obvious that urban renewal and transportation projects should be planned and implemented on a co-ordinated basis and by so doing substantial savings in the cost of land may be effected.

> "The meshing of highway and renewal projects in the same area can avoid substantial unnecessary costs, as well as reducing project expenses. One unnecessary cost is inflation of land value, due to one project being done ahead of another. Land near a new highway may appreciate in value because of new business opportunities, and cause added expense to a later renewal project. New private construction may take place, for which the owner will later have to be compensated. The same effects can be felt if the renewal project is first, with expensive new facilities necessarily demolished for highway right-of way.

[9]Miles L. Colean, *Renewing Our Cities* (New York; Twentieth Century Fund), 1953.

"New highways in urban areas sometimes induce new blight as a result of poor coordination with urban renewal. This occurs when the new highway traverses an area which has maintained a use unsuitable to the new environment. An example might be a retail commercial district which is cut in two by a controlled access facility, leaving a small section with no growth opportunity, or making access to it difficult. Residential property of high-type might be rendered undesirable by the presence of an interchange and its generated traffic. New highways built near rivers or railroads can make narrow strips of land worthless. Valuable industrial tracts might be damaged by division into parcels too small to use, or barred from access to rail or river connections. Even redeveloped areas can be blighted by such effects."[10]

Recognition by the Federal Government that rehabilitation of urban transportation facilities in the central areas of Canadian cities is an integral part of the physical renewal of those areas would no doubt spur activities in these related fields and promote the objective of sound redevelopment of the blighted areas.

[10]Thomas J. Seburn and Bernard L. Marsh, *Urban Transportation Administration* (Yale University Press).

Chapter 3. SENIOR GOVERNMENT INVOLVEMENT IN URBAN TRANSPORTATION

Federal Government Role in Urban Transportation — Canada and the United States

In view of the growing concern with problems of transportation in urban areas both in this country and the United States and in particular, the increasing role of the United States Government in these matters, it may be some interest to contrast briefly the activities of the two Federal Governments in this field in each country.

In Canada, up until the present time, the Federal Government has not become involved to any significant degree in the field of urban transportation. The Trans-Canada Highway, financed largely by Federal funds, has touched the skirts of the urban areas, but has not had any substantial effect on intra-urban transportation, nor was it intended that it should have. An outstanding exception to the above generalization is the routing of the Trans-Canada Highway across the island of Montreal. This major expressway passing through the developed areas of three suburban communities — Mount Royal, Côte St. Luc and Westmount, as well as the City of Montreal, crosses the South Shore of the St. Lawrence River via a 50 million dollar tunnel bridge. The net expenditures of the Federal Government for Trans-Canada Highway in Metropolitan Montreal are in the order of $52,000,000 for the five year period 1961-65 and are estimated at $80,000,000 for the six year period 1966-71. The routing of the Highway through the Metropolitan area will thus result in the construction of a major urban freeway which will no doubt have a considerable impact on intra-urban travel patterns as well as on intra-city traffic.

A further Federal influence in urban transportation, again in the Montreal Metropolitan area, is through a Crown Corporation, the National Harbours Board. The Federal Government does not normally contribute to the cost of building bridges (other than International Bridges and those on the Trans-Canada Highway). However, the National Harbours Board has built two bridges in Montreal, the Jacques-Cartier Bridge and the Champlain Bridge. The latter is a toll bridge and the former was until about two years ago when the tolls were removed.

The Federal Government through the National Capital Commission is responsible for a system of parkways in the Ottawa Metropolitan area. The extent to which the Federal Government may be involved in the implementation of major new transportation facilities in the National Capital, as recommended in the major study recently completed, does not seem to have been defined at the present time.

In its urban renewal policies the Federal Government accepts no responsibilities for the impact of its programs on urban transportation facilities and does not appear to recognize the intimate relationship between transportation improvements and renewal activities.

The Government has no policy with respect to the public transit component of urban transportation systems. The case of Metropolitan Toronto obtaining some financial assistance through the Municipal Development and Loan Fund seems to be an isolated case.

In addition, the Government through the Board of Transport Commissioners makes contributions to the cost of constructing grade separation structures where major roads cross rail lines at grade and where proper warrants can be met. While these arrangements have been very useful in urban areas, there are some indications that costs of building these structures have been rising to the point where the Board's contribution with its fixed upper limit may no longer be adequate to induce local governments to pursue this necessary work. This seems to be particularly true in urban areas where more elaborate and costly structures may be necessary and where land costs may be substantial.

By contrast the Federal Government of the United States is playing a steadily increasing role both with respect to urban highways and urban mass transit.

Federal aid for highways in the United States has a long history but originally such aid was confined to rural roads. In 1944, for the first time, specific authorization of Federal-aid funds was made for the urban extensions of the primary and secondary systems of Federal aided roads. The National System of Interstate and Defense Highways, now a dominant feature of the Federal-aid program was authorized in 1956.

The Congressional Acts of 1956 and 1961 provided for completion of the system by 1972 on a 90% Federal, 10% State matching basis.

The improvement of Interstate and other Federal-aid highways is financed from the proceeds of motor-fuel and other excise taxes deposited in the Federal Highway Trust Fund, thus the principle of ear-marking is clearly established. Administered by the Bureau of Public Roads the Federal assistance is a grant in aid type of program; that is, funds for use in highway improvements are allotted to States in accordance with formulas that give weight to population, area, mileage and (for the Interstate system) relative costs. The Federal-aid program is between the Federal and State Governments only. Insofar as urban areas are concerned, aid for projects which involve them must be channelled through the State Governments.

Federal aid financing for both Interstate, primary and secondary systems amounted to an estimated $3,675 million in 1965.

Federal assistance to mass transit is of more recent origin emerging initially as a result of the impending crisis in the commuter railroad services in the large metropolitan centres of the Eastern United States. At the outset proposals for Federal intervention in these matters received little support as the problems were not sufficiently widespread to attract a broad base of Congressional support. It was not until the advocates of Federal action in this field expanded their proposals to embrace the over-all urban public transportation problems as compared with the commuter rail problem that they were able to attract support from urban areas which had severe mass transit problems but no commuter railroads.

Proponents of Federal aid led by Senator Williams of New Jersey argued for Federal legislation on the grounds that the welfare of 100 million Americans depended upon urban transportation, on the need to protect the federal investment in urban highways and on the threat of traffic congestion and transit deterioration to the economic welfare of the nation's major wealth producing centres.

A bill proposing a modest level of Federal assistance to urban transit was finally passed by the Senate in 1960 but defeated in the House. The Eisenhower administration was opposed to Federal intervention in what it was considered a local matter. Administration opponents of the bill argued that the need was "for

stimulating and co-ordinating the planning of transportation systems, for integrating urban transportation systems with comprehensive planning and for designing transportation systems that will help create the sort of urban communities in which we want to live and work." Until this sort of planning was done, they argued, there would be no real measure of the need for metropolitan transportation facilities. Another administration argument for inaction was the lack of public bodies "equipped to finance and develop coordinated transportation systems for our metropolitan areas." When these planning and organizational tasks were completed, they argued, would be the time to judge whether Federal assistance was needed.

Senator Williams agreed that comprehensive planning must be encouraged "but first you have to give the communities some incentive which can't be accomplished by noble words alone." Giving priority to aid applicants with workable plans for coordinated transportation systems, declared the Senator, was the most effective way of spurring planning.

For want of a sufficiently broad base of support the bill died in committee but the issue remained very much alive. With the support of the Presidential nominee, John F. Kennedy, the Democratic party in 1960 placed urban affairs as a national issue in their party platform and pledged "Federal aid for comprehensive metropolitan transportation programs including bus and rail mass transit, commuter railroads as well as urban highway programs and construction of civil airports." Kennedy declared, "the Democratic Party knows of no wiser investment that this Nation could make than Federal aid to urban transportation."

Kennedy's election did not automatically ensure adoption of such a policy. Strong political interests were still very much opposed. However, the cities wanted action and the American Municipal Association and the U.S. Conference of Mayors were prepared to mobilize pressures from cities large and small. William's bill was introduced again in the Senate, with its sponsor emphasizing the central city aspect of his proposals.

> "A really constructive program of Federal encouragement and assistance in mass transportation can be a potent instrument in revitalizing our great urban centres. We cannot renew our cities by just building new buildings under the urban renewal program. We must also have a mass transportation program working hand-in-hand with other development programs, to help local leaders reshape 19th century cities to meet 20th century needs."

Finally, and only after many further concentrated political efforts by Williams and the mayors of the major urban areas, both the Senate and the House approved and the President signed into law the Housing Act of 1961 which provided $50 million in Federal loans for acquisition and improvement of mass transportation facilities in urban areas. Another $25 million was to be used for transit "demonstration grants." Finally federal urban planning assistance was made available "for comprehensive transportation surveys, structures and plans to aid in solving problems of traffic congestion, facilitating the circulation of people and goods in metropolitan and other urban areas and reducing transportation needs."

In 1964 an expanded mass transit bill was signed by President Johnson providing for $375 million in aid to public transit with federal grants covering two-thirds of the capital cost of mass transportation projects which are part of comprehensively planned urban transportation systems.

It should be noted that there is an important difference in principle involved in Federal aid to transit as compared to highways. In the latter case the Federal Government dealings are exclusively with the States but in the case of mass transit

the cities deal directly with Washington. This outcome appears to be due to the relative indifference of State Governments towards this exclusively urban problem which lead the Big City Mayors to carry their campaign directly to the Federal Government, or as put by Mayor Wagner of New York; "The City is a kind of island surrounded by a body of deep water called State Government. For Federal help to reach these islands, it must find its way past the often unfriendly reefs and shoals of State bureaucracy."

In relation to needs the Federal program of assistance to mass transit is an extremely modest one. The Bay Area Rapid Transit project in San Francisco alone is about three times the whole annual Federal aid program, to say nothing of the needs of the many other large Metropolitan areas. No doubt the principle of Federal assistance, now having been recognized, will be expanded and will serve as a catalyst to produce the action necessary to improve that country's mass transit systems.

The Role of Provincial Governments in Canada

The role of the Provinces in the field of urban transportation varies considerably across the country and has been changing as a number of the Provinces have shown increasing awareness of the magnitude of the problems involved and are adapting their policies and programs accordingly. It may best be illustrated by specific references to what is actually happening in urban areas in a number of Provinces.

Ontario

Provincial subsidies for urban roads vary with the category of the municipality and with the type of road. In cities and separated towns the Government pays 33⅓% of the costs of ordinary roads, including bridges and culverts. In the Municipality of Metropolitan Toronto the Government pays 50% of all road costs.

Under agreement between the Minister of Highways and a municipality, a road may be designated a "connecting link" in the Provincial Highway System and while remaining under local jurisdiction will qualify for Provincial aid up to 75% of construction costs only and to a maximum roadway width of 48 feet.

The Province more recently has recognized a responsibility to assist in financing rapid transit in Toronto.

Metropolitan Toronto

In 1953 the Provincial Government of Ontario recognized the problems inherent in the dynamic growth of the Toronto area and created the Municipality of

Metropolitan Toronto to deal with certain basic public services of an area-wide nature. The Government also provided certain important forms of financial assistance to assist the Metropolitan Government in meeting the obligations imposed on it by the Legislature. The results are an impressive tribute to the benefits which can accrue to an urban area when a Provincial Government recognizes its responsibilities and acts on them.

