SUMMARY REPORT

THE CORPORATION OF
THE CITY OF HAMILTON, ONTARIO

HAMILTON AREA TRANSPORTATION PLAN

HAMILTON, CANADA

DEPARTMENT OF TRAFFIC

CITY HALL

August 30, 1963.

His Worship Mayor Victor K. Copps,
City Hall,
Hamilton, Ontario.

Dear Mr. Mayor:

As instructed, the Technical Co-ordinating Committee for the Hamilton Area Transportation Study has prepared a summary version of the report on the Study, as received from the Consultants.

This summary report, which is submitted herewith, is intended to serve the needs of the majority of users. It presents all the major recommendations in the most concise form, without the large amounts of data, reasoning and textual description necessarily included in the Consultants' report. This may be considered as a "popular" or layman's version of the report, whereas the Consultants' report will be of greater interest and use to those technically involved and those requiring more detail.

The recommendations are presented mainly in the form of five maps, while the text is confined to the minimum essential as background and to enable an understanding of the recommendations.

Your Committee believes that this summary report is adequate to serve its intended purpose.

Respectfully submitted,

W E Ewens

(W. E. Ewens) P. Eng.,
Chairman,
Technical Co-ordinating Committee,
Hamilton Area Transportation Study.

PURPOSE AND SCOPE

This report presents a plan to meet the transportation needs of the Hamilton area through 1985. The objectives in the Study were to prepare a balanced plan, considering jointly the best use of highways, transit and terminal facilities as a system rather than as isolated projects, to integrate this transportation planning with land use planning, to make engineering analyses for determination of location, feasibility and cost of the proposed improvements, and to evaluate several alternative solutions and determine the priorities for specific projects. The plan was developed by the consulting firm of C. C. Parker & Parsons, Brinckerhoff Ltd., working closely with officials of the City of Hamilton, the Department of Highways, and other agencies.

The work was directed by a Technical Co-ordinating Committee made up of representatives from the participating agencies. The study area, consisting of the County of Wentworth and the Town of Burlington, was selected so as to include within it all of the land in the Hamilton Metropolitan Area which is expected to be urbanized by 1985. The plan includes an integrated program of new freeway construction, improvements to King's Highways and arterial streets, transit and parking requirements, railway grade separations, and truck route recommendations.

This summary report presents in concise form the principal components of the transportation system proposed. It does not contain the supporting data and details of the plan needed for its complete understanding and implementation. Because the maps illustrating it were produced by over-running in the production of the full report by the Consultants they bear figure and page numbers unrelated to the summary report.

DEVELOPING THE PLAN

A considerable amount of data was collected and analyzed to determine the needs of the study area. The collection of the necessary data was the joint responsibility of the participating agencies and the study staff and included an origin and destination survey, traffic volume counts and travel time measurements, population, employment, and land use data, an investigation of present transit operations, a physical inventory of the existing street and highway system, and the tabulation of accident statistics and other miscellaneous data. The origin and destination survey included a home-interview survey, in which all residents of selected sample households were asked for details of trips made on a particular day. The relationships between travel patterns and land use were established from an analysis of the origin and destination information. These relationships, when expressed as a series of mathematical equations, constitute the "traffic model". The extensive calculations required by this most modern technique were possible only with the use of an electronic computer. Use of these methods will make periodic revisions

of the plan readily possible. The pattern of future travel in the study area was determined by applying these relationships to the land use, population, and employment forecasts prepared by the local planning agencies.

The population of the study area is expected to reach 723,000 by 1985; almost double its present total of 372,000. The population of the City of Hamilton itself is expected to increase by about 60 per cent, while growths of more than 140 per cent and 180 per cent are expected in the Hamilton-Wentworth Planning Area and the Town of Burlington, respectively. Substantial growth is forecast for the area on the Mountain south of Mohawk Road within the City, with the present population of just over 8,000 people increasing to about 116,500 by 1985. As a result of these population growths and other factors, the number of motor vehicles registered in the study area is expected to increase by 130 per cent. Employment in the City of Hamilton is expected to grow from 110,000 in 1961 to 205,000 by 1985, which would be about 70 per cent of the projected total study area employment of 290,000.