Metropolitan Toronto carries out its transportation planning responsibilities (as well as the broader aspects of land use planning) through the Metropolitan Planning Board. It implements its road plans through its responsibility for the construction, maintenance and operation of a system of Metro, or major, streets in the metropolitan area.

At the same time as the Metropolitan Government was established the Province extended the area of jurisdiction of the formerly city-owned Toronto Transit Commission to the whole area and established it as a Metropolitan Transit Commission.

As a result of the increasing role of the Provincial and Metropolitan Governments in financing rapid transit in the area, road and rapid transit planning and construction have been closely integrated.

Fifty per cent of all capital costs of roads are paid by the Provincial Government with the Metropolitan Government financing the balance.

Initially the Toronto Transit Commission financed the capital cost of rapid transit from its own resources but it soon became evident that an adequate public transit system could not be provided on this basis. Subsequently, the Metropolitan Government recognized an obligation to provide assistance, generally intended to provide the costs of rapid transit rights-of-way and the construction of the necessary tunnels, structures, etc. The transit system's share has been considered to cover the costs of operating equipment. In 1963 the Highway Improvement Act was amended so that the Provincial Government would share in the cost of the Bloor-Danforth subway by recognizing one-third of the cost of approved facilities.

In the past three years expenditures on roads have averaged $34,000,000 annually and are projected at $24,000,000 annually for the next six years. These costs are shared 50%-50% by the Metropolitan and Provincial Governments with incidental Federal contributions through the Grade Crossing Fund.

Transit capital expenditures have been averaging $36,000,000 per year for the last six years and are projected at $25,000,000 for the next six years. The $150,000,000 total will be divided approximately as follows:

Metropolitan Government	$ 95,000,000
Provincial Government	20,000,000
Toronto Transit Commission	35,000,000
	$150,000,000

Thus Metropolitan Toronto plans to spend approximately $245,000,000 to improve its urban transportation facilities in the next five years, a somewhat more modest rate of investment than it has been necessary to make in the immediate preceding years.

Perhaps of more interest are the long-range plans for the area's transportation requirements as recommended by the Metropolitan Toronto Planning Board follow-

ing a comprehensive study using the most modern research techniques to forecast requirements to 1980. The recommended transportation plan includes 197 miles of expressways, 908 miles of arterial roads and 30½ miles of rapid transit lines. In addition, it recommends 10 expressway bus routes and 12 express bus routes on arterial roads to feed the rapid transit system. Although no specific proposals for rail commuter service are included in the recommended plan, the report acknowledges that such a service can fulfill a useful function, particularly for urbanized areas outside of the Metropolitan Planning area. This possibility was studied in greater detail by the Metropolitan Toronto and Region Transportation Study and plans to implement such a service are now actively in progress.

The combination of roads and rapid transit systems recommended in the plan were developed only after the most careful analysis of alternative systems.

The estimated cost of implementing the transportation plan is one billion dollars, of which approximately 35% would be for rapid transit, 40% for expressways and 25% for arterial road construction and improvement.

Thus Metropolitan Toronto is making the often empty phrase "balanced transportation" mean something. In the face of many obstacles and at great cost it is undoubtedly providing the finest combination of urban transportation facilities to be found in North America, all of which can be attributed to the exercise of political leadership on both the Metropolitan and Provincial levels of Government.

Ottawa-Hull Metropolitan Area

In 1965 a comprehensive transportation study was completed for the Ottawa-Hull Metropolitan Area by consultants retained for this purpose.

This study, using the latest techniques of transportation analysis to project requirements to 1986, recommended a substantial freeway system, extensive improvements to the arterial street system and a downtown distributor facility partly in depressed right-of-way and partly in tunnel. The report also recommends the establishment of an integrated metropolitan transit system and proposes that bus-rapid transit facilities be incorporated in certain elements of the projected freeway system by means of separated rights-of-way.

Costs of implementing the plan are estimated at approximately $435,000,000, of which $332,000,000 would be spent in Ontario and $103,000,000 in Quebec. Again, of the total mentioned, it is interesting to note that less than half, or $224,000,000, is involved in the freeway proposals while the balance is for the improvement of arterials and other major roads.

The report lists, in addition to the Provinces of Ontario and Quebec and the Cities of Ottawa and Hull, twenty-six other local governments as being involved in the metropolitan area. In addition there are four other special purpose agencies concerned, including the National Capital Commission.

Thus the Ottawa-Hull area has not only the usual complications normally found in local government in a metropolitan area but has the additional complication of a Provincial boundary and the presence of the Federal Government.

The Consultants refer to the problems presented by this welter of conflicting jurisdiction in their Report:

"In no sense can it be said that the machinery exists for comprehensive transportation planning in either the Ontario and Quebec sides individually, or in the Study Area as a whole. Even in Ottawa, there is no authority at the technical level responsible for co-ordinating the planning and operational activities of the Department of Planning and Works, Traffic Engineering Services, the Parking Authority and the Transportation Commission. The problem is intensified when the number of other agencies and municipalities involved in providing transportation facilities throughout the Study Area is considered, principal among these being the Provinces of Ontario and Quebec, the Federal Government, Hull and Eastview, Charleton County, Ottawa Suburban Roads Commission, Eastview Suburban Roads Commission, Nepean and Gloucester, Hull City and Metropolitan Transport Limited, and Canadian National and Canadian Pacific Railways.

"Much has to be done to coordinate land use developments with the planning, design, construction and operation of street, public transit and terminal facilities on an area-wide basis. Even if there is the utmost co-operation and liaison between the municipalities and agencies, there is cause for concern regarding the ability of the various groups to finance and construct individually the facilities required to serve the transportation needs of an area that is metropolitan in character. While at this time of writing the results are not known, the review of local government in Ottawa, Eastview and Carleton County undoubtedly will contain recommendations that will provide a basis for concerted action on the Ontario side of the Study Area. However, the transportation problem extends to both sides of the Ottawa River, and any attempt to deal with it less comprehensively will result in only partial solutions with limited chance of success. For this reason, it is imperative that proper administrative processes be evolved to co-ordinate transportation planning activities throughout the Study Area as a whole."

The City of Ottawa reports its projected capital expenditures on roads for the next five years at approximately $10,000,000 annually, up from an average of $6,300,000 in the past three years. These costs are subject to the normal cost-sharing arrangements prevailing with the Province.

Since the recommended transportation plan involves expenditures of $174,000,000 for the metropolitan area in the period 1965-71, it is apparent that the requirements of this plan go far beyond what the City can budget for at this time. The City reports that its capital expenditures on roads should be more than doubled in the next five years to meet its anticipated transportation requirements.

At the present time the metropolitan area is served by the City-owned Ottawa Transportation Commission in Ottawa and by a privately owned company in Hull. The report recommends an integrated transportation system to serve the whole area. While the publicly owned transit system has been able to operate on a self-sustaining basis in recent years, it is not considered that it can continue to do so in the future.

Hamilton

In the past ten years a number of special purpose studies have been conducted for the City of Hamilton or the metropolitan area. In 1963 a comprehensive trans-

portation study was carried out for the City of Hamilton by consultants engaged for that purpose. This study included an analysis of present and future land use, population and employment and the calibration of a traffic model from relationships developed in this process. It included an investigation of both public and private transportation requirements.

The consultants reported that the population of the study area was expected to double to 723,000 by 1985 and that the number of motor vehicles would increase in that period of time by 130%. The report states:

> "The present transportation system will be completely incapable of accommodating the increased travel which will accompany the growth described above. Already, congestion is found throughout the central business district, particularly along John, James, King and Main Streets. It was found that in 1961 the losses resulting from accidents, congestion and delay in this area combined to produce an economic loss equivalent to $1,000,000 per year."

After testing and discarding extreme "transit oriented" and "private vehicle oriented" systems, the study concluded by recommending an integrated program of street, highway and freeway improvements integrating public transit operations into this system by means of conventional bus operation on the improved thoroughfares system.

Cost of the recommended plan was estimated at $202,900,000 with the City's share being $75,300,000, the balance being largely the responsibility of the Provincial Government.

The City estimates indicate a sharp rise in capital expenditures on road facilities in the next five years, increasing from an average of $979,000 in the past three years to an average of $9,208,000 in the next five years, of which slightly over $5,000,000 is estimated to be the share of the Province of Ontario.

The transit system in Hamilton is owned by the City and its operations are under the jurisdiction of a publicly appointed commission. It is financially self-supporting and it is estimated that it can continue to pay its own way in the next few years.

Quebec

Montreal

In the great metropolitan area of Montreal very substantial expenditures are being undertaken to improve the urban transportation facilities, both expressways and rapid transit.

In so far as the road system is concerned, the Provincial Government is the main source of funds as the following statements show:

Expenditures on Roads in Metropolitan Montreal Area

Average Yearly Expenditures

Last 4 Years	Municipal	Provincial	Federal	Total
Roads (Autoroutes)	—	$ 6,300,000	—	$ 6,300,000
Roads	—	9,605,000	—	9,605,000
Roads	$5,000,000	—	—	5,000,000
Trans-Canada Highway	800,000	18,000,000	$10,400,000	29,200,000
TOTAL	$5,800,000	$33,905,000	$10,400,000	$50,105,000

Next 5 Years	Municipal	Provincial	Federal	Total
Roads (Autoroutes)	—	$ 5,580,000	—	$ 5,580,000
Roads	—	8,325,000	—	8,325,000
Roads	5,000,000	—	—	5,000,000
Trans-Canada Highway	3,300,000	20,800,000	13,400,000	37,500,000
TOTAL	$8,300,000	$34,705,000	$13,400,000	$56,405,000

The Federal Government roads expenditures in Montreal relate to the Trans-Canada Highway. The net expenditures by the Government for this purpose are approximately $52,000,000 for the five year period 1961-65 and $80,000,000 for the six year period 1966-71. Provincial contribution for this Highway are even higher, while the municipal share is by comparison modest.

Trans-Canada Highway — Average Yearly Expenditures

Years	Municipal	Provincial	Federal	Total
1961-65	$ 800,000	$18,000,000	$10,400,000	$29,200,000
1966-71	3,300,000	20,800,000	13,400,000	37,500,000

In addition, the Metropolitan Boulevard, originally built by the City of Montreal, has been taken over as a Provincial Highway and the amounts expended by the City have been refunded by the Province.

Thus the senior governments and in particular the Province of Quebec have sparked a substantial program of major thoroughfare improvements in Montreal by their assistance programs.

The City of Montreal is also engaged in the construction of a major underground rapid transit system, under authority granted by the Provincial Legislature. The system is expected to cost $213,700,000 over a five year period and important sections of it should be in operation in late 1966.

The surface system, operated by the Montreal Transportation Commission, has since its acquisition of the former private company, completely modernized the obsolete street car system at very substantial capital cost.

The surface system will be integrated with the "Metro" or underground system for maximum operating efficiency.

In 1966 the Legislature moved to place ultimate financial responsibility for public transit in Montreal on a metropolitan basis by enacting that interest and amortization of loans by debentures contracted by the city for the construction and equipment of the metro system, and the payment of operating deficits incurred by the Montreal Transportation Commission, shall be borne by the municipalities served by the transit system. Such expenses are apportioned among the municipalities in proportion to the total valuation of the taxable real estate in their respective territories standardized in accordance with a prescribed procedure.

The Province of Quebec does not contribute to the cost of rapid transit in Montreal.

New Brunswick

St. John

The Greater St. John area with a population of approximately 100,000 provides an illustration that the smaller metropolitan areas also have transportation problems.

A new comprehensive urban study is now being prepared which will have three general parts (1) The Community Plan (2) The Transportation Plan (3) The Urban Renewal Plan. The study will take approximately two years and will cost $265,000.

The City of St. John projects its expenditures on arterial and collector roads at $400,000 for capital improvements over the next five years compared with $118,000 average in the past three years. For arterial and collector roads the Provincial Government makes grants of 50% of cost up to a maximum roadway width of 24 feet.

There is also reference to a proposed Harbour Bridge and roadway complex to be financed by the Provincial and Federal Governments, the anticipated cost to be recovered from user tolls. The basis of Federal participation is not clear.

The area is served by a privately owned public transit system which is presumably self-supporting.

The City of St. John, with 60% of the Metro area population makes the following observations in connection with material submitted:

> "For several years it has been apparent that these urban areas have been one economic and social unit. However, past efforts toward amalgamation have been unsuccessful. In late 1965 and early 1966, several meetings have been held on this matter and indications are that a union of two or three of the major units will be possible in 1968.
>
> Because of the various municipal jurisdictions, planning and the solution of major transportation problems have been difficult. The new Comprehensive Study, when completed and adopted, should solve the present major problems in this respect in future years."

British Columbia

Vancouver

The Provincial Government makes grants to the cities of Vancouver, Victoria and New Westminster, for capital expenditures approved on major route projects; an annual total Provincial appropriation of $500,000 being divided among these three cities roughly on a mileage basis. In the smaller municipalities in the Metropolitan Vancouver area, the Province may pay 100% of the cost of non-freeway arterials (excluding curbs, gutters and street lighting) and the entire costs of freeways.

A number of transportation studies have been carried out in the Vancouver Metropolitan area of which the most important was that carried out by a Technical Committee representing the various municipalities involved and the Provincial Government. The plan, prepared in 1959, was designed to meet transportation requirements to 1976. The proposal assumed full development of major arterial streets and consisted principally of a freeway network to be supplemented by a system of bus rapid transit. This plan has not yet been implemented.

In 1963 it was agreed by the City and some of the municipalities concerned and the Provincial Government to review, update and recommend action on the 1959 plan and its proposals. A firm of consultants was engaged for this purpose.

The review and evaluation by the consultants strongly supported the need for a substantial program of freeways and crossings in the Vancouver Metropolitan area over a twenty year period and with costs estimated at $400,000,000. The consultants urged an immediate start on certatin key sections of the system along with more detailed study and engineering design with respect to certain other specific elements of the system.

It is obvious that the City of Vancouver cannot undertake a major share of a plan of this magnitude in view of the purely nominal financial assistance now extended by the Provincial Government.

A similar state of uncertainty appears to prevail with respect to the Metropolitan Transit System in Greater Vancouver. It was acquired by the Provincial Government as part of the B.C. Electric Company expropriation. Franchises are due to expire in the near future and the subsequent ownership and operation of the system is in doubt.

Alberta

Calgary — Edmonton

These two cities have a good deal in common, one being that they are the two fastest growing urban areas in the country. In addition, in both areas over 90% of the population of the Metropolitan area live within the city boundaries thus minimizing the problem of divided jurisdiction so commonly found elsewhere.

As a result of the very substantial growth rate being experienced, both these centres seem to have focussed a good deal of attention on their planning responsibilities including transportation planning.

In Edmonton in recent years a number of transportation studies have been carried out, of which the Metropolitan Edmonton Transportation Study is the most comprehensive. This plan, based on an analysis of present and future conditions of land use, population and employment and an investigation of present and future travel by auto and transit, estimates transportation requirements to 1980.

The proposals include a freeway plan with a downtown loop and radials, express bus operation on the freeway system with elevated routes and stations downtown and a downtown subway system and stations.

The estimated cost of the freeway plan is $92.5 million and the total program including upgrading arterial streets, new bridges, railroad grade separations, etc., is estimated at $133.5 million.

Capital expenditures on arterial and collector streets in Edmonton have averaged slightly over $2,000,000 for the last three years and are projected at $1.5 million for the next five years along with an additional $2,000,000 annually for the freeway system.

Thus the rate of capital expenditure is well below levels required to implement the recommendations of the Metropolitan Edmonton Transportation Plan. The City reports that it considers "that the Provincial Government should contribute a greater amount to the construction of major roads and bridges within the city limits, including right-of-way acquisition." The City estimates that the rate of capital investment in major roads should be tripled if its needs are to be met.

The Province of Alberta contributes one-half of the cost of construction of freeways and expressways, as well as "highway connectors" and major cross river bridges. There is no contribution for right-of-way. (It is understood that the contributions to freeways and expressways have recently been increased by the Province to 75% of construction costs.)

As indicated earlier, the City of Edmonton operates the public transit system and supports a level of service and a relatively low fare structure from its general revenues.

Calgary is in the process of reviewing previous transportation plans and preparing a new plan covering anticipated requirements over a 20-year period. It is expected that this plan will be completed in 1966.

It is anticipated that, as in Edmonton, the plans will call for substantial freeway construction as well as arterial street improvements, and will involve the public transit system.

Estimates of the rate of future capital expenditure on major roads show a very substantial increase for the City of Calgary. Average capital expenditures over the last three years of $1,350,000 ($1,000,000 on freeways and expressways and $350,000 on arterials and collectors) show an increase for the next five years (1966-71) to $9,000,000 annually, of which $6,000,000 would be for expressways and freeways and $3,000,000 for arterials and collectors.

The same cost sharing principles referred to in Edmonton's case apply to Calgary.

The transit systems in both Calgary and Edmonton are exempt from Provincial Motor Fuel Taxes.

Saskatchewan

Regina and Saskatoon

The two principal cities of Saskatchewan — Regina and Saskatoon — like Calgary and Edmonton contain virtually all the urban population within the City Limits. In this situation the planning and implementation of transportation requirements is considerably simplified and the problem confronting both of these areas appears to be primarily financial.

In Saskatoon plans for arterial improvements and freeway requirements are well-defined and are being implemented as finances permit.

Regina is in the process of preparing a transportation plan.

Saskatoon has been making rather substantial investments in freeway construction in the last few years, averaging $4,000,000 annually with $1,100,000 for arterial street improvements. Projected annual expenditures for the next five years are estimated at $1,400,000 for freeways and $1,200,000 for arterial streets.

Regina proposes to double its streets capital investments in the period 1966-71 over past years and estimates expenditures of $2,000,000 annually, of which half will be for freeways and expressways and the balance for arterial streets.

It is interesting to note that these two prairie cities, Regina with a population of 134,000 and Saskatoon with 120,000, have clearly indicated needs for freeway-expressway type thoroughfare improvements.

In both cases the Provincial Government assists the cities by contributing 50% of the cost of freeways, expressways and arterial streets.

The Government also exempts the transit systems from Provincial fuel tax. The transit systems in both cities are heavily supported by the cities out of their general revenues, this support amounting to 25% of the system's revenues in Saskatoon and 28% in Regina.

Manitoba

Metropolitan Winnipeg

In the 1950's the area comprising Metropolitan Winnipeg experienced the usual problems afflicting expanding urban areas, particularly those associated with area-wide services and the inability of the area municipalities to plan and finance these needed services in an orderly manner.

The Provincial Government recognized these difficulties and after very considerable study created by Provincial legislation the Metropolitan Corporation of Greater Winnipeg and charged it with responsibility for the major inter-municipal services.

The Metropolitan Government, carried on by an elected Council, administers planning functions for the whole area, water supply and waste disposal, a system of Metropolitan parks, all assessments, and the major transportation facilities for the area, including a system of Metropolitan Streets and the public transit system.

The transportation functions are closely related to the Corporation's land-use planning activities.

Initially capital grants for streets purposes were limited to such selected projects as the Province chose to approve and were limited to a sharing of construction costs. This led the Corporation to avoid necessary improvements in areas where right-of-way costs were apt to be unduly high. In spite of this, considerable improvements were carried out including the construction of two new bridges.

In 1965 the Provincial Government very considerably broadened the scope of its financial participation in Metro's transportation responsibilities. The Province now pays 50% of all approved road projects including property, street lighting, boulevarding, etc. The Government also substantially increased its maintenance grants.

The Corporation is now engaged in a comprehensive transportation study which is being carried out by its own staff. Early indications are that this study, in addition to demonstrating the needs for very considerable improvements to the arterial street system, will point up the necessity of a combined freeway-transit system. In fact the Corporation has already moved to protect by acquisition certain corridors where future freeway development appears necessary.

The Metropolitan Council also supports the public transit system (which has been considerably extended and improved) by substantial operating subsidies. Fares have been unchanged since 1957 and are the lowest of any major system in Canada. In 1966 the Provincial Government recognized the importance of mass transit services to the urban transportation complex by developing a grant formula. The Government will make a grant equal to the subsidy or 3% of the operating revenue, whichever is the lesser of the two. This arrangement is unique in Canada and illustrates the great changes in political thinking with respect to urban transportation facilities that has occurred in this Province.

Thus the Province of Manitoba at an early date recognized the developing problems of the Metropolitan area, including urban transportation, and has moved vigorously to combat them. The creation of a new level of government and the recognition of the need for financial support has not been accomplished without difficulties for the Province but the emerging results will no doubt vindicate their judgment.

Chapter 4. CONCLUSION

Future Needs

The future needs of Canadian urban centres for transportation systems have not until the recent past been very well defined. Even now the more advanced study techniques are only beginning to bring the future requirements into sharper focus in a few urban areas.

There is a great need for more adequate urban transportation planning and for the recruiting and training of personnel in the various disciplines involved in the urban planning process in general and transportation planning in particular. It is impossible to over-emphasize the importance of an adequately trained administrative corps in each major urban area if proper transportation plans are to be developed and implemented. The shortage of such personnel is now severe.

While all the larger and medium sized urban centres in Canada will unquestionably require freeway systems and extensive improvements to their arterial networks, it appears at this time that only Toronto and Montreal can support true rapid transit systems. The opportunity exists in the other centres of combining, in their radial freeways, fully segregated rights-of-way for high speed bus transit for the time being, the right-of-way being available for whatever type of rapid transit the future may dictate. This type of combined freeway-transit facility offers interesting possibilities for development which have been almost entirely ignored in the vast freeway systems of United States cities. There are many complex problems of design involved but the results could be rewarding.

The anticipated average yearly capital investments in urban roads by a group of representative Canadian cities is shown as approximately 158 million dollars. (See Table IX). This is an estimate of money likely to be spent, not an indication of need. It is also incomplete as a number of cities have not developed their capital budgets to the point where these estimates can be provided for even a few years in advance.

Table X shows that as of 1963 total expenditures of all levels of Government on urban roads in Canada as 291.1 million, an increase of 124.4% since 1956. By comparison total expenditures on all classes of roads in Canada was 1,205.7 million dollars in 1963, an increase of 55.7% over 1956. (Table XI). Expenditures on urban roads constituted 17% of the total in 1956 and 24% in 1963. During this same period, while total mileage of all streets, roads and highways increased by 6.8%, mileage of urban roads alone increased by 88.5%.

Clearly a great deal has been done to improve urban streets and the rate of investment in these facilities has been steadily increasing, and is becoming a larger part of the Nation's total investment in roads. It does not follow, however, that the needs are being met or that Canadian centres are winning the war to preserve urban transportation mobility.

In an attempt to relate present and projected levels of investment in urban roads to the levels necessary to meet demonstrated needs, a comparison was made

of six selected cities, related estimated expenditures required to produce the improvements recommended in major transportation studies with those likely to be provided in future capital budgets. (See Table XII). This comparison indicates that, in these cities at least, the projected rate of expenditure is far below the level needed to provide the future road systems which they undoubtedly require.