The present transportation system will be completely incapable of accommodating the increased travel which will accompany this growth. The estimated losses resulting from accidents, congestion and delay in the downtown area alone amounted to $1,000,000 for the year 1961. Over the whole of the City the corresponding loss was estimated at more than $13,000,000. If no improvements were made in the interim period, the estimated loss for the study area would exceed $50,000,000 per year by 1985.

Already serious congestion exists in the central business district as well as in various other areas. The congested areas include the Mountain access routes, which cannot accommodate an increased volume of traffic primarily because of capacity deficiencies at their terminals. The capacity provided on the approaches to the major industries in the City is insufficient for the present traffic demand. These deficiencies are most critical in the core of the industrial area and Burlington Street is now at its possible capacity easterly from Birch Avenue.

Although improvements to the efficiency of the traffic signal system and a program of street widenings, together with increased restrictions on curb parking and turns, would increase the capacity of the present network of arterial streets and highways, it was found that this increase would still be insufficient to accomodate the 1985 traffic volumes.

Consequently several transportation systems were evaluated in order to determine the most suitable plan for the Hamilton area. These systems were of two basic types. The first was a highly modernized public transportation system; and the second, a freeway system with integrated, but less ambitious, transit improvements.

Variations within each type of system were also considered, using such factors as traffic service, engineering feasibility, cost, the role of public transportation, compatibility with existing and future land use, property damage, integration with the existing street and highway system, present traffic needs, and flexibility for stage construction. Comparative analysis of the various possibilities and these factors produced the recommended plan. The final plan includes and is based on maximizing the capacity of the present street system by such means as signal system modernization, street widenings, intersection improvements, parking prohibitions and turn prohibitions. Many of these measures are urgently necessary to reduce the present high rate of economic loss and the very large number of accidents. If these improvements are not carried out, even the recommended freeway system will not be adequate to meet the expanding needs for safe and convenient travel within the study area.

THE RECOMMENDED PLAN

Due to the nature and distribution of the expected growth in the Hamilton area it was found that a transit-dominant transportation system is not feasible. Because the great majority of future travel will continue to be accomplished by automobile, an integrated program of street, highway and freeway improvements, estimated to cost approximately $200 million, will be required to accommodate the 1985 traffic demand. An integral part of the transportation plan will be a transit system that will include the use of buses on the freeways and arterial streets. The recommended plan of freeways, expressways and King's Highways is shown on the map of the study area on the following page. Supplementing these facilities will be a network of arterial streets and local improvements that are vital to a comprehensive system.

The facilities which form this highway plan include "Freeways", which are high-capacity grade-separated highways with complete control of access, "Expressways", which are similar to freeways except that they are designed for lower speeds and permit some signalized intersections and limited control of access, and "Arterial Streets", which are city streets which carry heavy volumes of traffic.

FREEWAYS, EXPRESSWAYS AND KING'S HIGHWAYS

East-West Freeway. This freeway, extending 7.2 miles from Highway 403 Freeway (the so-called Chedoke Expressway, now under construction), to connect with the Red Hill Creek Freeway, will be one of the most beneficial routes in the proposed system. It will provide excellent service to two major traffic generators in the City — the central business district and the Bayfront industrial area. It is an integral part of the plan to provide direct freeway access to and from the study area and in particular to and from the major Mountain access routes. It will also

provide a much-needed western exit for traffic from the lower City and industrial area by connecting with Highway 403 and the Q. E. W. While the $53.8 million cost is considerable it will be of vital importance to the growth of the city.

Highway 53 Freeway. With the rapid development in the Mountain area the present arterial street system will be severely overloaded by 1985. The proposed Highway 53 Freeway will relieve this congestion by distributing traffic from Highway 403 Freeway and the proposed Red Hill Creek Freeway, as well as distributing traffic to various major north-south connections.

Red Hill Creek Freeway. The study verified the need for a freeway in the vicinity of Red Hill Creek. This facility will act as the major entrance to the City at the northeast; it will connect the southeast Mountain area with the future east industrial area and it will serve as a by-pass route for through traffic.

Stoney Creek Expressway. This 2.8 mile expressway is essentially an extension of the East-West Freeway between Red Hill Creek Freeway and Highway 8. It gives improved access to the future developments east of Red Hill Creek.

North-South Freeway. Inherent in the problem of Mountain access is relief from the congestion that exists in the central business district due to traffic going to or from the present Mountain access routes. Traffic from the industrial area destined for the Mountain is forced through the Central Business District. The North-South Freeway will fill a dual role: provide additional Mountain access that will divert traffic from the central business district, and serve as a link in the freeway system between the Mountain area and the East-West Freeway.

Tunnel alternatives to this proposal were fully explored. It was found that tunnels would cost up to $30 million more to produce the same capacity. In addition, the portal for a tunnel would require acquisition of a very long strip of land and would extend south of Fennell Avenue. Thus it would be damaging to land use in the area and would provide very poor service for many persons living between the Mountain brow and this access point well to the south of them.

Extension of 403 and Q. E. W. Improvements. Traffic demands for additional capacity between Toronto and Hamilton will require the extension of Highway 403 in the northeasterly direction, from the Queen Elizabeth Way at Freeman to the limit of the study area, before 1985. The Q. E. W. will require widening throughout the study area, including a twin Skyway structure on the Beach Strip.

King's Highways. In addition to the Queen Elizabeth Way and Highway 403, other King's Highways form important links in the area's transportation network.

Capacity deficiencies existing today and expected by 1985 were evaluated and improvements are proposed as part of the recommended plan. These improvements consist primarily of the widening of existing two-lane highways. They are shown on the preceding map. Included are improvements to Highways 2, 5, 6, and 8, as well as several other King's Highways within the study area, at an estimated cost of over $17 million.

ARTERIAL STREETS

In the future, the arterial street system will accommodate movements not directly served by the freeways and will provide access to the freeway interchanges. A number of improvements will be required to provide sufficient capacity for this demand, and to integrate the freeway system with the existing arterial street network so that each, selectively, can provide the type of traffic service for which it is best suited. In addition, the arterial streets must carry present and increasing future volumes until the freeways have been completed. Improvements for this interim period are essential, both to permit the streets to carry the necessary volumes of traffic and to reduce the present accident record with its high economic losses.

The map on the following page shows the major improvements recommended, and a brief description of these and of the service they will provide is given below.

Below the Escarpment

Much of the present congestion in central Hamilton will be relieved by the East-West Freeway but some street widenings will be necessary to provide adequate access to this facility and to the proposed Claremont Access. The present lack of capacity on King Street between Wellington and Mary Streets will require the development of an alternative route to King Street along Wilson, Gore and Vine Streets. In order to provide sufficient capacity for east-west movements at the base of the escarpment it will be necessary to develop a continuous four-lane street along the alignments of Charlton Avenue, Cumberland Avenue, and Lawrence Road.

Because considerable industrial expansion is expected in the Bayfront area, six lanes will be required on Burlington Street east of Birch Avenue to accommodate the 1985 demand. This growth will also increase the volume of north-south traffic in East Hamilton. Sherman and Gage Avenues will require widening and it will be necessary to develop one-way pairs along Kenilworth and Crosthwaite Avenues, and Wentworth Street and Sanford Avenue. Widening will be necessary along Malta Street, Cochrane Road and Strathearn Avenue in order to provide adequate access to the Red Hill Creek Freeway.

Growth in the Dundas area will increase the east-west traffic volume through West Hamilton by 50 per cent. It is recommended that Aberdeen Avenue and the King-

Fig. 50

ARTERIAL STREET IMPROVEMENTS

CITY OF HAMILTON

- 1985 ARTERIAL STREETS
- PROPOSED NEW CONSTRUCTION
- PROPOSED WIDENING
- IMPROVED INTERSECTION
- PROPOSED FREEWAYS

In the future, the arterial street system will accommodate movements not directly served by the freeways and will provide access to the freeway interchanges. A number of improvements will be required to provide sufficient capacity for this demand. The recommended street improvement program will integrate the freeway system with the existing arterial street network so that each, selectively, can provide the type of traffic service for which it is best suited.