An indication of the magnitude of the investment which will be required over an extended period of time for thirteen Canadian urban areas is shown in Table XIII, all of which have been developed by major transportation studies.

Canadian urban areas, helped in most cases by increasing Provincial financial assistance, have thus been increasing their capital investments in road facilities, but not rapidly enough to meet their anticipated requirements. No doubt a large part of the resistance on the part of urban governments to providing the necessary level of expenditure is due to competing demands on their limited financial resources but perhaps even more to the conviction that the real property tax base is not the proper source of support for these expenditures. So long as urban streets were devoted primarily to land service functions, the conventional sources of tax money available to municipalities could logically be used for streets purposes. However, many of the new facilities required now and in the future will be designed primarily for large scale traffic movement and land service will be a relatively small factor, and in the case of freeways and other limited access facilities direct land service is denied. Clearly these major transportation undertakings should be provided from user tax revenues, a field of taxation occupied by the senior governments. A much larger share of user tax revenues will have to be diverted from rural to urban roads in order to meet urban needs, or user taxes will have to be increased for this purpose.

Urban Transit capital requirements for Canadian Transit systems, based approximately on existing levels of spending are as follows:

Rapid Transit	$75,000,000
Buses	14,000,000
Buildings and other capital	6,000,000
	$95,000,000

The current and capital costs of urban public transit are met in large part by the users of these systems even in the cities where public transit is financially supported by the cities. Expect in limited ways in Manitoba and Ontario, Provincial Governments have not recognized a responsibility to support urban transit systems. As transit costs continue to rise and as fares encounter practical ceilings, urban municipalities will feel obliged to support their transit systems, thus imposing further demands on the limited resources now available to them for urban transportation purposes.

Conclusions

We are apparently committed to becoming an increasingly urbanized society. As this process of urbanization continues and intensifies, the problem of maintaining reasonable standards of mobility in our urban areas will become progres-

sively more difficult and challenging. New transportation techniques and new public policies and even new political institutions will have to be developed to meet this new situation. The resulting costs will probably represent the largest single item of public expenditure in urban areas.

Travel patterns in modern urban communities bear no particular relationship to the old established political divisions of local government. Policies designed to cope with transportation requirements of a metropolitan area are slow to emerge from a conglomeration of municipal governments, if in fact they emerge at all. Implementation of recommended programs and construction of needed facilities can be even more difficult under these circumstances. Moreover, it is doubtful that the conflicting or competing interests in the typical politically divided metropolitan area can bargain effectively with the Senior Governments. The fragmented Metropolis is apt to be weak on both political and administrative levels.

Although the basic ingredients of the transportation problem may be similar in the different urban centres in this country, the manifestations can be quite different. The intensity of the problem appears to be related to size and the two great metropolitan areas — Toronto and Montreal — will require a mixture of transportation facilities that for some years at least will be unique in this country. So far as the physical transportation facilities are concerned, the requirement of each urban area will be different. There is no "pat" answer. Each one will have to plan and devise those which best meet its individual needs. The problems of the medium sized and smaller urban areas will change and intensify as their growth continues.

Although the transportation "mix" will vary in different cities, it appears quite certain that, in the calculable future, the private car will be the most dominant single element in the urban transportation system. The majority of all person trips in Canadian urban areas will be made by car. However, the dominance of the automobile will not be uniform throughout the Metropolitan areas. Public transit usage now equals or in some cases exceeds the use of private cars for transportation of persons to the central business districts and has the potential to continue this role in the future provided these mass transit services can be preserved or improved upon.

The cost of financial assistance to public transit by Canadian municipalities can be expected to increase sharply in the next few years. Statutory requirements that public transit be self-supporting may be repealed or more likely circumvented in one way or another. In either case, transit will constitute an additional financial burden for local governments.

While transit riding under favourable conditions may hold firm, or following rapid transit improvements in Toronto and Montreal, may substantially increase, costs in all cases may be expected to rise more rapidly than revenues. In most Canadian cities it will not be practical to raise fares much above 20¢ without seriously jeopardizing transit riding volumes. In most of the medium sized urban areas average length of transit ride will not exceed three miles and under these circumstances it is doubtful that even 20¢ fares are competitive.

Canadian transit systems will be hard pressed to maintain present levels of gross income, while costs will probably increase on the average of 2%—4% per year due to the very high labor content in transit costs. These increases are therefore apt to be reflected in their entirety in the net position of the transit utility. Thus Canadian municipalities will be faced with hard decisions with respect to their public

transit systems for they will have to be financially supported by an already hard-pressed and limited tax base or they will inevitably deteriorate and decline until they remain, if at all, as a token element in the urban transportation system.

The street systems of many Canadian urban areas were designed and constructed in another era and cannot meet today's transportation demands and those of the future. Improvements to basic arterial systems are necessary and in the case of approximately ten of the larger Canadian metropolitan areas, they should in addition be either planning or actively constructing the freeway facilities they will unquestionably require.

Freeways will in the majority of cases require the establishment of entirely new rights-of-way. Inasmuch as property acquisition costs will constitute a substantial part of the costs of freeways, long term advance planning is essential to protect future rights-of-way from encroachment or development in order to keep these costs to a minimum.

In addition, the integration of freeway planning with urban land use planning is a very complex long-range undertaking. Not only is it necessary to determine whether the facility is required and when, but its ultimate effects upon city growth, on re-development, on regional economies, and on the use of land generally, must be evaluated. Consideration must also be given to the integration of freeway development with regional and local highway and street patterns.

The opportunity also exists in this country to plan freeway systems to include fully segregated rights-of-way for public transit systems where such a provision appears to have immediate or long-range possibilities. These transit rights-of-way, representing a very modest increase in the total right-of-way required, might conceivably lie idle for some years or could be used immediately by conventional bus systems. Operating free from traffic interference out of pre-pay stations, much larger bus units (articulated or in trains) could be used even today under these circumstances. Much larger units would help to overcome one of transit's most intractable problems, the high cost of the labour component in transit service. Use of these rights-of-way for rail or other types of higher capacity rapid transit systems would be feasible if required at a later date.

The source of municipal revenues is largely the taxation of real property. Transportation improvements will be of benefit to the whole urban area and there is some justification for assessing part of the costs of these facilities on property owners, but the main beneficiaries will be the users and only the Provincial Governments directly and the Federal Government indirectly can tax the users. For these reasons as well as for many others having to do with the welfare of the country and the people, the cities and urban municipalities are looking to the senior governments for more leadership and assistance in dealing with these problems than has been forthcoming up until now.

It is difficult to generalize regarding the policies of the various Provincial Governments towards their urban transportation responsibilities because these policies vary so much from one Province to another and because they are changing quite rapidly, moving generally in the direction of a much more prominent role by the Provinces. The responsibility of the Provinces is clear enough. The municipalities are their creatures designed to carry out their purposes, but the urban municipalities are faced with dynamically changing conditions and new policies must be devised to meet these new circumstances. There are encouraging signs in a number of Provinces that these policies are beginning to emerge.

In so far as the Federal Government is concerned, it has obviously regarded the problem of urban transportation as one between the Municipalities and the Provinces. The Government has only become involved occasionally and indirectly, as a result of its activities in other fields, with consequences that have been sporadic and uneven in so far as their impact on urban transportation systems is concerned.

It may very well be asked if the Federal Government in this country should be expected to take any interest or exert any influence in such a matter. The question is not easy to answer, particularly in view of the changing relationships now taking place between the National Government and the Provinces and the unknown implications which they may have for our Federal system. These larger political questions are beyond the scope of the Technical Advisory Committee. Nevertheless, we are convinced that there is a national interest involved in the sound and economic development and re-development of the country's urban areas, where so much of the Nation's wealth will be produced and where such a large proportion of the total population will live. Urban transportation systems will be one of the important factors shaping the cities of the future as they have been in the past. The Government's concern with urban development in housing and urban renewal should lead it logically to an equal concern with urban transportation.

Recommendations

Without attempting at this time to delineate the respective roles of the Federal and Provincial Governments, we recommend that the Federation press for the development of policies of assistance from the Senior Governments in accordance with the following principles:

1. The objective should be to promote the development of balanced and economical urban transportation systems within the framework of sound urban development plans.
2. In order not to distort local choices, both major urban road facilities and public transit should receive assistance on the same basis.

In order to qualify for assistance the following requirements should be met:

(a) There should be in existence a comprehensive transportation plan, preferably encompassing the entire urban area and prepared by an official planning authority authorized to plan for the future development of the whole area.

(b) The plan should have the approval of the municipalities involved in the urban area.

(c) The plan should be approved by the Provincial Government concerned.

The financial assistance provided by the Senior Governments should be in the form of grants for specific projects which are part of the facilities recommended and approved in the transportation plan. It should be limited to projects having transportation values for the whole of the urban area concerned, and the following are suggested as typical:

Roadways

Costs of right-of-way acquisition and construction of:

(i) Urban freeways.

(ii) Urban thoroughfares having limited access characteristics.

(iii) Major arterials — generally divided thoroughfares providing for at least two moving lanes of traffic in each direction at all times (or other suitable warrants as may be developed to define more precisely this class of roadway).

Transit

(i) Costs of right-of-way acquisition and construction of rapid transit systems whether at grade, elevated in depressed rights-of-way, or underground.

(ii) Mass Transit vehicles.

(iii) Buildings, shops, storage and service facilities for transit vehicles.

Senior Government assistance should be extended only to local governments or their agencies. It should be withheld if the Governments are not satisfied that the plan has been adequately prepared or if there is doubt concerning the urban area's capacity for implementing it.

Such assistance should be large enough to provide a real incentive for Canadian urban areas to overcome barriers to regional planning, policy making and development of needed transportation systems.

There is every reason to expect that should such a policy be developed, the major urban areas of this country would start to move promptly to plan more adequately for their basic transportation facilities, to construct those needed now, to acquire and protect the rights-of-way for those needed in the future, to extend and improve their mass transit systems and in general do those things which are essential if the full potential of the cities of the future is to be realized.

TRANSPORTATION REPORTS

Vancouver, B.C.

"Study on Highway Planning" for Metropolitan Vancouver, British Columbia. "Freeways with Rapid Transit" prepared by Technical Committee for Metropolitan Highway Planning 1958-59.

"Review of Transportation Plans" Metropolitan Vancouver, B.C.
Stanford Research Institute and Wilbur Smith & Associates — 1964.

Ottawa, Ont. — Hull, Que.

"Ottawa-Hull Area Transportation Study".
De Leuw Cather of Canada — 1965.

Edmonton, Alta.

"Metropolitan Edmonton Transportation Study" 1963. Conducted by the Edmonton District Planning Commission and Member Communities in co-operation with the Government of the Province of Alberta.
Consultants — Stanley, Grimble, Roblin Ltd., etc.

London, Ont.

"London Area Traffic Plan — 1959-1980".
A. D. Margison & Associates.

Victoria, B.C.

"Capital Region of British Columbia Transportation Study" 1965.
Traffic Research Corporation.