Main one-way pair be extended westerly to Highway 102 to provide sufficient capacity for this increased demand. The extension of Aberdeen Avenue, in addition, will provide a much needed alternative in the event of any emergency closure of King or Main Streets.

Mountain Access

The construction of other Mountain access facilities in addition to the freeways mentioned previously is recommended. The Claremont Hill Access will connect Wellington and Victoria Streets with West Fifth and Upper James Streets. Service at the west end of the Mountain would be provided by a new facility in the vicinity of Garth Street. It is also recommended that St. Joseph's Drive connect the Sherman Cut with Charlton Avenue only. This latter proposal will permit the closing of St. Joseph's Drive west of Charlton Hill and between the Sherman Cut and Flock Road.

South of the Mountain Brow

On the Mountain itself the Highway 53 Freeway will provide excellent service for east-west movements south of Mohawk Road. Congestion will develop, however, on the major streets north of Mohawk Road. A number of intersection improvements are recommended to relieve this situation. In addition, the collection and distribution of traffic from the North-South Freeway will require the development of a one-way pair along Brucedale and Queensdale Avenues.

RAILWAY GRADE CROSSING IMPROVEMENTS

The major streets and highways in the Hamilton area frequently intersect major railway lines. Adequate protection is now provided at these intersections in the rural areas, but there are a number of hazardous railway crossings within the City. In addition, the rail movements interfere with the flow of traffic and reduce the capacity of the street system considerably. Using standards accepted by the Board of Transport Commissioners, a program of railway grade crossing improvements was developed and is recommended as an integral part of the transportation plan.

The expected increase in traffic volumes and reduction of existing hazards on the arterial street system will warrant the construction of 14 new grade separations with the railway lines, and the provision of signals and gates at many other grade crossings. It is also recommended that the C. N. R. line on Ferguson Avenue and the T. H. & B. line near Gage Avenue be relocated if possible.

TRANSIT FACILITIES

The transit plan was developed from an analysis of future trip generation and distribution and an investigation of the split of traffic volumes between the

automobile and public transit modes of travel. Although the great majority of future travel in the area is expected to be accomplished by automobile, it is expected that with full implementation of the transit plan, transit usage will increase by 70 per cent.

If all of the 1985 transit trips were to be accommodated by automobile, the demands on the area's streets, highways, freeways, and parking facilities, particularly in the central sections, would be considerably greater than indicated in the 1985 highway plan. The development of the transportation plan has indicated that the public transportation requirements of the area will be best met in the 1961-1985 period by a comprehensive network of local, limited-stop, and express bus services.

Express service is proposed, to the maximum extent warranted by traffic volumes, on important sections of the freeway and expressway network of the highway plan. Local routes should provide the basic service and should be operated at relatively frequent time intervals, with six to eight stops per mile in urban sections. Limited-stop service should be provided on the inner sections of certain longer routes as warranted. Such service operates along major arterials, often shared with local routes, but with stops only at major intersections, about one-half mile apart.

The recommended transit routes are shown on the maps on the following two pages.

PARKING

Present and future parking requirements were also investigated during the course of the study. It was found that there is a surplus of parking space in the downtown area at present, with only 70 per cent of the available space being utilized during the peak accumulation of parkers. As the parking demand increases, however, the demand for building space and the increasing need for curb-parking restrictions will reduce the supply of parking space. Consequently new parking facilities will be required in the intermediate future. It is estimated that by 1985 there will be a total requirement for 12,500 public and private parking spaces in the downtown area which represents an increase of about fifty per cent over the present capacity.

TRUCKING

Studies completed as bases for this report indicate that the number of trucks registered in the Hamilton area will increase 75 per cent by 1985. Accordingly a plan of truck routes was prepared for the year 1985, and is shown on the third following map.