CHART I

PERCENT OF POPULATION, URBAN — CANADA

1851 - 1961

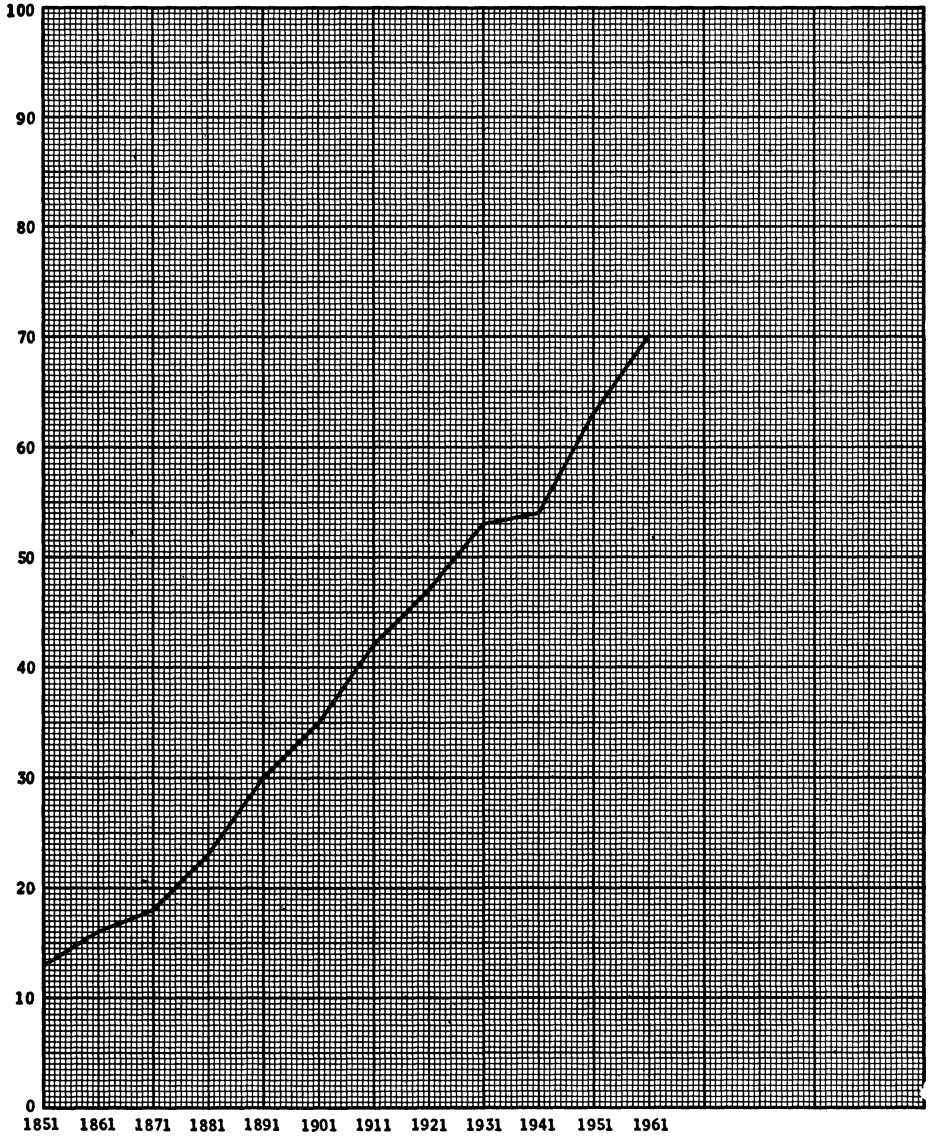

CHART II

TRANSIT
REVENUE PASSENGER TRENDS
ON CANADIAN PROPERTIES
INDEX — 1939 = 100
(SERVING CITIES IN VARIOUS
POPULATION RANGES)

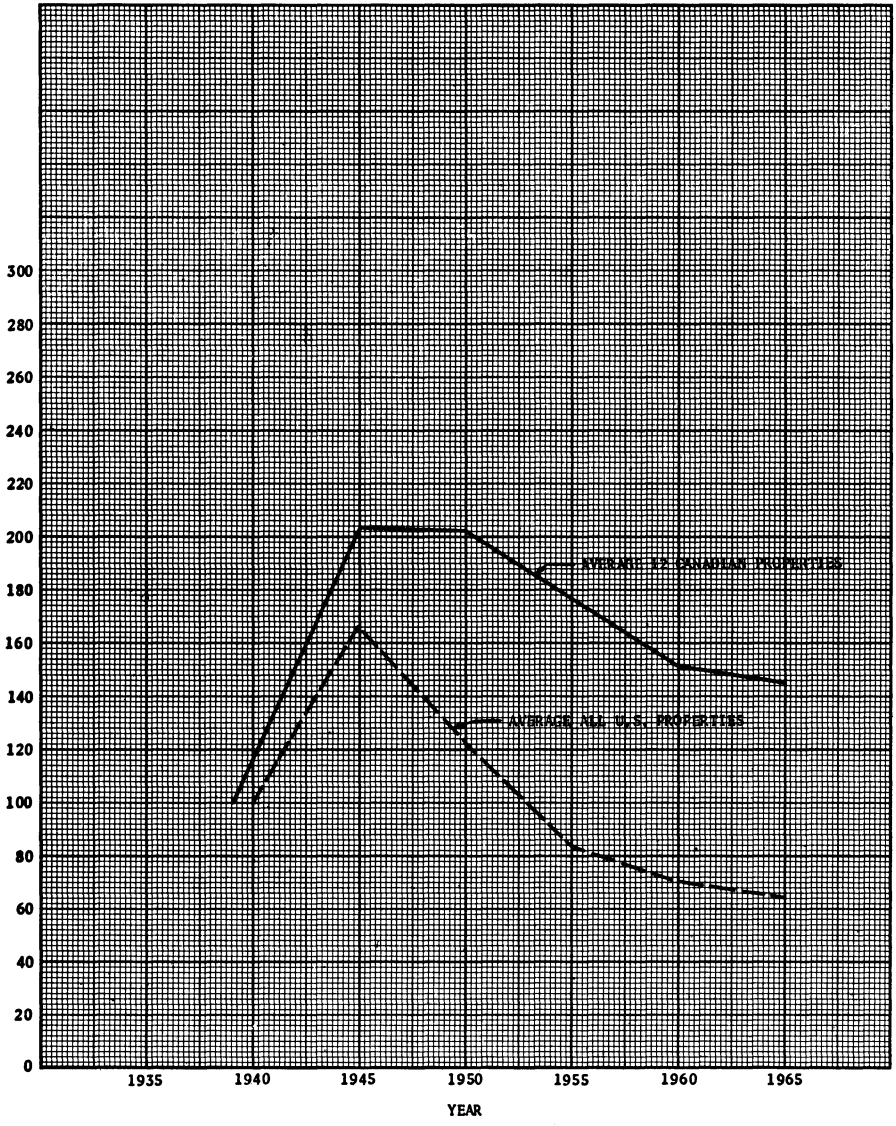

CHART III

HOURLY WAGE RATES
BUS DRIVERS
1939 TO 1965
AND PROJECTED TO 1973
(AVERAGE 13 CANADIAN PROPERTIES)

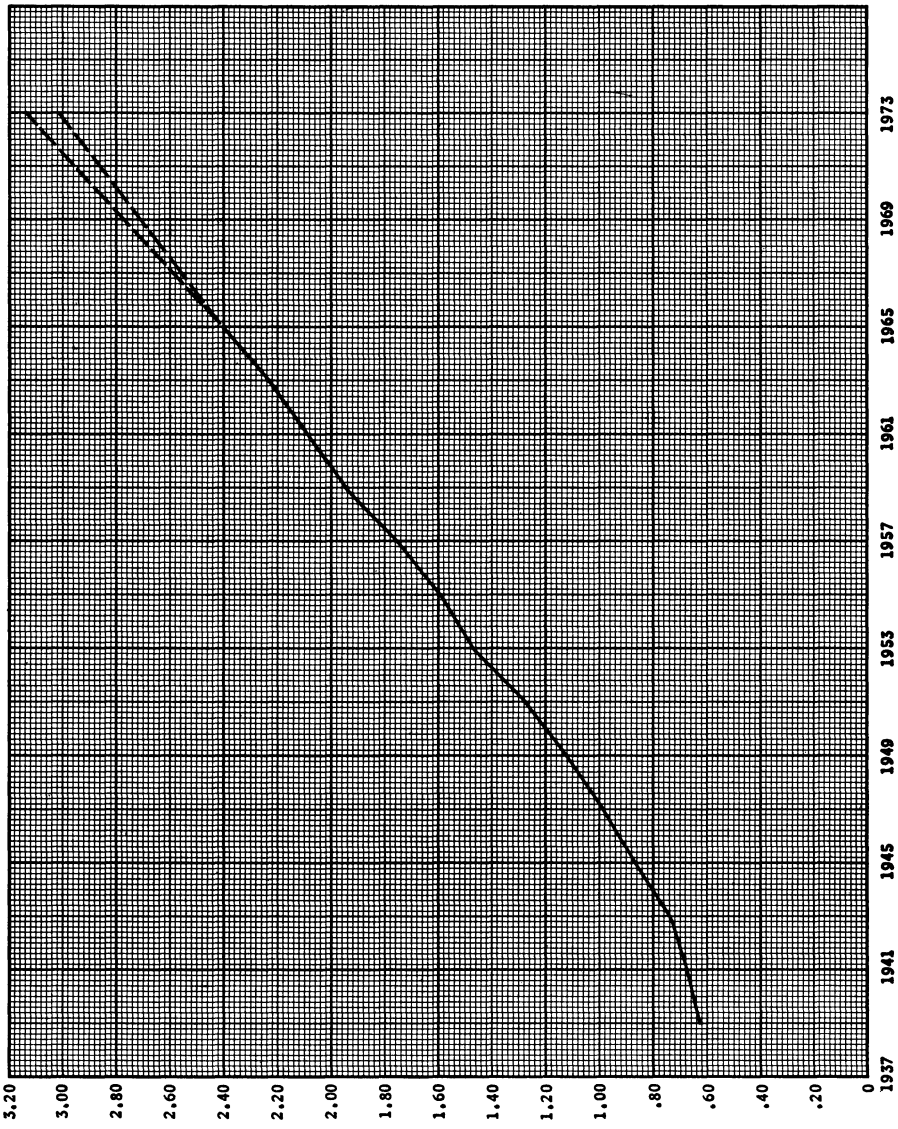

CHART IV

TRANSIT
REVENUE PASSENGER TRENDS
ON CANADIAN AND UNITED STATES PROPERTIES
AVERAGE 12 CANADIAN PROPERTIES — INDEX — 1939 = 100
AVERAGE ALL U.S. PROPERTIES — INDEX — 1940 = 100