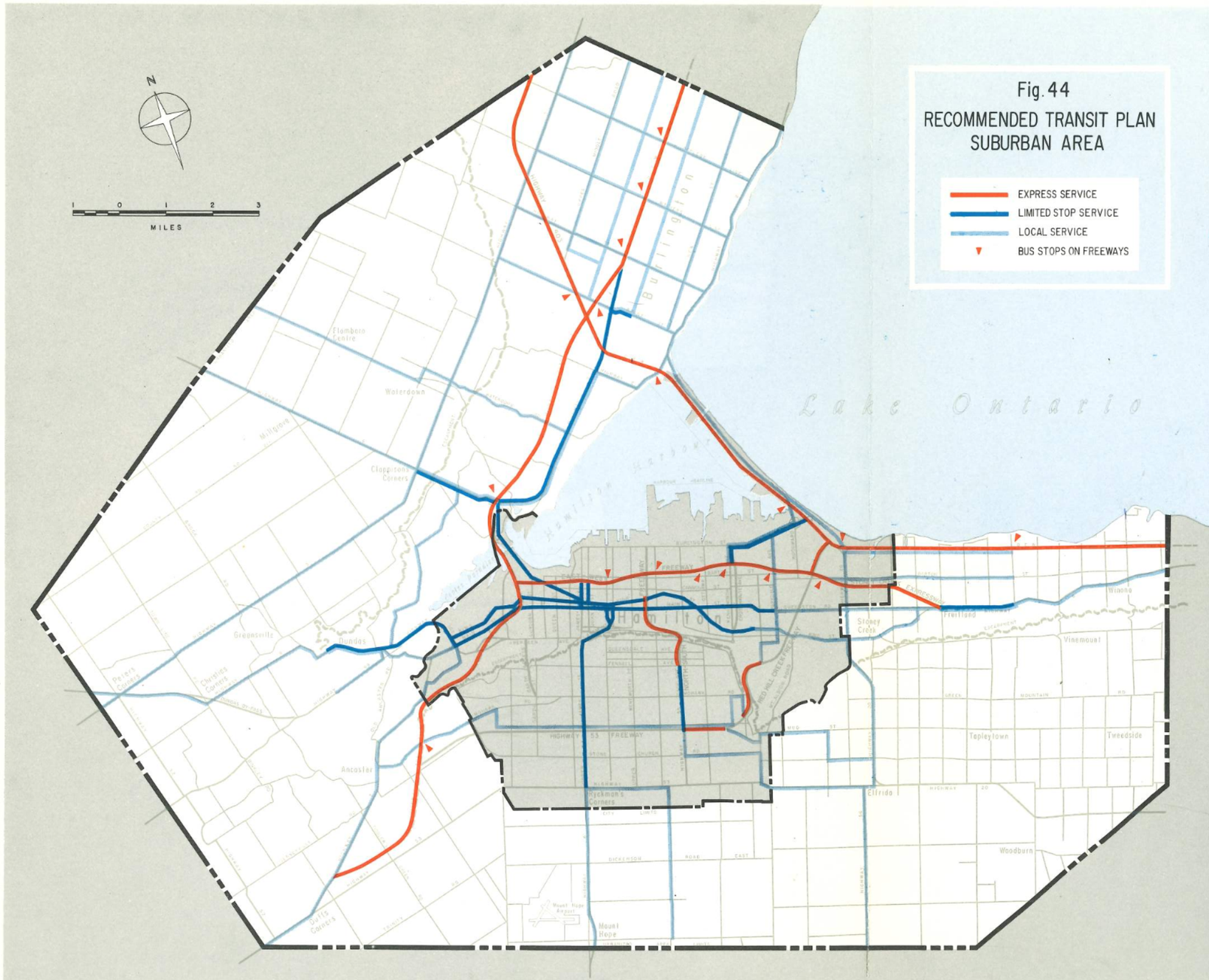


Fig. 44

RECOMMENDED TRANSIT PLAN
SUBURBAN AREA

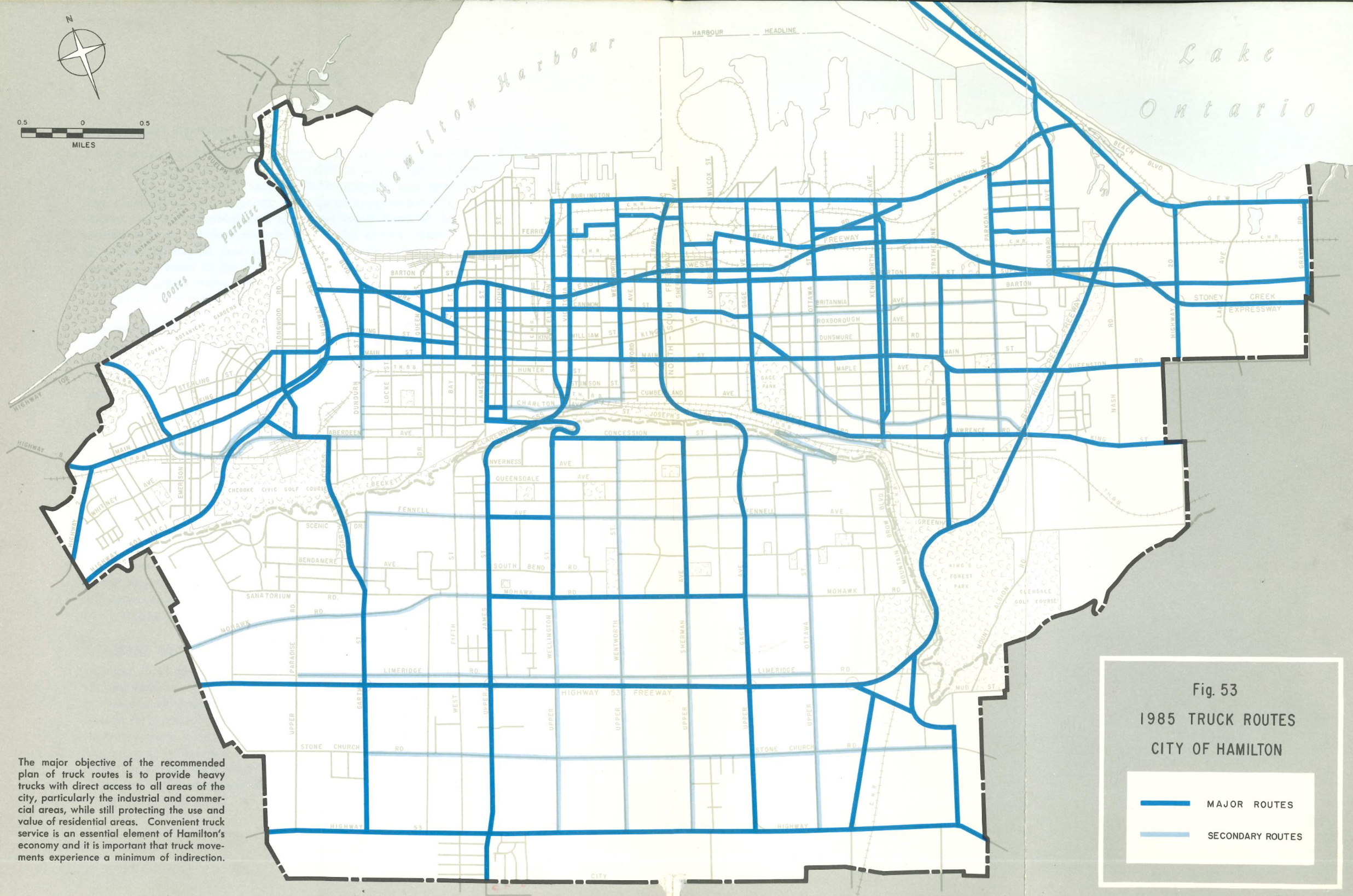
- EXPRESS SERVICE
- LIMITED STOP SERVICE
- LOCAL SERVICE
- BUS STOPS ON FREEWAYS

During the 1961-85 period the public transportation requirements of the Hamilton area will be best met by a comprehensive network of local, limited-stop, and express bus services which will provide frequent and fast service coverage with a minimum of transferring. The recommended transit plan has been developed to meet the 1985 needs of the area and will complement and integrate with the recommended street and highway system.

Fig. 45
RECOMMENDED TRANSIT PLAN
CITY OF HAMILTON

EXPRESS SERVICE
LIMITED STOP SERVICE
LOCAL SERVICE
BUS STOPS ON FREEWAYS

The transit plan provides for a basic network of local bus routes radiating principally from downtown Hamilton and most of these routes will terminate within four miles of the central business district. Longer routes will generally operate as express services via freeways or as limited-stop services on arterial streets but these services will become local routes in the suburban areas.



The major objective of the recommended plan of truck routes is to provide heavy trucks with direct access to all areas of the city, particularly the industrial and commercial areas, while still protecting the use and value of residential areas. Convenient truck service is an essential element of Hamilton's economy and it is important that truck movements experience a minimum of indirection.

Fig. 53

1985 TRUCK ROUTES

CITY OF HAMILTON

MAJOR ROUTES

SECONDARY ROUTES

ECONOMIC JUSTIFICATION

The future development and prosperity of the Hamilton area will be vitally affected by the transportation plan recommended in this report. Already the economic losses to the community through traffic congestion, indirectness of routes and the high accident rate are staggering. The losses are most severe in the central business district and the industrial area along the south shore of the Bay, but will affect increasingly the whole economic life of the greater Hamilton area. Therefore, the estimated capital cost of the recommended transportation system must be viewed in relation to the economic benefits that will accrue to the community. While only a few of the benefits can be measured in monetary terms, these alone indicate that the potential savings are exceptionally high.

Two methods of measuring these savings were used. One, the "benefit-cost ratio" divides the annual road-user savings by the annual capital cost, and any figure in excess of 1.3 is generally considered sufficient to establish the economic worth of a recommended facility or system. The other method is the "rate of return on the investment", in which the annual road-user savings are considered as a dividend or interest rate on the invested capital over a 30 year period. A 10 per cent rate of return is commonly taken to be adequate justification for undertaking construction.

The benefit-cost ratio for the recommended system is 4.89 and the rate of return on capital investment is 35.4 per cent. Therefore construction of the recommended street and highway system is amply justified by direct savings to the motorist, the trucker, industry and commerce through lower operating costs, lower accident rates, substantial time savings and increased comfort and convenience.

On the basis of the estimated revenue passenger trips attracted to the recommended transit system in 1985, the resulting operating revenue should be sufficient to meet all normal expenses of transit operation, together with debt service or depreciation of the rolling stock, land, buildings, inspection, and maintenance facilities required.

STAGING AND FINANCING

In order to obtain the maximum benefit from the recommended improvements, the implementation of the plan must follow a logical sequence. The three stages of construction presented in the tables which follow indicate the needs of the study area in their order of priority. Because of the limitations on funds, however, it has been necessary to assign some facilities that would provide immediate benefit to Stage 2, and, in the case of the East-West Freeway, to Stage 3. The cost estimates contained in these tables are based upon 1962 price levels and while a contingency allowance is included there is no provision for increased costs due to inflation.

The cost sharing indicated in the tables is based upon anticipated highway connecting link designations. These designations are subject to further negotiations between the Province and the City.

CONCLUSIONS

The recommended transportation plan presented herein was developed after a full appraisal of the present and future needs of the Hamilton area and although it does involve a substantial capital investment, it is felt to be financially feasible and is fully justified by economic considerations. This plan will, when implemented, alleviate many of the restrictions which the topography of the area has imposed upon the development of the City. Under this plan adequate capacity is provided for all essential movements within the City and for traffic approaching the City from outside points.

The recommended plan was evolved to provide a balanced, integrated solution whereby each mode of transportation fulfills the function for which it is best suited. For example, transit operations will continue to play a vital role in serving the area's major traffic generators, particularly during peak periods. The plan is an important first step in the continuing transportation function.

While the need for the recommended highway and transit facilities has been determined on the basis of long range planning, many key links in the system are needed now and are indeed overdue. Coupled with the construction of improvements which are part of the plan must be a continuous program of traffic regulatory measures to assure the best use from the present streets and highways and the new projects that will be built in the future. It is hoped that the plan presented in this report will serve as a guide for the important work that now can and must be done if the Hamilton area is to be properly served.