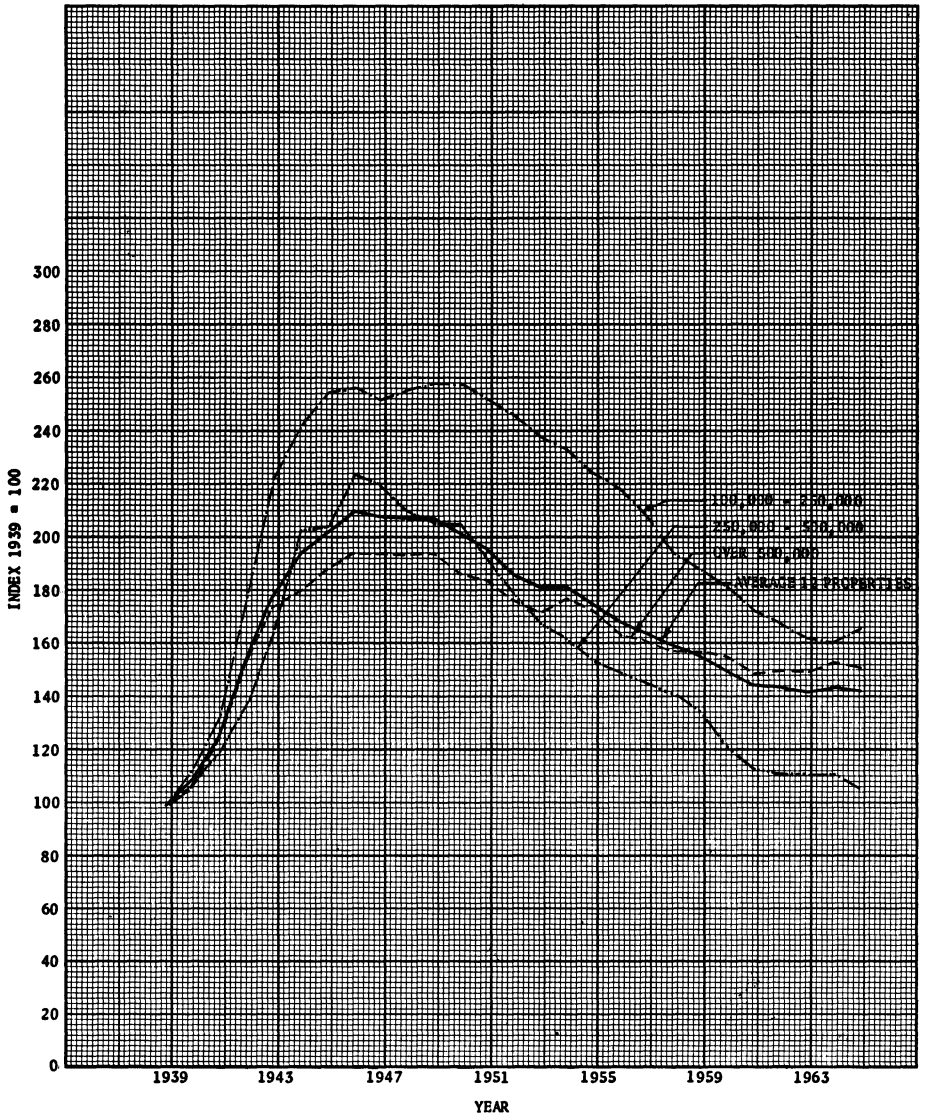

CHART V

TRANSIT
REVENUE PASSENGER TRENDS
ON UNITED STATES PROPERTIES
INDEX — 1940 = 100

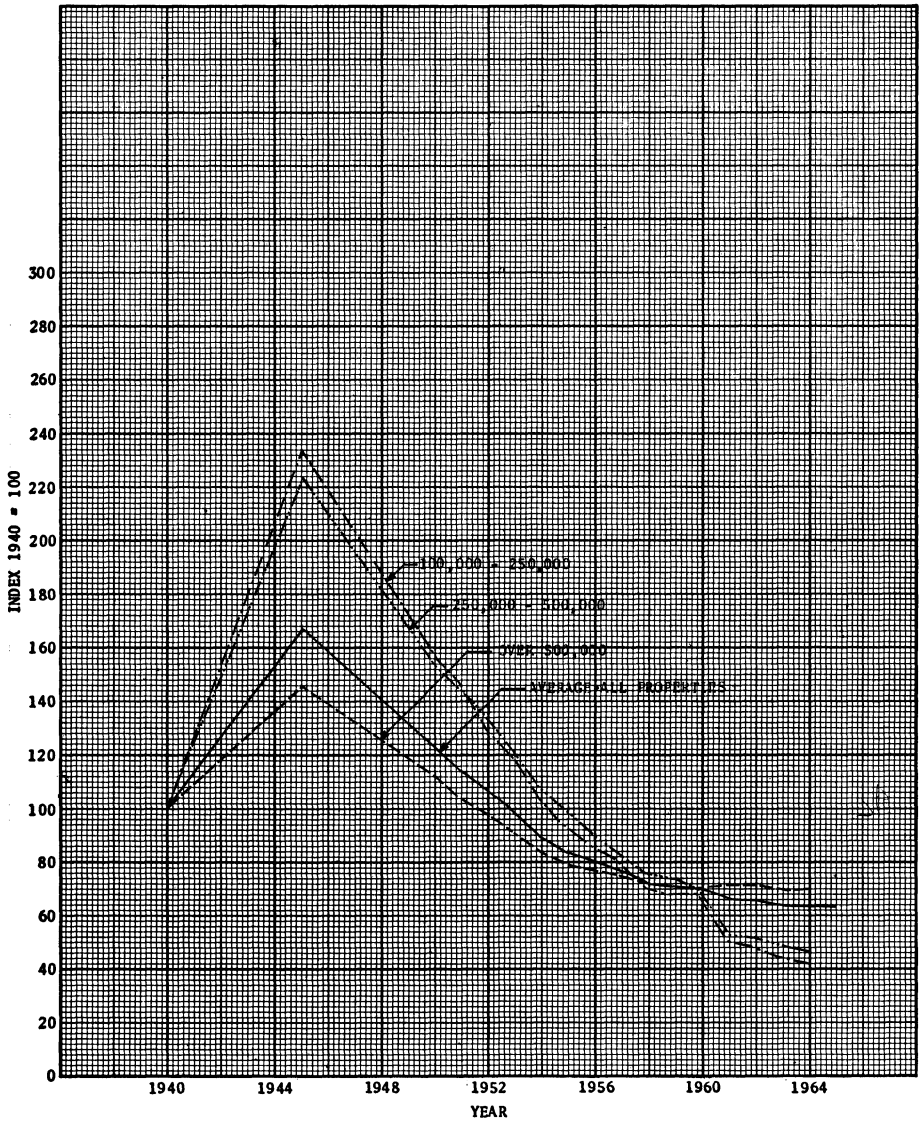

CHART VI

CANADIAN MOTOR VEHICLE REGISTRATION TREND

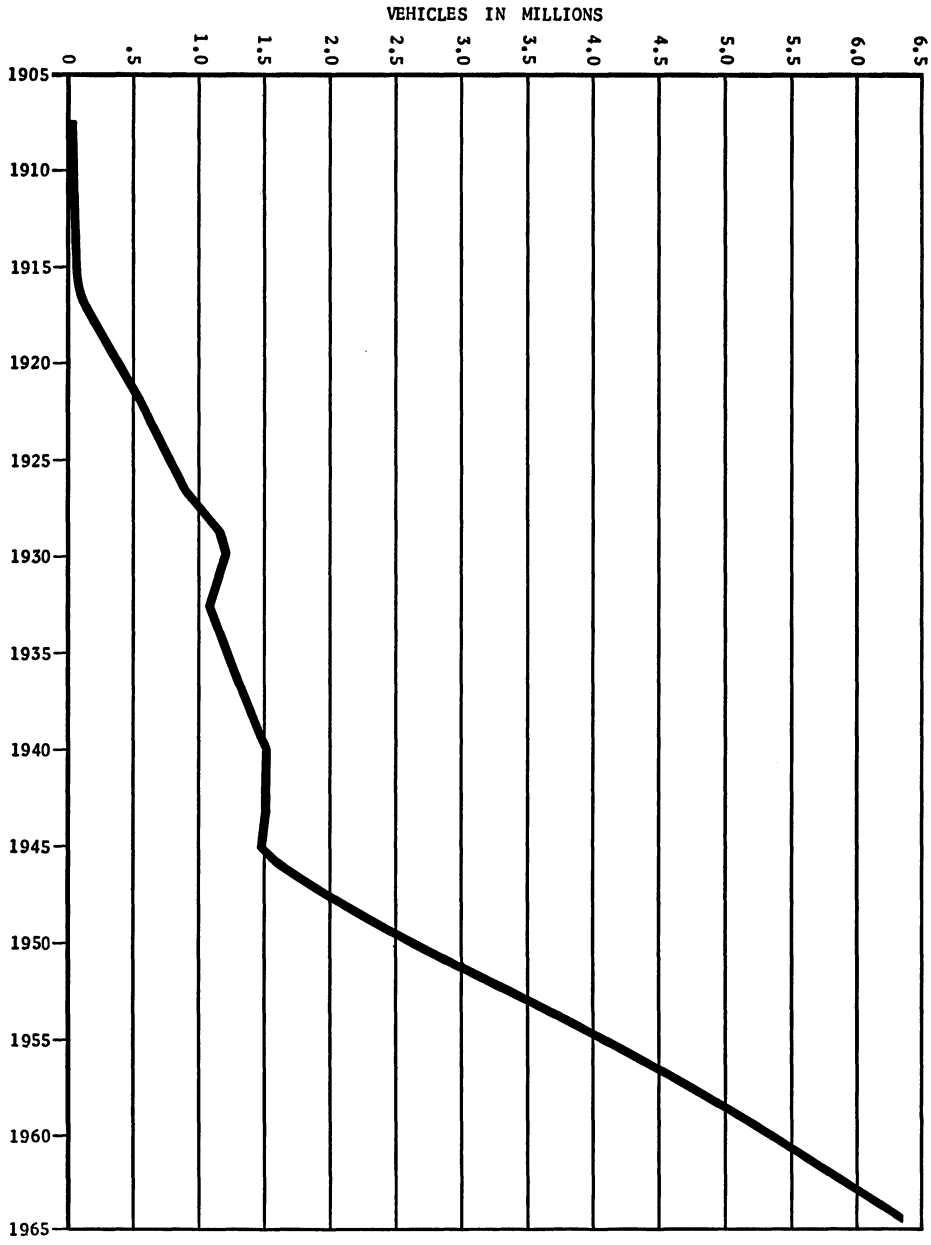

CHART VII
PERSONS PER MOTOR VEHICLE
TREND FOR CANADA

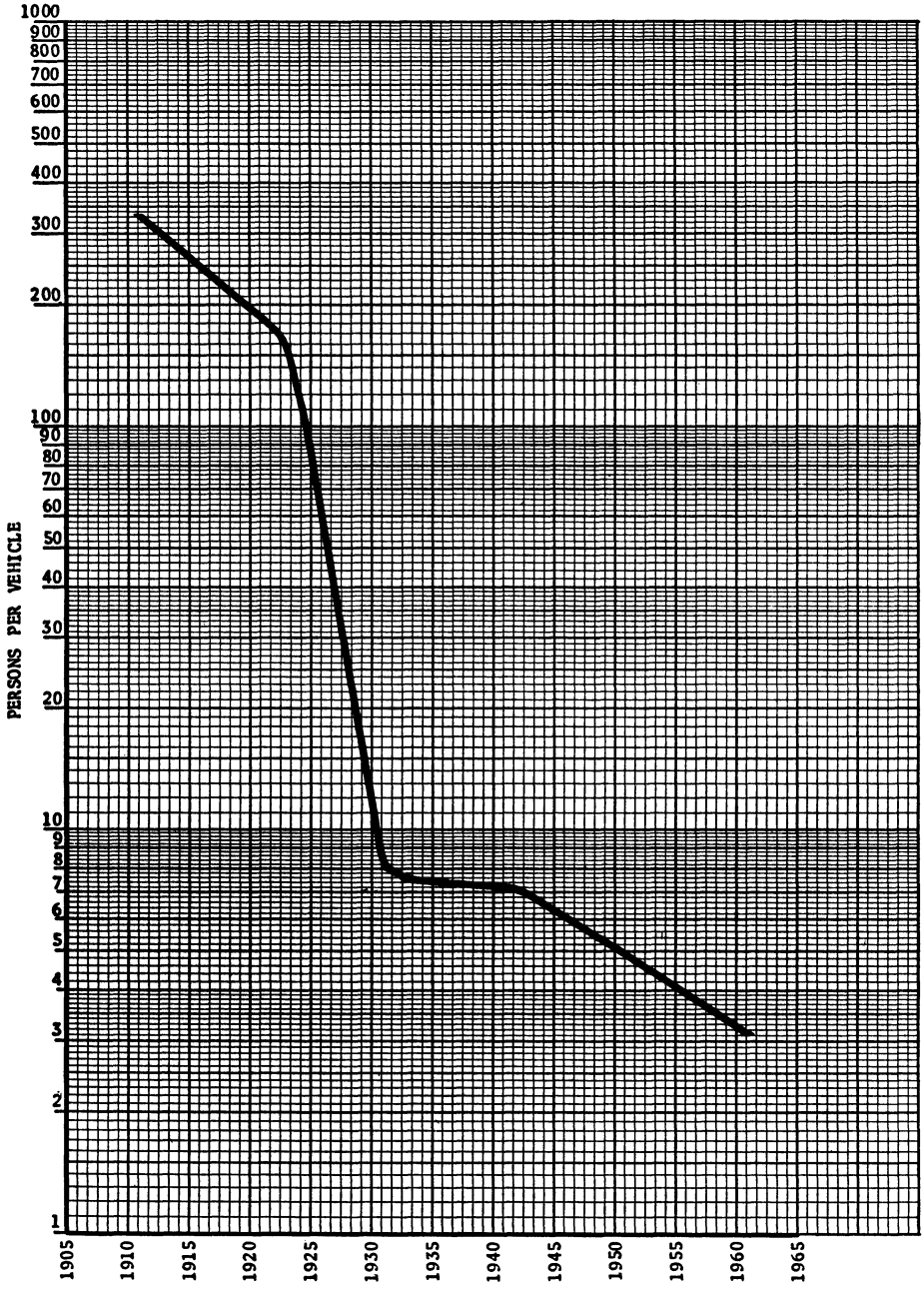

TABLE I

1951 Population of Urban Areas Having 50,000 Or More Inhabitants

	Population Central City	% of Total	Population Other Urban Municipalities	% of Total	Total Population Metropolitan or Urban Area	% of Total	Expressed as a Percentage of the Total Population of Canada
GROUP A							
Population of Over 1,000,000	1,697,274	67.5%	815,596	32.5%	2,512,870	100.0%	17.94%
GROUP B							
Population Range 250,000 to 1,000,000	1,443,616	71.7%	569,781	28.3%	2,013,397	100.0%	14.37%
GROUP C							
Population up to 250,000	1,196,262	68.3%	555,420	31.7%	1,751,682	100.0%	12.50%
TOTAL 35 URBAN AREAS	4,337,152	69.1%	1,940,797	30.9%	6,277,949	100.0%	44.81%

(POPULATION OF CANADA — 14,009,429)

Urban Areas Included in Various Size Groups:

GROUP A — Montreal, Toronto.

GROUP B — Vancouver, Winnipeg, Ottawa, Hamilton, Quebec City, Edmonton, Calgary.

GROUP C — Windsor, Halifax, London, Kitchener, Victoria, Regina, Sudbury, Sydney, N.S., Chicoutimi, St. Catharines, St. John, Saskatoon, Fort William, Port Arthur, St. John's, Trois-Rivières, Oshawa, Sherbrooke, Shawinigan, Kingston, Sarnia, Sault Ste. Marie, Brantford, Moncton, Niagara Falls; Charlottetown (a).

(a) Included in survey although under 50,000 population.

TABLE II

1961 Population of Urban Areas Having 50,000 Or More Inhabitants

	Population Central City	% of Total	Population Other Urban Municipalities	% of Total	Total Population Metropolitan or Urban Area	% of Total	Expressed as a Percentage of the Total Population of Canada
GROUP A							
Population of Over 1,000,000	1,863,469	47.4%	2,070,521	52.6%	3,933,990	100.0%	21.57%
GROUP B							
Population Range 250,000 to 1,000,000	1,894,795	61.8%	1,170,496	38.2%	3,065,291	100.0%	16.81%
GROUP C							
Population up to 250,000	1,655,682	67.9%	783,637	32.1%	2,439,419	100.0%	13.37%
TOTAL 35 URBAN AREAS	5,413,946	57.4%	4,024,654	42.6%	9,438,600	100.0%	51.75%

(POPULATION OF CANADA — 18,238,247)

Urban Areas Included in Various Size Groups:

GROUP A — Montreal, Toronto.

GROUP B — Vancouver, Winnipeg, Ottawa, Hamilton, Quebec City, Edmonton, Calgary.

GROUP C — Windsor, Halifax, London, Kitchener, Victoria, Regina, Sudbury, Sydney, N.S., Chicoutimi, St. Catharines, St. John, Saskatoon, Fort William, Port Arthur, St. John's, Trois-Rivières, Oshawa, Sherbrooke, Shawinigan, Kingston, Sarnia, Sault Ste. Marie, Brantford, Moncton, Niagara Falls; Charlottetown (a).

(a) Included in survey although under 50,000 population.

TABLE III

ALLOCATION OF REVENUE DOLLAR
BASED ON EXPERIENCE OF 24 CANADIAN AND AMERICAN TRANSIT SYSTEMS
SERVING POPULATIONS OF OVER 250,000

Personnel Costs	66.5 %
Goods & Services	12.67
Accident Costs	3.79
Depreciation	7.64
Direct Taxes Only	4.50
Available for Interest, Profit etc.	4.75
	100.00%

TABLE IV

DERIVED OPERATING RATIOS — YEAR 1964 — 19 U.S. TRANSIT SYSTEMS

City Served	Passengers Per Capita	Miles of Service Per 1,000 Population	Miles Per Vehicle	Vehicles Per 1,000 Population	Passengers Per Mile	Passengers Per Employee	Employees Per Vehicle	Speed M.P.H.	Average Fare	Profit (Loss) One Year's Operation
American Cities										
Minneapolis-St. Paul, Minn.	40.4	12,493	26,393	.47	3.24	48,429	1.8	11.4	22.1¢	$1,427,353
Milwaukee, Wisc.	87.9	24,273	34,985	.69	3.62	48,998	2.6	11.0	18.6	526,208
Oakland, Cal.	59.2	26,171	34,972	.75	2.26	36,721	2.2	13.7	24.2	(1,242,683)
San Diego, Cal.	21.8	10,123	32,929	.31	2.16	31,626	2.2	13.0	28.6	(86,765)
Buffalo, N.Y.	63.8	21,097	25,727	.82	3.02	41,446	1.9	11.1	24.5	159,800
Cincinnati, Ohio	50.6	18,332	24,265	.76	2.76	36,908	1.8	12.1	26.1	466,186
Kansas City, Mo.	38.2	15,954	31,726	.50	2.40	31,441	2.4	10.4	28.8	271,104
San Antonio, Texas	33.2	11,655	27,611	.42	2.84	41,216	1.9	12.3	20.7	231,527
Atlanta, Ga.	71.7	23,730	36,573	.65	3.02	48,255	2.3	12.3	21.8	130,896
Columbus, Ohio	37.7	11,152	30,760	.36	3.38	44,533	2.3	11.0	23.9	221,735
New Orleans, La.	135.2	24,840	31,038	.80	5.44	57,768	2.9	10.0	10.3	N.R.
Seattle, Wash.	64.0	25,325	32,553	.78	2.53	31,528	2.6	11.2	24.7	(577,622)
Louisville, Ky.	42.0	13,315	27,897	.48	3.15	42,073	2.1	11.8	22.5	370,167
Memphis, Tenn.	41.4	16,627	38,272	.43	2.49	38,997	2.4	12.2	21.7	184,716
Providence, R.I.	33.2	11,721	33,109	.35	2.84	33,309	2.8	9.9	23.9	(204,284)
Portland, Oregon	41.0	16,749	33,702	.50	2.45	38,365	2.1	12.1	27.8	80,008
Indianapolis, Ind.	42.5	12,999	26,393	.49	3.27	41,988	2.1	11.4	20.8	64,872
Akron, Ohio	14.0	6,414	30,254	.21	2.19	28,174	2.4	11.1	32.0	58,062
Dayton, Ohio	54.4	16,362	28,114	.58	3.32	48,573	1.9	11.5	19.4	(4,186)
Simple Average	51.2	16,807	30,909	.54	2.97	40,545	2.2	11.6	23.3¢	

TABLE V

DERIVED OPERATING RATIOS — YEAR 1964 — 10 CANADIAN TRANSIT SYSTEMS

City Served	Passengers Per Capita	Miles of Service Per 1,000 Population	Miles Per Vehicle	Vehicles Per 1,000 Population	Passengers Per Mile	Passengers Per Employee	Employees Per Vehicle	Speed M.P.H.	Average Fare	Profit (Loss) One Year's Operation
Canadian Cities										
Montreal, P.Q.	165.5	29,043	24,992	1.16	5.70	61,322	2.3	9.5	13.6¢	($1,199,878)
Toronto, Ont.	160.5	32,202	30,677	1.05	4.98	51,370	3.0	11.2	16.5	3,899,858
Vancouver, B.C.	101.3	26,496	32,911	0.81	3.82	N.A.	N.A.	10.6	15.0	(2,754,076)
Winnipeg, Man.	118.8	28,376	31,201	0.91	4.19	52,847	2.5	10.5	13.3	(1,456,382)
Edmonton, Alta.	80.1	20,035	N.A.	N.A.	4.00	N.A.	N.A.	N.A.	13.2	(788,530)
Ottawa, Ont.	91.4	21,166	28,737	0.74	4.44	52,571	2.4	10.3	16.4	491,740
Hamilton, Ont.	70.3	18,482	35,156	0.53	3.80	49,400	2.7	N.A.	N.A.	290,071
Calgary, Alta.	68.9	17,390	N.A.	N.A.	3.96	N.A.	N.A.	10.8	14.9	352,748)
Regina, Sask.	62.3	14,774	N.A.	N.A.	4.22	N.A.	N.A.	10.0	12.4	(364,839)
Saskatoon, Sask.	68.7	17,218	29,138	0.59	3.99	47,265	2.5	9.9	13.6	(153,962)
Halifax, N.S.	140.6	21,308	21,491	0.99	6.60	71,659	2.0	8.7	11.5	(101,920)
Simple Average	102.6	22,408	29,288	0.85	4.52	55,205	2.5	10.2	14.0¢	

TABLE VI

PROVINCIAL REVENUES FROM USER TAXES
(thousands of dollars)

Province	FISCAL YEAR 1965-66 (Estimates)	1964-65 (Actual)	1963-64 (Actual)	1962-63 (Actual)
Motor Fuel Taxes				
British Columbia	55,000	50,509	46,109	42,892
Alberta	42,000	39,970	37,479	35,395
Saskatchewan	30,550	31,620	29,672	27,548
Manitoba	34,707	31,697	24,528	23,329
Ontario	252,013	233,188	193,029	181,291
Quebec	191,000	166,039	149,659	119,460
New Brunswick	19,500	18,191	16,903	15,838
Nova Scotia	24,000	21,876	20,468	19,422
Prince Edward Island	3,500	3,309	3,165	2,726
Newfoundland	9,500	9,400	8,762	7,292
TOTAL	661,770	605,799	529,774	475,193
Licenses and Permits				
British Columbia	26,933	22,450	20,853	20,116
Alberta	16,322	15,001	14,180	14,792
Saskatchewan	10,000	9,149	8,531	8,071
Manitoba	10,400	8,288	9,392	7,519
Ontario	90,526	82,667	77,676	64,427
Quebec	62,000	53,562	49,943	47,562
New Brunswick	6,600	5,986	5,537	4,954
Nova Scotia	6,621	7,067	6,497	6,164
Prince Edward Island	950	922	850	767
Newfoundland	3,350	3,101	2,990	2,421
TOTAL	233,702	208,193	196,449	176,793
TOTAL REVENUE	895,472	813,942	726,223	651,986