THE RECOMMENDED PLAN — COSTS AND STAGING

FACILITY	LIMITS	COST SHARING (Costs in Millions) CITY	OTHER*	TOTAL
STAGE 1 (To 1970)				
Freeways and King's Highways				
East-West Freeway	Hwy. 403 to James Street	5.6	6.5	12.1
North-South Freeway	Fennell Avenue to Main Street	6.5	3.2	9.7
Property Acquisition	Hwy. 53 Fwy., Red Hill Creek Fwy., East-West Fwy., Stoney Creek Expwy.	2.8	1.3	4.1
Queen Elizabeth Way Widening	From Highway 2 North-Easterly	—	3.3	3.3
King's Highways	Various Locations	—	7.4	7.4
Arterial Street Improvements				
Burlington Street	Birch Avenue to Kenilworth Avenue	2.7	2.4	5.1
Kenilworth-Crosthwaite	Burlington Street to King Street	2.4	1.7	4.1
Aberdeen Avenue Extension	Longwood Road to Highway 102	0.9	0.4	1.3
Charlton-Cumberland	Gage Avenue to Queen Street	1.3	1.1	2.4
York Street Widening	Oxford Street to Locke Street	0.3	0.2	0.5
Misc. Arterial Streets	Various Locations	2.4	1.2	3.6
RR Grade Crossing Improvements				
Gage Avenue Grade Separation	Barton Street to Burlington Street	2.2	2.1	4.3
Ottawa Street Grade Separation	Beach Road to Burlington Street	1.1	1.1	2.2
Misc. Crossing Improvements	Various Locations	0.2	0.2	0.4
	TOTAL STAGE 1	28.4	32.1	60.5
STAGE 2 (To 1978)				
Freeways and King's Highways				
East-West Freeway	James Street to Birch Avenue	10.1	11.0	21.1
North-South Freeway	Main Street to Burlington Street	7.1	3.5	10.6
Red Hill Creek Freeway	King Street to Mohawk Road	4.5	2.3	6.8
Queen Elizabeth Way Widening	From Skyway Bridge Easterly	—	12.0	12.0
King's Highways	Various Locations	—	9.8	9.8
Arterial Street Improvements				
Claremont Access	Inverness Avenue to Hunter Street	1.6	3.5	5.1
Misc. Arterial Streets	Various Locations	0.4	0.7	1.1
RR Grade Crossing Improvements				
Misc. Crossing Improvements	Various Locations	1.1	1.7	2.8
	TOTAL STAGE 2	24.8	44.5	69.3
STAGE 3 (To 1985)				
Freeways and King's Highways				
East-West Freeway	Birch Avenue to Red Hill Creek Fwy.	7.0	12.1	19.1
Stoney Creek Expressway	Red Hill Creek Fwy. to Hwy. 8	1.4	3.5	4.9
Red Hill Creek Freeway	Queen Elizabeth Way to King Street	4.0	2.0	6.0
Highway 403 Extension	From Queen Elizabeth Way Northerly	—	6.2	6.2
Queen Elizabeth Way Widening	Twin Skyway and Approaches	—	20.9	20.9
Highway 53 Freeway	Red Hill Creek Fwy. to Hwy. 403	6.0	3.0	9.0
Arterial Street Improvements				
Garth Street Access	Fennell Avenue to Aberdeen Avenue	2.2	1.1	3.3
Misc. Arterial Streets	Various Locations	0.1	—	0.1
RR Grade Crossing Improvements				
Misc. Crossing Improvements	Various Locations	1.4	2.2	3.6
	TOTAL STAGE 3	22.1	51.0	73.1
	TOTAL STAGES 1, 2 and 3	**75.3**	**127.6**	**202.9**

* Includes Provincial and Federal Subsidy

RECOMMENDED HIGHWAY PLAN
FOR THE
HAMILTON AREA

- FREEWAYS PROPOSED
- FREEWAYS EXISTING
- KINGS HIGHWAYS IMPROVED
- INTERCHANGE PROPOSED
- INTERCHANGE EXISTING
- 1985 ARTERIAL STREETS

The recommended highway plan was developed after a full appraisal of the present and future needs of the study area. Adequate capacity is provided through 1985 for circulation within the city and for traffic approaching the city from outside points. An integrated program of arterial street improvements and transit, parking and truck route recommendations was also developed to complement the highway plan.