Source: Canadian Good Roads Association publication
"Highway Finance — 1965"

TABLE VII

NET EXPENDITURES OF PROVINCIAL GOVERNMENTS ON HIGHWAYS, ROADS AND BRIDGES

(thousands of dollars)

Province	FISCAL YEARS 1965-66 (Estimate)	1964-65 (Estimate)	1963-64 (Actual)	1962-63 (Actual)
British Columbia	85,000	62,000	90,829	85,238
Alberta	72,361	62,895	59,546	57,046
Saskatchewan	40,095	35,616	32,608	31,379
Manitoba	34,500	33,100	30,004	27,829
Ontario	329,393	299,706	290,321	232,752
Quebec	311,583	217,966	227,053	168,456
New Brunswick	28,217	26,696	27,931	29,267
Nova Scotia	34,100	20,200	31,425	27,455
Prince Edward Island	6,765	7,733	6,601	8,017
Newfoundland	30,400	28,975	22,541	19,191
TOTAL	972,414	794,887	818,859	686,630

Source: Canadian Good Roads Association publication "Highway Finance — 1965"

TABLE VIII

CANADA

MILES OF SURFACED URBAN ROADS AND STREETS

Year	Paved	Other Surfaces	Total
1944	6,148	3,740	9,888
1945	6,257	3,672	9,929
1946	6,330	3,701	10,031
1947	6,550	3,746	10,296
1948	6,888	3,648	10,536
1949	7,085	3,649	10,734
1950	7,364	3,558	10,922
1951	7,725	3,642	11,367
1952	8,102	4,066	12,168
1953	8,659	4,172	12,831
1954	9,358	3,761	13,119
1955	10,830	8,890	19,720
1956	11,557	9,131	20,688
1957	13,360	9,581	22,941
1958	14,163	9,741	23,904
1959	19,245	15,165	34,410
1960	19,843	15,012	34,855
1961	21,495	13,735	35,230
1962	23,677	15,560	39,237
1963	25,942	14,892	40,834

Source: Dominion Bureau of Statistics.

TABLE IX

AVERAGE YEARLY
(000's)
(Next 5 Years)

	TOTAL FREEWAYS & ARTERIALS			
	Local Government	Provincial Government	Federal Government	TOTAL
BRITISH COLUMBIA				
Victoria	$ 533	$ 103	$ 13	$ 649
ALBERTA				
Edmonton	2,600	900	—	3,500
Calgary	5,000	4,000	—	9,000
SASKATCHEWAN				
Regina	1,000	1,000	—	2,000
MANITOBA				
Winnipeg	5,000	6,233	350	11,583
ONTARIO				
Toronto	12,200	12,200	600	25,000
Hamilton	3,724	5,015	469	9,208
London	460	230	—	690
St. Catharines	1,057	597	—	1,654
Brantford	494	809	47	1,350
Kingston	107	129	—	236
Sault Ste. Marie	1,140	2,210	2,000	5,350
QUEBEC				
Montreal	8,000	35,000	13,000	56,000
Quebec City	500	4,500	—	5,000
NEW BRUNSWICK				
St. John	400	2,000	3,000	5,400
TOTAL OF ABOVE	$42,215	$74,926	$19,479	$136,620
Ottawa				$ 9,933(a)
Fort William				1,000(a)
Vancouver				10,644(a)
TOTAL				$158,197

(a) No breakdown on cost sharing or data incomplete.

TABLE X

TOTAL EXPENDITURE ON URBAN STREETS, BY PROVINCE

1956 to 1963

All Levels of Government

($ million)

Year	New-foundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatch-ewan	Alberta	British Columbia	Total
1956	$2.1	$.4	$3.3	$3.3	$ 34.5	$53.4	$5.5	$ 4.9	$15.7	$ 6.6	$129.7
1957	2.3	.2	3.1	2.7	48.4	56.3	6.8	4.5	15.5	7.6	147.4
1958	1.9	.5	3.3	3.4	48.5	70.9	7.1	5.8	14.5	8.4	164.3
1959	2.3	.3	2.9	3.4	58.7	80.2	7.8	8.0	16.5	11.8	191.9
1960	1.7	.3	3.9	3.2	101.3	99.0	13.3	13.0	19.5	17.1	272.3
1961	1.9	.4	3.7	3.7	61.3	105.8	10.5	10.8	22.1	15.1	235.3
1962	1.7	.2	6.0	4.1	62.2	116.5	11.9	10.5	21.8	19.0	253.9
1963	2.7	.5	6.1	3.8	63.3	147.3	14.3	13.6	19.6	19.9	291.1

Increase 124.4% since 1956

URBAN STREET MILEAGE

1956 to 1963

(Thousands of Miles)

1956	.4	.07	1.0	.6	5.3	7.5	1.4	1.6	2.4	2.6	22.87
1957	.4	.06	.9	.6	5.6	8.2	1.4	1.8	3.0	2.7	24.66
1958	.4	.07	.9	.6	5.8	8.5	1.5	1.9	3.0	3.0	25.67
1959	.4	.07	.9	.6	6.9	12.4	2.2	2.2	5.8	6.1	37.57
1960	.5	.09	1.0	.6	6.7	12.6	2.1	2.3	5.9	5.9	37.69
1961	.5	.1	1.0	.6	7.1	13.5	2.3	2.3	3.6	5.9	36.90
1962	.5	.1	1.2	.7	7.8	15.5	2.4	2.4	4.3	6.3	41.20
1963	.6	.1	1.2	.7	8.3	15.9	2.6	2.5	4.5	6.7	43.10

Source: 1956-57-D.B.S. "Highway Statistics"
1958-63-D.B.S. "Road and Street Mileage and Expenditure"

Increase 88.5% since 1956

TABLE XI

TOTAL EXPENDITURE ON URBAN STREETS, RURAL ROADS AND HIGHWAYS

1956 to 1963

All Levels of Government

($ million)

Year	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
1956	$12.1	$5.5	$30.5	$30.0	$163.6	$255.5	$31.4	$44.9	$89.6	$111.1	$ 774.2(a)
1957	12.6	5.0	31.2	32.2	181.3	270.6	36.5	46.0	89.8	136.8	842.0
1958	24.0	7.6	35.0	43.5	227.3	310.9	42.3	52.4	86.6	97.1	926.7
1959	26.5	10.2	38.3	42.0	233.7	344.6	52.3	52.3	90.2	118.1	1,008.2
1960	25.5	7.4	40.2	41.8	250.7	340.8	55.3	62.8	99.4	131.6	1,055.5
1961	18.9	8.4	35.8	39.5	210.8	343.7	44.9	55.3	93.5	127.6	978.4
1962	22.6	9.2	35.7	36.8	247.6	357.2	46.7	55.5	90.3	121.2	1,022.8
1963	38.2	9.5	38.8	38.9	309.4	433.4	50.1	61.4	98.2	127.8	1,205.7

Increase 55.7% since 1956

TOTAL MILEAGE — URBAN STREETS, RURAL ROADS AND HIGHWAYS

1956 to 1963

(Thousands of Miles)

1956	7.1	3.2	15.3	13.1	43.7	75.7	20.4	161.2	87.0	23.9	450.6(a)
1957	6.3	3.2	15.3	13.1	50.2	76.2	21.0	124.5	88.8	22.9	421.5
1958	6.6	3.2	15.3	13.2	50.5	72.0	21.0	121.0	64.1	32.9	399.8
1959	6.9	3.3	15.4	13.2	52.6	72.8	39.4	118.9	67.6	30.8	420.9
1960	7.0	3.2	15.6	13.4	53.8	74.6	35.6	120.0	69.1	26.7	419.0
1961	7.1	3.3	15.3	13.7	53.6	76.1	36.9	123.9	70.6	27.3	427.8
1962	7.3	3.3	16.5	14.4	62.3	92.7	44.4	126.4	74.7	33.2	475.2
1963	7.4	3.3	16.6	13.9	62.5	94.1	45.1	126.9	76.3	35.1	481.2

Increase 6.8% since 1956

(a) Yukon and Northwest Territories not included.

Source: 1956-57-D.B.S. "Highway Statistics"
1958-63-D.B.S. "Road and Street Mileage and Expenditure"

TABLE XII

AVERAGE YEARLY CAPITAL EXPENDITURES ON ROADS

Urban Area	Study Recommendations — Scale of Expenditure Required to Meet Needs	Projected Scale of Budget Expenditures 1966-71
Vancouver	$12,000,000(a)	$ 3,000,000
Ottawa-Hull	24,871,000(b)	9,933,000
Edmonton	10,000,000(c)	3,500,000
Hamilton	12,000,000(d)	9,200,000
London	3,000,000(e)	690,000
Victoria	3,000,000(e)	649,000
TOTAL	$64,871,000	$26,972,000

(a) Basis $60,000,000 in 5 years.

(b) Basis $174,120,000 in 7 years.

(c) Basis $200,000,000 in 20 years.

(d) Basis $60,500,000 in 5 years.

(e) Basis $18,000,000 in 6 years.

TABLE XIII

RECOMMENDED CAPITAL EXPENDITURES IN ROAD FACILITIES

Metropolitan Area						Total
Vancouver		$ 60,000,000 (immediately)	$100,000,000 (prior to 1976)	$ 60,000,000 (in 1976)	$125,000,000 (prior to 1985)	$ 345,000,000
Ottawa-Hull		$174,120,000 (1965-71)	$113,370,000 (1971-76)	$106,660,000 (1976-81)	$ 41,390,000 (1981-86)	$ 435,540,000
Hamilton		$ 60,500,000 (to 1970)	$ 69,300,000 (to 1978)		$ 73,100,000 (to 1985)	$ 202,900,000
	*(City	$ 28,400,000	$ 24,800,000		$ 22,100,000	$ 75,300,000
	(Other	32,100,000	44,500,000		51,000,000	127,600,000
		*Provincial and Federal Subsidy				
Toronto						$1,000,000,000 (to 1980)
		35% rapid transit, 40% expressways, 25% arterials ($800,000,000 to Metro Toronto) ($350,000,000 included in Capital Works Program to 1973)				
Kitchener-Waterloo	$ 9,012,000 (1961-65)	$ 8,424,000 (1966-70)		$ 10,071,000 (1971-80)		$ 27,507,000
Saskatoon						$ 24,040,000 (1980)
London	$10,735,000 (1960-65)	$ 17,874,000 (1966-70)		$ 22,328,000 (1971-80)		$ 50,937,000
Windsor		$ 10,923,875 (1963-70)	$ 4,699,100 (1971-76)	$ 3,836,000 (1977-82)		$ 19,458,975
Victoria		$ 18,015,000 (1966-71)	$ 14,235,000 (1971-76)	$ 11,625,000 (1976-81)		$ 43,875,000
Edmonton						$ 133,500,000
Ft. William-Port Arthur						$ 20,350,000